

**DARK THEME (Do not print; will waste ink)**

**Reminders:**

- This reviewer is split into two parts, one for the first semester and another for the second. The reason is it is too big to be put into one document.
- The subjects within this reviewer are all STEM subjects for Grade 11.
- These are compiled based on my notes that I typed during classes and from PowerPoint presentations and other learning materials provided.
- This reviewer might contain wrong/inaccurate information; if you spot one, I would be glad to correct it.
- This reviewer is available in default light mode, separated by subjects, and dark mode (the background is black – dark gray). If you're planning to have this printed, PLEASE USE THE LIGHT MODE ONE, AS THE DARK MODE VERSION WILL PRINT WITH THE DARK BACKGROUND AND WILL WASTE PRINTER INK.
- If you have any concerns, please contact me on [contentbyelmerf@gmail.com](mailto:contentbyelmerf@gmail.com).

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## 21<sup>st</sup> Century Literature from the Philippines & the World

### A. Periods of Philippine Literature

#### Pre-historic period

- Literature was principally oral in as much as writing was not yet invented and more of the works were concise poetic.

Bugtong (Riddles)	Dalit (Religious song)
Salawikain (Proverbs)	Kundiman (Love song)
Kasabihan (Saying)	Dipayanin (Drinking song)
Kantahing bayan (Folk song)	Hibais (Travel song)
Oyayi (Lullaby)	Bung-aw (Funeral song)
Soliranin (Boat song)	Bansal (Courting song)
Kumintang (War song)	

Diona (Wedding song)	
- With the passage of time Oral Literature becomes lengthy and this long form was known as epics. Examples are:	
Biag ni Lam-ang (Ilocanos)	Bantugan (Muslims)
Alim and Hudhud (Ifugaos)	Indarapatra and Sulayman (Maguindanao)
Kumintang (Tagalog)	Tatuaang (Bagobos)
Ibalon (Bicolanos)	
Maragtas and Hinilawod (Visayas)	
Hari sa Bukid (Hiligaynon)	
Dagoy and Sudsud (Tagbanuas)	

- Prose and works
  - Alamat (Legends)
  - Myth (Mito)
  - Kwentong Bayan (Folk tales)
  - Pabula (Fables)
  - Parabola (Parables)
- The oral works are able to be translated into written works through the use of syllabary called Baybayin.
  - Baybayin
    - Ferdinand Magellan is the one who discovered the Philippines.
    - The mission of Spanish Friars is to spread Christianity.
    - Doctrina Christiana: Catholic book of prayers and doctrines.
    - 
    - Francisco Baltazar (Ama ng Balagtasan)
      - o Wrote the immortal allegorical work entitled Florante at Laura
    - Awit composed of dodecasyllabic monoriming quatrains as opposed to Korido which is octasyllabic monoriming quatrains.
    - Crisostomo Sotto: Father of Pampango Literature
    - Pedro Bukaneg: Father of Ilocano Literature
    - Fr. Modesto De Castro: Wrote Ubana and Felisa (Book of etiquette)

### Spanish Period

- More productive part of the period
- The propagandist raised led by Dr. Jose Rizal battted for assimilation.
- Gat Andres Bonifacio: Head of the Revolutionists and the Supremo of the Katipunan.
- Pseudonyms
  - o Rizal – Dimas Alang, Laong Laan
  - o Del Pilar – Plaridel
  - o Jaena – Diego Laura
  - o Jose Ma. Panganiban – Jomapa

### American Period

- Americans defeated the Spaniards in the Spanish-American War which resulted in the Treaty of Paris (the treaty that sold the Philippines to America)
- Introduced the public-school system in the Philippines and the English Language.
- Thomasites: First English teachers, they are called Thomasites because they boarded the SS Thomas when they arrived at the Philippines.

List of periods of Philippine Literature in English	
Period of orientation (1900-1910)	Post-war period (1945-1950)
Period of apprenticeship (1910-1920)	Modern period (1951-1971)
Period of experimentation (1920-1940)	Martial law era (1971-1986)
Period of discontent (1941-1944)	Contemporary period (1986-present)

Similarities and differences of periods of the Philippine Literature	
Period of re-orientation (1898-1910)	Period of activism (1970-1972)
Period of imitation (1910-1925)	Period of new society (1972-1981)
Period of self-discovery (1925-1941)	Period of the Third republic (1981-1985)
Post-war re-orientation (1945)	Contemporary period (1986-present)
Rebirth of freedom (1946-1970)	

### Japanese Period

- The invaders saw to it that Filipino movements to be limited.
- The writers stop wielding pens and started wielding guns.
- They introduced Nippongo and their literary arts and forms.
- Ikebana: Art of arranging flowers
- Origami: Art of folding papers
- Tempura and sushi: Cuisine
- Haiku
  - o About Nature
  - o Consisting 17 syllables
  - o 5-7-5
- Senryu
  - o About human nature
  - o The tone is satirical and ironical
  - o 5-7-5
- Tanka
  - o Has 5 lines and 31 syllables
  - o 5-7-5-7-7
- Carlos Palanca Memorial Awards for Literature
  - o Known to be the most prestigious and longest-running award-giving body in the field of literature, equivalent to the world-renowned Pulitzer Prize.

### Martial Law

- September 21, 1972
- The freedom of the press was curtailed in much the same way as the other freedoms (speech, assembly) were suppressed.
- Ended January 1, 1981
- EDSA revolution: the climax and most intense protest

### Reform the Army Movement (RAM): Marcos loyalist soldiers

## B. Literary works of Region IV

### Region IV A (CALABARZON)

- Regional capital: Calamba City, Laguna
- Composed of the following provinces: Cavite, Laguna, Batangas, Rizal, and Quezon.
- The region where the Philippines' independence was declared in June 12, 1898 (Kawit, Cavite)

#### Cavite

- Located on the southern shores of Manila Bay.
- Known as the “Historical Capital of the Philippines” and was the cradle of Philippine revolution.
- Main Languages: Tagalog, Chavacano, English.

Writer	Background	Literary Works
Mars Ravelo	October 9, 1916 – September 12, 1988	Darna, Dyesebel, Captain Barbell, Lastikman, Bondying, Varga, Wanted: Perfect Mother, Hiwaga, Maruja, Mariposa, Roberta, Rita, Buhay Pilipino, Jack and Jill, Flash Bomba, Tiny Tona, Dragonna

#### Laguna

- Capital: Santa Cruz

Writer	Background	Literary Works
Dr. Jose Rizal Jose Protasio Rizal Mercado y Alonzo Realonda	June 19, 1861 – December 30, 1896 Ophthalmologist (eye expert)	Noli Me Tangere El Filibusterismo Mi Ultimo Adios Kundiman (Tagalog)

#### Batangas

- Often referred to by its ancient name Kumintang.
- Called the heartland of the Tagalog language by the Summer Institute of Linguistics.

Writer	Background	Literary Works
Bienvenido Lumbera	National Artist of the Philippines and a recipient of the Ramon Magsaysay Award for Journalism, Literature and Creative Communication. Received the Carlos Palanca Memorial Award	Ka Bel The Yaya's Lullaby Servant Sadness Magic Eulogy of Roaches

#### Rizal

- Named after Jose Rizal

Writer	Background	Literary Works
Maestrio Lucio D. San Pedro	Angono Rizal February 11, 1913 – March 31, 2002	Sa Ugoy ng Duyan Lahing Kayumanggi

#### Quezon

- Named after Manuel L. Quezon
- Capital: Lucena City

Writer	Background	Literary Works
Paz Marquez-Benitez	Born in 1894 in Lucena, Tayabas (now Quezon)	Dead Stars A Night in the Hills Filipino Love Stories

### C. Textula

- Poetry genre mastered by Frank Rivera
- Entire poems are written and read on mobile phones
- Traces its origins to the traditional Tagalog form of Poetry called Tanaga
- A short poetry in a form of tanaga, dalit, at diona, that is sent through SMS on mobile phone with your friends, families, loved ones, and through netizens.
- Consists of 4 lines with 7 syllables each
- Rhyme schemes may vary in Textula:

AAAA/Basic

ABBA/Inipit

ABAB/Salitan

AABB/Sunuran

### D. Poetry

#### Definition

- A collection of words that express an emotion or idea.
- Literary attempts to share personal experiences and feelings.
- Good poems show images which leave the reader the sense of delight, awe and wonder.
- A type of writing that uses language to express imaginative and emotional qualities instead of or in addition to meaning.
- May be written as individual poems or included in other written forms as in dramatic poetry. Hymns, or song lyrics.
- Poetry requires
  - o Creativity
  - o Emotion
  - o Artistic quality
  - o Logic

#### Key elements

- Form
- Speaker
- Sound
- Imagery
- Figurative language
  - o The use of words outside of their literal or usual meaning to add beauty and force.

- Characterized by the use of similes and metaphors.
- Simile
  - A direct, explicit comparison of one thing to another in which the words *like* or *as* are used.
  - Example: Your voice is *as* beautiful as the Selecta Ice cream music.
- Personification
  - Strategy of giving animate qualities to abstract concepts, or inanimate things.
  - Example: This *handless* clock stares *blindly* from its tower.
- Onomatopoeia
  - The attempt to echo or imitate sounds with words.
  - Example: *Meow meow* I'm a cow
- Hyperbole
  - An exaggeration.
  - Example: I have been listening to this song for a million times now.
- Rhyme
  - Matching of sounds that are similar.
- Rhythm
  - Movement with uniform recurrence of a beat or accent. In its crudest form rhythm has a beat with little or no meaning.
- Alliteration
  - Repetition of the initial letter or sound in two or more words in a line.
- Repetition
  - Using the same key word or phrase throughout a poem.
- 

### Types of poetry

- Free verse
  - Doesn't follow any patterns in rhythm, rhyme scheme, line length
- Haiku
  - Three-line Japanese poetic form
  - 5-7-5
  - About nature
- Narrative poem
  - A poem that tells the sequence of events of a story
- Sonnet
  - Very structured 14-line poem that follows a specific rhyme structure and rhythm.
  - Two most common sonnets are Italian and English sonnets.
  - William Shakespeare wrote many English sonnets, which are also referred to as Shakespearean sonnets.

## **E. Context**

Key to understanding text

- Context is the background, environment, setting, framework, or surroundings of events or occurrences. Simply context means circumstances forming a background of an event, idea or statement, in such a way as to enable readers to understand the narrative or a literary piece. It is necessary in writing to provide information, new concepts, and words to develop thoughts.
- Whenever writers use a quote or a fact from some source, it becomes necessary to provide their readers some information about the source, to give context to its use. This piece of

information is called context. Context illuminates the meaning and relevance of the text, and may be something cultural, historical, social, or political.

### Function

- Context is all about providing a background or picture of the situation, and who is involved. Context is an essential part of a literary text, which helps engage the audience. If writers ignore context, they may overlook a critical aspect of the story's intent. Without context, readers may not see the true picture of a literary work. Context helps readers understand the cultural, social, philosophical, and political ideas and movements prevalent in society at the time of the writing.

### Types of context

#### 1. Author's context vs. reader's context

- Austen was hunched over her small writing desk in the village of Chawton during England's Georgian era as she wrote Persuasion. You are more likely reading it in a cozy bed, listening to Taylor Swift and half considering what you're going to watch on Netflix later. Remember, your current social and cultural context can have a great influence on how you read a text, so it's always important to imagine the author's own context - whether this be very similar, or very different from the context of their text. It's as easy as a Google search!

#### 2. Social context

- Social context of a text is the way in which the features of the society it is set in impact on its meaning. There are two aspects to social context: the kind of society in which the characters live, and the one in which the author's text was produced.

#### 3. Historical contexts

- The historical context of a text is entangled with its social context, as underlying norms and convention are historically specific. The historical context is important to note especially when large changes have occurred between the time the work was produced, and our current day, so it is not assessed by our own concerns alone.

#### 4. Cultural contexts

- Culture refers to a particular "Way of life", involving religion, race and nationality, as well as things like food, dress code and manners. Furthermore, culture can relate to art, music, writing and literature itself. Cultural context, which is similarly linked with social, historical and ideological context, is especially important to note if the author is attempting to make a comment on an aspect of culture, or a clash of two cultures.

## F. Literary Adaptation

- Literary adaptation is the adapting of a literary source (e.g. a novel, short story, poem) to another genre or medium, such as a film, stage play, or video game.
- It can also involve adapting the same literary work in the same genre or medium just for different purposes, e.g. to work with a smaller cast, in a smaller venue (or on the road),

or for a different demographic group (such as adapting a story for children). Sometimes the editing of these works without the approval of the author can lead to a court case.

- It also appeals because it obviously works as a story; it has interesting characters, who say and do interesting things. This is particularly important when adapting to a dramatic work, e.g. film, stage play, teleplay, as dramatic writing is some of the most difficult. To get an original story to function well on all the necessary dimensions—concept, character, story, dialogue, and action—is an extremely rare event performed by a rare talent.
- Perhaps most importantly, especially for producers of the screen and stage, an adapted work is more bankable; it represents considerably less risk to investors, and poses the possibilities of huge financial gains. This is because:
  - It clearly works as a literary piece in appealing to a broad group of people who care.
  - Its title, author, characters, etc. may be a franchise in and of themselves already.
  - It has already attracted a following.
    - It already attracted a following
    - It clearly works as a literary piece in appealing to a broad group of people who care
    - Its title, author, characters, etc. may be a franchise in and of themselves already

### Process

- Plagiarism occurs in every genre, and throughout history, but such literary rights violations can be challenged in court. In the case of Hollywood films, judgments for the plaintiff can run into the millions of dollars, but these have typically been for outright theft of a screenplay idea rather than for fraudulent adaptations (see Buchwald v. Paramount).
- Because of the importance of telling a story with a limited number of characters, short stories often make better sources for adaptable material than do novels.<sup>[5]</sup> For the stage, in addition, theater audiences tend to accept and prefer works of a more conceptual, thought-based nature,<sup>[6]</sup> meaning their preferences need to be considered when selecting a work for adaptation, but also when determining how best to adapt it. The stage imposes physical limits of size and technology. Not every illusion that can be made to appear real on the movie screen can be made to appear so on stage.

### Types of adaptation

- Film Adaptation

- The transfer of a work or story, in whole or in part, to a feature film. Although often considered a type of derivative work, film adaptation has been conceptualized recently by academic scholars such as Robert Stam as a dialogic process. A common form of film adaptation is the use of a novel as the basis of a feature film. Other works adapted into films include non-fiction (including journalism), autobiography, comic books, scriptures, plays, historical sources and other films. From the earliest days of cinema, in nineteenth-century Europe, adaptation from such diverse resources has been a ubiquitous practice of filmmaking.

- Television Adaption

- Feature films are occasionally created from television series or television segments. In some cases, the film will offer a longer storyline than the usual television program's format and/or expanded production values. During the 1970s, many UK television series were turned into films including Dad's Army, On the Buses, Steptoe and Son and Porridge. In 1979, The Muppet Movie was a big success. In the adaptation of The X-Files to film, greater effects and a longer plotline were involved. Additionally, adaptations of television shows will offer the viewer the opportunity to see the television show's characters without broadcast restrictions. These additions (nudity, profanity, explicit drug use, and explicit violence) are only rarely a featured adaptive addition (film versions of "procedurals" such as Miami Vice are most inclined to such additions as featured adaptations) – South Park: Bigger, Longer & Uncut is a notable example of a film being more explicit than its parent TV series.
- At the same time, some theatrically released films are adaptations of television miniseries events. When national film boards and state-controlled television networks co-exist, filmmakers can sometimes create very long films for television that they may adapt solely for time for theatrical release. Both Ingmar Bergman (notably with Fanny and Alexander but with other films as well) and Lars von Trier have created long television films that they then recut for international distribution.
- Even segments of television series have been adapted into feature films. The American television sketch comedy show Saturday Night Live has been the

origin of a number of films, beginning with The Blues Brothers, which began as a one-off performance by Dan Aykroyd and John Belushi.

## G. Self and Peer Evaluation

- Group work can be more successful when students are involved in developing the evaluation process. This may include establishing their own evaluation criteria through consultation with teaching staff.

### Aims of self and peer evaluation

- Increase student responsibility and autonomy
- Strive for a more advanced and deeper understanding of the subject matter, skills, and processes
- Lift the role and status of the student from passive learner to active learner and assessor (also encourages a deeper approach to learning)
- Involve students in critical reflection
- Develop in students a better understanding of their own subjectivity and judgement

### Self-Evaluation

- A process which deals with the value of self-confidence. We should be aware of the fact that working alone has its own value and importance though it is often underrated. It is linked with introspection, self-discovery and self-realization.
- Learner evaluates himself in various forms, journalizing, taking tests, writing revisions of work, asking questions, and through discussions.
- When students evaluate themselves, they are assessing what they know, do not know, and what they would like to know. They begin to recognize their own strengths and weaknesses. They become more familiar with their own belief and possibly their misconceptions.
- After they self-evaluate, they will be able to set goals that they feel they can attain with the new knowledge they have about themselves.
- Advantages
  - Self-evaluation is the first essential step in any evaluation process.
  - It is an expected part of student professional performance and can provide information useful for planning and student improvement.
  - It helps teacher also to write evaluating various aspects of the performance indicating their strength and weaknesses.
  - It helps the teacher to get an opportunity to think, reflect and write down the lack points.
  - It helps the students to get a better idea of the goals they are trying to reach.
  - Students can take responsibility of their own learning.
  - Students get a chance to predict their main targets for the coming year and think about their career advancement.
- Disadvantages
  - Teacher feedback: Students can be undecided or if they haven't received enough feedback from the teacher, they may have doubts regarding to the progress.
  - Consciousness: Students need to have a very high degree of consciousness, so they can be able to analyze the errors that they have made.

- Format based plan: Self-assessment can be very time consuming, so as teachers we have to plant it before and write an adequate format, so it doesn't take students too long to answer it, and so it is easy to check.
- Lack of maturity: Some students are not ready to have a self-assessment task, mostly because they aren't aware of the seriousness or importance of the process.
- Language: It implies knowledge about language and learning which most second language learners don't have.
- Self-evaluation only works if students have been trained to self-assess themselves.

#### Peer-evaluation

- Students individually evaluated each other's contribution using a predetermined list of criteria or may be evaluated by teacher also.
- Grading is based on a predetermined process, but most commonly it is an average of the marks awarded by the members of the group.
- Advantages:
  - Encourages student involvement and responsibility
  - Encourages students to reflect on their role and contribution to the process of the group work
  - Focuses on the development of student's judgement skills
  - Students are involved in the process and are encouraged to take part ownership of this process
  - Provides more relevant feedback to students as it is generated by their peers
  - It is considered fair by some students, because each student is judged on their own contribution
  - When operating successfully can reduce a lecturer's marking load
  - Can help reduce the 'free rider' problem as students are aware that their contribution will be graded by their peers
- Disadvantages
  - Additional time can increase a lecturer's workload
  - Students will have a tendency to award everyone the same mark
  - Students feel ill equipped to undertake the assessment
  - Students may be reluctant to make judgements regarding their peers
  - At the other extreme students may be discriminated against if students 'gang up' against one group member

## H. Literary Criticism

### Criticism

- The term 'criticism' is often understood to be:
- The act of finding fault; ensure; disapproval
- The act of criticizing, especially adversely
- But the term 'criticism' as it is used in this course signifies:
- The act of interpreting, analyzing, and making judgements of individual and comparative worth works of art such as literature.
- A critical comment, review, article, essay, etc. expressing such analysis and judgement.

### **What is a literary criticism?**

- Literary criticism is the interpretation, analysis, classification and ultimately the judgement of literary works.
- Usually in the form of a critical essay, but in-depth book reviews can sometimes be considered as literary criticism.
- Criticism may examine a particular literary work, or may look at an author's writings as a whole.

### **A Critic Etymology**

- 1580s: Critic is "one who passes judgement", from M.Fr. critique (14c.), from L. criticus "a judge, literary critic," from Gk. Kritikos "able to make judgments," from krinein "to separate, decide." Meaning "one who judges merits of books, plays, etc."
- 17th to 18th centuries: The critic was considered a judge who finds the faults and merits of a literary work.

### **A Literary Critic**

- Not someone who merely evaluates the worth or quality of a piece of literature, but rather, is someone who argues on behalf of an interpretation or understanding of the particular meaning(s) of literary texts.
- The task of literary critic is to explain and attempt to reach a critical understanding of what literary texts mean in terms of their aesthetic, as well as social, political, and cultural statements and suggestions.
- Does more than simply discuss or evaluate the importance of a literary text; rather, a literary critic seeks to reach a logical and reasonable understanding of not only what a text's author intends for it to mean but, also, what different cultures and ideologies render it capable of meaning.

### **Literary Theory**

- A very basic way of thinking about literary theory is that these ideas act as different lenses critics use to view and talk about art, literature, and even culture.
- These different lenses allow critics to consider works of art based on certain assumptions within that school of theory.
- The different lenses also allow critics to focus on particular aspects of a work they consider important.
- Modern literary criticism is often informed by literary theory, which is the philosophical discussion of its methods and goals.
- E.g. if a critic is working with certain Marxist theories, s/he might focus on how the characters in a story interact based on their economic situation.
- If a critic is working with post-colonial theories, s/he might consider the same story but look at how characters from colonial powers (Britain, France, and even America) treat characters from, say, Africa or the Caribbean.
- Proposes particular, systematic approaches to literary texts that impose a particular line of intellectual reasoning to it.
- For example, a psychoanalytic literary theorist might take the psychological theories of Sigmund Freud or Carl Jung and seek to reach a critical understanding of a novel such as Ernest Hemingway's *For Whom the Bell Tolls*.

### Literary Criticism vs. Literary Theory

- Literary criticism is the practice of interpreting and writing about literature as the latter, in turn, strives to make sense of the world.
- Literary theory is the study of the principles which inform how critics make sense of literary works.
- There are many different approaches we can take to critical analysis.
- Literary theories provide a framework for our discussion of a text.

### Related Terms

- A critical analysis is an in-depth examination of some aspect of the literary work.
- You may examine any element of the text: character development, conflicts, narrative point of view, etc.
- Book review/literary review

### Types of Literary Criticism

A broad division can be made between the types of literary criticism:

1. Practical criticism
2. Theoretical criticism
3. Descriptive criticism
4. Prescriptive criticism

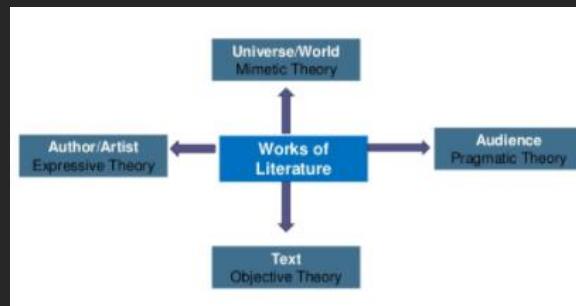
These four types can be grouped in to two classes:

1. Practical and theoretical criticism
  - Practical criticism focuses on the examination of individual text
  - Theoretical criticism discusses the nature of literature, and the relation between literature, critics and society
2. Descriptive and prescriptive criticism
  - Descriptive criticism tends to explain the piece of literature as it is, in its original form
  - Prescriptive criticism argues on how it ought to be

The various theories of literary criticism are categorized into four major classes:

1. Mimetic theory
  - Sees a work of literature as if it is reflecting the universe like a mirror.
  - It regards literature as imitating or reflecting life, and therefore emphasizes on the truth and accuracy of its representation.
  - That is why it is said that it is realism in general sense. (Mimetic means imitation and the word is first used by Aristotle in 4<sup>th</sup> century B.C., where he states that tragedy is the imitation of an action.)
2. Pragmatic theory
  - Sees literature as designed to achieve its effects on the audience (instructions, aesthetics, joy, etc.) and judge it according to the successful achievement of this assumed aim.
  - Pragmatic theories emphasize on the reader's relation to the work. The work is treated as something that is constructed to achieve certain effects on the audience.

- Effects may be for the aesthetic pleasure, instruction or any kind of emotion.
3. Expressive theory
- Centers on the artist.
  - Wordsworth's definition of the poetry as the spontaneous overflow of powerful feelings is typical and nearly all Romantic and 19<sup>th</sup> Century criticism generally regards art as primary concerned with expressing the poet's feelings or psyche.
  - Examines text as an expression of the writer's feelings, imagination, and personality. It tends to judge the work by its sincerity or the extent to which it has successfully revealed the author's state of mind.
  - Romantic critics such as Coleridge and Wordsworth were expressive critics in this sense.
4. Objective theory
- Focuses more on the text without the influences of the writer or the reader.
  - The text here is supreme and once this text is produced the writers fizzles out and the only interpretation to be gotten is what can be inferred from the text, the direct message which the text itself has which has to be inferred within the text.
  - To them there is no correspondence between the universe and the work and we cannot know the true nature of either the audience or the author.



## Approaches to Literary Criticism

### Traditional approaches

1. Historical/biographical approach
  - Views literature as the reflection of an author's life and times (or of the characters' life and times).
  - It is necessary to know about the author and the political, economical, and sociological context of his times in order to truly understand his works.
  - Advantages
    - Works well for some which are obviously political or biographical in nature.
    - Places allusions in their proper classical, political, or biblical background.
  - Disadvantages
    - "The intentional fallacy"
    - Tends to reduce art to the level of biography and make it relative (to the times) rather than universal.

2. Moral/philosophical approach

- Asserts that the larger purpose of literature is to teach morality and to probe philosophical issues.
- Authors intend to instruct the audience in some way.
- Advantages
  - Useful for works which do present an obvious moral philosophy.
  - Useful when considering the themes of works.
  - Does not view literature merely as “art” isolated from all moral implications.
  - Recognizes that literature can affect readers and that the message of a work is important.
- Disadvantages
  - Such an approach can be too “judgmental”.
  - Some believe literature should be judged primarily (if not solely) on its artistic merits, not its moral or philosophical content.

Modern approaches

1. Formalism/new criticism
2. Psychoanalytical approach
3. Feminism
4. Marxism

## I. Writing the Literary Analysis

An analysis explains what a work of literature means, and how it means it.

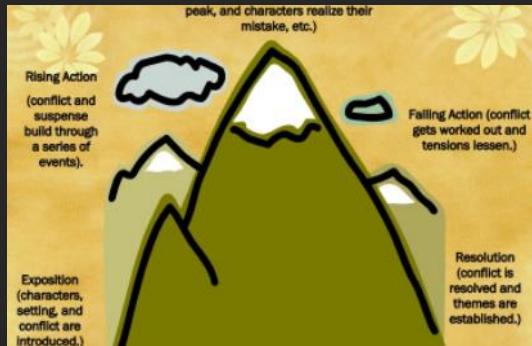
### How is a literary analysis an argument?

- When writing a literary analysis, you will focus on specific attribute(s) of the text(s).
- When discussing these attributes, you will want to make sure that you are making a specific, arguable point (thesis) about these attributes.
- You will defend this point with reasons and evidence drawn from the text. (Much like a lawyer)

### How to analyze a story

1. Meaning of the story (interpretation)
  - Identify the theme(s) and how the author announces it.
  - Explain how the story elements contribute to the theme.
  - Identify contextual elements (allusions, symbols, other devices) that point beyond the story to the author’s life/experience, history or to other writings.
2. Essential elements of the story
  - Theme: Main idea – what the work adds up to
    - Main idea or underlying meaning of the literary work
      - What the author wants the reader to understand about the subject
      - In fables, this may also be the moral of the story
  - Plot: Relationship and patterns of events
    - All stories, literary essays, biographies, and plays have a beginning, a middle and an end.
      - Typically, the beginning is used to describe the conflict/problem faced by the character/subject.

- The middle is used to describe the climax or crisis reached by the character/subject.
- The end is used to resolve the conflict/problem and establish a theme.



- Characters: People the author creates
  - Including the narrator of a story or the speaker of a poem
- Setting: When and where the action happens
  - Time period
  - Geographical location
  - Historical and cultural context
    - Social
    - Political
    - Spiritual
  - Instrumental in establishing mood
  - May symbolize the emotional state of the characters
  - Impact on characters' motivations and options
- Point of view: Perspective or attitude of the narrator or speaker
  - First person
    - Narrator is a character within the story – reveals own thoughts and feelings but not those of others
  - Third person
    - Objective: narrator outside the story acts as a reporter – cannot tell what characters are thinking
    - Limited: narrator outside the story but can see into the mind of one of the characters
    - Omniscient: narrator is all-knowing outsider who can enter the mind of more than one character

### 3. Structure of the story

### 4. Rhetorical elements

- Identify the author's use and explain their importance.
- Foreshadowing
  - Use of hints or clues to suggest events that will occur later in the story
  - Builds suspense – means of making the narrative more believable
- Tone
  - Author's attitude – stated or implied – towards the subject
  - Revealed through word choice and details
- Mood
  - Climate of feeling in a literary work

- Choice of setting, objects, details, images, words
- Symbolism
  - Person, place, object which stand for larger and more abstract ideas
- Irony: Contrast between what is expected or what appears to be and what actually is
  - Verbal irony – contrast between what is said and what is actually meant
  - Irony of situation – an event that is the opposite of what is expected or intended
  - Dramatic irony – audience or reader knows more than the characters know
- Figurative language: Language that goes beyond the literal meaning of words
  - Simile
  - Metaphor
  - Alliteration
  - Personification
  - Onomatopoeia
  - Hyperbole

### Types of conflict

1. Person vs. person
  - Events typically focus on differences in values, experiences, and attitudes.
2. Person vs. society
  - The person is fighting an event, an issue, a philosophy, or a cultural reality that is unfair.
3. Person vs. nature
  - The character is often alone dealing with nature in extreme circumstances.
4. Person vs. fate / supernatural
  - The text is characterized by a person contending with an omnipresent issue or idea.
5. Person vs. self
  - The person is conflicted with childhood memories, unpleasant experiences, or issues with stress and decision-making.

### **J. Types of characters**

1. Protagonist
  - Main character
  - Center to the action of a story and moves against the antagonist.
2. Antagonist
  - Character or force that opposes the main character
  - The villain or a force which opposes the protagonist
3. Foil
  - Character that provides a contrast to the protagonist
4. Round
  - Three-dimensional personality
  - Have various characteristics or traits
  - Can change or grow
  - Readers see more than one side of a round character

5. Flat
  - Only one or two striking qualities – all bad or all good
  - Readers see one side of a flat character
  - Usually minor characters and reveal one or two traits
  - May be used as a contrast to a major character
6. Dynamic
  - Grows and progress to a higher level of understanding
  - Characters who develop and change are not only round characters, but often dynamic.
  - Scrooge changes from a tight-fisted, greedy unhappy man to one who was generous and loved life
  - Gru changes from a villain set on destroying the world to a loving father.
7. Static
  - Remains unchanged throughout the story
  - One dimensional - readers see only one side.
  - Stays the same and do not develop
  - Readers learn little about this character
  - Static characters are flat characters.
8. Stereotype
  - Sometimes characters with common, generalized traits are repeatedly found in unrelated stories
  - These characters are known by what they do and how they act
  - The author doesn't need to tell us much about the character because we've encountered the stereotype before and can make some inferences.
9. Confidant
  - Often a friend or authority figure, whose role is to listen to the protagonist's secrets, examine their character, and advise them on their actions.

## K. Spoken Word Poetry

### Origins

- Spoken word has existed for many years. Long before writing, through a cycle of practicing, listening and memorizing, each language drew on its resources of sound structure for aural patterns that made spoken poetry very different from ordinary discourse and easier to commit to memory. "There were poets long before there were printing presses, poetry is primarily oral utterance, to be said aloud, to be heard."
- Poetry, like music, appeals to the ear, an effect known as euphony or onomatopoeia, a device to represent a thing or action by a word that imitates sound. "Speak again, speak like rain" was how Kikuyu, an East African people, described her verse to author Isak Dinesen,[5] confirming a comment by T. S. Eliot that "poetry remains one person talking to another".
- The oral tradition is one that is conveyed primarily by speech as opposed to writing, in predominantly oral cultures proverbs (also known as maxims) are convenient vehicles for conveying simple beliefs and cultural attitudes. "The hearing knowledge we bring to a line of poetry is a knowledge of a pattern of speech we have known since we were infants".

- Performance poetry, which is kindred to performance art, is explicitly written to be performed aloud[10] and consciously shuns the written form. "Form", as Donald Hall records "was never more than an extension of content."<sup>[12]</sup> Performance poetry in Africa dates to prehistorical times with the creation of hunting poetry, while elegiac and panegyric court poetry were developed extensively throughout the history of the empires of the Nile, Niger and Volta river valleys.<sup>[13]</sup> One of the best-known griot epic poems was created for the founder of the Mali Empire, the Epic of Sundiata. In African culture, performance poetry is a part of theatics, which was present in all aspects of pre-colonial African life<sup>[14]</sup> and whose theatrical ceremonies had many different functions: political, educative, spiritual and entertainment. Poetics were an element of theatrical performances of local oral artists, linguists and historians, accompanied by local instruments of the people such as the kora, the xalam, the mbira and the djembe drum. Drumming for accompaniment is not to be confused with performances of the "talking drum", which is a literature of its own, since it is a distinct method of communication that depends on conveying meaning through non-musical grammatical, tonal and rhythmic rules imitating speech. Although, they could be included in performances of the griots.
- In ancient Greece, the spoken word was the most trusted repository for the best of their thought, and inducements would be offered to men (such as the rhapsodes) who set themselves the task of developing minds capable of retaining and voices capable of communicating the treasures of their culture. The Ancient Greeks included Greek lyric, which is similar to spoken-word poetry, in their Olympic Games.

### Slam Poetry

- Slam poetry, a form of performance poetry that combines the elements of performance, writing, competition, and audience participation. It is performed at events called poetry slams, or simply slams. The name slam came from how the audience has the power to praise or, sometimes, destroy a poem and from the high-energy performance style of the poets.
- The concept of slam poetry originated in the 1980s in Chicago, Illinois, when a local poet and construction worker, Marc Kelly Smith, feeling that poetry readings and poetry in general had lost their true passion, had an idea to bring poetry back to the people. He created a weekly poetry event—the poetry slam—where anyone could participate. Poets would perform their work and then be judged by five random audience members on a scale of 0 to 10. Out of the five, the highest and lowest scores were dropped and the three remaining scores were added to give the poet an overall score. Whoever had the highest score at the end of the competition was deemed the winner.
- Poetry slams are held in any venue that welcomes them, such as parks, bookstores, coffeehouses, and bars. Although the rules associated with poetry slams may vary by venue or event, there are general guidelines that are often adhered to:
  1. Anyone, regardless of age, race, sex, education, class, disability, gender, or sexuality, can compete.
  2. Poems can be about any subject but typically are supposed to be the creation of the performing poet.

3. Poems are not to exceed a three-minute limit (with 10-second grace period); if they do, points are deducted.
  4. No props may be used when performing the poem.
  5. No musical accompaniment or musical instruments may be used when performing, but the poet is allowed to sing, clap, hum, or make noise with the mouth or other body parts.
  6. Poets may perform on their own or in groups with other poets.
- Today slam poetry is considered an artistic movement as well as a genre of poetry and spoken word.

## Earth Science

### A. The Origin of the Universe

#### Theories of the Origin of the Universe

##### a. The steady state theory

- First proposed by Sir James Jeans in 1920
- The universe is always expanding
- Matter is constantly formed as the universe is expanding
- It gained popularity after it was revised by Sir Fred Hoyle, Sir Hermann Bondi, and Thomas Gold in 1948 as an alternative to the Big Bang Theory.
- However, toward the middle of 1960s, evidences that would contradict the steadiness or the unchanging state of the universe were brought out.

##### b. The plasma universe and the little bangs

- By Nobel Laureate Hannes Alfvén
- 99% of the universe is plasma (ionized gas that conducts electricity)
- States that the big bang never happened
- Universe is crisscrossed by gigantic electric currents and huge magnetic fields
- Brought about by laboratory experiments

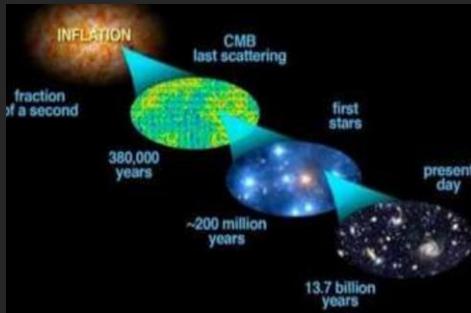
##### c. Black hole theory

- By theoretical physicist Nikodem Poplawski
- When a black hole forms upon the collapse of a dying star, a universe is born at the same time from the white hole on the other side of the wormhole.

##### d. The parallel universe

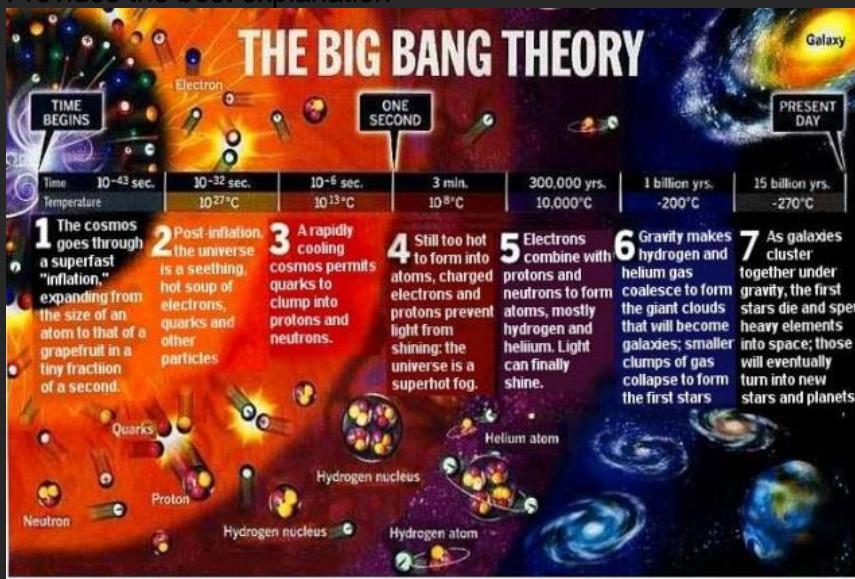
##### e. Cosmic inflation theory

- By Alan Guth and Andrei Linde in the 1980s.
- The term inflation refers to the rapid expansion of space-time.
- The early universe was a rapidly expanding bubble of pure vacuum energy. It did not have any matter or energy.



f. Big bang theory

- By Georges Lemaitre (1894-1966), Belgian cosmologist and Catholic priest
- The red shift
- An expanding universe
- The universe was once very small and very hot, and then it expanded over time until it reached its peak.
- Happened 13.7 billion years ago (that is also the age of the universe).
- Super atom [The universe was once crammed into a size of an atom called the super atom]
- Provides the best explanation



g. Cyclical or oscillating universe

h. Atomic universe

i. Aristotelian universe

j. Stoic universe

k. Heliocentric universe

l. Ptolemaic universe

m. Matrix universe/simulation theory

Where do astronomers base their findings about the origin of the universe?

- CMB (Cosmic Microwave Background) is a thermal radiation used in observational cosmology because it is considered the oldest light in the universe.
- CMB can be detected as a glow which is believed to be a remnant from an early stage of the development of the universe.
- Because of this belief, the big bang theory gained the most support from the scientific community.

## B. Earth as a system

Earth is a complex system of interacting physical, chemical, and biological processes, and provides a natural laboratory whose experiments have been running since the beginning of time.

The origin of the systems approach to the study of Earth

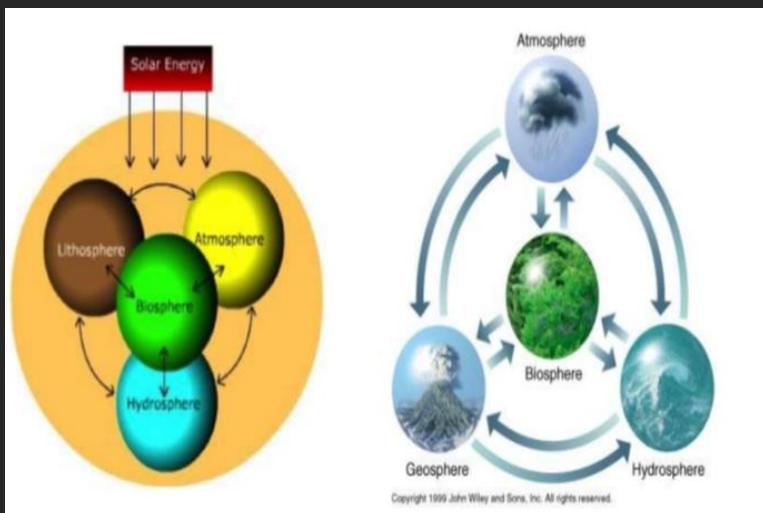
- One of the first scientist to push for a more integrated or holistic approach in the understanding of the universe (and by extension the Earth) was Friedrich Wilhelm Heinrich Alexander von Humboldt. He considered the universe as one interacting entity.
- The term "biosphere" was popularized by Vladimir Vernadsky (1863-1945), a Russian-Ukrainian scientist who hypothesized that life is a geological force that shapes the Earth.
- In the 1970s, the Gaia Hypothesis was jointly developed by James Lovelock, an English scientist/naturalist, and Lynn Margulis, an American microbiologist. According to the Gaia Hypothesis, the biosphere is a self-regulating system that is capable of controlling its physical and chemical environment.
- In 1983, NASA advisory council established the Earth Systems Science Committee. The committee, chaired by Moustafa Chahine, published a ground breaking report "Earth System Science: A Program for Global Change in 1988". For the first time, scientists were able to demonstrate how many systems interact.

Earth System Science

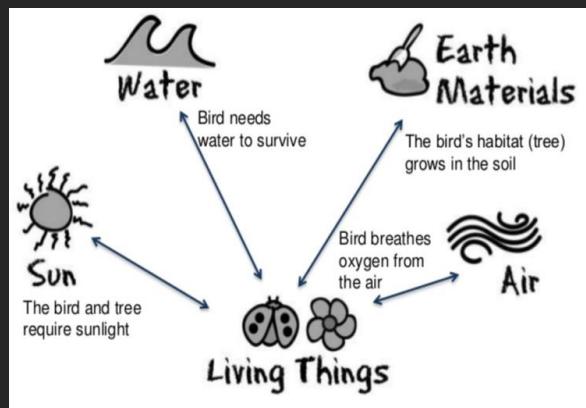
- Earth is a dynamic body with many separate, but highly interacting parts or spheres.
- Earth system science studies Earth as a system composed of numerous parts, or subsystems.
- System: A set of interconnected components that are interacting to form a unified whole.
- Earth is essentially a closed system.
- A closed system is a system in which there is only an exchange of heat or energy and no exchange of matter.
- The Earth receives energy from the sun and returns some of this energy to space.

Earth Science Terms	
Closed system	Open system
- Held to be isolated only to itself and not to its environment	- There's an exchange of matter and energy to its environment

The Earth's Systems	
Air (Atmosphere)	Water (Hydrosphere)
Land (Geosphere/Lithosphere)	Life (Biosphere)



- Biosphere
  - o Includes all life forms on Earth
  - o Covers all ecosystems – from the soil to the rainforest, from mangroves to coral reefs, and from the plankton-rich ocean surface to the deep sea.
  - o The life zone of the Earth and includes all living organisms, and all organic matter that has not yet decomposed.
- Hydrosphere
  - o Dynamic mass of water that is continuously on the move.
  - o About 70% of the Earth is covered with liquid water (hydrosphere) and much of it is in the form of ocean water.
  - o Only 4% of Earth's water is fresh – two-thirds are in the form of ice, and the remaining one-third is present in streams, lakes, and groundwater.
  - o Includes all water on Earth (including surface and groundwater)
- Atmosphere
  - o The thin gaseous layer that envelopes the lithosphere.
  - o The present atmosphere is composed of 78% nitrogen (N), 21% oxygen (O<sub>2</sub>), 0.9% argon, and trace amount of other gases.
  - o One of the most important processes by which the heat on the Earth's surface is redistributed is through atmospheric circulation.
  - o Gaseous envelope that surrounds the Earth and constitutes the transition between its and the vacuum of space.
- Lithosphere
  - o Includes the crust and the upper part of the mantle.
  - o Layers of the Earth
    - Crust (continental and oceanic)
    - Mantle (upper & lower)
    - Core (outer & inner)
  - o Comprises of the solid Earth and includes both Earth's surface and the various layers of the Earth's interior



- Major themes
  - o Scale
    - Processes in the Earth system act on length scale of microns to thousands of kilometers, and on time scales of milliseconds to millions of years.
  - o Energy
    - The Earth system is powered by one external source: The Sun; and two internal ones: radioactive decay, and gravitational energy (heat still being lost from planetary formation)
  - o Cycles
    - Material in the Earth system is continually recycled in numerous overlapping cycles.

## C. Minerals

- Naturally formed, generally inorganic, crystalline solid composed of an ordered array of atoms and having a specific chemical composition.
- Building blocks of rocks.
- Mineralogy: Study of minerals
- Naturally occurring
  - o Not made by humans
- Solid
  - o Must be solid at temperatures normally experienced at Earth's surface.
- Orderly crystalline structure
  - o Their atoms are arranged in an orderly, repetitive manner.
- Well-defined chemical composition
  - o Most are made up of two or more elements.
  - o Example is quartz ( $\text{SiO}_2$ )
- Generally inorganic
  - o Found naturally on the ground.
  - o Formed by natural geologic processes.

### Physical properties of minerals

Property	Description
Luster	Refers to the way of light is reflected from a mineral surface. Some have a metallic surface such as gold, silver, and copper. Others are described as vitreous or glassy, pearly, silky, resinous, and earthy or dull.
Hardness	Refers to the mineral's resistance to being scratched. The harder ones are difficult to scratch, the softer ones are less resistant to scratches.

	Frederich Moh, A German mineralogist prepared a scale of hardness with a number of 1-10 in the increasing hardness.
Color and streak	Refers to the color of the powdered mineral. The sample is rubbed across a piece of unglazed porcelain or streak plate.
Cleavage	Tendency of minerals to break along planes of weak bonding. Described by the number of planes exhibited and the angles at which they meet.
Fracture	Minerals that do not exhibit cleavage are said to fracture when broken. Some break like glass, some into splinters or fiber.
Color	Some are the same color like azurite is always deep blue, malachite is green, cinnabar is red and sulfur is yellow.
Specific gravity	A number which represents the ratio to the weight of an equal volume of water. Example: Galena is 7.5 times heavier than a comparable volume of water.
Crystal form	External features of a mineral reflect its orderly internal arrangement of atoms.

Mohs Hardness Scale			
10	Diamond	5	Apatite
9	Corundum	4	Fluorite
8	Topaz	3	Calcite
7	Quartz	2	Gypsum
6	Orthoclase	1	Talc

#### Chemical properties of minerals

Geologists have recently determined that the minerals goethite and hematite ( $\text{Fe}_2\text{O}_3$ ) exist in abundance on Mars, sure signs of the presence of water. None of those geologists have been to Mars, but the unmanned rovers Spirit and Opportunity have.

These rovers are equipped with three mass spectrometers, each of which is capable of determining the chemical composition of a solid with a high degree of accuracy. With such a precise chemical analysis in hand, geologists on Earth had no problem identifying the minerals.

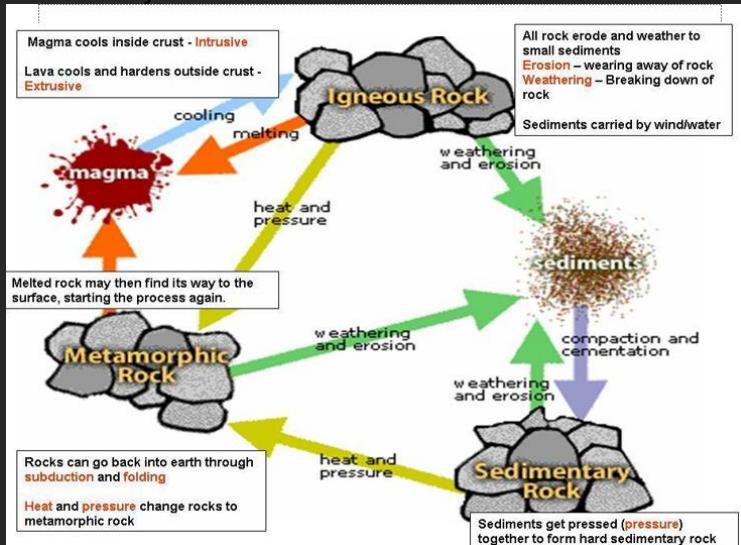
Chemical properties of minerals show the presence and arrangement of atoms in minerals. Using their chemical properties, minerals are identified by how they react to certain substances.

- A sample chemical test is
  - a. Taste test –  $\text{NaCl}$  (Sodium Chloride/Table salt) has a distinctly salty taste. (What a shocker there)
  - b. Fizz test – carbonate minerals in hydrochloric acid, giving off bubbles of carbon dioxide gas.
- Magnetism: Magnetite is always magnetic.
- Reaction with acid: Carbonate minerals react visibly with acid.
- Taste, odor, feel: Salt, zinc sulfide, talc.
- Color and density are determined primarily by the chemical composition.
- Minerals are classified on the basis of their chemical composition.

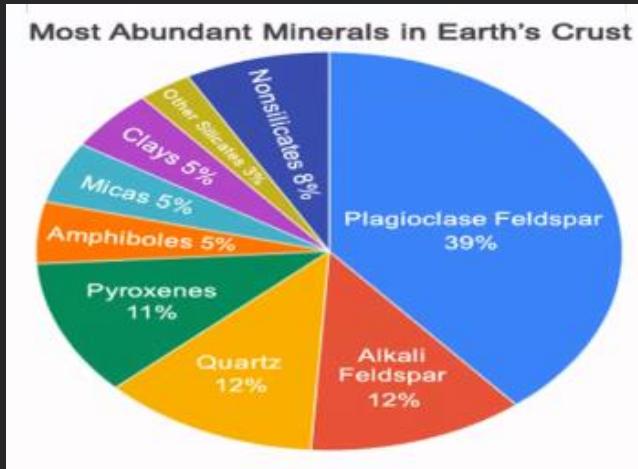
## D. Igneous, Sedimentary, and Metamorphic rocks

### Rocks

- A rock is an aggregate of one or more minerals, or a body of undifferentiated mineral matter. Common rocks include granite, basalt, limestone and sandstone.
- The rock cycle



- The different processes involved in the formation of the three types of rocks, namely igneous, sedimentary and metamorphic. It also shows how rocks change from one form to another.



- The rock cycle demonstrates the relationships among the three major rock groups.
- It is powered by the internal heat of the Earth as well as Earth's momentum and the energy from the sun.
- It involves processes on the Earth's surface as well as the Earth's interior.
- It connects the hydrologic cycle with the tectonic cycle.

### Igneous rocks

- o Form when magma cools and hardens.
- o Comes from Latin that means “fire formed”
- o Rock type that forms from the solidification of a molten mineral solution.
- o All igneous rocks have a random fabric of fused mineral grains.

- Types
  - Intrusive rocks (plutonic)
    - Form inside the Earth (underground) when magma cools slowly to create crystals.
    - Intrusive → Inside
  - Extrusive rocks (volcanic)
    - Form on the Earth's surface (above ground) when lava cools quickly to create small crystals.
    - Extrusive → Exit/outside
- Types of magma
  - Felsic
    - Light color, high in silica, viscous (thick and slow), low in iron, calcium or magnesium
    - Felsic = Feldspar + Silica
  - Mafic
    - Dark color, low in silica, not viscous (thin and watery), high in iron, calcium and magnesium
    - Mafic = Magnesium + Iron (Fe)
- Texture refers to the crystal size.
  - Fine-grained
    - Crystals are too small to see (basalt)
  - Coarse-grained
    - Crystals are easily visible (granite)
  - Glassy
    - Occurs when rock freezes instantly. There are no crystals. (obsidian)
    - May be felsic, but is usually mafic. Even when felsic it appears dark nonetheless because the small percentage of mafic minerals in the rock form a homogenous solution with the felsic minerals tinting the overall color to dark.
  - Porphyritic
    - A rock with large crystals surrounded with fine grained crystals. (rhyolite)
    - Light colored (felsic), fine grained (volcanic) igneous rock.
  - Vesicular
    - Rock that has many holes in it. (pumice)
      - Pumice: Fine grained, felsic, vesicular volcanic igneous rock.
      - Scoria: Fine grained, mafic, vesicular volcanic igneous rock.
- Rocks can be grouped into families
  - Granite family
    - Felsic, light, contains quartz, feldspar, and muscovite.
    - Granite, rhyolite, obsidian, pumice
  - Gabbro family
    - Mafic, dark, contains feldspar, olivine, biotite.
    - Gabbro, basalt, scoria
  - Diorite family
    - Intermediate composition and color.

- Diorite, andesite, obsidian

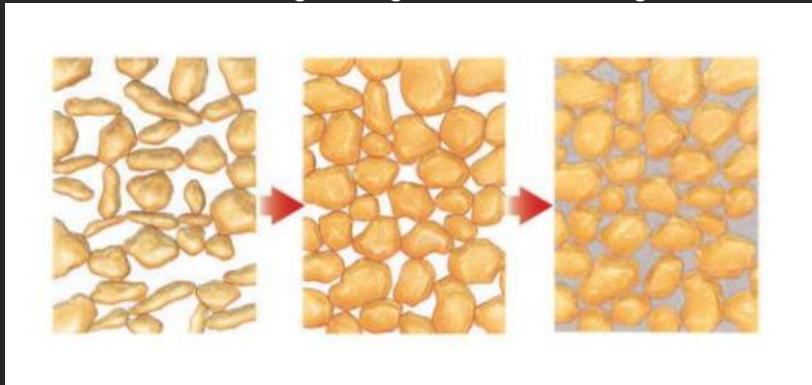
### Sedimentary rocks

- Formed from pre-existing rocks or pieces of once-living organisms.
  - They form from deposits that accumulate on the Earth's surface.
  - Often gave distinctive layering or bedding.
- Forms through a process
1. Weathering and erosion
    - Weathering: set of physical and chemical changes that breaks rocks into smaller pieces.
      - Size can range from microscopic to huge boulders.
      - Physical weathering -> rock fragments break off
      - Chemical weathering -> minerals in a rock are dissolved or are chemically changed.
    - Erosions: Removal and transport of sediment
      - Four main agents: glaciers, wind, water, gravity
      - For these reasons eroded sediment will eventually wind up downhill.
  2. Deposition and sorting
    - Occurs when sediments settle on the ground or sink to the bottom of water (deposition)
    - Usually large grains will settle to the bottom and the finer grains on top (sorting)
    - Sorted deposits --> water and wind
    - Unsorted deposits --> glaciers and mudslides
  3. Lithification
    - Most sediments wind up at low points (valleys and or bottom of ocean basin)
    - As sediment builds up, pressure and temperature increase in bottom layers
    - This leads to compaction and cementation.

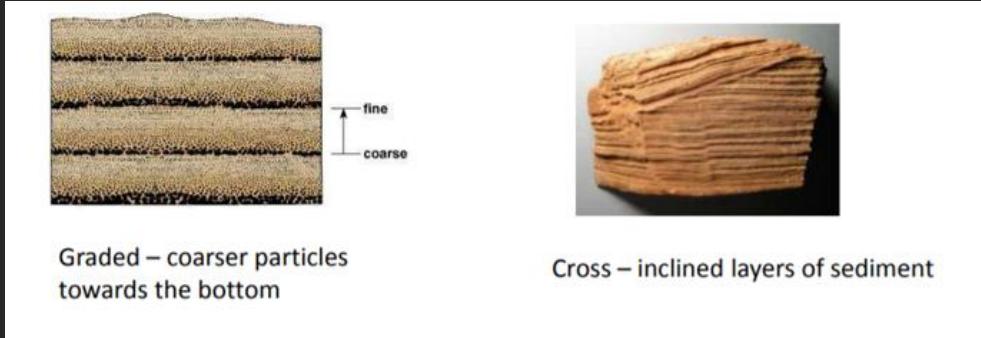
- Steps in lithification
- a. Compaction: layers of sediment are pushed together
    - Some materials compact better than others.



- b. Cementation: mineral growth glues sediments together into solid rock.



- Sedimentary features
  - Primary feature of sedimentary rock is horizontal layering called bedding.
  - Results from the way sediment settles out of water or wind
    - Graded: coarser-particles towards the bottom
    - Cross: inclined layers of sediment



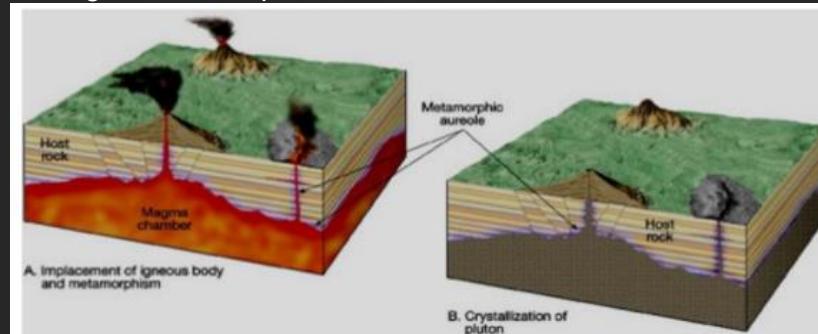
- When sediment is moved into small ridges by wind or wave action or by a river current, ripple marks form.
- As sediment is transported, pieces that began with an angular shape knock into each other and become rounded as their edges are broken off.

- Harder materials -> more rounded
- Further distance travelled -> more rounded
- Fossils are the preserved remains, impressions, or any other evidence of once-living organisms.
- During lithification, parts of an organism can be replaced by minerals and turned into rock.
- Types of sedimentary rocks
  - Clastic
    - Formed from the abundant deposits of loose sediments that accumulate on the Earth's surface-most common type
    - Classified based on the sediment size:
      - Coarse-grained
        - ❖ Contains gravel sized rock and mineral fragments
        - ✓ Conglomerate: rounded particles
        - ✓ Breccia: angular particles
      - Medium grained
        - ❖ Contains sand sized rock and mineral fragments
        - ✓ Sandstone: contains quartz and rock, high porosity so often contains oil, gas and ground water
      - Fine- grained
        - ❖ Contains silt and clay sized particles
        - ✓ Siltstone: Quartz and clay, fine grained
  - Chemical
    - Forms after the concentration of dissolved minerals reaches saturation and crystal grains settle out
    - Water evaporates and the minerals become more concentrated leading to thick layers on the bottom of a body of water. Usually forms in areas that lack precipitation
  - Biochemical
    - Form from the remains of once-living organisms
    - Most abundant is limestone (made of calcite)
    - Many contain fossils
      - Coquina, limestone

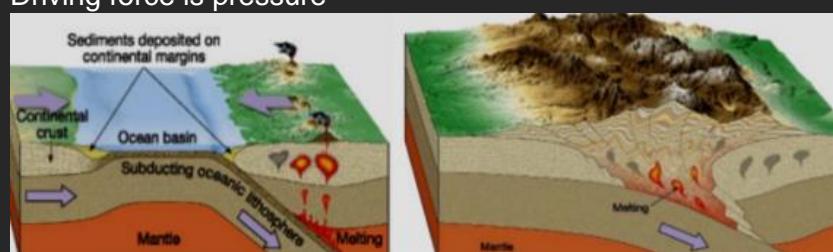
### Metamorphic rocks

- Rocks are changed as a result of exposure to intense heat and/or pressure
- Created by heat, pressure and/or chemically reactive fluids
- Metamorphic rocks are produced from
  - Igneous, sedimentary, and metamorphic rocks
- Metamorphism
  - Progresses incrementally from low-grade to high-grade
  - During metamorphism, the rock remains solid
  - Characterized by:
    - Growth of new minerals from pre-existing minerals through recrystallization
    - Deformation of existing materials
      - Change in shape and orientation

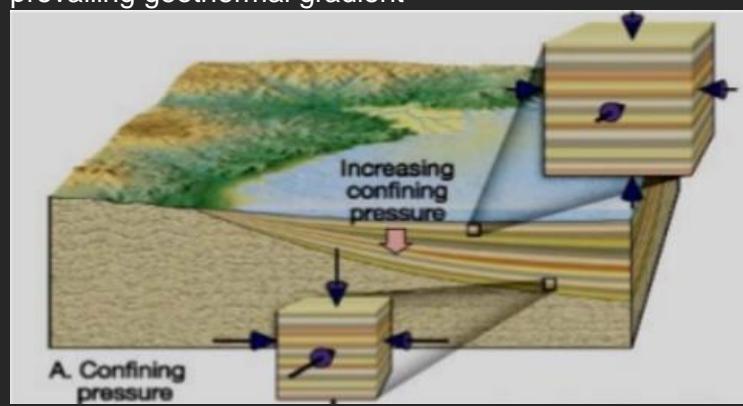
- Layers are folded and broken
- Metamorphic settings
- Types of metamorphism / metamorphism settings
  - Contact/thermal
    - Occurs due to a rise in temperature when magma invades a host rock
    - A zone of metamorphism forms in the rock surrounding the magma
    - Most easily recognized when it occurs at the surface, or in a near-surface environment
    - Driving force is temperature



- 
- Regional
  - Produces the greatest quantity of metamorphic rock
  - Associated with mountain building and the subducting plate (high P, low T metamorphism)
  - Happens in convergent zones
  - Driving force is pressure
- 
- Burial
  - Associated with very thick sedimentary strata
  - Required depth varies from one location to another depending on the prevailing geothermal gradient



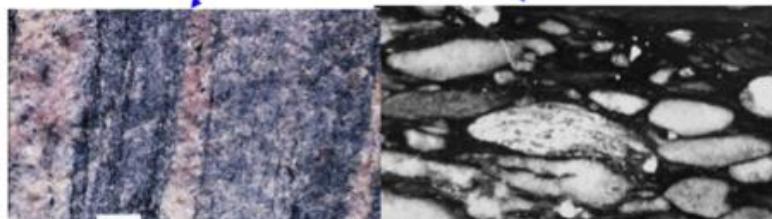
- Hydrothermal



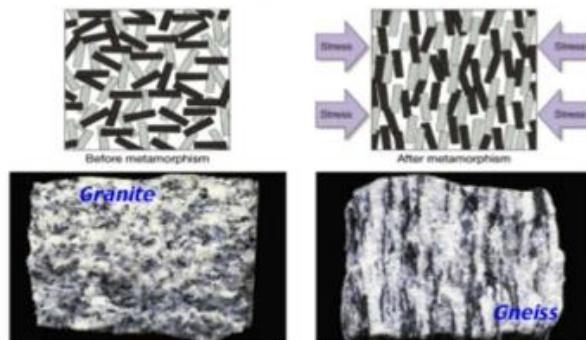
- Chemical alteration caused when hot, ion-rich fluids, called hydrothermal solutions, circulate through fissures and cracks that develop in rock
- Most widespread along the axis of the mid-ocean ridge system.
- Impact
  - Occurs when high speed projectile called meteorites strike Earth's surface.
- Agents of metamorphism
  - Heat
    - The most important agent
    - Two sources of heat
      - Contact metamorphism: heat from magma
      - Increase in temperature with depth due to geothermal gradient
  - Pressure (stress)
    - Increase with depth
  - Fluids
    - Help transporting elements from one crystal to a new metamorphic crystal (enhances migration of ions)
    - Mainly water with other volatile components
- Origin of pressure in metamorphism
  - Confining pressure applies forces equally in all directions
  - Rocks may also be subjected to differential stress which is unequal in different directions.
- Importance of parent rock
  - Most metamorphic rocks have the same overall chemical composition as the parent rock from which they formed
  - Mineral makeup determines, to a large extent, the degree to which each metamorphic agent will cause change
- Metamorphic textures
  - Refers to the size, shape, and arrangement of grains within a rock
  - Foliation – any planar arrangement of mineral grains or structural features within a rock
    - Parallel alignment of platy and/or elongated minerals
    - Foliation can form through
      - Rotation of platy and/or elongated minerals
      - Recrystallization of minerals in the direction of preferred orientation
      - Changing the shape of equidimensional grains into elongated shapes that are aligned
    - Examples of foliation

## Examples of foliation

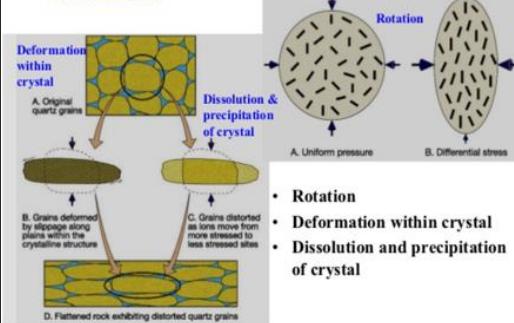
- Parallel alignment of flattened mineral grains and pebbles
- Compositional banding



## Development of foliation due to directed pressure (stress)



## Directed pressure (stress) effects on minerals



- Foliated textures
  - Rocky or slaty cleavage
    - ❖ Closely spaced planar surfaces along which rocks split

- Schistosity
  - ❖ Platy minerals are discernible with the unaided eye and exhibit a planar or layered structure
  - ❖ Rocks having this texture are referred as schist
- Gneissic texture
  - ❖ Segregation of minerals leads to distinctive banded appearance
- Non-foliated textures
  - Metamorphic rocks that lack foliation are referred to as non-foliated
  - Develops in environments where stress (deformation) is minimal
  - Typically composed of minerals that exhibit equidimensional crystals



- Foliated rocks
  - In this group, changing degree of metamorphism leads to characteristic rock series
    - (Shale) slate -> Phyllite -> schist -> gneiss
    - (Basalt) greenschist -> amphibolite
    - (Basalt) blueschist -> eclogite
- Non-foliated rocks
  - Quartzite (sandstone)
  - Marble (limestone)
  - Hornfels (claystone)
  - Coal (peat)

Scheme for Metamorphic Rock Identification						
TEXTURE	GRAIN SIZE	COMPOSITION	TYPE OF METAMORPHISM	COMMENTS	ROCK NAME	MAP SYMBOL
FOLIATED MINERAL ALIGNMENT	Fine	MICA QUARTZ FELDSPAR AMPHIBOLE GARNET PYROXENE	Regional (Heat and pressure increases)	Low-grade metamorphism of shale	Slate	
	Fine to medium			Foliation surfaces shiny from microscopic mica crystals	Phyllite	
				Platy mica crystals visible from metamorphism of clay or feldspars	Schist	
	Medium to coarse			High-grade metamorphism; mineral types segregated into bands	Gneiss	
NONFOLIATED BAND-BWS	Fine	Carbon	Regional	Metamorphism of bituminous coal	Anthracite coal	
	Fine	Various minerals	Contact (heat)	Various rocks changed by heat from nearby magmas/lava	Hornfels	
	Fine to coarse	Quartz	Regional or contact	Metamorphism of quartz sandstone	Quartzite	
		Calcite and/or dolomite		Metamorphism of limestone or dolostone	Marble	
	Coarse	Various minerals		Pebbles may be distorted or stretched	Metaconglomerate	

- Metamorphic rock series

- Slate
  - Very fine-grained
  - Excellent rock cleavage
  - Most often generated from low-grade metamorphism of shale, mudstone, or siltstone
  - Gray to black color
- Phyllite
  - Glossy sheen and often wavy surfaces
  - Gradation in the degree of metamorphism between slate and schist
  - Platy minerals not large enough to be identified with the unaided eye
  - Exhibits rock cleavage
  - Composed mainly of fine crystals of muscovite and/or chlorite
- Schist
  - Medium to coarse-grained
  - Platy minerals predominate
  - Commonly inside micas
  - The term schist describes the texture
  - To indicate composition, mineral names are used (such as mica schist)
  - Varieties
    - Mica schist (biotite, muscovite)
    - Greenschist (green chlorite)
    - Blueschist (blue amphibole)
- Gneiss
  - Medium to coarse-grained
  - Banded appearance
  - High-grade metamorphism
  - Often composed of white or light-colored feldspar rich layers with bands of dark ferromagnesian minerals
- Marble
  - Metamorphosed limestone or dolostone
  - Non-foliated
  - Composed essentially of calcite or dolomite crystals

- Coarse, crystalline
- Used as a decorative and monument stone, table top
- Exhibits a variety of colors
- Quartzite
  - Non-foliated
  - Formed from a parent rock of quartz-rich sandstone
  - Quartz grains are fused together
  - Sugary texture

## E. Ores

- An ore is a mineral or combination of minerals from which a useful substance, such as a metal can be extracted and used to manufacture a useful product
- Minerals are formed over a period of millions of years in the earth's crust

### Use and exploitation

- Main uses of minerals are as follows:
  - a. Development of industrial plants and machinery
  - b. Generation of energy (coal, lignite, uranium)
  - c. Construction, housings, settlements
  - d. Defense equipment, weapons, armaments
  - e. Transportation means
  - f. Communication- telephone wires, cables, devices
  - g. Medicinal system- particularly in Ayurvedic system
  - h. Formation of alloys for various purposes (e.g. phosphorite)
  - i. Agriculture- as fertilizers, seed dressings, and fungicides (e.g. zinc containing zinc, manganese-containing manganese etc.)
  - j. Jewelry (e.g. gold, silver, platinum, diamond)
- Based on their properties, minerals are basically of two types
  - Non-metallic minerals (graphite, diamond, quartz, feldspar)
  - Metallic minerals (bauxite)

**Table 2.3.1. Major reserves and important uses of some of the major metals**

Metal	Major World Reserves	Major Uses
Aluminium	Australia, Guinea, Jamaica	Packaging food items, transportation, utensils, electronics
Chromium	CIS, South Africa	For making high strength steel alloys, In textile/tanning industries
Copper	U.S.A., Canada, CIS, Chile, Zambia	Electric and electronic goods, building, construction, vessels
Iron	CIS, South America, Canada, U.S.A.	Heavy machinery, steel production, transportation means
Lead	North America, U.S.A., CIS	Leaded gasoline, Car batteries, paints, ammunition
Manganese	South Africa, CIS, Brazil, Gabon	For making high strength, heat-resistant steel alloys
Platinum group	South Africa, CIS	Use in automobiles, catalytic converters, electronics, medical uses.
Gold	South Africa, CIS, Canada	Ornaments, medical use, electronic use, use in aerospace
Silver	Canada, South Africa, Mexico	Photography, electronics, jewellery
Nickel	CIS, Canada, New Caledonia	Chemical industry, steel alloys

**Table 2.3.2. Major uses of some non-metallic minerals**

Non-metal Mineral	Major Uses
Silicate minerals	Sand and gravel for construction, bricks, paving etc.
Limestone	Used for concrete, building stone, used in agriculture for neutralizing acid soils, used in cement industry
Gypsum	Used in plaster wall-board, in agriculture
Potash, phosphorite	Used as fertilizers
Sulphur pyrites	Used in medicine, car battery, industry.

- Quick facts
  - The Philippines is situated along the Circum-Pacific Ring of Fire, where the processes of volcanism and plate convergence caused the deposition of minerals, both metallic and non-metallic
  - Large reserves of various of minerals beneath our ground has put the country in the world mineral map as 5th mineral country in the world; 3rd in gold reserves; 4th in copper; 5th in nickel
- Mining is the process of extracting buried material below the earth surface; quarrying refers to extracting materials directly from the surface.
- How are minerals extracted from the ground?
  - Underground mining
    - Only option when ore deposits are located deep below the surface
  - Surface (open pit) mining
    - Can make use of the following three types:
      - Open pit mining in which machines dig holes and removes the ores (copper, iron, gravel, limestone, sandstone, marble, granite)
      - Dredging in which chained buckets and draglines are used which scrap up the minerals from under-water mineral deposits.
      - Strip mining in which the ore is stripped off by using bulldozers, power shovels and stripping wheels (e.g. phosphate rocks)
  - Placer mining
    - Raw materials are deposited on the surface of sand on beaches or places where the rivers or oceans touch the land.
    - The sand is picked up manually and transported to separation plants
    - Heavy minerals are then separated according to their size to different grades.
  - Hydraulic mining
    - Involves high pressure water. Water is sprayed at an area of rock and/or gravel and the water break the rock up, dislodging ore and placer deposits. The water/ore mixture is then milled.
    - This is a very destructive way to mine and has been outlawed in most areas.
  - In-situ mining

- In-situ leaching/recovery/solution mining, used to recover minerals such as copper and uranium through boreholes drilled into a deposit, in situ
- Impacts of mining
  - Mining is done to extract minerals (or fossil fuels) from deep deposits in soil by using sub-surface mining or from shallow deposits by surface mining.
  - The former method is more destructive, dangerous and expensive including risks of occupational hazards and accidents.
  - The environmental damage caused by mining activities are as follows:
    - Devegetation and defacing of landscape
    - Subsidence of land
    - Groundwater contamination
    - Surface water pollution
    - Air pollution
    - Occupational health hazards
- Remedial measures
  - Low-grade ores can be better utilized by using microbial-leaching technique
  - This biological method is helpful from economic as well as environmental point of view
  - Restoration of mined areas by re-vegetating

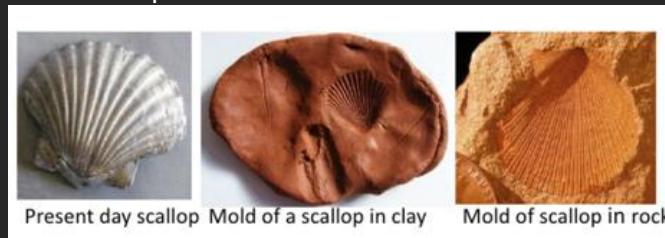
## F. Other sources of energy: Fossil fuels

### Fossils

- Preserved remains of once-living organisms
- Fossils are formed when animals or plants are buried in sedimentary rock.
- You should remember how sedimentary rock is formed and how to identify which layers are the oldest and which are the youngest.
- If sediment covers a dead organism before it has time to rot, the organism's body may become fossilized.
- As many years pass, new types of sediment are deposited on top of the original sediment containing the fossil and the layers of sediment change to rock.
- Fossils at the very top layer of the sedimentary rock is younger than the fossils at the bottom layers

### Types of fossils

- Molds
  - A mold forms when: a. an organism dies and is buried in sediment such as sand, silt or clay; b. the sediment changes to rock and the organism's body decomposes leaving an imprint or mold in the rock. Molds can be seen if the rock is broken open



- Casts

- A cast forms when an organism dies and is buried in sediment. Its body rots leaving a hole in the shape of its body. Water with minerals fills up the hole. When the water evaporates, a copy of the original structure of organism is formed as a rock.

Picture of present day snail



Picture of fossilized snail



- 

- Trace

- Include leaf prints, burrows, coprolites (feces), trails, footprints
- Trace fossils of an animal tell something about its movement and behavior.
- Trace fossils are not an imprint of the hard part of an animal's body.



- 

- Whole or a part of the body is preserved

- In rare instances an entire organism or its skeleton is preserved because the organism gets trapped preventing its body from decaying.

A spider trapped in tree sap. The tree sap hardened into amber, preserving the whole spider.



- 

Fossil fuels

- Formation of fossil fuels

- Coal, crude oil and natural gas are called fossil fuels because they formed from
  - Plastic
  - Cast or molds
  - Sediment such as gravel, sand, silt, and clay
  - Remains of ancient plants and/or animals
- Three types
  - Coal
    - Before the dinosaurs, many giant plants died in swamps.
    - Over millions of years, the plants were buried under water and dirt.
    - Heat and pressure turned the dead plants into coal.
  - Crude oil and natural gas
    - Tiny sea plants and animals died and were buried in the ocean floor. Over time, they were covered by layers of silt and sand.
    - Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.
    - Today, we drill down through layers of sand, silt, and rock to reach the rock formations that contain oil and gas deposits

#### Main uses of fossil fuels

- Electricity: Coal alone provides half the electricity.
- Heating: Oil and natural gas are commonly used for heating homes as well as providing heat for industrial applications
- Transportation: Oil supplies 99% of the energy for cars in the form of gasoline and diesel

#### Limits

- Fossil fuels are non-renewable resources, which means there is a limited supply. As more fossil fuels are used, the unused resources will be more costly to collect and prices will rise.

#### Consideration

- When they are burned, they release pollutants that contribute to global warming and acid rain. (and yes, climate change is real)

### **G. Energy resources**

#### Ways in reducing waste

- Prolongs fossil fuel supplies
- Reduces oil imports and improves energy security
- Buys time to phase in renewable energy
- Creates local jobs

#### How can we cut energy waste?

1. Cogeneration - involves using a combined heat and power (CHP) system. (Ex. Steam and energy from same fuel source)
2. Replace energy-wasting electric motors
3. Recycling materials (ex. Steel from recycled scrap iron instead of virgin iron ore)
4. Switch from low-efficiency to higher-efficiency fluorescent lightning and light-emitting diodes (LEDs)

#### More energy efficient vehicles

- There is a growing interest in developing modern, super-efficient, ultralight, and ultrasound cars that could get up to 130 kph (300 miles per gallon) using existing technology – a concept that Amory Lovins invented in 1991.
- Hybrid car

#### Building design that save energy and money

- Principle of sustainability - Facing the sun so it can get more heat from solar energy
- Energy efficient compact fluorescent lights focus only on work areas instead of the entire work room.
- Green architecture (energy efficient and money-saving designs)
- Living roofs or garden roofs
- Superinsulation

#### Scientific principles of sustainability

- Solar energy
- Biodiversity
- Chemical cycling

#### Other energy resources trade-offs

##### 1. Solar energy

Advantages	Disadvantages
Renewable and pollution free	Needs lots of space
Reduces electricity	High initial cost
Less to no maintenance for years	No solar power at night and cloudy days
More solar energy in summer	DC equipment are expensive
Diverse application	Expensive battery
Can be stored in a battery	Less solar energy in winter

##### 2. Hydropower

Advantages	Disadvantages
Renewable	Requires flowing water
Generally no required fuel	Can interfere with view
Constant energy	Disrupts the ecosystem
Cheap	People moved to make way
No pollution	Reservoirs can fill with dirt and become useless

##### 3. Wind energy

Advantages	Disadvantages
Doesn't carbon dioxide or other pollutants	Unreliable sources of energy
Renewable source of energy	Expensive to store
Pollution-free	Generates only employment
Lesser space	

#### 4. Biomass sources

- Biological material derived from living or recently living organisms. In the context of biomass as a resource for making energy, it most often refers to plants or plant-based materials which is not used for food or feed, and are specifically called lignocellulosic biomass.
- Biomass energy is the energy which contained inside plants and animals. This can include organic matter of all kinds: plants, animals, or waste products from organic sources.
- Biomass is a renewable energy resource derived from the carbonaceous waste of various human and natural activities.

Advantages	Disadvantages
Good for the earth	Expensive to make
Renewable	Haven't found ways to store the energy
Useful to create things and products	Requires more fuel
Clean	Harmful for the environment
Reduces landfills	Requires more land

#### 5. Geothermal

Advantages	Disadvantages
Low cost	Source is close to volcanic activity
Inexhaustible	Some plants use lots of water – creating water pollution
No environmental impact	Supply could change
Pumps can store heat for later use	Cannot be transported
	High start up cost

#### 6. Hydrogen energy

Advantages	Disadvantages
Readily available	H <sub>2</sub> is difficult/expensive to produce, store and transport
No harmful emissions	Fuel cells require pure fuel
Environmentally friendly	Platinum catalysts are expensive and rare
Used as fuels in rockets	Proton exchange membranes must be kept moist
Fuel efficient	Hydrogen fuel cell stacks are heavy.
Renewable	

## H. Harnessing Geothermal Energy

### Geothermal Energy

- Heat energy of the Earth
- Can be generated by:
  - Geothermal power plants, which use the heat from deep inside the Earth
  - Geothermal heat pumps, which tap into heat close to the Earth's surface to heat water or provide heat for buildings.

### How is geothermal energy generated?

- Magma heats nearby rocks and underground aquifers. Hot water can be released through geysers, hot springs, steam vents, underwater hydrothermal vents and mud pots. These are all sources of geothermal energy. Their heat can be captured and used directly for heat, or their steam can be used to generate electricity

### Geothermal reservoirs

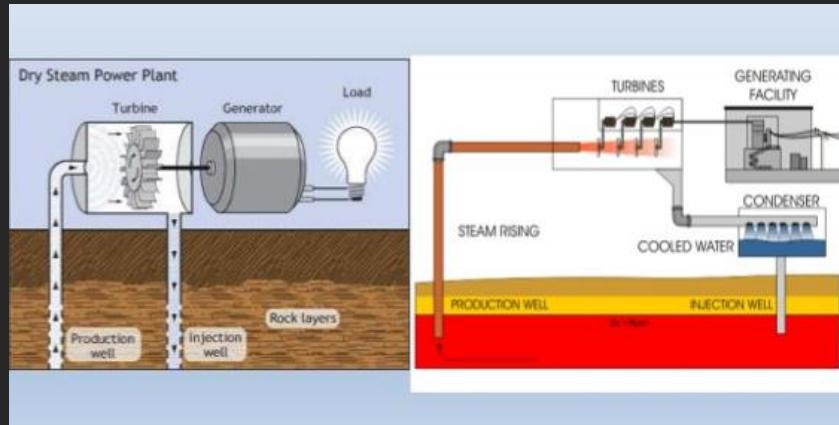
- Reservoirs can be suspected in the area where we find:
  - Geyser
  - Boiling mud point
  - Volcano
  - Hot springs
- The rising hot water and steam is trapped in permeable and porous rocks to form a geothermal reservoir
- Geothermal reservoirs are pools of water heated by magma deep below the surface. Water or steam can escape from cracks in the earth in the form of geysers (or sometimes as magma from a volcano). The ability to harness the steam is what powers a geothermal power plant
- Can be discovered by
  - Testing the soil
  - Analyzing the underground temperature
- Most of the geothermal reservoirs in the US are located in the western states, Alaska, and Hawaii. California is the state that generates the most electricity from geothermal energy. The Geysers dry steam reservoir in northern California is the largest known dry steam field in the world.

### Use of geothermal energy

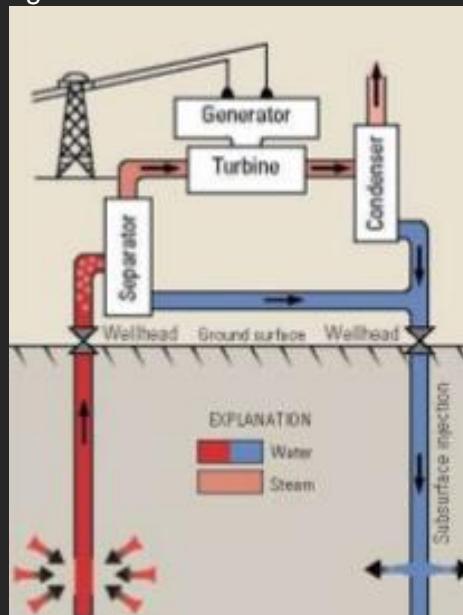
- Direct use
  - Hot springs used as spas
  - Heating water in fish farm
  - Provide heat for buildings
  - Raising plants for greenhouses, drying crops
  - Provides heat to industrial processes
- Indirect use of geothermal energy

### Three types of power plants

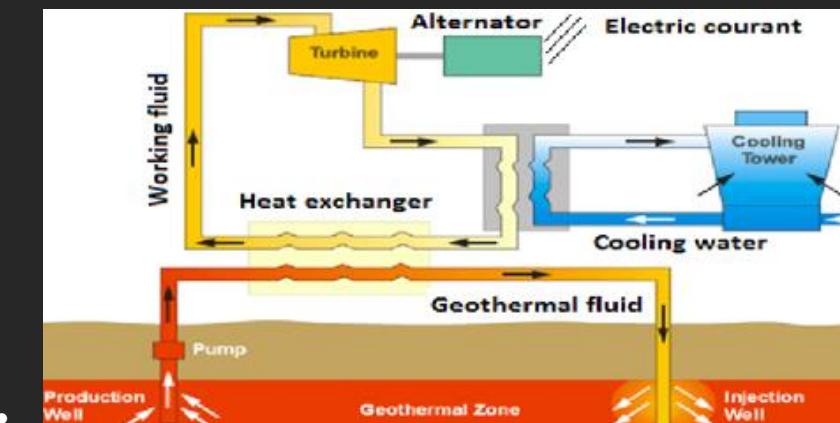
- Dry steam power plant



- 
- Flash steam power plant
  - The hot water is pumped under great pressure to the surface]
  - When it reaches the surface, the pressure is reduced causing some of the fluid to rapidly vaporize or "flash".
  - The vapor then drives a turbine, which drives a generator
  - The cold water is returned to the reservoir to be heated by the geothermal rocks again.



- 
- Binary cycle power plant
  - Transfer the heat from geothermal hot water to another liquid. The heat causes the second liquid to turn to steam, which is used to drive a generator turbine.

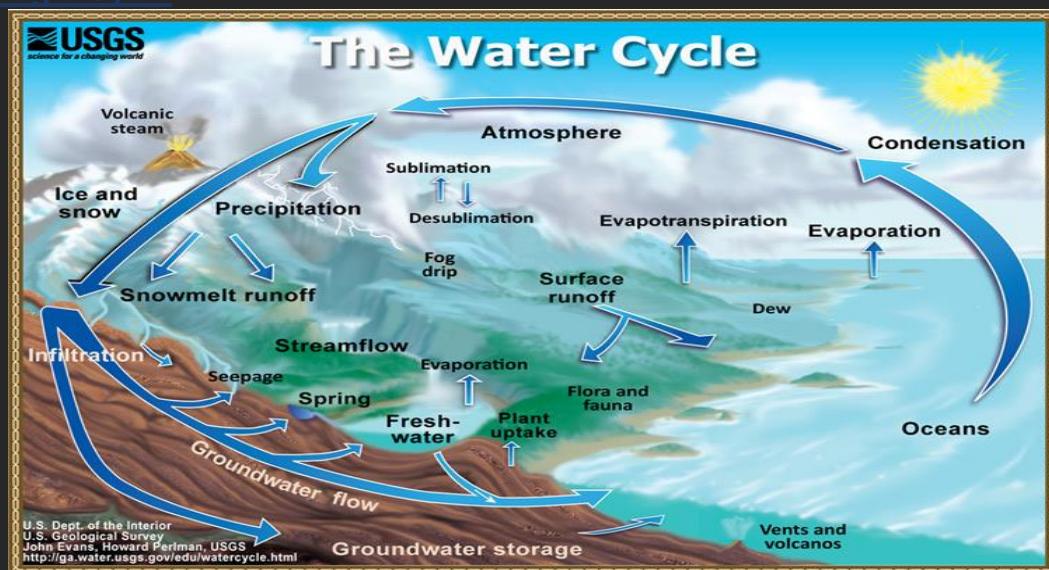


## I. Water

### Introduction

- Looking at the Earth from outer space, one realizes why it is called the "blue planet". Water covers about 71% of its surface, and the water that is deep enough, appear blue to the unaided eye.
- Distribution of water on the Earth's surface
  - 97.5% as salt water in oceans and seas.
  - 2.5% as fresh water in lakes, rivers, wetlands, ground water, biota, soil and the atmosphere.
  - 1.7% in polar icecaps and glaciers.

### Hydrologic Cycle



Three main loops of hydrologic cycle

Loop	Description	Image
Surface run-off loop	Where water runs across the ground surface and becomes part of the surface water system.	
Evapotranspiration loop	Where water infiltrates and is held as capillary water, then returned to the atmosphere by evaporation or transpiration.	<p style="text-align: center;"><math>\text{evapotranspiration} = \underbrace{\text{transpiration} + \text{evaporation}}</math></p>
Ground water loop	The water infiltrates, percolates to join ground water, moving through aquifers, and exits through springs, wells, where it rejoins surface water. Aquifer: Porous rocks that filters the water.	

### Evaporation and Relative Humidity

- Evaporation is the change of water molecules from liquid to vapor due to higher kinetic energy which it absorbs from sunlight.

- The amount of water vapor is actually present in air compared with that the air can normally hold at a given temperature is called relative humidity (RH)

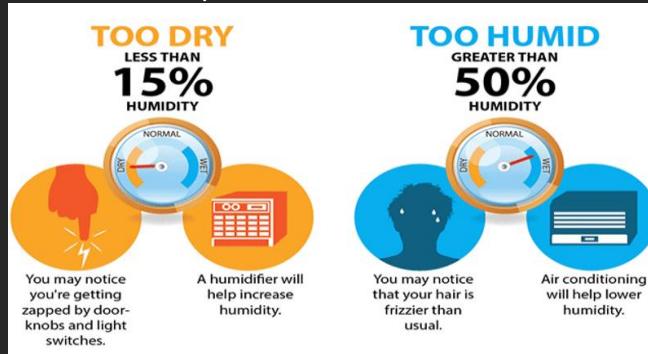
$$\text{Relative Humidity (rH)} = \frac{\text{actual amount of water vapor in air}}{\text{saturated amount the air can hold at that temperature (from graph)}} \times 100$$

- For example, 60% humidity means the air contains 60% of the maximum amount of water vapor it can hold at a given temperature. Given that the temperature of the surrounding air is 30°C. The vapor pressure of water at 30°C is 31.81 mmHg. A relative humidity of 60% means that the surrounding air contains water vapor capable of exerting only 19.1 mmHg.

### Appendix B Vapor Pressure of Water at Various Temperatures

Temperature (°C)	Pressure (mmHg)	Temperature (°C)	Pressure (mmHg)
0	4.6	27	26.7
5	6.5	28	28.3
10	9.2	29	30.0
11	9.8	30	31.8
12	10.5	35	42.2
13	11.2	40	55.3
14	12.0	45	71.9
15	12.8	50	92.5
16	13.6	55	118.0
17	14.5	60	149.4
18	15.5	65	187.5
19	16.5	70	233.7
20	17.5	75	289.1
21	18.7	80	355.1
22	19.8	85	433.6
23	21.1	90	525.8
24	22.4	95	633.9
25	23.8	100	760.0
26	25.2	105	906.1

- The amount of water that air can hold increases and decreases with temperature.
- As warm moist air cools, the amount of water it can hold decreases.
- Cooling air beyond the point where RH reach 100% forces excess moisture to condense, forming clouds.
- Further cooling and condensation produce rain.



### Condensation

- It is the formation of liquid water from water vapor.
- If the droplets form in the atmosphere, the result is **fogs** and **clouds**.
- If the droplets form in the cool surfaces of vegetation, the result is **dew**.

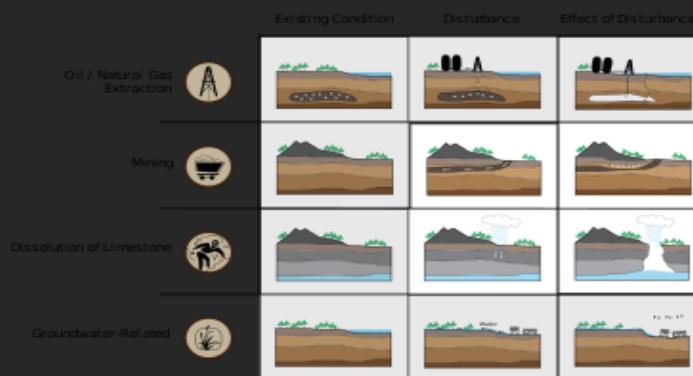
### Precipitation

- It is the cooling of air beyond the point where RH reaches 100% forcing excess moisture to condense, forming clouds.
- Further cooling causes condensation followed by precipitation.
- Rain, snow, sleet or hail.

## J. Human Activities and Water Quality

### How the Activities of Living Organisms affect the Water Cycle

1. Clear cutting of forests
  - Reduces infiltration of water into the ground, causing diminished biodiversity.
2. Urban development
  - Replaces soil with asphalt, increasing run-off from the usual 10% to 43%
3. Plant cover
  - Diminishes the impact of raindrops and reduces erosion.
4. Land subsidence
  - Causes building foundations, road ways, water and sewer lines to crack.
  - Causes of land subsidence



5. Sinkholes
  - Underground caverns, when they are drained of supporting ground water, it collapses.
6. Saltwater intrusion
  - Could contaminate drinking water supply of many towns and cities.



- Occurs when too much groundwater is pumped from coastal aquifers, thereby upsetting the subterranean balance between inland freshwater and the relentless ocean.
- Water moves through the ground as it does in rivers: from high elevation to low. At the margin of a coastal aquifer, fresh water and salt water mix.
- When the rate of groundwater pumping increases, the equilibrium shifts

Human activities affect the hydrologic cycle by

- Reducing the infiltration of water
- Increasing run-off
- Reduces transpiration
- Draining of the ground water
- Contaminating fresh water.

## K. Parameters of Water Quality

### Physical Parameters

1. Turbidity
  - Due to clay, silt, and tiny fragments of organic matter

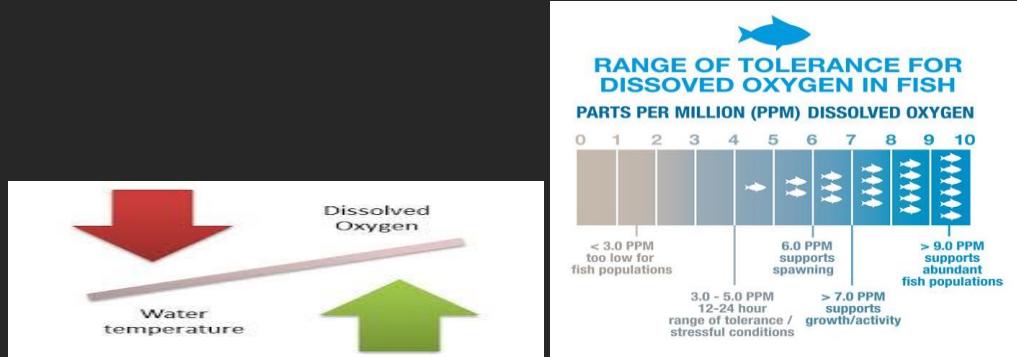


2. Temperature
  - In an aquatic environment, certain species have optimal temperatures
  - Ex. Trout is 15C while Carp is 32C
3. Color, taste, and odor
  - Due to dissolved and suspended colloids from decaying leaves and microscopic plants
  - Hydrogen sulfide (H<sub>2</sub>S), a foul-smelling gas that smells like rotten eggs is evolved.

## Chemical Parameters

### 1. Dissolved oxygen

- It is the amount of oxygen dissolved in water.
- High DO means better quality of water.
- At 20°C the average DO value is 9.0 ppm or mg/L



### 2. Biochemical Oxygen Demand (BOD)

- Microbes demand or use up oxygen in biochemical reactions that sustain them.
- The more organic materials present in a water sample, the higher the BOD.
- 20 days
- BOD values taken after 20 days is called ultimate carbonaceous BOD.
- Measuring BOD
  - The DO of the water sample is measured at time = 0.
  - The sample is incubated in the dark at 20°C for 5 days.
  - The DO of the same water sample is measured after a 5-day lapse.
  - BOD<sub>5</sub> = DO at t=0 minus DO after 5 days
  - BOD values in excess of 10mg/L indicate pollution

### 3. Chemical Oxygen Demand (COD)

- Measures the amount of all organic materials including non-biodegradable substances.
- It uses a strong oxidizing agent (K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>H<sub>2</sub>SO<sub>4</sub> and heat) (potassium dichromate, sulfuric acid)
- Results within 2 hours
- COD are always higher than BOD

### 4. Total Solid Content

- Refers to the total solid content in a water sample, which dissolved (TDS) or suspended (TSS)
- TDS

$$TDS = \frac{(A-B) \times 1000}{C}$$

- Where A is the weight of dish + residue in mg.
- B is the weight of empty dish in mg
- C is the volume of sample filtered, in mL.

- TSS

$$\frac{\text{TSS} = (\text{X}-\text{Y}) \times 1000}{\text{C}}$$

- Where X is the weight of filter paper + residue, in mg
- Y is the weight of dry filter paper, in mg
- C is the volume of sample filtered, in mL.
- Sample problem
  - An evaporating dish weighs 40.525 grams. A 100 mL water sample was filtered, evaporated to dryness, cooled and weighed. The weight was found to be 40.545 grams. The residue left in the filter paper weighed 0.34 grams. The initial weight of the filter paper was 0.300 grams.  
Calculate TDS, TSS and total solid content of the water sample.
  - $\text{TDS} = \frac{(40.545 - 0.300) \times 1000}{100} = 200 \text{ mg/L}$
  - $\text{TSS} = \frac{(340 - 300) \times 1000}{100} = 400 \text{ mg/L}$
  - Total solid content = TDS+TSS =  $200+400= 600\text{mg/L}$

5. Water hardness

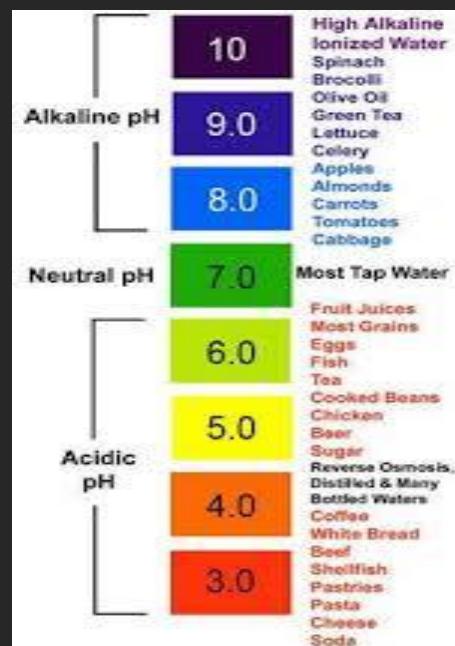
- Is expressed as  $\text{Ca}^{+2}$  and  $\text{Mg}^{+2}$  content of water and is expressed as ppm  $\text{CaCO}_3$ .
- When ppm  $\text{CaCO}_3 > 300\text{mg/L}$  water is considered hard.
- When ppm  $\text{CaCO}_3 < 75 \text{ mg/L}$ , water is considered soft.
- Hard water deposits scales in hot water pipes, and make lather production difficult.
- On the other hand, very soft water is undesirable because it increases the corrosion problems, and some health officials believe it is associated with the incidence of heart diseases.

6. Presence of residual chlorine

- Is indicative if good water quality.
- 0.2 mg/L is considered optimal but in the presence of organic materials, chlorine may react with them to form toxic compounds like chloroform ( $\text{CHCl}_3$ ) which are also potential carcinogens.

7. Acidity and Alkalinity

- Shown by pH values
- Indicative of pollution
- A pH range of 6-9.5 is still within tolerance limits of aquatic life.



### Biological Parameters

- Good quality means it is free from disease causing organisms.
- Instead of testing each pollutant separately, a single species is tested for (indicator organism)
- Coliform group (bacteria)
- Two groups of Coliform organisms
  - Total coliform: all members of the coliform group
  - Fecal coliform: came from the intestines of warm-blooded animals
  - Escherichia Coli (E. Coli): from humans

#### Total Coliform, Fecal Coliform and E.coli



- Coliform tests
  - Total coliform test
    - Is done when the intended use for the water is for drinking
  - Fecal coliform test

- Monitors pollution of surface and ground water to make sure that disinfection processes are working.
- FC/FS values
  - Are done when the origin of pollution is required.
  - Fecal streptococci (FS): another indicator organism; came mainly from animals
  - Interpretation of FC/FS values
    - FC/FS Values > 2, fecal contamination comes from human sources
    - FC/FS Values < 1, the contaminant is from animals
    - FC/FS Values greater than 1 but less than 2 is inconclusive.

## L. Activities that affect the quality and quantity of soil

Soil is a resource you can't live without. Whether it's supplying you with food, oxygen, or clean water. It sustains life.

Soil is so important to not only humans but the world. So, it's important that we conserve our soil.

### Why is soil important?

- Soil is a mixture of mineral fragments, organic material, water, and air.
- Soil provides habitat for organisms such as plants, earthworms, fungi, and bacteria.
- Plants get water and nutrients from the soil. Because plants form the base of the food web, **healthy soil** is important for land ecosystems.
- Stores water and nutrients
- Different types of soil can store different amounts of water.
- Soils are also part of the nutrient cycle.
- Plants take up nutrients and water from the soil. Plants and animals that eat them die and are broken down by decomposers.
- The decomposers release nutrients back into the soil, and the cycle starts again.

### Activities that affect the soil

1. Farming
  - Farming is how humans have received their food for over 10,000 years.
  - Farmers often add nutrients to their soils in the form of organic or artificial fertilizers to make crops grow better.
2. Mining
  - Strip mining and open pit mining involves the removal of plants. This can cause more exposure to air and water, which can speed up the process of chemical weathering.
  - The speed up of chemical weathering can cause a type of pollution called acid drainage.
  - This acid can seep into the soil and be harmful to plants trying to grow.
3. Construction of structures
  - To make various buildings and sites, people need to dig up soil.

- A lot of this can cause the soil to wash or be blown away which can cause rivers and lakes to become muddy.
- The effects can lead to flooding or can fill up lakes and reservoirs.

### How do these human activities affect the soil?

#### Dust Bowl

- In the 1930s, large areas of the Great Plains of the United States were wiped out by huge dust storms.
- Farmers in the area had over plowed and overgrazed the land. A severe drought dried out the topsoil, and winds carried away the soil in huge black clouds.
- A similar dust bowl is forming now in China because of similar farming practices and drought conditions.

#### How?

- When urbanization occurs at the edge of a city or town, it is called urban sprawl
- Urban sprawl replaces forests, fields, and grasslands with houses, roads, schools, and shopping areas.
- Urban sprawl decreases the amount of farmland available for growing crops, and it decreases the number of natural areas that surround cities.
- Erosion is the process by which wind, water, or gravity transports soil and sediment from one place to another.
- Erosion can speed up when land is degraded or cleared for farming, exposing the soil to blowing wind and running water.
- Soil nutrients can get used up if the same crops are planted year after year. Farmers can plant a different crop each year to reduce nutrient loss.
- Pollution from industrial activities can damage land.
- Mining wastes, gas and petroleum leaks, and chemical wastes can kill organisms in the soil.
- Desertification is the process by which land becomes more desert-like and unable to support life.
- Without plants, soil becomes dusty and is prone to erosion.
- Overgrazing, deforestation, and urbanization can lead to desertification.
- The removal of trees and other vegetation from an area is called deforestation.
- Logging for wood, surface mining, and urbanization can cause deforestation.
- Deforestation leads to increased erosion.

## M. Different Types of Wastes

### Introduction

- The volume and type of solid and hazardous wastes increase all over the world due to rapid economic growth, urbanization and industrialization.
- Managing solid wastes in society has been a challenge for as long as people have gathered together in sufficient number to impose a stress on local resources.
- Improper management of solid waste is one of the main causes of environmental pollution and degradation in many cities, low collection coverage, inadequate transport service, and lack of suitable treatment, recycling and disposal equipment's are factors

responsible for unsatisfactory waste management, leading to water, land and air pollution and for putting people and environment at risk.

### What is waste?

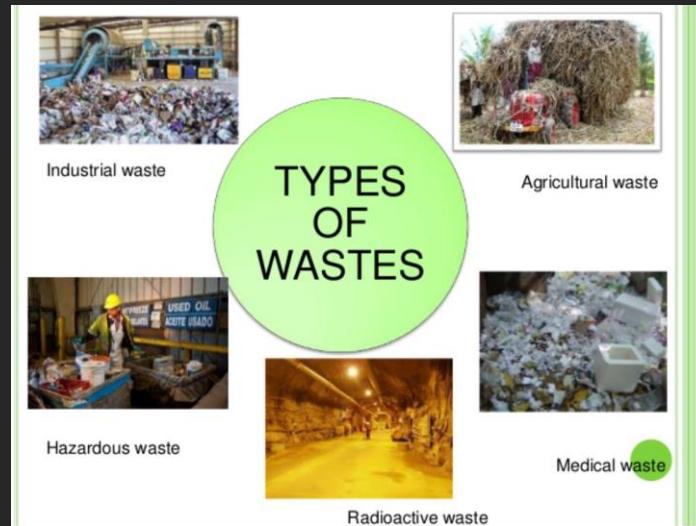
- Waste is defined as unwanted and unusable materials and is regarded as a substance which is of no use.
- Also known as garbage.
- Garbage is mainly considered as a solid waste that includes wastes from our houses (domestic waste), wastes from schools, offices, etc. (municipal wastes) and wastes from industries and factories (industrial wastes).

### Sources of Waste

1. Industrial
  - Wastes created in factories and industries.
  - Most industries dump their wastes in rivers and seas which cause a lot of pollution.
  - Example: Plastic, glass, chemical solvents, paints.
  - Includes: Manufacturing, mining, coal combustion, oil and gas production.
2. Commercial
  - Commercial wastes are produced in schools, colleges, shops, and offices.
  - Example: Plastic, paper, etc.
3. Domestic
  - The different household wastes which are collected during household activities like cooking, cleaning, etc. are known as domestic wastes.
  - Example: Leaves, vegetable peels, excreta, etc.
4. Agricultural
  - Various wastes produced in the agricultural field are known as agricultural wastes.
  - Example: Cattle waste, weed, husk, etc.

### Types of wastes

1. Biodegradable waste
  - These are the wastes that come from our kitchen and it includes food remains, garden waste, old newspapers, etc.
  - Biodegradable waste is also known as **moist waste**.
  - This can be composted to obtain manure. Biodegradable wastes decompose themselves over a period of time depending on the material.
2. Non-biodegradable waste
  - These are the wastes which include broken glass pieces, plastics, etc.
  - Non-biodegradable waste is known as **dry waste**.
  - Dry wastes can be recycled and can be reused.
  - Non-biodegradable wastes do not decompose by themselves and hence are major pollutants.



## N. Effects of Waste on People's Health and Environment

### Introduction

- The environment in the present age is exposed to major setbacks will change the chemical composition in the most systems in the sea and ocean, air and soil. Has left many pollutants imprint in the environment, including solid waste, which had the role of environmental disruption in many of the elements of the environment.
- Cause the accumulation of solid waste a lot of health problems where garbage becomes a breeding ground for microbes and insects like flies, mosquitoes and rats, cats and dogs, which helps in the spread of the diseases that affect human health and infrastructure in addition to the psychological and social effects of the citizens.

### How long does it take for waste to degrade?

There are different categories of waste generated, each take their own time to degenerate :	
Type of litter	Approximate time it takes to degenerate the litter
Organic waste such as vegetable and fruit peels, leftover foodstuff, etc.	a week or two.
Paper	10–30 days
Cotton cloth	2–5 months
Wood	10–15 years
Woolen items	1 year
Tin, aluminium, and other metal items such as cans	100–500 years
Plastic bags	one million years?
Glass bottles	undetermined

### Common waste

- Paper** accounts for more than 71 million tons of garbage.
- Yard wastes are the next most common waste, contributing more than 31 million tons of **solid waste**.
- Metals account for more than 8% of all household waste

- Plastics are close behind with another 8% or 14 million tons.

### Plastics

- With its exclusive qualities for being light yet strong and economical, has invaded every aspect of our day-to-day life.
- It has many advantages: it is durable, light, easy to mold, and can be adapted to different user requirements.
- Once hailed as a "wonder material", plastic is now a serious worldwide environmental and health concern, essentially due to its nonbiodegradable nature.
- Plastics have use in all sectors of economy - infrastructure, construction, agriculture, consumer goods, telecommunications, and packaging.
- Disadvantages: burning of plastics, especially PVC releases dioxin and furan into the atmosphere. Thus, conventional plastics, right from their manufacture to their disposal are a major problem to the environment.

### Characteristics of waste

- Corrosive: these are wastes that include acids or bases that are capable of corroding metal containers, e.g., tanks
- Ignitability: this is waste that can create fires under certain condition, e.g., waste oils and solvents
- Reactive: these are unstable in nature, they cause explosions, toxic fumes when heated.
- Toxicity: waste which are harmful or fatal when ingested or absorbed

### Waste disposal

1. Landfills
  - Waste is placed into or onto the land in disposal facilities
2. Underground injection wells
  - Waste are injected under pressure into a steel and concrete-encased shafts placed deep in the earth.
3. Waste piles
  - It is accumulations of insoluble solid, non-flowing hazard waste. Piles serve as temporary or final disposal.
4. Land treatment
  - It is a process in which solid waste, such as sludge from wastes is applied onto or incorporated into the soil surface.
5. Wastes are disposed in flowing rivers in less developed countries.

### Causal of increase in solid waste

- Population growth
- Increase in industrial manufacturing
- Urbanization
- Modernization
  - Modernization, technological advancement and increase in global population created rising in demand for food and other essentials. This has resulted to rise

in the amount of waste being generated daily by each household. 158 million tons of municipal solid waste is produced annually in U.S.

### Points of contact

- Soil absorption, storage, and biodegrading
- Plant uptake
- Ventilation
- Runoff
- Leaching
- Insects, birds, rats, flies and animals
- Direct dumping of untreated waste in seas, rivers and lakes results in the plants and animals that feed on it.

### Impacts of solid waste

#### On health

- Chemical poisoning through chemical inhalation
- Uncollected waste can obstruct the storm water runoff resulting in flood
- Low birth weight
- Cancer
- Congenital malformations
- Neurological disease
- Nausea and vomiting
- Increase in hospitalization of diabetic residents living near hazard waste sites
- Mercury toxicity from eating fish with high levels of mercury

#### On animals and marine life

- Increase in mercury level in fish due to disposal of mercury in the rivers
- Plastic found in oceans ingested by birds
- Resulted in high algal population in rivers and sea
- Degrades water and soil quality

#### Environment

- Waste breaks down in landfills to form methane, a potent greenhouse gas
- Change in climate and destruction of ozone layer due to biodegradable waste
- Littering, due to waste pollutions, illegal dumping
- Leaching: is a process by which solid waste enter soil and ground water and contaminating them

**SOLID WASTE AND HEALTH HAZARDS**

Health Hazard due to Household Waste	Health Hazard due to Hospital Waste	Health Hazard due to Agricultural Waste
<ul style="list-style-type: none"> <li>The waste part of vegetables, fruits, spoiled cooked food etc. laying outside attract flies, rats and other creatures that in turn spread diseases.</li> <li>The decomposed waste releases a bad odour, it leads to unhygienic conditions and that is why there is increase in health hazards.</li> </ul>	<ul style="list-style-type: none"> <li>The indisposed hospital waste offers a fertile breeding ground to microbes responsible for spreading of diseases like cholera, HIV, hepatitis B, brain infection and several skin and body allergies.</li> </ul>	<ul style="list-style-type: none"> <li>The residue in agriculture areas after harvesting crops like peels of groundnuts, the waste matter of coconut etc. get decayed and decomposed and result into diseases.</li> <li>Sometimes the uncollected solid waste can also obstruct water runoff and stagnant water becomes breeding ground of disease – causing germs.</li> </ul>

**THE NEW FOOD CHAIN**

The diagram shows a sequence: MICROPLASTICS (represented by a plastic bottle) leads to TO FISH (represented by a fish), which then leads to TO US (represented by a person's mouth).

## O. Weathering

### Definitions

Weathering, erosion, mass-wasting, and depositional (sedimentation) processes occur at or near Earth's surface and produce changes to the landscape that influence surface and subsurface topography and landform development.

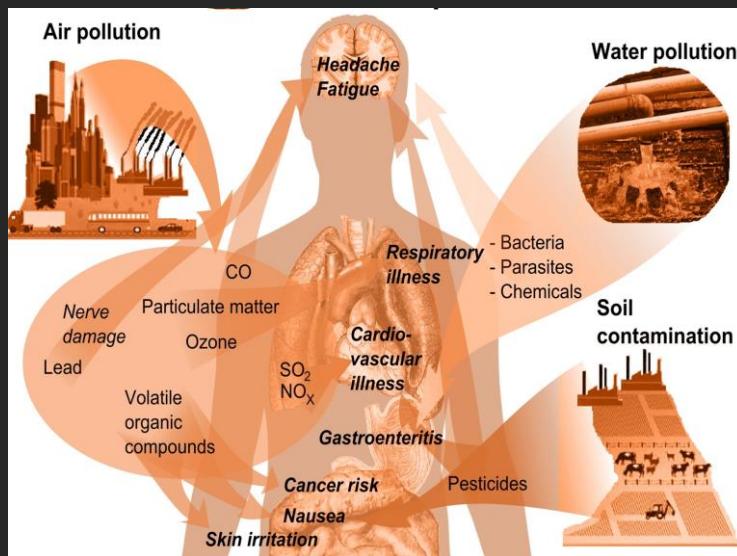
- Weathering is the physical disintegration or chemical alteration of rocks at or near the Earth's surface.
- Erosion is the physical removal and transportation of weathered material by water, wind, ice, or gravity.
- Mass wasting is the transfer or movement of rock or soil down slope primarily by gravity.
- Deposition is the process by which weathered and eroded materials are laid down or placed in a location that is different from their source.

These processes are all very important to the rock cycle because over geologic time weathering, erosion, and mass wasting transform solid rock into sediments and soil that results in the redeposition of material forming new sedimentary rocks.

### Types of weathering

1. Mechanical (physical) weathering is the physical disintegration and reduction in the size of the rocks without changing their chemical composition. Ex: Exfoliation, frost wedging, salt wedging, temperature changes, and abrasion.
  - a. Exfoliation
    - A mechanical weathering process whereby pressure in a rock is released along parallel alignments near the surface of the bedrock and layers or slabs of the rock along these alignments break off from the bedrock and move downhill by gravity.

- Primarily occurs on intrusive igneous or metamorphosed rocks that are exposed at the Earth's surface.
- b. Frost wedging
- Mechanical weathering process caused by freeze-thaw action of water that is trapped between cracks in the rock.
  - When water freezes, it expands and applies pressure to the surrounding rock forcing the rock to accommodate the expansion of the ice.
  - This process gradually weakens, cracks, and breaks the rock through repetitive freeze-thaw weathering cycles.
- c. Temperature changes
- Daily (diurnal) and seasonal temperature changes affect certain minerals and facilitates the mechanical weathering of bedrock.
  - Warmer temperatures may cause some minerals to expand, and cooler temperatures cause them to contract.
  - This gradual expansion and contraction of mineral using it to break apart into structure.
- d. Salt wedging
- Occurs when salts crystallize out of solution as water evaporates. As the salt crystals grow, they apply pressure to the surrounding rock weakening it, until it eventually cracks and breaks down, enabling the salt crystal to continue growing.
  - Salt wedging is most common in drier climates, such as deserts.
  - Water is volatile (evaporates), and salt is not (doesn't evaporate)
- e. Abrasion
- Occurs when rocks collide against each other while they are transported by water, glacial ice, wind, or gravitational force.
  - The constant collision or gravitational falling of the rocks causes them to slowly break apart into progressively smaller particles.
2. Chemical weathering decomposes, dissolves, alters, or weakens the rock through chemical processes to form residual materials. Ex: Carbonation, hydration, hydrolysis, oxidation, and solution.
3. Biological weathering is the disintegration or decay of rocks and minerals caused by chemical or physical agents of organisms. Ex: Organic activity from lichen and algae, rock disintegration by plant or root growth, burrowing and tunneling organisms, and acid secretion.



## General Biology

### A. Introduction

#### What is biology?

- Derived from bios (referring to life) and logos (meaning study). Biology means the study of life.
- All living things are made of cells. Some organisms are **unicellular** – only consist of a single cell that carries out all life processes; others are **multicellular** – composed of many cells which perform specialized and specific functions.

#### Characteristics of a living organism

- Reproduction
  - o Ability of living things to produce new individuals closely resembling them.
    - Asexual
      - Involves one parent
      - Involves no gametes
      - Offspring are genetically the same as the parents
    - Sexual
      - Usually involves 2 parents
      - Involves gametes
      - Involves fertilization
      - Offspring are genetically different from each of parents
- Metabolism
  - o Greek: metabole = change
  - o Set of life-sustaining chemical reactions in organisms.
  - o Three main purposes:
    - Conversion of food to energy to run cellular processes
    - Conversion of food/fuel to building blocks for proteins, lipids, nucleic acids, and some carbohydrates
    - Elimination of nitrogenous wastes
- Growth and development
  - o Growth

- Refers to the increase in size and number
- Has a quantitative measure
- Involves the increase in size and number
- Development
  - Refers to an improvement in circumstances
  - Has a qualitative measure
  - Encompasses over all changes including growth and other progressive changes
- Response to stimuli
  - Internal stimuli: Feeling hungry or thirsty
  - External stimuli: Sunburn, shivering
- Homeostasis
  - Ability to maintain a relatively stable internal state that persists despite changes in the world outside. All living organisms, from plants to puppies to people, must regulate their internal environment to process energy and ultimately survive.
- Adaptation
  - Change in an organism that help it survive and reproduce in its environment.
  - The adjustment or changes in behavior, structure and physiology of an organism to become more suited to the environment.
  - The organism's means to survive. Living organisms over the course of time have adapted to various changing environmental conditions.

## B. Cell Theory

- Two Dutch eye glass makers, Zaccharias Janssen and son Hans Janssen experimented with two lenses in a tube. The Janssens observed that viewed objects in front of the tube appeared greatly enlarged, creating both the forerunner of the compound microscope and the telescope.

1665

- English scientist Robert Hooke discovered cells while looking at a thin slice of cork.
- He described the cells as tiny boxes or a honeycomb.
- He thought that cells only existed in plants and fungi.

1673

- Dutch microscope maker Anton van Leeuwenhoek was the first one to view living cells of organisms.
- He used a handmade microscope to observe pond water and discovered single-celled organisms he called animalcules.
- 

1838

- German professor of botany Matthias Schleiden identified the first plant cells and concluded that **all parts of a plant is made of cells**.

1839

- German biologist Theodor Schwann who viewed animal parts under a microscope and discovered that animals were made up of cells. He extended Schleiden's theory in plants to animals, stating that **all living things are composed of cells.**

1855

- German doctor Rudolph Virchow observed, under the microscope, that cells divide.
- He proposed an important extension of cell theory that **all living things arise from pre-existing cells (Omnis cellula e cellula).** This statement has become what is known as the biogenetic law.

Three basic components of the Cell Theory		
1	2	3
All organisms are composed of one or more cells.	The cell is the basic unit of life in all living things.	All cells are produced by the division of preexisting cells.

#### 1. All organism are composed of one or more cells

- All living organisms are made up of cells.
- If any organism is observed under a microscope, it is observed that it is made up of tiny block like structures which may have any shape.

#### 2. The cell is the basic unit of life in all living things

- All life processes of an organism are performed by individual cells, and due to combined working of all the cells, a process or an action is performed. Thus, it is clear that the cell is the basic functional unit of life.

#### 3. All cells are produced by the division of preexisting cells

- Unicellular organisms
  - o Contain only one cell
  - o Production of a new cell results in a new organism
- Multicellular organisms
  - o New cells arise for growth or to replace old damaged cells

## C. Eukaryotes and Prokaryotes

Prokaryotes	Eukaryotes
Commonly called bacteria	Cytoplasm present
Cells with simple structure	Larger, more complex
No membrane around the nucleus and lack any membrane bound organelles	Have many membrane-bound organelles (mitochondria, vacuole, endoplasmic reticulum, ribosomes, lysosomes, plastids in plants)
Have a cell wall	Cell membrane inside wall (plants)
Have a naked loop of DNA which stores genetic information	Some have flagella/cilia for movement
They also have circular rings of DNA called plasmids	Outer boundary is cell membrane except in plant cells
No nucleus	Have a nucleus
No membrane enclosed organelles	Membrane enclosed organelles

Single chromosomes	Chromosomes in pairs
No streaming in the cytoplasm	
Cell division without mitosis	Cell division by mitosis
Simple flagella	Complex flagella
Smaller ribosomes	Larger ribosomes
Simple cytoskeleton	Complex cytoskeleton
No cellulose in cell walls	Cellulose in cell walls
No histone proteins	DNA bound to histone proteins

## D. Organelles of eukaryotes

### Organelles

- Little organs of the cell
- Small structure in the cell that performs a specific function
- Membrane - bound organelles

#### 1. Cell Membrane

- Biological membrane that separates the interior of all cells from the outside environment.
- It also helped in the movement of substances in and out of cells.
- The basic function of the cell membrane is to protect the cell from its surrounding.
- Boundary of the cell.
- Made of a phospholipid bilayer, with protein molecules scattered all over.
- Regulates what comes in and out of the cell, provides for some protection of the cell.

#### 2. Cell Wall

- Cell walls are the outermost boundary in fungi, bacteria, and plants.
- They are not found in animal cells. The primary function of the cell wall is to provide structure and support.
- The cell wall does not regulate what enters and leaves the cell.
- Cell walls of plants are composed of cellulose.
- Cell walls of fungi are composed of chitin.

#### 3. Cytoplasm

- Gel like substance enclosed within the cell membrane.
- About 70% to 90% water and usually colorless.
- Everything in a cell except the nucleus is cytoplasm.
- Clear, gelatin-like, watery substance surrounding the organelles.
- Maintains the shape and consistency of the cell.
- Allows for chemical reactions necessary in metabolism.
- Cytoplasm refers to all gel like the parts of the cell except the nucleus.
- Cytosol refers to part of cytoplasm not taken up by cell organelles.

#### 4. Mitochondria

- Organelles that acts like a digestive system that takes in nutrients, breaks them down, and creates energy for the cell. The process of creating cell energy is known as cellular respiration.

## 5. Ribosomes

- Cells need to make proteins. Those proteins might be used as enzymes or as support for other cell functions.
- Ribosomes are the protein builders or the protein synthesizers of the cell.
- Site of protein synthesis (aka translation).
- Found attached to the rough ER or floating free in cytoplasm.
- Not membrane-bound.
- Produced in a part of the nucleus called the nucleolus.

## 6. Golgi Bodies

- Organelle found in eukaryotic cells.
- It was identified in 1897 by the Italian physician Camillo Golgi and named after him in 1898.

## 7. Nucleus

- The cell nucleus acts like the brain of the cell. It helps control eating, movement, and reproduction. The nucleus is not always in the center of the cell. It will be a dark spot somewhere in the middle of all of the cytoplasm.
- Contains the directions to make proteins.
- Two main jobs are to protect the DNA and make sure that DNA is always available for use.
- Found in all cells.

## 8. Nuclear membrane

- Encloses the nucleus in eukaryotes.
- The membrane is penetrated by nuclear pore complexes.

## 9. Chromosomes

- Made up of DNA. Segments of DNA in specific patterns are called genes.
- The chromosomes and genetic material can be found in the nucleus of a cell.

## 10. Vacuole

- The blank looking structures in the cytoplasm is known as the vacuole.
- Animal cells have smaller vacuole.
- Plant cells have larger vacuole
- Storage space of the cell.

## 11. Endoplasmic reticulum

- Works as transportation.
- Aka E.R. (endo = inside, cytoplasmic + reticulum means network of membranes inside the cytoplasm)
- Connected to nuclear envelope.
- Rough ER: studded with ribosomes; it chemically modifies proteins.
- Smooth ER: no ribosomes; it makes lipids.
  - o Smooth ER
    - Lacks associated ribosomes.

- Membranous elements are highly curved and tubular, forming an interconnecting system of pipelines curving through the cytoplasm.
- Rough ER
  - Defined by the presence of ribosomes bound to its cytosolic surface
  - Typically composed of a network of flattened sacs (cisternae)

## 12. Lysosomes

- Garbage disposal of the cell.
- Membrane-bound.
- Contain digestive enzymes that break down big molecules and damaged organelles.
- The suicide bag of the cell.

## 13. Centrioles

- During cell division - help assemble the spindle apparatus that moves chromosomes.
- Usually found only in animal cells.
- Made of microtubules arranged in a special way.

## 14. Nucleolus

- A large dense area in the nucleus.
- Site of ribosome production.

## 15. Chloroplasts

- Food producers of the cell. They are only found in plant cells.
- The purpose of the chloroplast is to make sugars and starches. They use a process called photosynthesis to get the job done.

## 16. Plastids

- Major organelles found in the cells of plants and algae.
- Often contain pigments used in photosynthesis and the types of pigments present can change or determine the cell's color.

Exclusivity	
Plant cells	Animal cells
Chloroplast	Lysosomes*
Plastid	Centrioles
Cell wall	Cilia (hair like)
Central vacuole	Flagella (tail like)

## E. Similarities and differences between animal and plant cells

### Similarities

- Both are eukaryotic cells
- Have a true nucleus
- Have similar processes for reproduction, which include mitosis and meiosis
- Obtain the energy they need to grow and maintain normal cellular function through the process of cellular respiration.

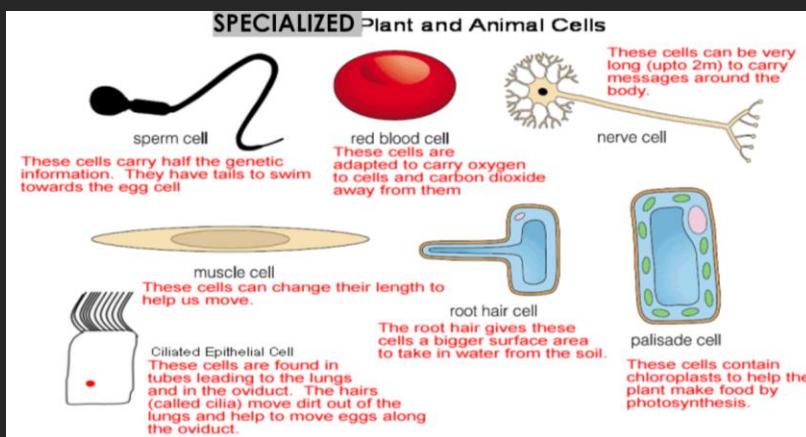
- Also contain organelles
- Have some of the same cell components in common including a nucleus, golgi complex, endoplasmic reticulum, ribosomes, mitochondria, peroxisomes, cytoskeleton, and cell membrane.

### Difference

- Size
  - Animal cells are smaller than plant cells. Animal cells range from 10 to 30 micrometers in length, while plant cells range from 10 to 100 micrometers in length.
- Shape
  - Animal cells come in various sizes and tend to have round or irregular shapes. Plant cells are more similar in size and are typically rectangular or cube shaped.
- Energy storage
  - Animal cells store energy in the form of the complex carbohydrate glycogen. Plant cells store energy as starch.
- Proteins
  - Of the 20 amino acids needed to produce proteins, only 10 can be produced naturally in animal cells. The other so-called essential amino acids must be acquired through diet. Plants are capable of synthesizing all 20 amino acids.
- Differentiation
  - In animal cells, only stem cells are capable of converting to other cell types. Most plant cell types are capable of differentiation.
- Growth
  - Animal cells increase in size by increasing in cell numbers. Plant cells mainly increase cell size by becoming larger. They grow by absorbing more water into the central vacuole.
- Cell wall
  - Animal cells do not have a cell wall but have a cell membrane. Plant cells have a cell wall composed of cellulose as well as a cell membrane.
  - Fungi: cell wall=made up of chitin
  - Plant cell: cell wall=made up of cellulose
- Centrioles
  - Animal cells contain these cylindrical structures that organize the assembly of microtubules during cell division. Plant cells do not typically contain centrioles.
- Cilia
  - Found in animal cells but not usually in plant cells. Cilia are microtubules that aid in cellular locomotion.
- Cytokinesis
  - Cytokinesis, the division of the cytoplasm during cell division, occurs in division, occurs in animal cells when a cleavage furrow forms that pinches the cell membrane in half. In plant cytokinesis, a cell plate is constructed that divides the cell.
- Glyoxysomes

- These structures are not found in animal cells but are present in plant cells. Glyoxysomes helps degrade lipids particularly in germinating seeds, for the production of sugar.
- Lysosomes
  - Animal cells possess lysosomes which contain enzymes that digest cellular macromolecules. Plant cells rarely contain lysosomes as the plant vacuole handles molecule degradation.
- Plastids
  - Animal cells do not have plastids. Plant cells contain plastids such as chloroplasts, which are needed for photosynthesis
- Vacuoles
  - Animal cells have many small vacuoles. Plant cells have a large central vacuole that can occupy up to 90% of the cell's volume.
- Plasmodesmata
  - Animal cells don't have plasmodesmata, which are pores between plant cell walls that allow molecules and communication signals to pass between individual plant cells.

### Specialized cells



	<b>EGG CELL</b>	Large Contains lots of cytoplasm	
	<b>NERVE CELL</b>	Long connections at each end Can carry electrical signals	
	<b>RED BLOOD CELL</b>	Large surface area Contains haemoglobin, which joins with oxygen	
	<b>ROOT HAIR CELL</b>	Large surface area	
	<b>LEAF PALISADE CELL</b>	Large surface area Lots of chloroplasts	
	<b>XYLEM CELL</b>	Hollow so it conducts water Strong cell walls	

### F. Cell Cycle

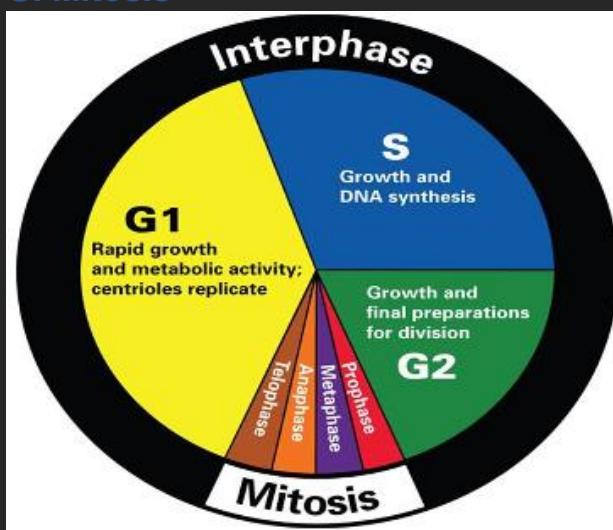
- Scientists have identified a repeating cycle of events in the life of a cell.

- This cycle of events is called the cell cycle.

### Cell Division

- Every hour, about one billion cells die and one billion cells are made in your body. Part of the cell cycle includes making new cells in a process called cell division
- The ability of organisms to reproduce their kind is one characteristic that best distinguishes living things from nonliving matter.
- The continuity of life from one cell to another is based on the reproduction of cells via cell division.
- This division process occurs as part of the cell cycle, the life of a cell from its origin in the division of a parent cell until its own division into two.
- In unicellular organisms, division of one cell reproduces the entire organism i.e. cloning
- Multicellular organisms depend on cell division for:
  - Development
  - Growth
  - Repair

### G. Mitosis



- A typical cell goes through a process of growth, development, and reproduction called the cell cycle. Most of the cycle is called interphase.

### Interphase

- Often called the "resting" phase but the cell is not at rest
- Cell may not be dividing but it is active.
- Composed of G1, S, G2
- Where cells spend most (~90%) of its time

#### *G1 (Gap 1 Phase)*

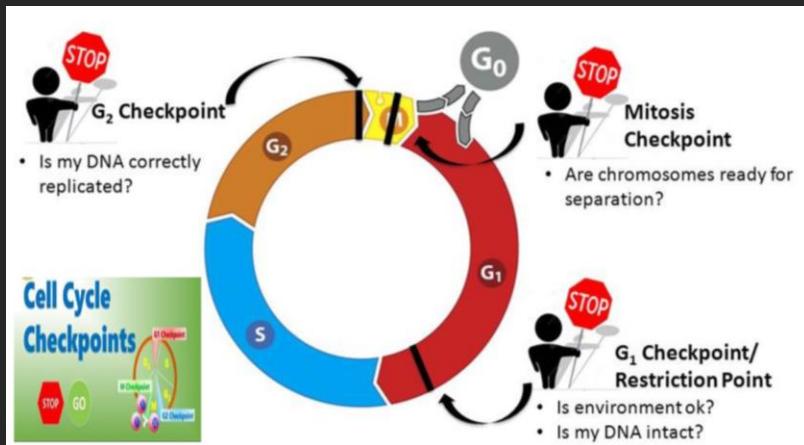
- Period of rapid growth
- New proteins and organelles are produced
- Chromosomes are unwound (chromatin)

- Preparing for DNA synthesis
- Chromosomes
  - Are stored in the nucleus
  - Every cell that contains a nucleus will have chromosomes
- DNA: Genetic code
  - Genetic information is stored on the chromosomes
  - The coded information on chromosomes are called DNA (Deoxyribonucleic Acid)
- Chromosome structure
  - Chromatin: The unwound form of the chromosome
  - Condensed: the tightly wound (coiled) form of the chromosome
  - Coiled DNA: Chromosome; Uncoiled DNA: Chromatin



*mmm, genetic spaghetti*

### Checkpoints



- Not all cells are programmed to divide. There are checkpoints at different stages of the cell cycle. Some cells, such as nerve cells, do not continue past the G<sub>1</sub> checkpoint of interphase, do not enter synthesis, and therefore do not enter mitosis under normal conditions.

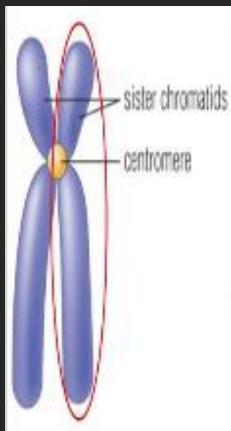
### G/S Checkpoint

- Primary decision point (restriction point)

- If cell receives "GO" signal, it divides
  - Internal signals: cell growth (size), cell nutrition
  - External signals: "growth factors"
- If a cell doesn't receive a signal, it exits cycle and switches to G0 phase (non-dividing, working state)
- A cell that doesn't meet all the requirements will not progress to the S phase.

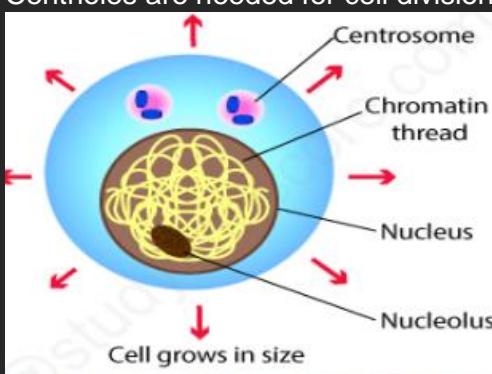
### *S (Synthesis Phase)*

- DNA is copied or replicated
- Cell makes a copy of its entire set of chromosomes (DNA)
- During interphase, (in the S phase), the DNA replicates
- Chromosomes that have duplicated will have two sister chromatids attached to the same centromere
- Sister chromatids have identical genetic information



### *G2 (Gap 2 Phase)*

- Cell grows larger in size in preparation for cell division
- Produces organelles and structures needed for cell division
- Example: centrioles and nucleolus are duplicated
- Centrioles are needed for cell division



## G2 Checkpoint

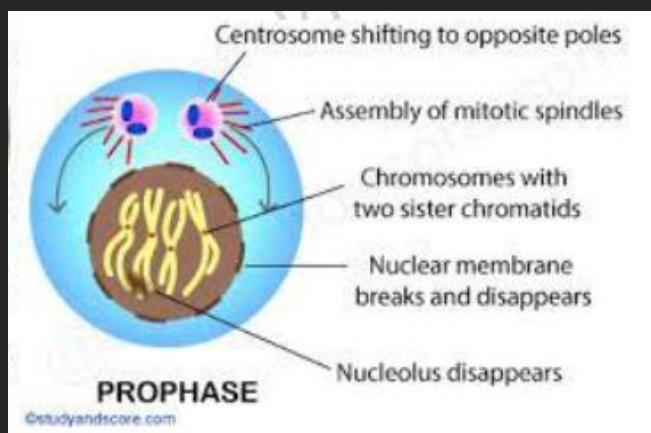
- More growth
  - o Cell volume increases
- G2 checkpoint
  - o DNA mistakes?
  - o Cell volume ok?
  - o Environment good?
- Shortest phase
- DNA is replicated
- Cell size must be large enough
- Environment must be suitable

## M (Mitosis Phase)

- All of the cell's energy is devoted to the process of cell division
- M phase is divided into mitosis and cytokinesis
- Chromosomes would be condensed in M phase
- The cell separates the copied chromosomes to form two full sets (mitosis) and the cell divides into two new cells (cytokinesis)
- The period between cell divisions is known as interphase
- Cells that are not dividing leave the cell cycle and stay in G0.

### Stages of Mitosis

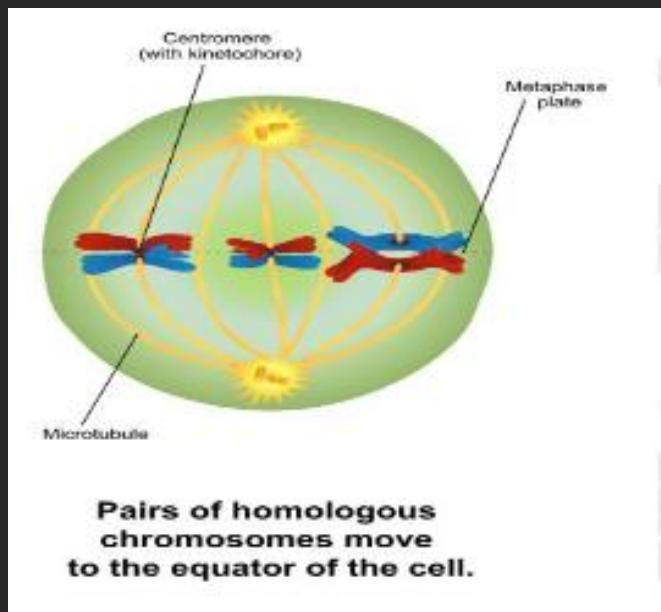
#### Prophase



- DNA winds into chromosomes to keep it organized
- Centrosome shifting to opposite poles
- Assembly of mitotic spindles
- Chromosomes with two sister chromatids, condenses
- Nuclear membrane breaks and disappears
- Nucleolus disappears
- Mitotic spindle begins to form and is complete at the end of prophase
- Kinetochores begin to mature and attach to spindle

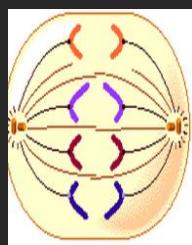
- Kinetochore: special protein that the spindle fibers cling into

### Metaphase



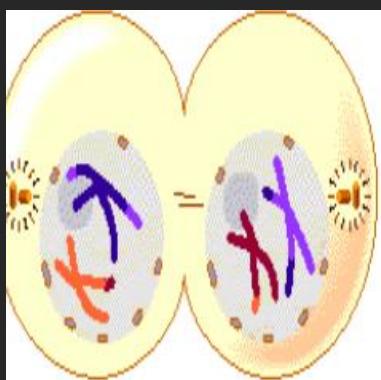
- Chromosomes line up at the middle
- Attached to protein cables that will help them move
- Kinetochores attach chromosomes to mitotic spindle
- Chromosome align in the metaphase plate
- Pairs of homologous chromosomes move to the equator of the cell
- Spindle fibers/microtubules: pushes the chromosomes to the middle
- Homo: same

### Anaphase



- Chromosomes split, separating pairs
- Starts moving to opposite ends
- Chromatids move apart from each other
- Chromatids are called chromosomes after the separation
- Chromosomes can be seen moving. They take on a rough V shape
- Result of anaphase is an equal separation and distribution of chromosomes.
- Centromeres divide in two.
- Spindle fibers pull sister chromatids to opposite poles of the cell.
- Each pole (future daughter cell) now has an identical set of genes.

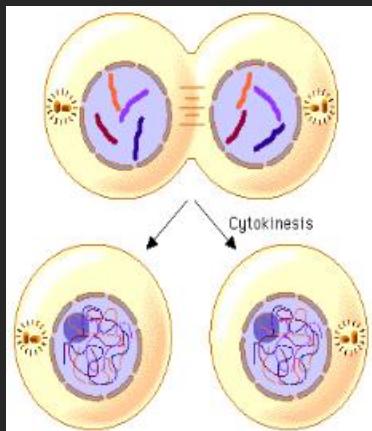
### *Telophase*



- Cell starts to divide
- Nucleus forms again
- New nuclear envelope forms
- Chromosomes unfold back into chromatin
- Nucleoli reappears
- Cell continues to elongate

Anaphase	Telophase
Kinetochores shorten, separating chromosomes to opposite poles	Chromosomes reach poles of cell
Polar microtubules elongate preparing cell for cytokinesis	Kinetochores disappear
	Polar microtubules continue to elongate preparing cell to cytokinesis
	Nuclear membrane re-forms
	Nucleolus reappears
	Chromosomes decondense

### *Cytokinesis*



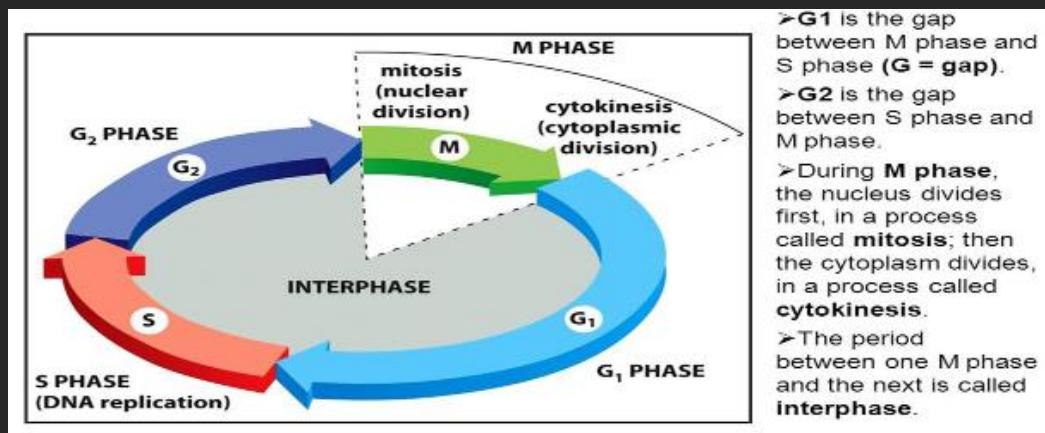
- DNA unwinds again
- Cells separate
- Now they can do their everyday jobs
- Daughter cells divide

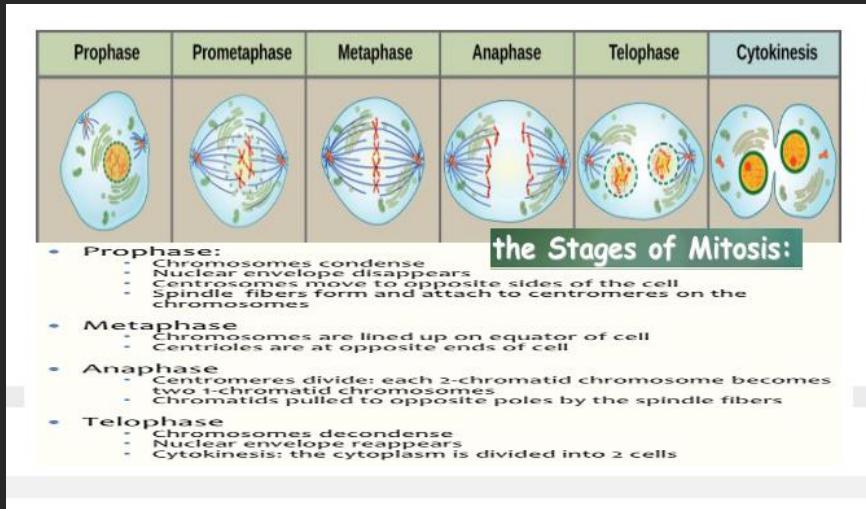
#### New Daughter cells

- Gets two exact copies of original cells, same DNA, pretty much clones
- Have the same number of chromosomes as each other and as the parent cell from which they were formed
- Identical to each other, but smaller than parent cell
- Must grow in size to become mature cells (G<sub>1</sub> of Interphase)

#### Summary

- A cell divides into two or more daughter cells during cell division
- A cell division cycle is broadly divided into Interphase and Miosis
- The stages in the interphase of a cell cycle are G<sub>1</sub>-S-G<sub>2</sub>.
- Mitosis takes place in four stages.
- The 4 stages are prophase, metaphase, anaphase, and telophase.
- Cytokinesis is the ultimate step during which the cytoplasm of the parent cell divides.





## H. Meiosis

- A special type of cell division in which chromosomes duplicate only once, but the cell divides twice. So one parental cell produces 4 daughter cells, each having half the chromosome number and DNA amount than the normal parental cell. So meiosis is called "Reductional division".
- A type of cell division that results in four daughter cells each with half the number of chromosomes of the parent cell, as in the production of gametes and plant spores
- Mitosis occurs in somatic cells/body cells
- Meiosis occurs in gametes/sex cells
- Sexual reproduction is the production of haploid cells and the fusion of two of those cells to form a diploid cell. Before sexual reproduction can occur, the number of chromosomes in a diploid cell must decrease by half.
- Meiosis produces cells with half the number of chromosomes as the original cell.
- Haploid cells used in sexual reproduction, gametes, are formed during meiosis, which consists of one round of chromosome replication and two rounds of nuclear division.
- Meiosis I is the first round of meiotic division, while meiosis II is the second round.

### Key terms

- Haploid: of a cell having a single set of unpaired chromosomes
- Gamete: a reproductive cell, male (sperm) or female (egg), that has only half the usual number of chromosomes
- Diploid: of a cell, having a pair of each type of chromosome, one of the pair being derived from the ovum and the other from the spermatozoon

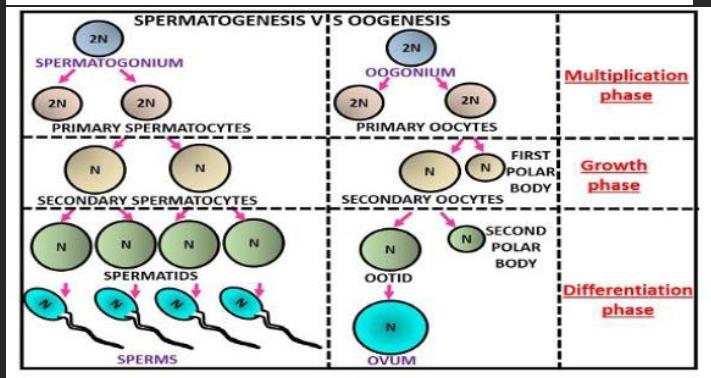
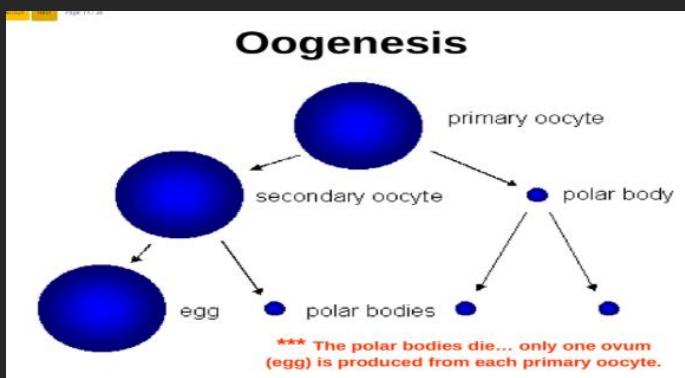
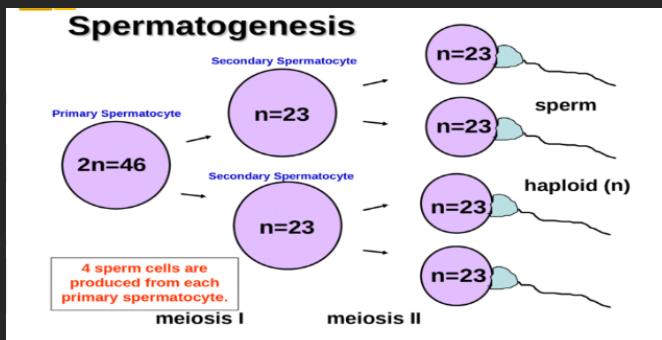
### Organisms that reproduce sexually are made up of two different types of cells

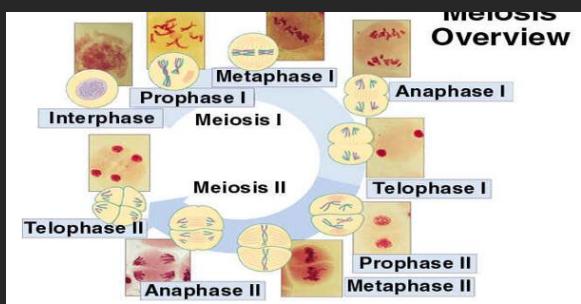
1. Somatic cells are body cells and contain the normal number of chromosomes, called the diploid number (symbol is  $2n$ ). Examples: skin cells, brain cell, etc.

2. Gametes are the sex cells and contain only 1/2 the normal number of chromosomes... called the haploid number (symbol is n)... sperm cells and ova are gametes

### Gametes

- The male gamete is the sperm and is produced in the male gonad the testes (meiosis is called spermatogenesis)
- The female gamete is the ovum and is produced in the female gonad the ovaries (meiosis is called oogenesis)

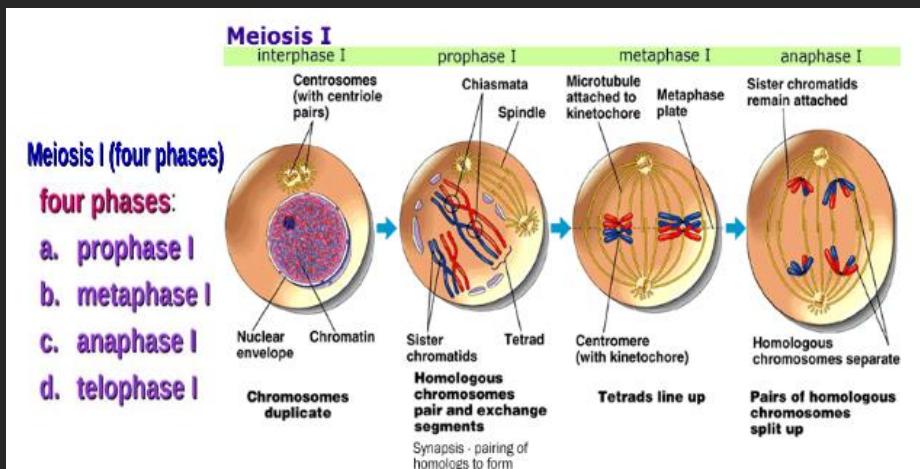




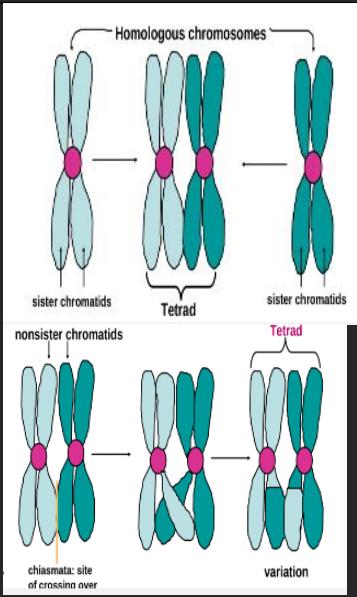
### Interphase I

<p><b>Interphase</b></p>	<ul style="list-style-type: none"> <li>- Similar to mitosis interphase</li> <li>- Chromosomes replicate (S phase)</li> <li>- Each duplicated chromosome consists of two identical sister chromatids attached at their centromeres</li> <li>- Centriole pairs also replicate</li> </ul>
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### Meiosis I

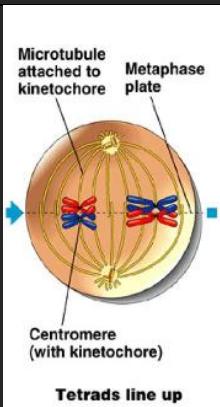


### Prophase I



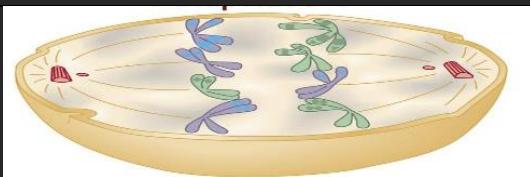
- Longest and most complex phase.
- 90% of meiotic process is spent in prophase I
- Chromosomes condense
- Synapsis occurs: homologous chromosomes come together to form a tetrad.
- Tetrad: Two chromosomes or four chromatids (sister and non-sister chromatids)
- During prophase I, "crossing over" occurs.
- Crossing over is one of the two major occurrences of Meiosis (other is non-disjunction)
- During crossing over, segments of non-sister chromatids break and reattach to the other chromatid.
- The Chiasmata (chiasma) are the sites of crossing over.

### Metaphase I



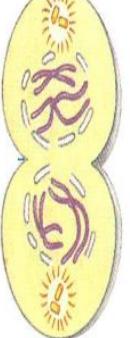
- Shortest phase
- A short resting period where the chromosomes are lined up on the equator of the cell, with the centrosomes at opposite ends and the spindle fibers attached to the kinetochore. Everything is aligned for the rest of the division process to occur.
- Tetrads align on the metaphase plate.
- Independent assortment occurs:
  - Orientation of homologous pair to pole is random
  - Variation
  - Formula  $2^n$

### Anaphase I

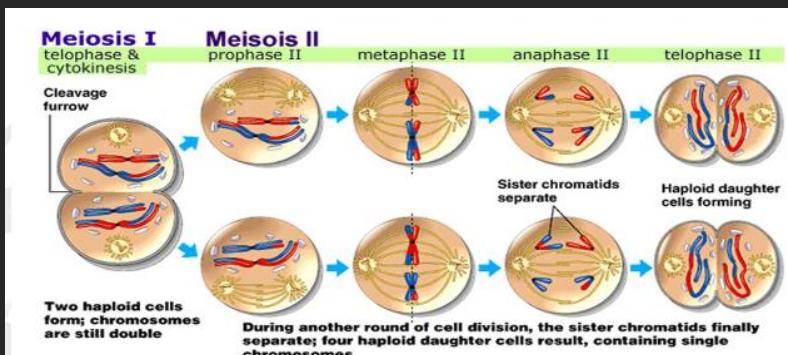


- Homologous pairs separate
- Sister chromatids (now called dyads) remain together.
- Homologous chromosomes separate and move towards the poles
- Sister chromatids remain attached at their centromeres

### Telophase I

	<ul style="list-style-type: none"> <li>- Two daughter cells are formed with each one containing only one chromosome of the homologous pair.</li> <li>- The daughter cells are now haploid.</li> <li>- Nuclear membrane and nucleolus reappear.</li> <li>- Spindle fibers disappear</li> <li>- Cytokinesis divides cell into two</li> </ul>
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## Meiosis II



### Prophase II

- Absent if interphase II is absent.
- Nucleoli and nuclear envelopes disperse and the chromatids shorten and thicken
- Centrioles move to opposite poles
- New spindle fibers appear

### Metaphase II

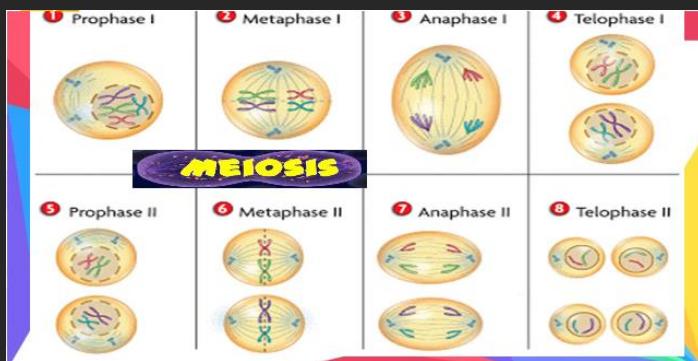
- Chromosomes line up separately on the equator of the spindle
- Kinetochores pointing towards opposite poles

### Anaphase II

- Centromeres divide and the spindle fibers pull the chromatids to opposite poles

### Telophase II

- Four haploid daughter cells are formed
- The chromosomes uncoil, lengthen, and become very indistinct
- Spindle fibers disappear
- Nuclear envelope re-forms
- Subsequent cleavage (animals) or cell wall formation (plants) will produce four daughter cells from the original single parent cell

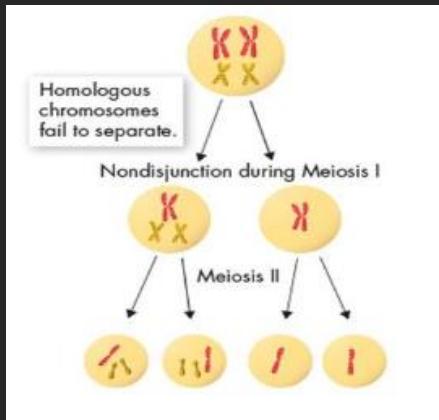


### Significance of Meiosis

- Halving the chromosome number ensures that when gametes with the haploid number fuse to form a zygote the normal diploid number is restored.
- Meiosis leads to increased variation because when fertilization there is a recombination of parental genes
- During Metaphase I, homologous chromosomes are together at the equator of the spindle but they separate into daughter cells independently of each other
- Chiasmata and crossing-over can separate and rearrange genes located on the same chromosome

### Chromosomal disorders

- The most common error in meiosis occurs when homologous chromosomes fail to separate. This mistake is known as nondisjunction, which means “not coming apart”
- Nondisjunction may result in gametes with an abnormal number of chromosomes, which can lead to a disorder of chromosome numbers.



## I. Disorders resulting from the malfunctioning of the cell during cell division

### Terms to remember

1. Aneuploidy - a gain or loss of chromosome from the normal count of 46 in humans
2. Trisomy - presence of an extra chromosome in cells
3. Monosomy - loss of one chromosome in cells

4. Tetraploid - cells with two additional sets of chromosomes

Karyotype

- The number and visual appearance of the chromosomes in the cell nuclei of an organism or species.

Karyotyping

- A laboratory procedure that allows your doctor to examine your set of chromosomes

Cancer

- Abnormal growth of cells caused by multiple changes in gene expression leading to deregulated balance of cell proliferation

Patau syndrome

- Serious eye, brain, circulatory defects as well as cleft palate. 1:5000 live births. Children rarely live more than a few months.
- X - 2, 13th Chromosome - 3

Down syndrome

- A congenital disorder, caused by the presence of an extra 21st chromosome, in which the affected person has mild or moderate mental retardation
- Trisomy 21

Turner syndrome

- Individuals are genetically female. However, they do not mature sexually during puberty and are sterile. Short in stature and normal intelligence.
- Monosomy X/XO
  - 1 in 5000 births
  - Varied degree of effects
  - Webbed neck
  - Short stature
  - Immature sterile females

Klinefelter syndrome

- XXY males, male sex organs; unusually small testes, sterile, breast enlargement and other
- feminine body characteristics. Normal intelligence.

**J. Cell Membrane**

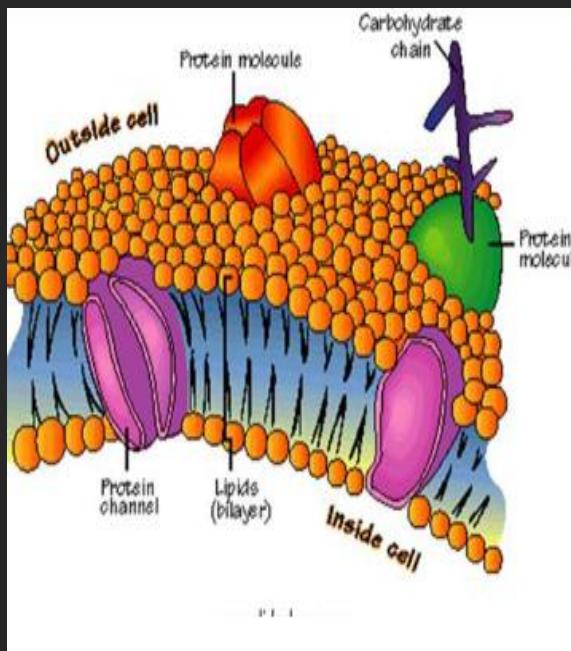
*Introduction*

- In order for the cell to stay alive, it must meet the characteristics of life which include taking nutrients in and eliminating wastes and other by-product of metabolism. Several mechanisms allow cells to carry out these processes. All of the cell's activities are in one way or another tied to the membrane that separates its interior from the environment.

- Every cell is encircled by a membrane and most cells contain an extreme extracellular membrane system.
- Membranes fence off the cell's interiors from its surroundings.
- Membranes let in water, certain ions, and substrates and they excrete waste substances.
- Without a membrane the cell contents would diffuse into the surroundings, information containing molecules would be lost and many metabolic pathways would cease to work.
- Location
  - In an animal cell, outermost layer
  - In a plant cell, just inside the cell wall
  - Present in both

#### *Structure of the cell membrane*

- The fluid mosaic model of membrane structure [Image]
- The membrane is a mosaic (mixture) of different protein molecules floating in a bilayer (double layer of phospholipids)
- Each phospholipid has a hydrophilic (water loving) head and hydrophobic (water hating) tails
- Because of this feature of phospholipids, the lipid bilayers assemble themselves (spontaneous)



#### *What does the membrane do?*

- Allows for different conditions between inside and outside of cell
- Subdivides cell into compartments with different internal conditions
- Allows release of substances from cell via vesicle fusion with outer membrane
- Protects the cell
- Controls incoming and outgoing substances
- Maintain ion concentrations of various substances
- Selectively permeable - allows some molecules in, others are kept out

- All this maintains homeostasis (internal balance)
- Properties
  - Semi-permeable
  - Fluidity

### *Cell transport mechanisms and homeostasis*

Outside - Extracellular fluid

- Contains all sorts of things that cells need and that the organism provides. Your digestive tract is choosy, but not perfectly picky

Selective permeability

- Allows cells to choose and move the right stuff - controlled!

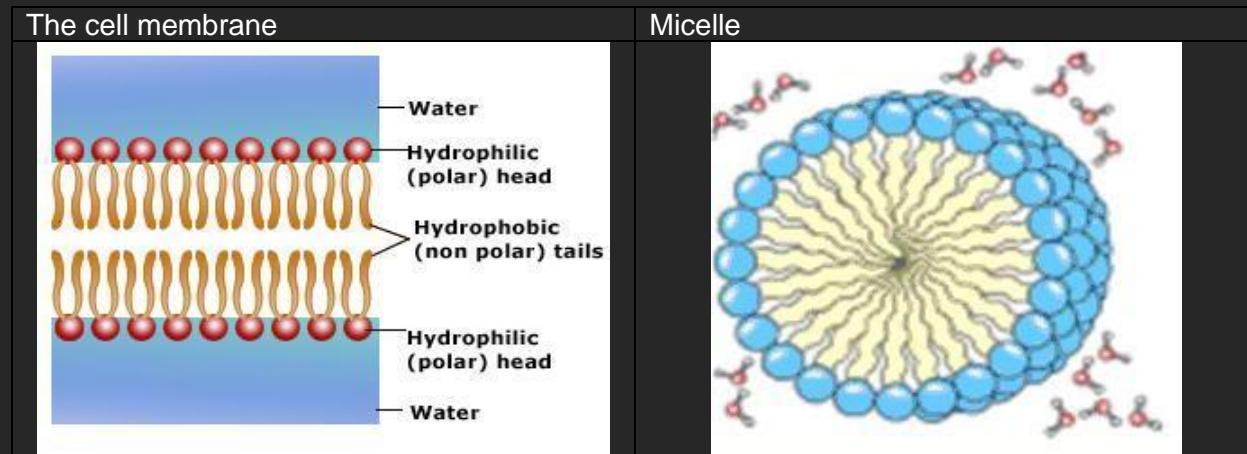
Inside - Cytoplasm

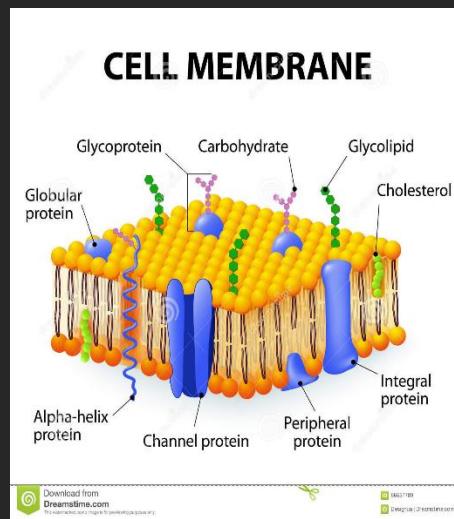
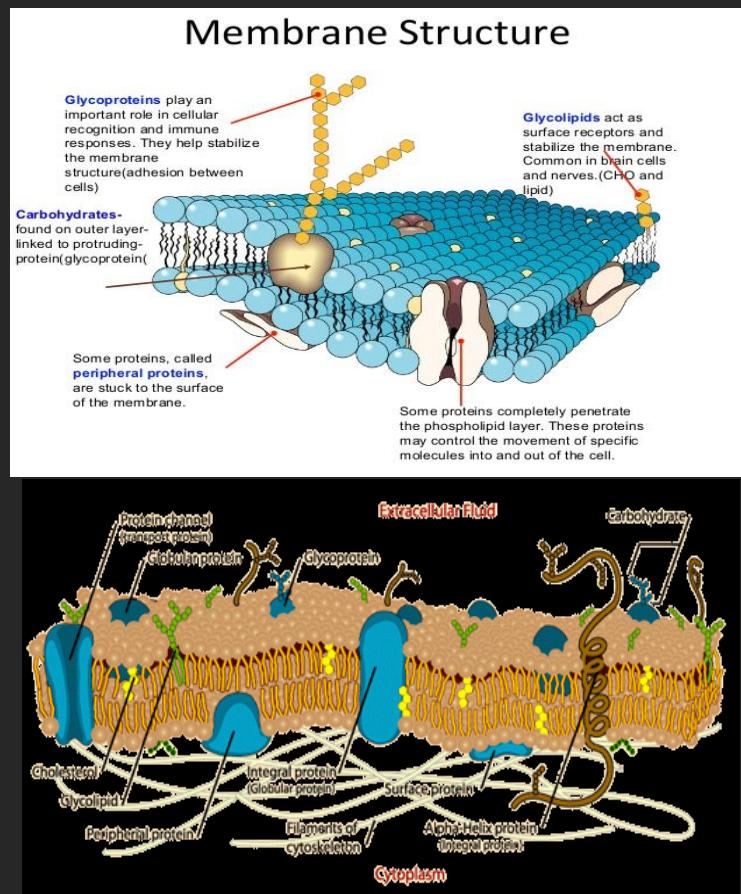
- The right stuff
- Contains a precisely balanced solution of all of the right stuff! This is homeostasis. Must be able to transport the right stuff in.

The cell needs specific things

- The right ions, as many amino acids as possible, glucose, its proteins, etc.
- Other things are kicked out

### *Cell membrane structure*





- Glycoprotein
  - Important in cellular recognition and immune responses. They help stabilize the membrane structure
  - Lectin and white blood cell
  - Mucus

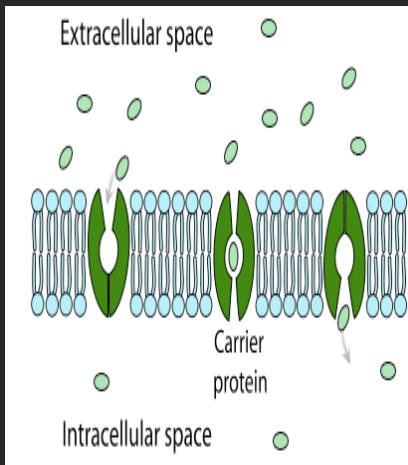
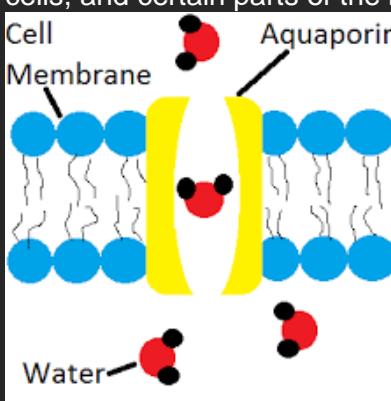
- Blood type
- Blood clot; Hemophilia
- Cadherins in skin
- Carbohydrates
  - Function as adhesion and address loci for cells
- Cholesterol
  - Makes the cell membrane more flexible, stronger and less permeable to water-soluble substances
- Glycolipids
  - Acts as surface receptors and stabilize the membrane. Common in brain cells and nerves
- Peripheral proteins
  - Some act as receptors, some as enzymes, catalyzing the reaction and since many are cytoskeletons, they give a cell its shape, offers support and facilitate movement
- Integral protein function
  - As transporters, channels (potassium channel), linkers, receptors.
- Transport protein
  - Controls the movement of substances in and out of the cell

## K. Transport mechanisms

Refers to the collection of **mechanisms** that regulate the passage of solutes such as ions and small molecules through biological membranes

### *Diffusion*

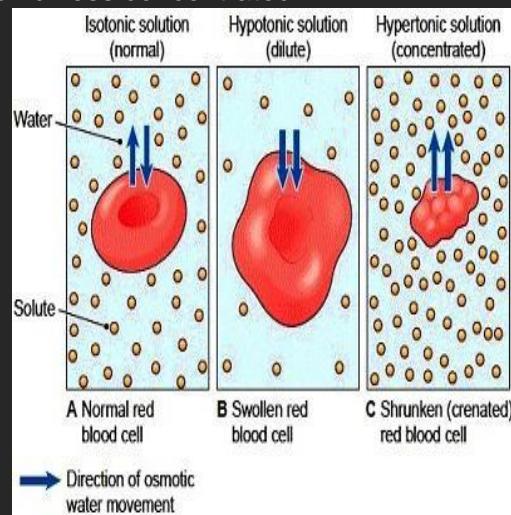
- Spontaneous movement of particles from an area of high concentration to an area of low concentration.
- Mainly occurs in gaseous state or within gas and liquid molecules
- Types of diffusion
  - Passive diffusion
    - Does not require energy
    - Types
      - Simple diffusion
        - Substances tends to move from an area where they're more concentrated to an area where they're less concentrated
  - Facilitated diffusion
    - Molecules diffuse across the plasma membrane with assistance from membrane proteins
    - Channel proteins
      - Span the membrane and make hydrophilic tunnels across it, allowing their target molecules to \* pass through by diffusion

- 
- Carrier proteins
  - Can change their shape to move a target molecule from one side of the membrane to the other
- Aquaporins
  - Are channel proteins that allow water to cross the membrane very quickly, and they play important roles in plant cells, red blood cells, and certain parts of the kidney
- Importance: to create energy; helps in exchange of gases during respiration

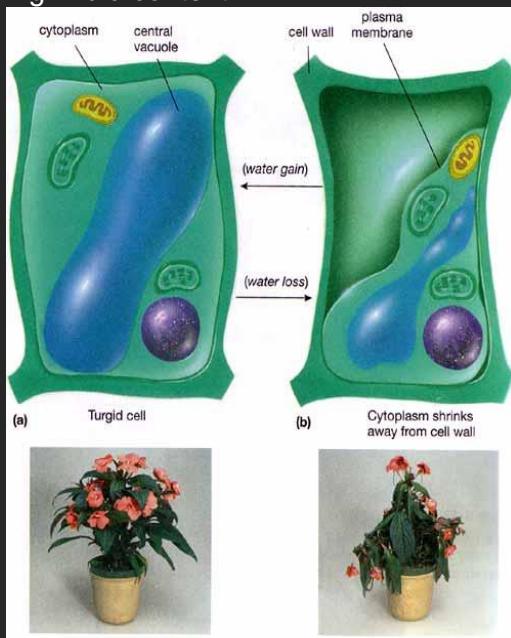
### Osmosis

- Osmosis is the spontaneous net movement of water across a semipermeable membrane from a region of low solute concentration to a more concentrated solution, up a concentration gradient. This equalizes concentrations on both sides of the membrane
- Process

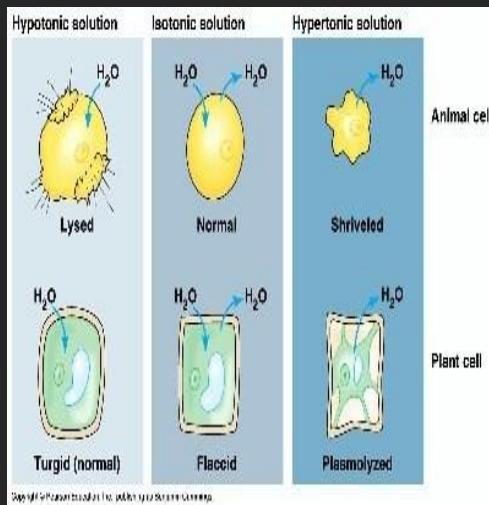
- It occurs when the medium surrounding the cell has a higher water concentration than the cell.
- Importance
  - In animals, osmosis influences the distribution of nutrients and the release of metabolic waste products. In plants, osmosis is partially responsible for the absorption of soil water and for the elevation of the liquid to the leaves of the plant
- Types of solution
  - Hypotonic: less concentrated



- Example: Turgidity; State of being **turgid** or swollen, especially due to high fluid content.



- Hypertonic: more concentrated

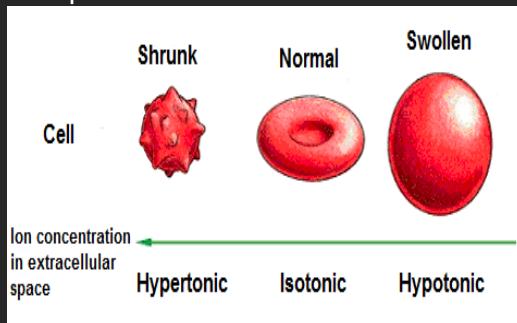


- Example: Hemolysis; Caused by water movement out of the cell due to hypertonic solution



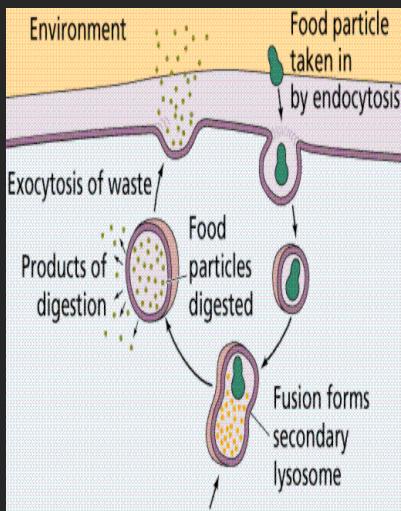
- Conditions that can cause hemolysis are hepatitis, typhoid fever, sickle cell anemia, E. coli or streptococcus bacteria, leukemia, lymphoma, tumors

- Isotonic
  - Refers to two solutions having the same osmotic pressure across a semipermeable membrane.

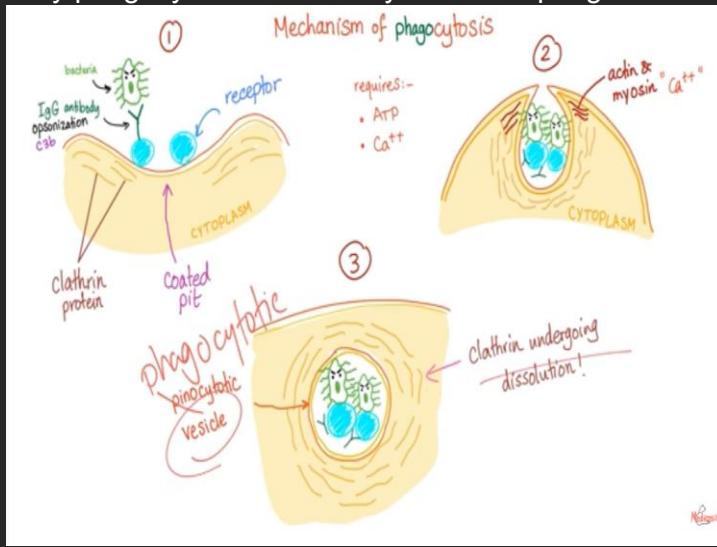


#### Vesicle-mediated transport

- Large substances will be enclosed in a membrane bound sac composed of the plasma membrane or the internal membrane
- **Vesicles** or other bodies in the cytoplasm move macromolecules or large particles across the plasma membrane.

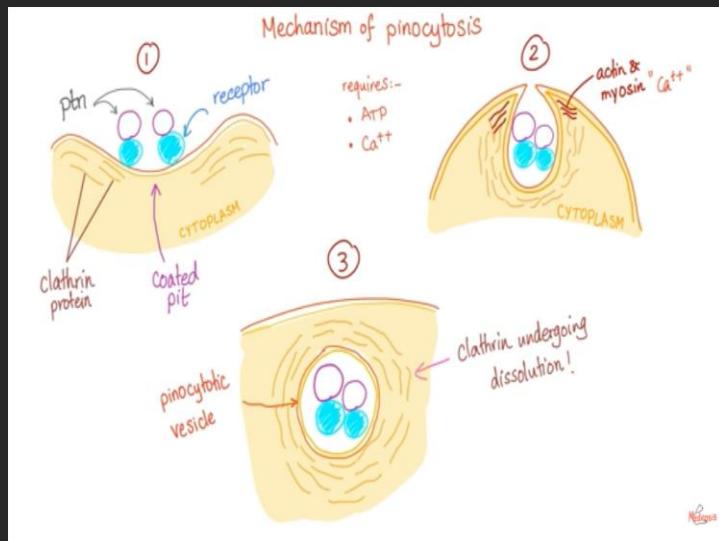


- Endocytosis
  - Large molecule needs to be transported inside the cell
- Exocytosis
  - Large molecules need to be transported out of the cell
- Phagocytosis
  - The ingestion of bacteria or other solid material
  - Cell eating
  - Seen in microscopy
  - Substance not in solution
  - Only occurs in phagocytic cells (leukocytes, macrophages)
  - Bacteria, whole cells, degenerating (dead) tissue
  - Only phagocytic cells "leukocytes" macrophages



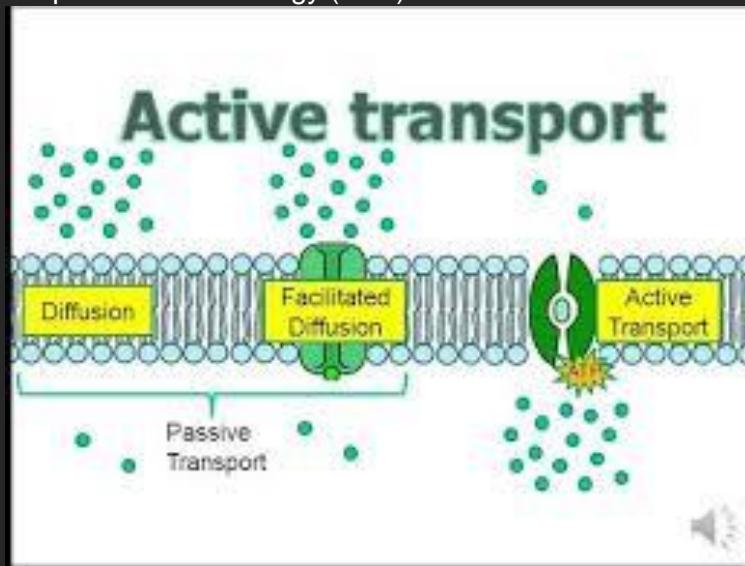
- Pinocytosis
  - The ingestion of liquid into a cell by the budding of small vesicles from the cell membrane
  - Cell drinking
  - Not seen in microscopy - seen only with Electron Microscope
  - Substance in solution

- Protein, vit. B12 + glycoprotein
- All cells



### Active transport

- Is the movement of molecules across a cell membrane from a region of lower concentration to a region of higher concentration—against the concentration gradient.
- Requires cellular energy (ATP)



- Types
  - **Primary active transport** that uses adenosine triphosphate (ATP)
  - **Secondary active transport** that uses an electrochemical gradient.
- An example of active transport in human physiology is the uptake of glucose in the intestines.
- Ions, glucose and amino acids.

## L. Structure and functions of biological molecules

Large molecules

- Inside of every living organism
- Are essential for biological processes

### Biomolecule

- Also called biological molecule
- Any of numerous substances that are produced by cells and living organisms
- Organic compounds (made of carbon)
- Carbohydrates, lipids, nucleic acids, and proteins.
- Elements that make up biomolecules
  - Carbon, hydrogen, oxygen, nitrogen, phosphorus

### *Macromolecules*

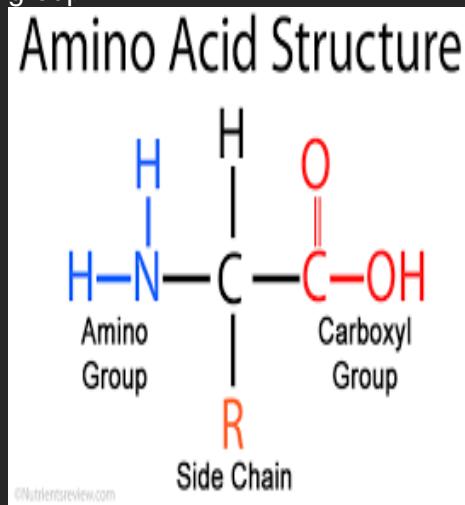
- Macromolecules are polymers, built from monomers
  - A polymer is a long molecule consisting of many similar building blocks
  - These small building-block molecules are called monomers
  - Three of the four classes of life's organic molecules are polymers
- | Molecule      | Monomer        |
|---------------|----------------|
| Carbohydrates | Monosaccharide |
| Proteins      | Amino acids    |
| Nucleic acids | Amino acids    |
- Lipids are not considered polymers because they are not made up of similar smaller units

## M. Amino acids and proteins

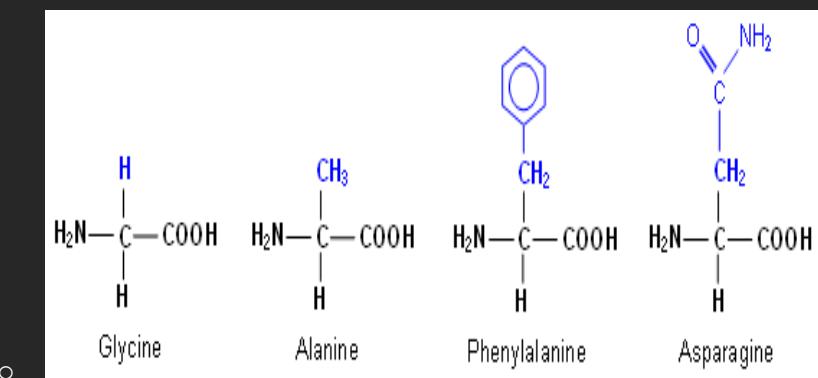
### *Amino acids and proteins*

#### Amino acid

- A simple organic compound containing both a carboxyl (-COOH) and an amino (-NH<sub>2</sub>) group

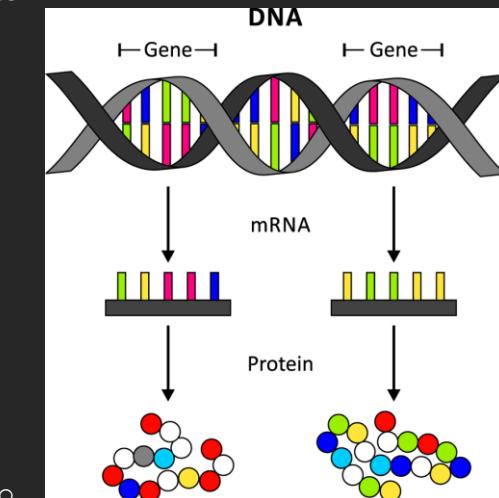


- The twenty -amino acids have the same general structure; however, they have different side-chains (R-group).



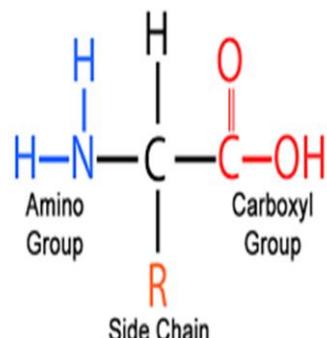
## Proteins

- polymers composed of amino acid monomers
- Functions
  - They act as hormones (e.g. insulin)
  - They form muscle fibers
  - Proteins form many cell structures (protein carriers etc.)
  - They are important structural molecules
  - Enzymes are made from proteins
  - They form many binding proteins (hemoglobin etc.)
- Protein in DNA

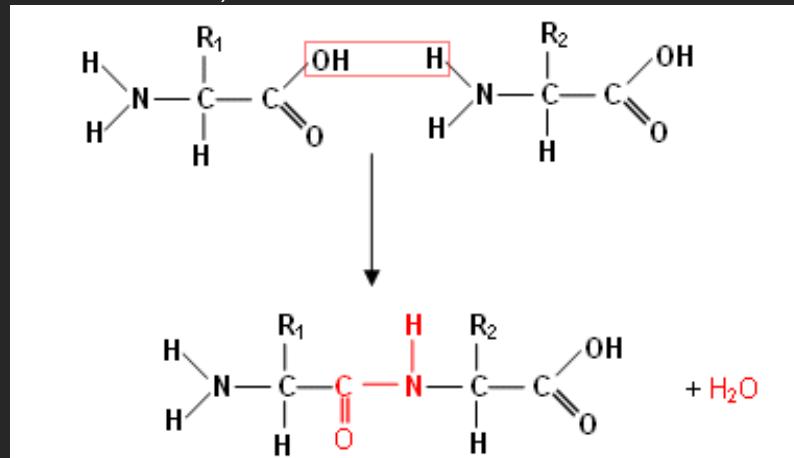


- How are proteins formed?
  - Amino acids join together to form **polypeptides**, which make proteins.
  - The reaction is an example of a **condensation reaction**, as one amino acid joins onto the next forming a larger molecule with the loss of a smaller molecule.
  - The amino acids join together when the **carboxylic acid group** on one amino acid **joins on to the amino group** on the next (a molecule of water is lost each time).
  - Condensation reaction

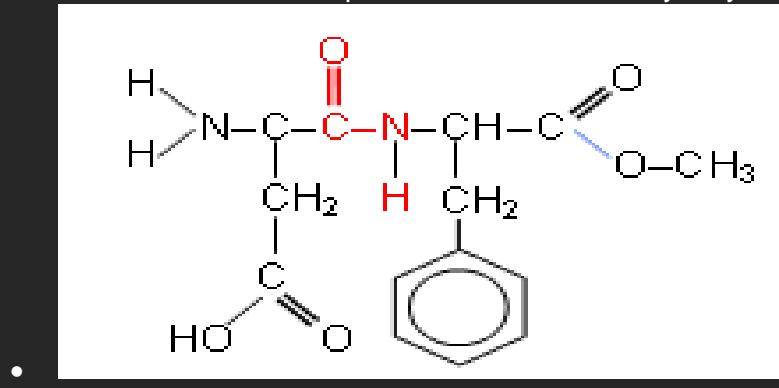
## Amino Acid Structure



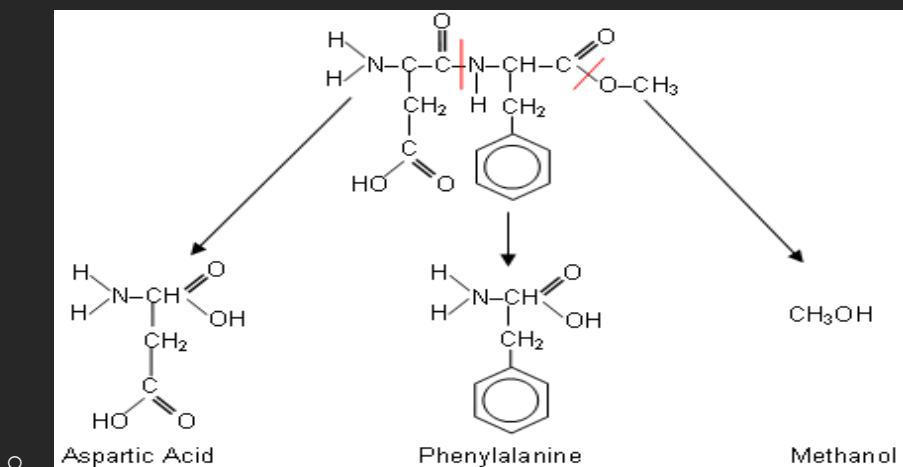
- The amino acids join together when the **carboxylic acid group** on one amino acid **joins on to the amino group** on the next (a molecule of water is lost each time).



- **Hydrolysis** is the breakdown of **protein** into smaller peptides and free amino acids
  - Example
    - Aspartame is an artificial sweetener which can be used as a useful substitute for a protein to demonstrate hydrolysis



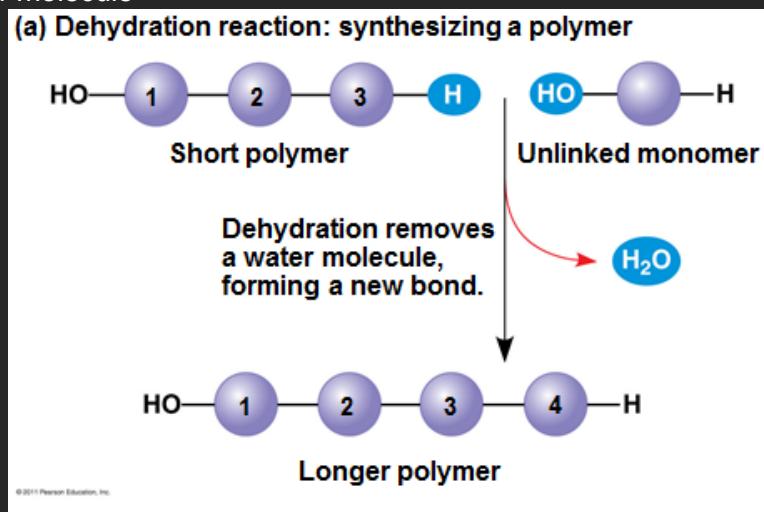
- Hydrolysis of aspartame



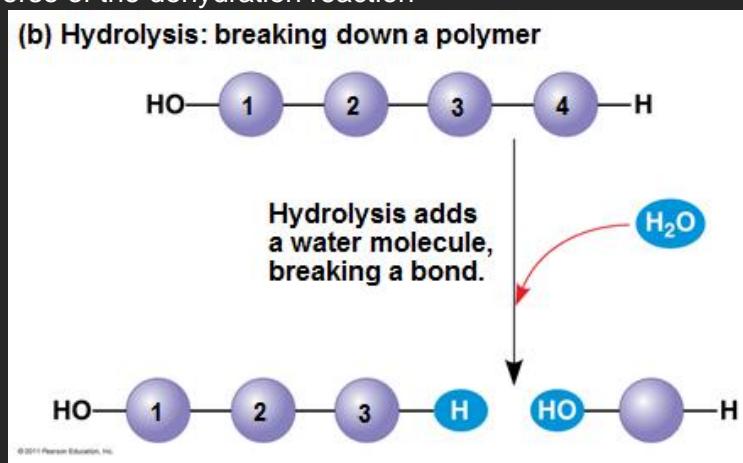
## N. Carbohydrates

### Synthesis and breakdown of polymers

- A **dehydration reaction** occurs when two monomers bond together through the loss of a water molecule



- Polymers are disassembled to monomers by **hydrolysis**, a reaction that is essentially the reverse of the dehydration reaction



### Diversity of polymers

- Each cell has thousands of different macromolecules
- Macromolecules vary among cells of an organism. Vary more within a species, and vary even more between species.
- An immense variety of polymers can be built from a small set of monomers.

### Carbohydrates

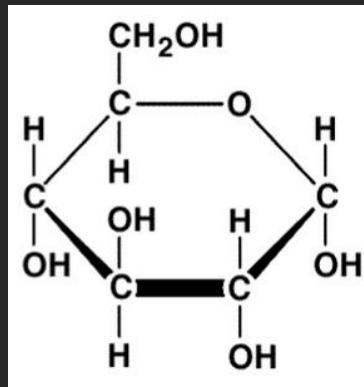
- **Carbohydrates** include sugars and the polymers of sugars
- The simplest carbohydrates are *monosaccharides*, or single sugars
- Carbohydrate macromolecules are *polysaccharides*, polymers composed of many sugar building-blocks

### Sugars

- **Monosaccharides** have molecular formulas that are usually multiples of  $\text{CH}_2\text{O}$

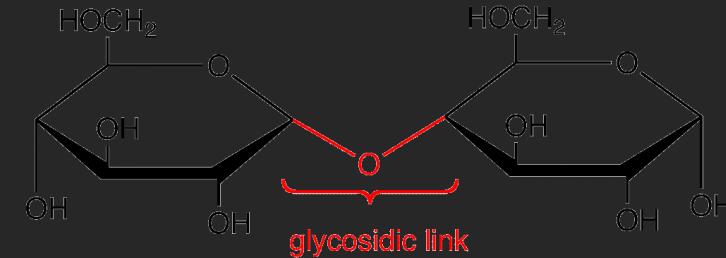
- Glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is the most common monosaccharide
- Monosaccharides are classified by

- The location of the carbonyl group
- The number of carbons in the carbon skeleton



- A **disaccharide** is formed when a dehydration reaction joins two monosaccharides

- This covalent bond is called a **glycosidic linkage**



- Polysaccharides, the polymers of sugars, have storage and structural roles

- The structure and function of a polysaccharide are determined by its sugar monomers and the positions of glycosidic linkages

- Types - storage

- **Starch**, a storage polysaccharide of plants, consists entirely of glucose monomers

- Plants store surplus starch as granules within chloroplasts and other plastids

- The simplest form of starch is amylose
- **Glycogen** is a storage polysaccharide in animals
  - Humans and other vertebrates store glycogen mainly in liver and muscle cells
- Types – structural
  - The polysaccharide **cellulose** is a major component of the tough wall of plant cells
    - Like starch, cellulose is a polymer of glucose, but the glycosidic linkages differ
    - The difference is based on two ring forms for glucose: alpha ( $\alpha$ ) and beta ( $\beta$ )
- Random acts of biology
  - **Cellulose** in human food passes through the digestive tract as insoluble fiber
  - Some microbes use enzymes to digest cellulose
  - Many herbivores, from cows to termites, have symbiotic relationships with these microbes
  - **Chitin**, another structural polysaccharide, is found in the exoskeleton of arthropods
  - **Chitin** also provides structural support for the cell walls of many fungi
  - Chitin is used to make a strong and flexible surgical thread that decomposes after the wound or incision heals.

## O. Lipids

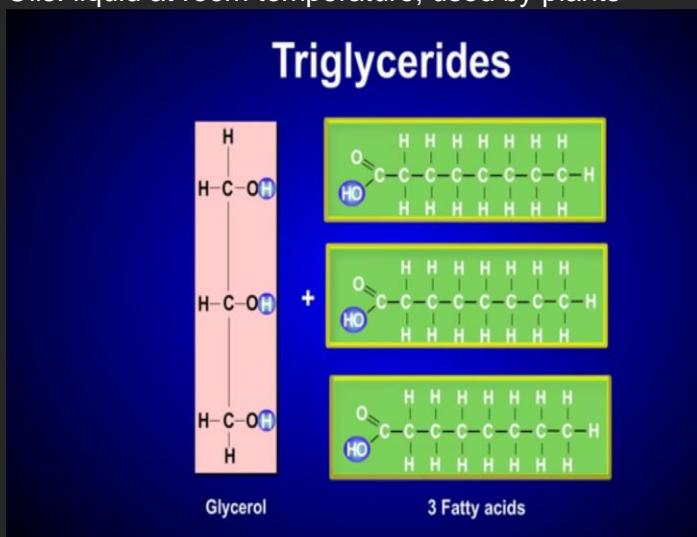
### *What are lipids?*

- Energy storage, protection, insulation, lubrication, hormone precursors, cell membranes
- Lipids are hydrophobic
- Lipids are a diverse group of hydrophobic molecules
- Lipids are the one class of large biological molecules that do not form polymers
- The unifying feature of lipids is having little or no affinity for water (water fearing)
- Lipids are hydrophobic because they consist mostly of hydrocarbons, which form nonpolar covalent bonds
- The most biologically important lipids are fats, phospholipids, and steroids.
- Lipids are macromolecules made of fatty acid monomers.
- Functions of lipids include structural support for the cell, energy storage, and cell signaling.

### *Triglycerides and fats*

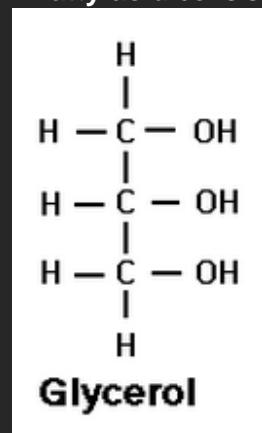
- Fats: solid at room temperature; used by animals

- Oils: liquid at room temperature; used by plants

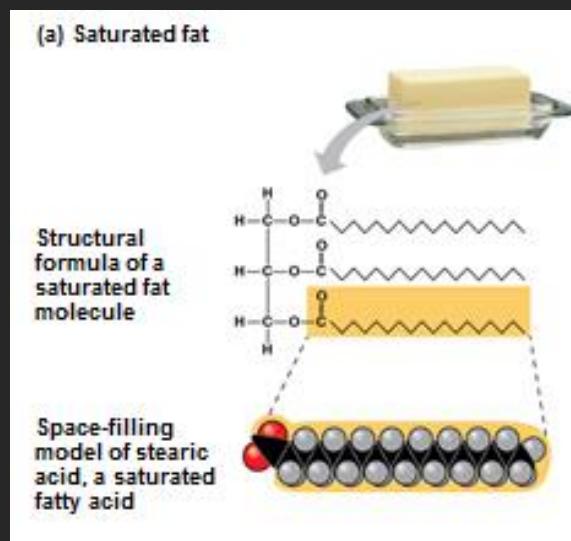


- Fats

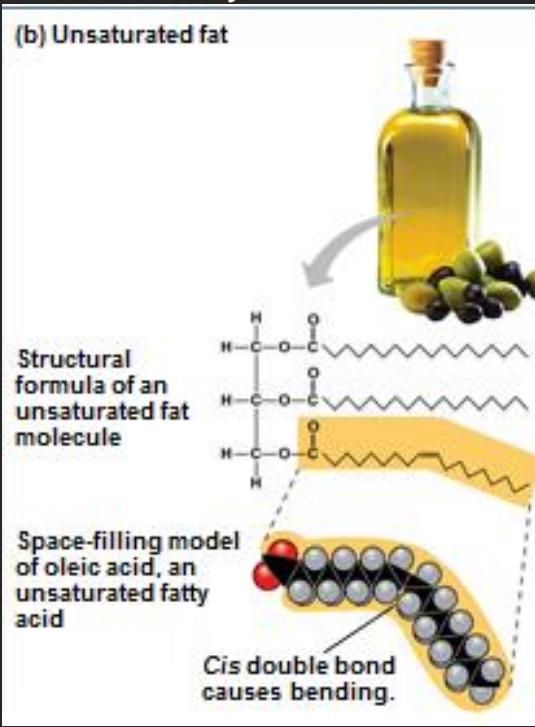
- Fats** are constructed from two types of smaller molecules: glycerol and fatty acids
- Glycerol is a three-carbon alcohol with a hydroxyl group attached to each carbon
- A **fatty acid** consists of a carboxyl group attached to a long carbon skeleton



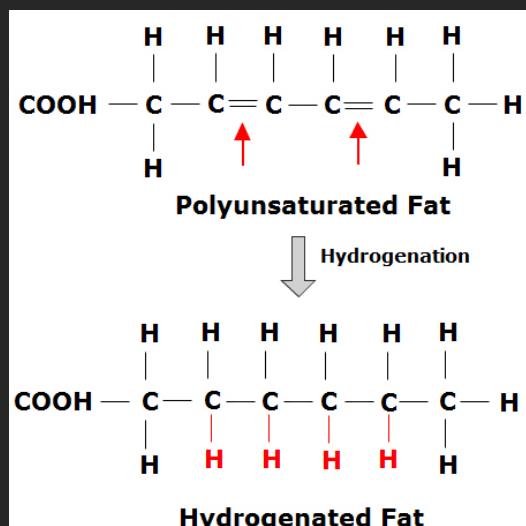
- Fats are insoluble in aqueous environments
- Fats separate from water because water molecules form hydrogen bonds with each other and exclude the fats
- In a fat, three fatty acids are joined to glycerol by an ester linkage, creating a **triacylglycerol**, or triglyceride
- Polar substances dissolves polar substances; non-polar substances dissolves non-polar substances; Water is polar.
- Saturated or unsaturated?
  - Saturated
    - Fats made from **saturated** fatty acids are called saturated fats, and are solid at room temperature
    - Most animal fats are saturated (lard)
    - Saturated fatty acids** have the maximum number of hydrogen atoms possible and *no double bonds*



- 
- Unsaturated
  - Fats made from unsaturated fatty acids are called unsaturated fats or oils, and are liquid at room temperature
  - Plant fats and fish fats are usually unsaturated
  - **Unsaturated fatty acids** have *one or more double bonds*



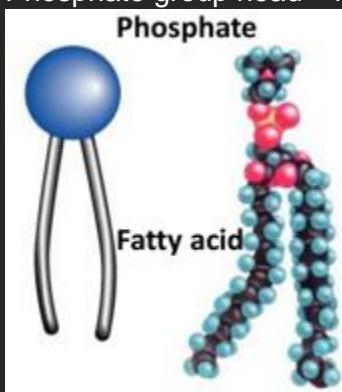
- 
- A diet rich in saturated fats may contribute to cardiovascular disease through plaque deposits
- **Hydrogenation** is the process of converting unsaturated fats to saturated fats by adding hydrogen



- Certain unsaturated fatty acids are not synthesized in the human body
- These must be supplied in the diet
- These essential fatty acids include the omega-3 fatty acids, required for normal growth, and thought to provide protection against cardiovascular disease
- Trans fat
  - **Hydrogenating** vegetable oils also creates unsaturated fats with *trans* double bonds
  - **These *trans* fats may contribute more than saturated fats to cardiovascular disease**
- The major function of fats is energy storage
- Humans and other mammals store their fat in adipose cells
- Adipose tissue also cushions vital organs and insulates the body

### *Phospholipids*

- When phospholipids are added to water, they self-assemble into a bilayer, with the hydrophobic tails pointing toward the interior
- The structure of phospholipids results in a bilayer arrangement found in cell membranes
- Phospholipids are the major component of all cell membranes
- Fatty acid tails – hydrophobic
- Phosphate group head – hydrophilic



- Arranged as a bilayer

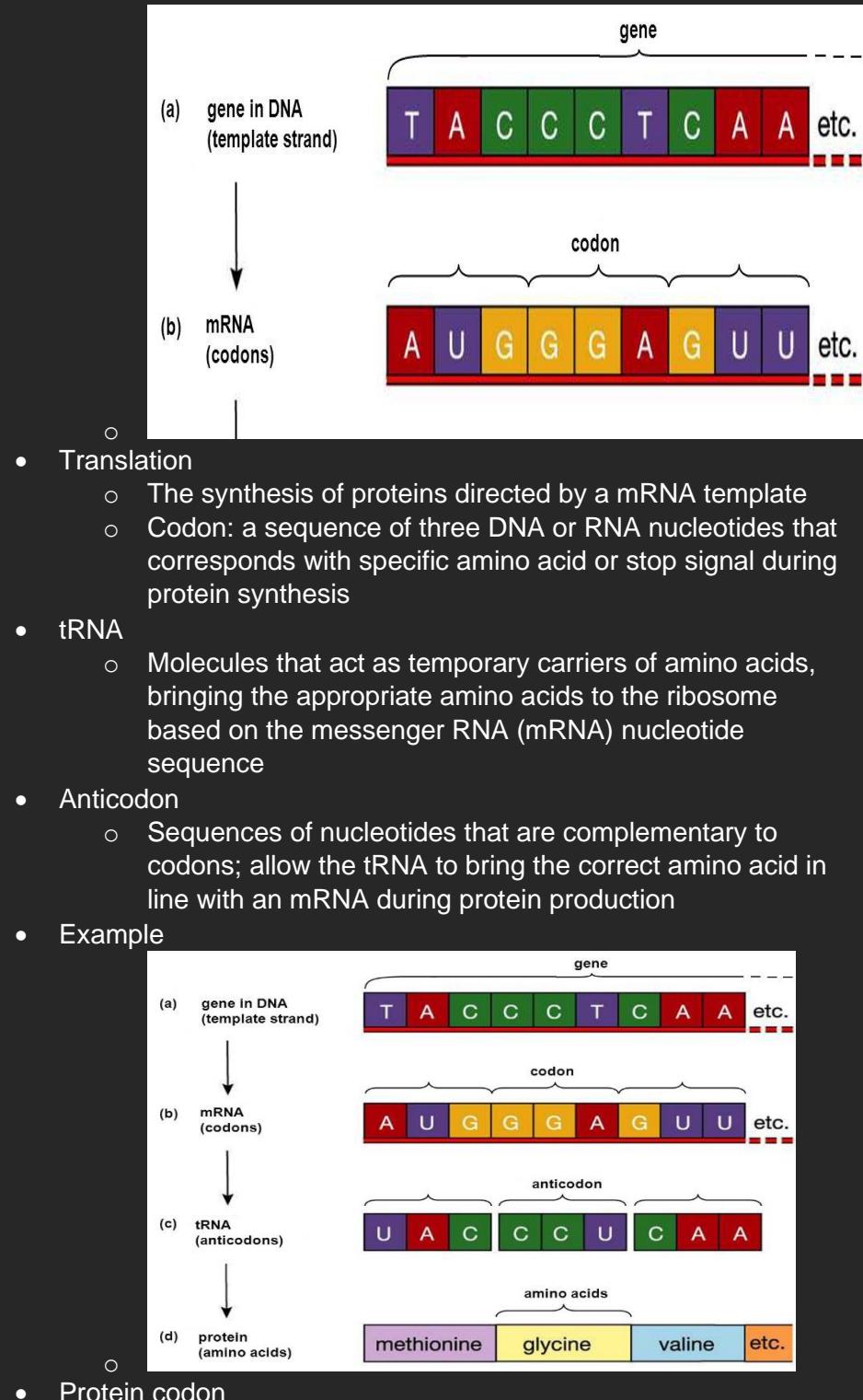
### *Steroids*

- **Steroids** are lipids characterized by a carbon skeleton consisting of four fused rings
- **Cholesterol**, an important steroid, is a component in animal cell membranes
- Although cholesterol is essential in animals, high levels in the blood may contribute to cardiovascular disease

## P. Nucleic acid

### *DNA and RNA*

- They are polymers of nucleotides
- Nucleotide is a molecular complex of three subunits: phosphate, a pentose sugar, and a nitrogen-containing base.
- Two types of nucleic acid
  - DNA
    - Deoxyribonucleic acid
    - Long-term storage of genetic information
    - Sugar: deoxyribose
    - Bases: adenine, guanine, thymine, cytosine
    - Strands: double stranded
    - Helix: yes
    - DNA structure
      - Phosphate backbone
      - Nitrogenous base pairs
      - Deoxyribose
      - Hydrogen bonds
    - Protein synthesis
      - A process that takes the coded message of DNA and converts it into a usable protein molecule.
      - Transcription
        - Process of using DNA to create messenger RNA, also simply called mRNA
        - mRNA: molecule that carries the DNA's coded instructions for making a protein
      - RNA polymerase
        - An enzyme that is responsible for copying a DNA sequence into an RNA sequence, during the process of transcription.
      - Example



		second letter				third letter	
		U	C	A	G		
first letter	U	UUU } Phe UUC UCC UUA } Leu UUG }	UCU } UCC UCA UCG }	UAU } Tyr UAC <b>UAA stop</b> <b>UAG stop</b>	UGU } Cys UGC <b>UGA stop</b> UGG Trp		U C A G
	C	CUU } CUC CUA CUG }	CCU } CCC CCA CCG }	CAU } His CAC CAA } Gln CAG }	CGU } CGC CGA CGG }		U C A G
	A	AUU } Ile AUC AUA <b>AUG Met</b>	ACU } ACC ACA ACG }	AAU } Asn AAC AAA } Lys AAG }	AGU } Ser AGC AGA } Arg AGG }		U C A G
	G	GUU } GUC GUA GUG }	GCU } GCC GCA GCG }	GAU } Asp GAC GAA } Glu GAG }	GGU } GGC GGA GGG }	U C A G	
First Letter	Second Letter				Third Letter		
U	U	C	A	G			
phenylalanine	serine	tyrosine	cysteine		U		
phenylalanine	serine	tyrosine	cysteine		C		
leucine	serine	stop	stop		A		
leucine	serine	stop	tryptophan		G		
C	leucine	proline	histidine	arginine	U		
leucine	proline	histidine	arginine		C		
leucine	proline	glutamine	arginine		A		
leucine	proline	glutamine	arginine		G		
A	isoleucine	threonine	asparagine	serine	U		
isoleucine	threonine	asparagine	serine		C		
isoleucine	threonine	lysine	arginine		A		
(start) methionine	threonine	lysine	arginine		G		
G	valine	alanine	aspartate	glycine	U		
valine	alanine	aspartate	glycine		C		
valine	alanine	glutamate	glycine		A		
	valine	alanine	glutamate	glycine	G		

- RNA

- Transfer the genetic code from the nucleus to the ribosomes to make proteins
- Ribonucleic acid
- Sugar – Ribose
- Bases – Adenine, guanine, uracil, cytosine
- Strands – Single strand
- Helix - No

## Komunikasyon at Pananaliksik sa Wika at Kulturang Filipino

### A. Batayang Kaalaman sa Wika

Ano ba ang wika?

Ayon sa lingguwistang si Henry Gleason

Ang wika ay masistemang balangkas ng sinasalitang tunog na pinipili at isinasaayos sa paraang arbitraryo upang magamit ng taong kabilang sa isang kultura.

Ayon kay Noam Chomsky

Ang wika ay proseso ng malayang paglikha; ang mga batas at tuntunin nito ay hindi natititag, ngunit ang paraan ng paggamit sa mga tuntunin ng paglikha ay Malaya at nagkakaiba-iba, maging ang interpretasyon at gamit ng mga salita ay kinasasangkutan ng proseso ng malayang paglikha.

Ayon kay Nelson Mandela

Kapag kinausap mo ang tao sa wikang kanyang nauunawaan, ito'y patungo sa kanyang isip. Kapag kinausap mo siya sa kanyang wika, ito'y patungo sa kanyang puso.

Ayon kay Pamela Constantino at Galileo Zafra (2000)

Ang wika ang kalipunan ng mga salita at ang pamamaraan ng pagsasama-sama ng mga ito para magkaunawaan o makapag-usap ang isang grupo ng tao.

Ayon kay Bienvenido Lumbera (2007)

Parang hininga ang wika, sa bawat sandal ng buhay natin ay nariyan ito. Palatandaan ito na buhay tayo, at may kakayahang umugnay sa kapwa nating gumagamit din nito. Sa bawat pangangailangan natin ay gumagamit ang tao ng wika upang kamtin ang kailangan natin.

Ayon kay Alfonso O. Santiago

Wika ang sumasalamin sa mga mithiin, lunggati, pangarap, damdamin, kaisipan o saloobin, pilosopiya, kaalaman at karunungan, moralidad, paniniwala, at mga kaugalian ng tao sa lipunan.

Ayon kay Jose P. Rizal

Habang pinangangalagaan ng isang bayan ang kanyang wika, pinangangalagaan nya ang marka ng kanyang Kalayaan, gaya ng pangangalaga ng tao sa kanyang Kalayaan habang pinanghahawakan niya ang sariling paraan ng pag-iisip.

## **B. Kahalagahan at kalikasa ng Wika**

- Mahalaga ang wika bilang pagiging instrumento nito sa komunikasyon
- Mahalaga ang wika sa pagpapanatili, pagpapayabong, at pagpapalaganap ng kultura ng bawat grupo ng tao
- Ang wika ang batayan ng pagiging Malaya at may soberanya ang isang bansa
- Wika ang nagsisilbing tagapag-ingat at tagapagpalaganap ng mga karunungan at kaalaman
- Mahalaga ang wika bilang lingua franca

## **C. Katangian ng Wika**

### Masistema

- Ang wika ay may masistemang balangkas. Binubuo ng mga makabuluhang tunog o ponema ang wika na nakalilikha ng mga yunit ng salita na kapag pinagsama-sama ay nakabubuo ng pangungusap.

### Arbitrary

- Pinagkakasunduan ang anumang wikang gagamitin ng mga grupo ng tao sa kanilang pang-araw-araw na pamumuhay.

### Dinamiko

- Ang pagiging buhay o dinamiko ng wika. Ibig sabihin ang wika ay nagbabago at sumasabay sa panahon. Malaya itong tumatanggap ng mga pagbabago upang mapagyaman at yumabong.

### Unique

- Natatangi ang bawat wika. Walang wika ang magkatulad na katangian. May kani-kaniyang lakas at kahinaan ang wika.

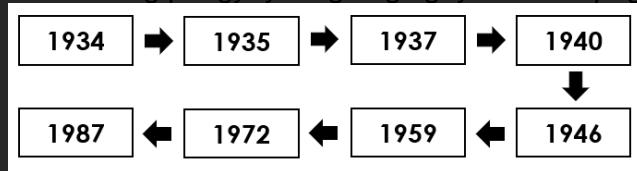
### Superyor

- Walang wikang superyor sa iba pang wika. Lahat ng wika ay pantay-pantay sapagkat mayroon itong kanyan-kanyang taglay na natatangi sa isa't isa.

## **D. Mga konseptong pangwika**

### Wikang Pambansa

- Isang wikang magiging daan sa pagkakaisa at pag-unlad bilang simbolo ng kaunlaran ng isang bansa.
- Kinikilalang pangkalahatang midyum ng komunikasyon sa isang bansa. Kadalasan, ito ang wikang ginagamit sa pang-araw-araw na pamumuhay ng lahat ng mamamayan ng isang bansa.
- Timeline ng pangyayaring nagbigay-daan sa pagkahirang ng Wikang Pambansa



### Wikang panturo

- Ito ang wikang ginagamit sa formal na pagtuturo – sa pagpapaliwanag sa mga aralin at sa mga talakayan sa klase. Ito rin ang wikang ginagamit sa pagsulat ng aklat, modyul, at iba pang material na panturo.
- Itinaas ng Konstitusyon ng 1987 ang paggamit ng Filipino bilang wikang panturo.

### Wikang opisyal

- Ito ay itinadhana ng batas na maging opisyal na talastasan ng pamahalaan. Ibig sabihin, ito ang wika na maaaring gamitin sa anumang uri ng komunikasyon, lalo na sa anyong nakasulat, sa loob at labas ng alinmang sangay o ahensya ng gobyerno.
- Wikang opisyal ng Pilipinas: Filipino at Ingles

## **E. Unang wika, pangalawang wika, at iba pa**

### Unang wika

- Tawag sa wikang kinagisnan mulka sa pagsilang at unang itinuro sa isang tao.
- Tinatawag din itong katutubong wika, mother tongue, arterial na wika, at kinakatawan din ng L1.

### Pangalawang wika

- Itinuturing na pangalawang wika o L2 ang wikang hindi "taal" o hindi katutubo sa isang tao. Pangalawang wika ang tawag sa iba pang mga wikang matutuhan ng isang tao pagkaraang matutuhan ang kaniyang unang wika.
- Sa pagdaan ng panahon ay lalong lumalawak ang mundo ng bata. Dito ay may iba't ibang wika pa siyang naririnig o nakikilala na kalaunan ay natututunan na niya at nagagamit sa pakikipagtalastasan sa mga tao. Ito ang tinatawag na ikatlong wika o L3.

### Bilingguwalismo

- Ito ay ang pagkakaroon ng natural na kasanayan at kahusayan sa paggamit ng dalawang wika nang may pantay na kahusayan.
- Kinikilala sa larangan ng edukasyon sa ating bansa ang bilingguwalismo bilang patakaran pang-edukasyon dahil na rin sa ating karanasang pangkasaysayan.
- Ang akala ng iba, sa ganitong mga pahayag nagagamit ang konsepto ng bilingguwalismo. Isa itong maling paniniwala dahil naituturing lamang na bilingguwal ang isang tao kung magagamit ang ikalawang wika nang matatas sa lahat ng pagkakataon.

### Multilingguwalismo

- Ito ay tumutukoy sa pagkakaroon ng pantay na kahusayan sa paggamit ng higit pa sa dalawang wika.
- Ang Pilipinas ay isang bansang multilingguwal. Mayroon tayong mahigit 150 wika at wikain kaya naman bibihira lang ang Pilipino na monolingguwal.

### Homogenous na wika

- Kahit na may iba't ibang wikang ginagamit ang mga Pilipino, mayroon pa ring mga taong nagsasalita at nagkakaintindihan sa iisang wikang ginagamit. Nangyayari ito dahil walang malaking pagkakaiba sa wikang kanilang ginagamit.
- Homegenous ang wika kung ang mga taong gumagamit nito ay iisang bigkas ng mga salita, pare-pareho ang tono at intonasyon, at iiisa ang pagpapakahulugan sa mga salitang kanilang ginagamit.

### Heterogenous na wika

- Isla lamang ang ibig tukuyin kapag sinabing heterogenous ang wika – na may barayti at pagkakaiba-iba ang bawat wika. Tinatawag din itong lingguwistikong barayti ng wika.
- Heterogenous ang Tagalog. Iba ang Tagalog-Manila sa Tagalog-Nueva at sa Tagalog-Laguna.
- Halimbawa, kapag sinabi ng taga-Nueva Ecija na "urungan ang pinggan", "hugasang ang mga pinggan" ang ibig sabihin nito.

## **F. Mga konseptong Pangwika / Mga barayti ng wika**

### Dayalek

- Ito ang barayti ng wikang ginagamit ng particular na pangkat ng mga tao mula sa isang particular na lugar tulad ng lalawigan, rehiyon, o bayan.

- Maaaring gumagamit ang tao ng katulad na wika subalit naiiba ang punto o tono, may magkaibang katawagan para sa iisang kahulugan, iba ang gamit na salita para sa isang bagay, o magkakaiba ang pagbuo ng mga pangungusap.

#### Idyolek

- Sa barayting ito, napalulutang ang katangian at kakanyahang natatangi ng taong nagsasalita. Sinasabing walang dalawang taong nagsasalita ng iisang wika ang bumibigkas nito nang magkarehong-magkareho.
- Halimbawa: “Magandang gabi, Bayan!”, “Hindi naming kayo tatantanan!”, “Anak, paki-explain. Labyu!”, “Darla, nakakaloka!”

#### Sosyolek

- Ito ang barayti ng wikang nakabatay sa katayuan o antas panlipunan o dimensiyong sosyal ng mga taong gumagamit ng wika.
- Kapansin-pansing ang mga tao ay nagpapangkat-pangkat batay sa ilang katangian tulad ng kalagayang panlipunan, paniniwala, oportunidad, kasarian, edad, at iba pa.
- May pagkakaiba ang barayti ng nakapag-aran sa hindi nakapag-aran; ng mayaman sa mahirap; ng babae sa lalaki; gayundin ng wika ng preso; wika ng tindera sa palengke; at iba pang pangkat.
- Halimbawa: “gay lingo”, “conyo”, “jejemon”

#### Etnolek

- Ito ang barayti ng wika mula sa mga etnolongguistikong grupo. Ang salitang etnolek ay nagmula sa pinagsamang etniko at dialek. Taglay nito ang mga salitang magiging bahagi na ng pagkakilanlan ng isang pangkat etniko.
- Ang vakkul na tumutukoy sa gamit ng mga Ivatan na pantakip sa ulo sa init man o sa ulan.
- Ang bulanon na ang ibig sabihin ay full moon.
- Ang kalipay na ang ibig sabihin ay tuwa o ligaya.
- Ang palangga na ang ibig sabihin ay mahal o minamahal.
- Ang paggamit ng mga Ibaloy nh SH sa simula, gitna, at dulo ng salita tulad ng shuwa (dalawa), sadshak (kaligayahan), peshen (hawak).

#### Register

- Ito ang barayti ng wika kung saan naiaangkop ng isang nagsasalita ang uri ng wikang ginagamit niya sa sitwasyon at sa kausap.
- Pormal na tono ng pananalita ang ginagamit sa isang tao kapag may mas mataas na katungkulang o kapangyarihan, nakatatanda, o hindi niya masyadong kilala.
- Pormal na wika rin ang ginagamit sa pagsimba o pagsamba, sa mga seminar, sa mga talumpati, sa korte, at iba pa.
- Ang hindi pormal na paraan ng pagsasalita ay nagagamit naman kapag ang kausap ay mga kaibigan, malalapit na kapamilya, kaklase, at iba pa.

#### Pidgin at Creole

- Ang pidgin ay umusbong na bagong wika o tinatawag sa Ingles na “nobody’s native language” o katutubong wikang di pag-aari ninuman.
- Nangyayari ito kapag may dalawang taong nagtatangkang mag-usap subalit pareho silang may magkaibang unang wika kaya’t di magkaintindihan dahil hindi nila alam ang wika ng isa’t isa.

### Lingguistikong komunidad

- Ito ay ang iba't ibang uri ng mga wikang ginagamit sa komunidad paglipas ng panahon.

## **G. Heograpikal, Morpolohikal, at Ponoholikal na barayti ng wika**

### Heograpikal

- Nasa katawagan ng salita ang pagkakaiba
  - Mangungutang ka?
    - Pampanga - Ibig magtatanong ng direksyon
    - Maynila - Ibig manghiram ng pera o salapi

### Morpolohikal

- Ang pagkakaiba ay nasa anyo at ispeling ng salita
  - Kumain
    - Batangas – Nakain
    - Camarines Sur – Makakan

American English	British English
Acknowledgement	Acknowledgement
Theater	Theatre
Fiber	Fibre
Fulfill	Fulfil
Airplane	Aeroplane

### Ponolohikal

- Pagkakaiba sa bigkas at tunog ng mga salita

Nike	Nayk	Nay-ki
Accurate	A-kyu-reyt	A-kyu-rit
Away	A-wey	A-way
Today	Tu-dey	Tu-day
Porsche	Por-sha	Porsh
Centennial	Sen-ten-yal	Sin-tin-yal
Google	Goo-gel	O-goo-loog-ga-loog

## **H. Pagsulong ng wikang pambansa**

Espanyol at Ingles – Wikang panturo sa mga paaralan dulot ng mahabang pananakop ng mga dayuhan

### Artikulo XIV, Seksyon 3 ng Konstitusyon (1935)

- Ang Pembansang Asamblea ay gagawa ng mga hakbang tungo sa paglinang at pagpapatibay ng isang panlahat na Wikang Pambansa na nasasalig sa isa sa mga wikang katutubo. Hangga't walang ibang itinatadhana ang batas, Ingles at Espanyol ay magpapatuloy na mga wikang opisyal.

Manuel L. Quezon (Pangulo ng Pilipinas sa panahon ng Commonwealth mula 1935 hanggang 1944)

- Pinangunahan niya ang mga hakbang tungo sa pagkakaroon natin ng isang wikang pambansa. Noong Nobyembre 13, 1936, pinagtibay ng Pambansang Asamblea ang Batas Komonwelt Blg. 184 na nagtataugat ng Surian ng Wikang Pambansa (SWP) at nagtakda rin ng tungkulin at kapangyarihan sa ahensya.

Surian ng Wikang Pambansa

- Kraytirya sa pagpili ng batayan ng Wikang Pambansa
  1. Iyong wikang maunlad na sa kayarian nito
  2. May mekanismo at literatura
  3. Ginagamit ng nakararaming Pilipino

Tagalog

- Nilagdaan ni Pang. Manuel L. Quezon noong Disyembre 30, 1937 ang Kautusang Tagapagpaganap Blg. 134, na nagtatakda na Tagalog ang siyang gagamiting saligan ng Wikang Pambansa.

Abril 1, 1940: Kautusang Tagapagpaganap Blg. 263

- Iniuot ni Pang. Quezon ang pagpapalimbag ng wikang Tagalog-English Vocabulary at Balarila ng wikang Pambansa (Lope K. Santos - Ama ng Balarilang Filipino)
- Noong Hunyo 19, 1940, sinimulang ituro sa mga paaralang pampubliko at pribado ang wikang Pambansa (na nasasalig sa wikang Tagalog).

Hulyo 4, 1946: Batas Komonwelt Blg. 570

- Isa na ang Tagalog na gagamitin bilang wikang opisyal sa iba't ibang sangay ng pamahalaan.

Agosto 13, 1959: Kautusang Pangkagawaran Blg. 7

- Nilagdaan ng Kalihim ng Edukasyon na si Jose Romero, sinimulang kilalanin ang wikang Pambansa sa katawagang "Pilipino".

Pahayag ng Korte Soprema

- Ang Tagalog bilang batayan ng ating pambansang wika (na pinatunayan sa ulat ng Kawanihan ng Sensus na siyang pinakamalaganap na sinasalita sa ating mga katutubong mga wika), ang hayagang pagtanggap at pagkilala dito sa bayan ng pamahalaan, sa tadhana ng Batas Komonwelt Blg. 570 na pinagtibay ng Kongreso na nagpapahayag na ang Wikang Pambansang Pilipino ay isa sa mga wikang opisyal ng Pilipinas simula Hulyo 4, 1946, ay nakapaglagay sa isyu ng katalinuhan at kaangkupan sa pagkapili sa Pilipino na batay sa Tagalog bilang wikang Pambansa natin sa katayuang lampas sa awtoridad ng mga hukuman upang rebisahin at isantabi.

Konstitusyon 1973

- Ang Pambansang Asamblea ay gagawa ng mga hakbang tungo sa pagpapaunlad at pormal na pagpapatibay ng panlahat na wikang pambansa na tatawaging Filipino. Hanggang walang ibang ipinapasya ang batas, ang Ingles at Pilipino at magpapatuloy na wikang opisyal.

#### Konstitusyon ng 1987, Artikulo 14, Seksyon 6

- Ang wikang pambansa ng Pilipinas at Filipino. Samantalang nililinang, ito ay dapat payabungin at pagyamanin pa, salig sa umiiral na mga wika sa Pilipinas at sa iba pang mga wika.

#### Kautusang Tagapagpaganap Blg. 335

- Isinulong at nilagdaan ni Pang. Corazon Aquino ang kautusan na, "na nag-aatas sa lahat ng kagawaran, kawanihan, tanggapan, ahensya, o anumang instrumentaliti ng pamahalaan na magsagawa ng mga hakbang para sa layuning magamit ang wikang Filipino sa mga opisyal na transaksyon, komunikasyon, at korespondensiya." Ang kautusang ito ay ipinatupad ng Linangan ng mga Wika sa Pilipinas (dating SWP).

#### Batas Republika Blg. 7104

- Sa panahon ng panunungkulan ni Pang. Corazon Aquino naisabatas ang paglikha ng Komisyon ng Wikang Filipino noong Agosto 14, 1991.
- Ang Komisyon ng Wikang Filipino ay bubuuin ng labing-isang komisyoner na kakatawan sa mga pangunahing wika sa Pilipinas, na kinabibilangan ng Tagalog, Cebuano, Ilokano, Bikol, Kapampangan, Pangasinense Hiligaynon, Samar-Leyte, sa pangunahing wika ng Muslim Mindanaw; ang kahilagaang mga Pamayanang Kultural, at Katimugang mga Pamayanang Kultural.

### **I. Conative, Informative, at Labelling na gamit ng Wika**

#### Conative

- Wikang layunin ang mag-utos

#### Informative

- Wikang layunin ang magbigay impormasyon

#### Labelling

- Wikang pagbabansag, katawagan; dapat positibo ang pagkasabi

### **J. Gamit ng Wika**

Ang pinakadiwa ng wika ay panlipunan. Isang magandang ehemplong magpapatunay rito ay ang kuwento ni Tarzan. Mga tunog ng hayop ang kanyang unang natutuhan dahil ito ang wika ng mga kasama nyang hayop sa gubat.

Ang isang batang walang ugnayan sa ibang tao ay mahihirapang matutong magsalita dahil wala naman siyang kausap. Maging ang isang taong bagong lipat lang sa isang komunidad na may ibang wika, kung hindi ito makikipag-ugnayan sa iba, ay hindi matutuo ng ginagamit nilang wika.

Kung gayon, ang isang taong hindi nakikipag-ugnayan o nakikisalamuha sa isang komunidad ay hindi matutong magsalita sa paraan kung paano nagsasalita ang mga naininirahan sa komunidad na iyon. Sadyang ang wika nga ay isang sistema ng pakikipag-ugnayan na nagbubuklod sa mga tao. Hindi matatawaran ang mahalagang gamit nito sa lipunan.

#### 1. Phatic

- Nagpapakita ng pakikipagkapwa-tao o pakikipag-ugnayan.
- Karaniwang maikli ang mga usapang phatic. Sa Ingles, tinatawag itong social talk o small talk.

#### 2. Emotive

- Padamdamin
- Pagpapahayag ng mga saloobin, damdamin at emosyon

#### 3. Expressive

- Nakakatulong sa atin upang mas makilala at mauunawan tayo ng ibang tao. Gayundin sa pagbuo sa isang kaaya-ayang relasyon sa ating kapwa.
- Hindi maiwasan sa pakikipag-usap na nababanggit natin ang ilang bagay tungkol sa ating sariling paniniwala, pangarap, mithiin, panuntunan sa buhay, kagustuhan, at marami pang iba.

#### 4. Instrumental

- Gamit ng wikang tumutugon sa mga pangangailangan ng tao gaya ng pakikipag-ugnayan sa iba lalo na kung mayu mga katanungang kailangan sagutin; pagpapakita ng patalastas tungkol sa isang produkto na nagsasaad ng gamit at halaga ng produkto; paggawa ng liham-pangangalakal; liham na patnugot; at iba pa.

#### 5. Regulatoryo

- Gamit ng wika upang kumontrol ng kilos, asal o paniniwala ng iba at makaimpluwensiya ang tagapagsalita sa kanyang kausap. Saklaw ng gamit na ito ang pagbibigay ng direksyon gaya ng pagtuturo kung saan matatagpuan ang isang partikular na lugar; direksyon sa pag-inom ng gamot; direksyon sa pagsagot sa pagsusulit; at direksyon sa paggawa ng anumang bagay.
- Halimbawa rin ng panregulatoryo ang instruksyon sa mga artistang gumaganap sa drama sapagkat kontrolado ang iskrip ang kanilang mga kilos at galaw.

#### 6. Interaksyunal

- Ang gamit na ito ay makikita sa paraan ng pakikipagtalakayan ng tao sa kanyang kapwa; pakikipagbiruan; pakikipagtalo tungkol sa isang partikular na isyu; pagsasalaysay ng malulungkot o masasayang pangyayari sa isang kaibigan o kapalagayang loob; paggawa ng liham-pangkaibigan at iba pa.

## 7. Personal

- Naipapahayag sa gamit na ito ang sariling pala-palagay o kuro-kuro sa paksang pinaguusapan. Kasama rin dito ang pagsulat ng talaarawan o dyornal. Dito rin naipahahayag ang pagpapahalaga sa anumang anyo ng panitikan.

## 8. Heuristiko

- Ang gamit na ito ay tumutukoy sa pagkuha o paghahanap ng impormasyon may kinalaman sa paksang pinag-aaralan. Kabilang dito ang pag-iinterbyu sa mga taong makasasagot sa mga tanong na kailangan sa paksang pinag-aaralan; pakikinig sa radyo; panonood ng telebisyon; at pagbabasa ng pahayagan at mga aklat. Nakakukuha tayo ng mga impormasyon sa mga nabanggit sa sanggunian.

## 9. Impormatibo

- Ito ay may kinalaman sa pagbibigay ng mga impormasyon sa paraang pasalita at pasulat. Kabilang dito ang ulat, pamanahong papel, tesis, disertasyon, panayam, at pagtuturo sa klase

## K. Kakayahang Sosyolingguwistiko

Tinutukoy ng kakayahang sosyolingguwistiko ang kakayahang gamitin ang wika nang may naaangkop na panlipunang pagpapakahulugan para sa isang tiyak na sitwasyong pangkomunikasyon.

Hal.1: Magandang araw po! Kumusta po kayo? (Pakikipag-ugnayan sa mga nakatatanda at may awtoridad)

Hal.2: Uy! Kumusta ka naman? (Kakaiba sa paggamit natin ng impormal na wika sa ating mga kaibigan at kapareho ng estado.

Kadalasan, para sa mga taal na tagapagsalita ng isang wika (Hal.: Ang mga tao na Tagalog ang unang wika ay tinatawag na taal na tagapagsalitang Tagalog), nagiging natural lamang o hindi na kailangang pag-isipan ang paggamit ng naaangkop na pahayag ayon sa sitwasyon.

Gayunman, para sa hindi taal na tagapagsalita, dapat niyang matutuhan kung paano "lumikha at umunawa ng wika sa iba't ibang sosyolingguwistikong konteksto, na may pagsasaalang-alang sa mga salik gaya ng estado ng kausap, layunin ng interaksiyon, ati tinatakdang kumbensiyon ng interaksiyon" (Freeman at Freeman, 2004)

### S.P.E.A.K.I.N.G. model

Nilinaw ng sosyolingguwistang si Dell Hymes (1974) ang nasabing mahalagang salik ng lingguwistikong interaksiyon gamit ang kanyang modelong S.P.E.A.K.I.N.G.

S	etting and scene	Saan ang pook ng pag-uusap o ugnayan? Kailan ito nangyari?
P	articipants	Sino-sino ang kalahok sa pag-uusap?
E	nds	Ano ang pakay, layunin, at inaabhang bunga ng pag-uusap?
A	ct sequence	Paano ang takbo o daloy ng pag-uusap
K	ey	Ano ang tono ng pag-uusap? Seryoso ba o pabiro?
I	nstrumentalities	Ano ang anyo at estilo ng pananalita? Kumbersiyonal o may mahigpit na pagsunod sa panuntunang panggramatika?

N	orms	Ano ang umiiral na panuntunan sa pag-uusap at ano ang reaksiyon dito ng mga kalahok? Malaya bang nakapagsasalita ang mga kalahok o nalilimitahan ba ang pagkakataon ayon sa uri, lahi, kasarian, edad, at iba pang salik?
G	enre	Ano ang uri ng sitwasyon o material na ginagamit? (Hal. Interbyu, panitikan, liham)

### Etnografiya ng Komunikasyon

Ang salitang Etnografiya ay nangangahulugang sistemataikong pag-aaral sa tao at kultura sa pamamagitan ng pagdanas at pakikipag-ugnayan sa mga kalahok sa kanilang natural na kapaligiran.

### Mga varayti ng wika

1. Formalidad at informalidad ng sitwasyon
2. Ugnayan ng mga tagapagsalita
3. Pagkakakilanlang etniko at pagkakapaloob sa isang pangkat
4. Awtoridad at ugnayang pangkapangyarihan

Batay sa teoryang sosyolingguistikong ay ang pagbabago sa wika ay dulot ng panlipunang phenomenon

### L. Kakayahang Pragmatiko

Pragmatiko – tumutukoy sa pag-aaral sa paggamit ng wika sa isang particular na konteksto upang magpahayag sa paraang diretsahan o may paggalang. (Lightbrown at Spada, 2006)

Ang isang taong may kakayahang pragmatiko ay mabisang nagagamit ang yaman ng wika upang makapagpahayag ng mga intensyon at kahulugang naayon sa konteksto ng usapan at gayundin, natutukoy ang ipinapahiwatig ng sinasabi, di sinasabi at ikinikilos ng kausap

### Ayon kay J.L. Austin

- Ang pakikipag-usap ay hindi lamang sa paggamit ng mga salita upang maglarawan ng karanasan kundi “paggawa ng mga bagay gamit ang mga salita o speech act.”
- Hal: Pakiusap, pagtanggi, pagpapaumanhin, pangangako at iba pa.

### Tatlong sangkap ng Speech Act

Sangkap	Kahulugan	Halimbawa
Ilocutionary force	Sadya o intensyonal na papel	Pakiusap, utos o pangako
Locution	Anyong lingguistikong	Patanong, pasalaysay
Perlocution	Epekto sa tagapakinig	Pagtugon sa hiling o pagbibigay atensyon

Halimbawa

Sangkap	Isang kostumer sa restoran ang nagpahayag sa waiter ng ganito: “Mayroon ba kayong tubig na walang yelo?”
---------	----------------------------------------------------------------------------------------------------------

Illocutionary force	Paghiling na madalhan sya ng inuming tubid na walang kasamang yelo
Locution	Patanong
Perlocution	Pagsunod ng waiter sa kahilingan ng kostumer

### Interlanguage Pragmatics

- Pagkatuto ng ikalawang wika
- Ang pag-aaral sa kung paano ang mga hindi taal na tagapagsalita ng partikular na wika at nagsisimulang matuto nito ay umuunlad ang kakayahan sa pagpapahayag ng kanilang intension sa pamamagitan ng iba't ibang speech act.
- Naobserbahan nila sa pagaaral na ito ang pagkakaiba sa pakikipag-usap ng ginagawa ng mga estudyanteng taal at di-taal na tagapagsalita ng Ingles sa kanilang mga propesor hinggil sa pagpili ng kanilang kurso.
- Halimbawa: Sa mungkahing pagpili ng kurso ng tagapayo, nakikita ang
  - Hindi Taal na tagapagsalita ng English ay magpapahayag ng...
 

Hindi Taal na tagapagsalita ng English ay magpapahayag ng...	Taal na tagapagsalita na nagbibigay ng suhestyon sa anyong...
I think I am not interested in that course	I think this other course would better meet my needs

### Berbal at di-berbal na komunikasyon

- Berbal: uri ng komunikasyong gumagamit ng salita sa anyong pasalita at/o pasulat man. Nagagawa ito sa paraang oral.
- Di-berbal: ayon sa mga pag-aaral, lubhang napakalaki ng elementong di-berbal sa pakikipag-usap sa mga taong napapaloob sa sariling kultura. Sa katunayan, tinatayang 70 porsiyento ng isang karaniwang kumbersasyon ang binubuo ng di-berbal na element (Maggay 2002).
- Uri ng di-berbal
  - Kinesika (kinesiks)
    - Tumutukoy sa kilos o galaw ng katawan
  - Proksemika (proxemics)
    - Tumutukoy sa oras at distansiya sa pakikipag-usap. Ang oras ay maaaring pormal gaya ng isinasaad ng relom o impormal na karaniwang nakadiukit sa kultura gaya ng mga terminong "ngayon na", "sa lalong madaling panahon", at "mamaya na". Ang distansiya naman ay nagbabago rin depende sa natamong ugnayan sa kausap.
  - Pandama o paghawak (haptics)
    - Itinuturing na isa sa mga pinakaunang anyo ng komunikasyon. Kadalasang nagsasaad ito ng positibong emosyon o pakikiramay sa mga hindi magandang karanasan. Halimbawa: pagtapik sa balikat o pagyakap sa kausap.
  - Paralanguage
    - Tumutukoy sa tono ng tinig at kalidad at bilis ng pagsasalita.
  - Katahimikan o kawalang kibo

- Lubhang makahulugan na karaniwang ginagawa upang mag-isip at paghandaan ang sasabihin, o di kaya ay magparating ng tampo o sama ng loob
- Kapaligiran
  - Tumutukoy sa pinagdarausahan ng pakikipag-usap at ng kaayusan nito.

### *Mga kagawiang pangkomunikasyon ng mga Pilipino*

- Mga salitang di tuwirang pagtukoy o pahilis na pagpapatama o pagpupuntiryा
  - A: Pahaging - isang mensaheng sinadyang magmintis at ipinaalingawngaw lamang sa paligid
  - B: Padapis - isang mensaheng sadyang lihis sa layuning matamaan nang bahaga ang kinauukulan nito
- Mga salitang ang pinatatamaan ng mensahe ay hindi ang kausap kundi ang mga taong nasa paligid at nakarinig ng usapan
  - A: Parinig - malawakang ginagamit upang maiparating ang naisasaloob, hindi sa kaharap na kausap kundi sa sinomang nakikinig sa paligid
  - B: Pasaring - mga berbal at di berbal na nagpaparating ng puna, paratang, at iba pang mensaheng nakasasakit sa mga nakarinig na kunwari ay labas sa usapan.
- Mga salitang kumukuga ng atensyion sa pamamagitan ng pandama
  - A: Paramdam - isang mensaheng ipinapaabpot ng tao, o maging ng espiritu. Sa pamamgitan ng mga ekspresyon nararamdaman gaya ng pagdadabog, pagbagsak ng kasangkapan, maklakas na pagsara ng pinto, kaluskos, at iba pa.
  - B: Papansin - isang mensaheng may latyuing humingi ng atensyon na kadalasang naipapahayag sa pamamaghitan ng pagtatampo, pagkabalidosa sa pananamit at pagkilos, sobra-sobra pangungulit, at iba pang kalabisang kumukuha ng atensyon
- Mga salitang nagtagay ng kahuluhgna na ang dating sa nakririnig ay napatatamaan sya
  - A: Sagasaan - pahayag na lumalagpas sa hangganan sa pakikipag-usap na tinututulan ng nakikinig bilang isang paalala na maaaring may masakatna "Dahan dahan at baka makasagasa siya"
  - B: Paandaran - mekanismo ng pahiwatig na kadallasang nakapokus at umiikot sa isang paksa na hindi tuwirang maipahayag subalit paulit-uluit na binabanggit tuwing may

## **M. Kakayahang Diskorsal**

### Diskurso

- Nangangahulugang "pag-uusap at palitan ng kuro" - UP Diksyunaryong Filipino 2010

### Kakayahang Diskorsal

- Kakayahang umunawa at makapaghahayag sa isang tiyak na wika

### *Dalawang karaniwang uri ng kakayahang diskorsal*

#### 1. Kakayahang tekstuwal

- Kahusayan ng isang indibidwal sa pagbasa at pag-unawa ng iba't ibang teksto gaya ng mga akdang pampanitikan, gabay instruksyunal, transkripsyon, at iba pang pasulat na komunikasyon.

## 2. Kakayahang retorikal

- Tumutukoy naman sa kahusayan ng isang indibidwal na makibahagi sa kumbersyon.
- Kakayahang unawain ang iba't ibang tagapagsalita at makapagbigay ng mga pananaw o opinyon.

### *Dalawang panuntunan sa pakikipagtalastasan*

#### 1. Pagkilala sa pagpapalitan ng pahayag

#### 2. Pakikiisa

### *Panuntunan sa kumbersasyon (Grice 1957, 1975)*

#### 1. Kantidad

- Gawing imosrmatibo ang ibibigay na imosrmasyon ayon sa hinihingi ng pag-uusap - hindi lubhang kaunti o lubhang damdaming impormasyon.

#### 2. Kalidad

- Sikaping maging tapat sa mga pahayag; iwasang magsabi ng kasinungalingan o ng anumang walang sapata na batayan

#### 3. Relasyon

- Tiyaking angkop at mahalaga ang sasabihin

#### 4. Paraan

- Tiyaking maayos, malinaw, at hindi lubhang mahaba ang sasabihin

### *Pagpapahaba ng pangungusap*

#### 1. Pagpapahaba sa pamamagitan ng kataga

- Napahahaba ang pangungusap sa pamamagitan ng mga katagang gaya ng pa, ba, naman, nga, pala, at iba pa.
- Hal: May ulam. / May ulam ba? / May ulam pa. / May ulam pa ba?

#### 2. Pagpapahaba sa pamamagitan ng panuring

- Napahahaba ang pangungusap sa pamamagitan ng mga panuring na na at ng.
- Hal: Siya ay anak. Siya ay anak na babae. Siya ay anak na bundon babae.

#### 3. Pagpapahaba sa pamamagitan ng pagtatambal

- Napagtatambal ang dalawang payak na pangungusap sa pamamagitan ng mga pangatnig na at ngunit, datapwat, subalit, saka, at iba pa.
- Ang mabubuong pangungusap ay tinatawag na tambalang pangungusap.

- Hal: Nagtatrabaho sa pabrika ang kaniyang tatay at nagtitinda sa palengke ang kaniyang nanay. Matagal siyang mag-aryl ng aralin subalit tikay namang matataas ang kanyang marka sa mga pagsusulit.

#### 4. Pagpapahaba sa pamamagitan ng komplemento

- Komplemento; bahagi ng panaguri na nagbibigay ng kahulugan sa pandiwa.

##### *Uri ng komplemento ng pandiwa*

###### a. Komplementong tagaganap

- Isinasaad ang gumagawa ng kilos.
- Pinangungunahan ng panandang ng, ni, at panghalip.
- Hal: Ibinalot ni Jay ang mga tirang pagkain. Ibinalot niya ang mga tirang pagkain. Ibinalot ng kaniyang kaibigan ang mga tirang pagkain.

###### b. Komplementong tagatanggap

- Isinasaad kung sino ang nakiikinabang sa kilos; pang-ukol na para sa, para kay, at para kina.
- Hal: Naghanda ng regalo si Thea para sa kaniyang kapatid. Bumili ng laruan si Bryan para kay Jave.

###### c. Komplementong sanhi

- Isinasaad ang gumagawa o ng kilos - dahil sa o kay at mga panghalili nito.
- Hal: Nabaon sa utang si Delia dahil sa pagkakalulong sa sugal. Dahil kay Alvin, naparusahan si Michelle.

###### d. Komplementong layon

- Isinasaad ang bagay na ipinahahayag ng pandiwa; ng
- Hal: Regular na umiiom ng gamot ang aking lola. Naglalako ng turong si Aling Pising tuwing hapon.

###### e. Komplementong kagamitan

- Isinasaad ang instrumentong ginamit upang maisakatuparan ang kilos; sa pamamagitan ng mga panghalili nito.
- Hal: Sa pamamagitan ng internet, napapabilis ang pagkuha ng impormasyon. Magkakasundo lamang sila sa pamamagitan ng paguuusap.

## Oral Communication

### A. The Communication Process

What is communication?

"Communication is **the transmission and reception of information** between a human source (encoder) and receiver (decoder) using a signaling system" - Perry Blackburn in his book, *The Code Model of Communication*

"Communication refers to the transmission of information (a 'message') between a source and receiver using a signaling system." - David Crystal in his book, *A Dictionary of Linguistics and Phonetics*

In Linguistic contexts, source and receiver are interpreted in human terms, the system involved is a LANGUAGE, and the notion of response to the message becomes of crucial importance. In theory, communication is said to have taken place if the information received is the same as that sent.

## B. Elements of communication

1. Sender - conveys messages by converting their thoughts into symbols or observable signals such as words. He/she is the **source or the originator** of the communication message.
2. Messages - are **ideas or thoughts** that are transmitted from the sender to the receiver.
3. Channels - refers to the **medium** through which the message is sent.
4. Receiver - **hears the signals** and converts the symbols into their thoughts.
5. Feedback - refers to the message transmitted by the receiver in **response** to the message of the speaker.

## C. Nature of Oral Communication Process

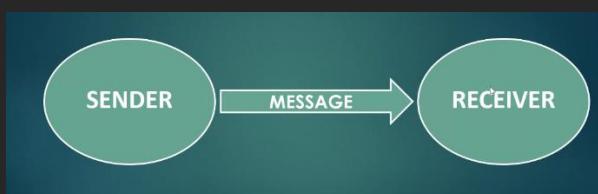
1. The sender **converts** his or her signals such as words.
2. The sender **sends** the signals such as words.
3. As the signals are sent through the channel, there is some **noise**.
4. The receiver **hears** the signals using the ears.
5. The receiver **converts** the signals into thoughts.
6. The receiver **sends feedback** by becoming the sender.

## D. Models of Communication

Models show a pattern or flow of communication as well as the elements involved in that particular kind of communication.

### 1. Linear Model

- Communication have evolved through the years and experts have made the process more detailed and updated. The linear model was the **first model of communication**.
  - a. It is a **unidirectional model**. The process is moving in one direction only, which means the speaker is sending a message to the receiver with or without effect.
  - b. It presents a simple communication act. The linear model does not look like a process. Instead, it is **transmission only of a cause and effect**, or also known as one-way causality.
  - c. It **involves persuasion, not mutual understanding**. The linear model promotes influence or advice rather than cultivates a mutual understanding among communicators.
  - d. It **values psychological effects over social effects**. The linear model concentrates on the psychological effects (such as the individual understanding of the message) of the communicators rather than the social effects (like relationships among communicators).



### 2. Interactive model

- An improved process. It still begins with a sender, in which a speaker encodes a message using different channels.
- The distinction of this model is its **internal and external interference that disturb the understanding of the messages**. The feedback makes the cycle interactive or collaborative. The elements in the communication cycle are not stable especially when interference is around.

#### Internal interference

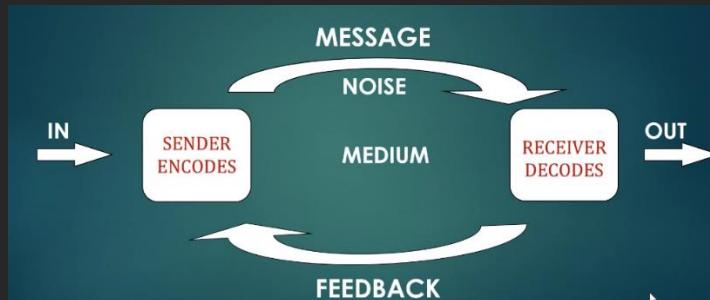
- A form of distraction that begins in the **thought of either participant of the process**
- This could be in a form of **anticipation of possible events**.
- This mood and personal prejudices may interfere with the communication.
- It includes the amount of attention we pay to others that influences the way we interpret messages.

Ex.

- A student is inattentive to the lecture of the teacher because she is thinking about the long quiz in her next subject. Internal interference prevents the accurate decoding of a message.

#### External interference

- Form of destruction that **arises in the environment where the communication is happening**.
- **Any stimuli in the environment may distract one's communication**. It could be a bad odor, room temperature, or a very attractive passerby.
- In a verbal communication, **speech impediment can be an external interference while physical incapability may limit the understanding of nonverbal communication**.



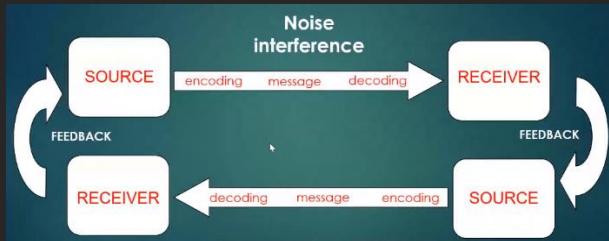
#### 3. Transactional Model

- The transactional model of communication is more detailed **and involves more elements of communication**.
- It considers the situation of the communication where there is a **simultaneous exchange of messages between the sender and the receiver**.
- The face to face communication includes **psychological communications**, which involves impressions being formed in the thoughts of both parties.

Three principles involved in transactional model of communication:

- a. **Participation is continuous and simultaneous**. People engaged in the communication transfer spontaneous and immediate messages. As one listens, he/she gives feedback verbally and nonverbally.

- b. All communications have a past, present, and future. People present in the communication react to the situation based on their own past experiences, current status, and anticipated future. All these factors definitely influence one's shared message.
- c. All communicators play roles. One's role in a relationship, like the role of parents or children in the family, controls his or her words and actions. These roles whether established by the society (like professions) or by the family, may be understood differently by the different people we meet. Their diverse perceptions affect our response to the different forms of communication.



## E. Communication Strategies

- Communication strategies are attempts by participants in a communication activity, but mainly by the speaker to express his or her ideas in a way that minimizes a breakdown in communication.
- These strategies, which can be collectively described as topic management, are very important in ensuring smooth interaction between speakers and listeners.

### 1. Nomination

- It allows the listeners or audience to tune in into the topic, recall background information they have about it, and prepare them to listen to what is to be said about the topic.
- Several forms or expressions that can be used for topic nomination:

Let's talk about...

I would like to talk about...

Today, I am going to discuss/talk about...

### 2. Restriction

- It is determined and limited by the amount of time given to a speaker.
- Since the time is limited, the speaker must make it clear to the audience where he or she restricts the discussion.
- A topic must be restricted so that it can be properly discussed fully, resulting in better communication.
- Example: A broad topic may require an hour to discuss, but a topic that is properly restricted would have enough time for discussion and even questions. Give such time, enough details can be given to support the speaker's assertion.

### 3. Turn-taking

- A discussion involves changing from one speaker to another in a way that doesn't disrupt the communication process.
- In a proper turn-taking, speakers must know when to take their turn or allow the other to speak. This means, one speaker should not take too much time in speaking.

### 4. Topic control

- Means the speaker should focus on the topic without straying into other discussions. The speaker must not allow any incidental mention of other topics from talking attention away from what he or she is talking about.

#### 5. Topic-shifting

- As a shift in communicative strategy may affect the message. Some listeners who are not ready for a shift in topic may develop different reactions such as a feeling that the speaker has not fully discussed the topic.
- Forms used when shifting topic include the following:

Let us now turn to the issue/topic of...

I will now talk about...

In addition to (current topic), there is also the (next topic)

#### 6. Repair

- Sometimes a speaker is misunderstood by the audience. In this case, the speaker must clarify what he or she is saying.

- Particular attention must be given to the piece of utterances that produced misunderstanding. The speaker must repair the miscommunication by rephrasing or using other words that express the meaning better to his or her audience.

- Several forms can be conveniently used to signal repair. They include:

I mean...

What I mean is...

Let me rephrase that...

In other words, ...

#### 7. Termination

- Any speech or discussion must be terminated properly. Without doing so, the listeners or participants would be left wondering what happened to the discussion and will not understand whether the topic was fully discussed.

- One way to terminate a speech or a discussion is to restate the main idea of the speech in a way that is memorable to the listeners.

- Another is to give the summary of the discussion. Sometimes, the speaker uses familiar forms that signals termination of a speech or discussion.

- Forms used to terminate discussion, or a speech include the following:

Let me end by saying...

In conclusion...

In summary...

We were able to discuss...

## **F. Functions of Oral Communication**

### 1. Regulation/Control

- It occurs when an individual is quite uncertain towards another expected behavior that may be unusual from the usual friendly initial encounters.

- Most initial encounters are expected to be polite, friendly interactions. In order to create a more pleasant environment, people may increase the frequency and duration of various nonverbal immediacy behaviors hoping the other person will reciprocate the increased level of involvement and thereby create a more pleasant interaction context.

Example: In order for the speaker to receive a pleasant and kind response to his/her audience, he/she may smile, laugh, or show a friendly facial expression.

## 2. Social interaction and emotional expression

- Emotions coordinate social interaction.

- A person's emotional expression serves as a social expression which suggest prepared responses in others.

Example of social interactions:

Anger elicits fear-related responses.

Distress which elicits sympathy from observers.

## 3. Communication and motivation

- Every communication starts with a motivation. The key to communicative competence of a person in finding motivation to communicate better than he/she currently does.

- Examples of communications used as motivation include expressing one's ambitions, talking about preferences, ordering in a fast food restaurant, asking for milk

## 4. Communication and information

- Communication can be used for giving and getting information. Giving information usually comes in the form of statements of facts (grammatically known as declaratives), and sometimes in terms of rhetorical questions. Getting information can come in the form of questions intended for getting information (grammatically known as interrogatives), commands (grammatically known as imperatives), and even through statements.

Giving information...

Using statements (PNU was established in 1901)

Using rhetorical questions (Did you know earphones can be used as microphones?)

Getting information...

Using questions (Where is Mt. Halcon?)

Using imperatives (Show me how to tie a knot.)

Using declaratives (I need to understand how my bill was computed.)

## **G. Speech Context**

What is context in speech?

- Situation that brings people to a conversation or a speaking event

- It involves the particular time and place of the communication

- It also includes their shared understanding of the communicators on the topic of communication.

Types of speech context

### 1. Intrapersonal

- Humans constantly involved in thinking, dreaming imagining, and worrying about different happenings in their surroundings.

- The communication is intrapersonal **when the person communicates with himself/herself**. Experts believe that effective communication with others must start with effective communication with oneself.

*Dimensions of "self" (Steinberg, 2007)*

- a. **The Physical self is the material body** with its internal functions and outward appearance.
- b. **The Emotional self is the affective side** of the people.
- c. **The Intellectual self is the cognitive part** of human being.
- d. **The Moral self is the ethical beliefs and values** being observed by people

### 2. Interpersonal

- Humans are naturally social beings; they are made to interact with others at any given chance. According to a number of tourists, Filipinos are hospitable and friendly perhaps because they are good in interpersonal communication

- This speech context is examined between two people or more, especially among strangers, who are developing and maintaining a communication report.

Effects of interpersonal communication

- a. **Learning.** It allows people to gather information about themselves, other people, past, present, and predicted events; beliefs and attitude
- b. **Helping.** It provides people advice, emotional support, or assistance that can help them personally or others with a problem.
- c. **Influencing.** It allows people to persuade another person to provide help, share an activity, change an attitude, counsel a relationship, give permission or fulfill an obligation.
- d. **Relating.** It allows people to experience closeness or distance, agreement or disagreement, equality or inequality with others.
- e. **Playing.** It allows people to experience humor, camaraderie, celebration or pass time or coordinate fun activities.

Dynamics of interpersonal communication

1. A dyad consists of two persons who are formally or informally interacting with each other verbally or nonverbally

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>- More intimate</li> <li>- Noticeable nonverbal cues</li> <li>- Direct and vocal</li> <li>- Necessary to give immediate response</li> </ul>	<ul style="list-style-type: none"> <li>- Prone to subjectivity</li> <li>- Unable to end a conversation immediately</li> <li>- Unorganized thoughts</li> </ul>

2. A small group consists of three to fifteen people exchanging views on a common topic or aiming at a common goal face to face.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>- More sources of ideas and suggestions</li> <li>- Good for doing tasks</li> <li>- Easy to arrive at a consensus</li> </ul>	<ul style="list-style-type: none"> <li>- Domination</li> <li>- Unreconciled individual differences</li> <li>- Vested interest</li> </ul>

## H. Types of Speeches

- The principle purpose of speech will generally fall into four basic types

### 1. Informative

- You explain something to people
- Help people to understand something
- Show them how to do something
- John Locke: Tabula Rasa (blank sheet)
- To not experience mental blocks, think of the audience as blank sheets, it will boost the confidence, think of the listeners as those that do not know the topic yet.

Points to remember

- You have to remember that the whole purpose of your speech is to teach the audience something that they don't already know.
- The audience need time to take in what you've said.
- If you speak too quickly your audience will be trying to understand one sentence while you're speaking the next sentence!

Examples

- The speech given by the head of an organization
- A computer programmer speaking about new software
- A travelogue about the tour
- The teacher telling students about something

### 2. Persuasive

- To sell an audience on an idea
- To promote a specific product
- To convince someone to take action
- You want them to think, act and believe in what you want them to.

Points to remember

- Make use of graphs and supporting documentation
- Present some facts and figures but make sure that they're accurate and that they support your point of view
- If there have been similar problems you can tell your audience how they are solved.
- Try to make it personal to your listeners, if it's going to affect their family, home or job, they will start to take notice.

### Examples

- Improve your health through better eating
- Television violence is negatively influencing our children
- Become a volunteer and change the world

### 3. Entertaining

- Usually short
- Giving the audience an enjoyable experience
- Leave the audience with a favorable impression not only of himself or herself, but also of the organization
- To amuse through humors, stories, or illustrations

### Purpose

- Crowd pleaser
- Get promotion
- Hold attention

### Points to remember

- The speech still must make a valid point or argument, but it can be done using humor
- A speech to entertain may be either informative or persuasive in nature, but the supporting materials are selected primarily based on their entertainment

### Examples

- After dinner speech
- Comic monologues

### 4. Technical

- Visuals and printed handouts
- Even videotape
- This is informative

### Points to remember

- This is informative but goes beyond simple information
- It may be a presentation to peers at a professional meeting
- May be an official presentation to a group such as regulatory body

## **I. Speech Styles**

- Refers to the distinctive way of communicating. It consists of particular pattern of linguistic, vocal and nonverbal behaviors.
- Refer primarily to the manner one communicates than the meaning of the communication.

### 1. Assertive style

- Is born of high self-esteem. It is the healthiest and most effective style of communication because it is the sweet spot between too aggressive and too passive speakers.
- When one is assertive, he/she has the confidence in communicating without resorting to verbal manipulation. People with assertive style of speaking are well-respected by others because of their strong personality.

#### Characteristics

- Goal achiever without hurting others
- Protective of own rights and respectful to others'
- Social and emotionally expressive
- Responsible in his/her choice
- Open for suggestions and anticipates possibility of rejection
- Grateful to compliments

#### 2. Dominant style

- Speaker takes charge of the communication. People with dominant speech style are always the limelight of the speech context.
- They are the center of the communication more than the message and the occasion. They usually leave an impact to the other members of the speaking community because of their humor and rich criticism about any topic.

#### Characteristics

- Speaker with loud voice and aggressive attitude
- Humorous and entertaining
- Attention seeker
- Vocal and open
- Intimidating actuations

#### 3. Submissive style

- About pleasing others to avoid conflict. It puts importance on other people's needs and rights
- Displays martyr-like attitude and a refusal to try out initiatives to improve oneself. In the communication process, some people take advantage of persons with submissive speech style because they are quite weak to defend themselves.
- People with submissive speech style recognize others positively as good listeners.

#### Characteristics

- Apologetic during conversations and avoiding any confrontation
- Attentive and friendly
- Relaxed (low-tension level)
- Inexpressive of his/her real feelings

#### 4. Persuasive style

- Is tricky, calculating and perceptive speech.

- These communicators are skilled at influencing and controlling others perception of their own advantage.
- They use stories, metaphor with exaggerated movements to further convince others.
- Usually goes with a flattering high speech.

### Characteristics

- Influential, argumentative and convincing
- Making others feel obliged or sorry for them
- Asking others indirectly for needs to be met

## J. Speech Act

### Definition

- Is concerned with the ways in which language can be used.
- Originated with Austin 1962 and developed by Searle 1969.
- They both believed that language is not only used to describe things, but also to do things.
- In other words, actions are performed via utterances which are generally called speech acts.

### Levels of Speech acts

#### a. Locutionary act

- Performance of an utterance; phonology, syntax and semantics.

Example:

“It’s hot in here.”

- You just want to say something that is based on what you feel and what you believe.

#### b. Illocutionary act

- Intended action of the utterance; pragmatic.

Example:

“It’s hot in here.”

- It means either, someone should close the window (when in direct sunlight) or someone should leave the window open all day so the air would go inside.

#### c. Perlocutionary act

- Actual effect; persuading, inspiring, asking and so on.

Example:

“It’s hot in here.”

- Someone would open and close the windows when it’s hot.

### Types of speech acts

#### a. Assertives

- Utterances that tell how things are in the world. They are representations of reality.
- A speech act that commits the speaker to the truth of a proposition; a true or false.
- These are in the form of statements, descriptions, classification, explanations, and clarifications.

**b. Directives**

- Attempts by the speaker to get the listener to do something.
- Correct uses of directives must always refer to the future voluntary acts and not impossible to do. They are said to obey or disobey.
- These are in the form of orders, commands, requests, and reference to pleading, begging, praying, insisting, and suggesting.

**c. Commissives**

- Utterances that commit a speaker to some voluntary action.
- They reveal the intention of the speaker.
- Commissives are in the form of vows, threats, pledges, guarantees, contracts, promises, covenants, and oaths.

**d. Expressives**

- Utterances representing psychological attitudes. It reveals the speaker's emotions towards a particular proposition.
- Expressive includes thanking, apologizing, congratulating, and welcoming.

**e. Declarations**

- Foundations of the human civilization. These are utterances that change the world in the form of social and political transformation.
- The proposal is brought into existence by means of declarations.
- These include marriages.

**Direct and indirect speech act**

- Speaking any language is similar to performing a speech act.
- Utterances are not only set of phrases but also a kind of intentional action.
- What one intends to contribute to what one is doing.

**a. Direct speech act**

- Explained with the grammatical structure (performative verb) it most naturally takes. It requires a good motif for the situation.
- However, being too direct when stating one's opinion might sound insulting especially to listeners who are particular to social status.
- Direct command may sound very authoritative to some. Likewise, asking direct questions to an acquaintance or a stranger may seem intrusive or nosy. Thus, direct speech act must be accordingly observed.
- There is a direct relationship between the structure/form and the communicative function of the utterance.

Structural form	Communicative form
1. It is cold today.	Direct declaration
2. I order you to leave the office.	Direct order
3. I warn you not to play with the knives.	Direct warning

**b. Indirect speech act**

- Defined with interrogative structure (question form). It explains the relationship between the actual words spoken and the speaker's intention.
- Indirect speech act is very useful in socially distant situations. People have varied levels of directness tolerance, so it is safer to say it politely.

Structural form ≠ Communicative form

Can you open the door?

Question Request

- The speaker communicates to the receiver more than he actually says.

## K. Principles of Effective Speech Writing

### 1. Audience analysis/audience profile

- Involves identifying the audience and adapting a speech to their interests, level of understanding, attitudes, and beliefs.
- Taking an audience-centered approach is important because a speaker's effectiveness will be improved if the presentation is created and delivered in an appropriate manner.

### 2. Logical or topical pattern/logical organization

- If you are giving a speech or presentation that contains several ideas that are interrelated in such a way that one flows naturally to the next, the logical pattern of organization can be used.
- As the name implies, you'll be organizing the information in a logical manner according to topic.

### 3. Duration

- The average person speaks somewhere between 125 and 150 words per minute.
- It's almost always better to speak more slowly than too quickly. Thus, if you're speaking for 20 minutes, you want a total word count of somewhere between 2,500 and 3,000 words. Be careful!

### 4. Word choice

- Use of rich, colorful, and precise language that communicates not just in a functional way, but in a way that moves and enlightens the reader. In good descriptive writing, strong word choice paints pictures in the readers' mind.

### 5. Grammatical correctness

- In prescriptive grammar, correctness is the notion that certain words, word forms, and syntactic structures meet the standards and conventions (that is, the "rules") prescribed by traditional grammarians.

### 6. Articulation

- Articulation (pronunciation and talking) is the ability to physically move the tongue, lips, teeth and jaw to produce sequences of speech sounds, which make up words and sentences.

#### 7. Modulation

- Modulation is when you control or adjust something, like when you lower your voice to a loud whisper in order to make what you're saying more dramatic and mysterious.
- The noun modulation has several meanings, including a change of key in music or of the sound of a person's voice.

#### 8. Stage presence

- The sum total of all the qualities that keep your audience engaged while you deliver a speech. Therefore it, without doubt, plays a vital role while delivering a speech. It is inclusive of everything from the body posture to the tone of your speech.

#### 9. Facial expressions, gestures and movements

- As you progress as a speaker from gestures and movement, you will need to turn your attention to facial gestures and expressions.

#### 10. Rapport with the audience

- "Building rapport" is the name given to the process of creating an understanding and harmonious bond between yourself and someone else.
- When rapport is present you feel at ease, happy and comfortable in the other person's company.

### L. Speech in Speech Context, Act, and Communicative Strategy

Shift in Speech context, act, and communicative strategy affects the following:

#### 1. Language forms

- Deals with the internal grammatical structure of words and phrases as well as the words themselves.
- When one compares boy and boys, for example, or man and men, he or she is considering the relationship between different language forms or structures.

#### 2. Duration of interaction

- The length of time that something lasts or continues
- The speaker should engage the audience by interacting with them instead of just speaking to them. Interaction is important in public speaking because it involves your audience being more directly with both you as speaker and your content.

#### 3. Relationship of speaker

- Connection of the speaker to the listeners or audience

## M. Roles and Responsibilities of the Speaker

### 1. Perform pre-speech research

- Successful public speakers complete in-depth research before making a presentation. They research their topic to make sure that they are well informed. Public speakers also learn about their audience in order to present in a personalized and relevant way. Their research helps them decide what to say and how to present in a valuable and practical way.

### 2. Write and outline speeches

- Public speakers spend their time creating a speech that educates and motivates a crowd. They make sure that all talking points are sharp and concise. The most successful public speakers outline speeches that are engaging, informative, and persuasive.

### 3. Rehearse speeches

- Practicing speeches prior to delivering them live is critical for public speakers. They prepare and rehearse to make their presentations more effective. Public speakers use rehearsals to simplify their message, and find new ways to engage their audience through stories, analogies, and other interplay activities. Their goal is to motivate their audience to act on the information they provide.

### 4. Give public presentations

- Public speakers are essentially hired to deliver live presentations and seminars. Their talks must hold audience attention and encourage participation to be successful. A public speaker may talk to small groups of 10 or large groups of 10,000. Some presentations have a training and development component while others are more inspirational.

### 5. Interacting with audience members

- Public speakers, especially those that work in a training capacity, are usually expected to interact with audience members after their speeches. Through these conversations, they gain speech feedback, which they incorporate into future presentations. They also answer individual questions from audience members. Some more well-known public speakers also provide autographed memorabilia and products after their speech.

## N. Principles of Effective Speech Writing

Public speakers should be able to communicate in friendly, poised, and persuasive way.

Employers typically look for candidates with at least six months of public speaking, entertainment, or teaching experience.

The following skills are essential for getting the job done:

### 1. Clear articulation

- Public speakers must be able to speak loudly, clearly, concisely without distracting verbal fillers and rambling sentences.

2. Good body language

- Great public speakers use vocal tone, facial expression, body language, and timing to communicate their points. Persuasive use of body language accents, words and transforms presentations from boring to interesting and engaging.

3. Sales skills

- Specific industries hire public speakers to generate sales and add allure and interest to products and services.

4. Teaching skills

- Some public speakers work as corporate trainers that use adult learning principles to create educational presentations that are easy to understand.

5. Memorization

- Many corporately sponsored public speakers are given specific information that they must memorize and integrate within their presentations.

6. Audience assessment skills

- Successful public speakers evaluate their audience regularly and adopt their presentation content to crowd receptiveness and characteristics.

7. Interpersonal skills

- Public speakers interact with people continually and need a positive demeanor and relationship skills to be effective at their job.

## PE & Health 1

### A. Aerobic Exercise

- Also called endurance activities, are physical activities in which people move their large muscles in a rhythmic manner for a sustained period.
- Aerobic activity makes a person's heart beat more rapidly to meet the demands of the body's movement.
- Over time, regular aerobic activity makes the heart and cardiovascular system stronger and fitter.

#### F.I.T.T. Principle

- Frequency: refers to the frequency of exercise or how often you exercise.
- Intensity: refers to the intensity of exercise undertaken or how hard you exercise.
- Time: refers to the time you spend exercising or how long you exercise for.
- Type: refers to the type of exercise undertaken or what kind of exercise you do.

### B. Health related fitness

#### What is fitness

- Defined as the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies.

### Components of health-related fitness

#### 1. Cardiovascular endurance

- Also known as cardiorespiratory endurance or aerobic fitness refers to your body's ability to efficiently and effectively intake oxygen and deliver it to your body's tissues by way of the heart, lungs, arteries, vessels, and veins.

#### 2. Muscular strength

- Refers to the amount of force a particular muscle group can produce in one, all-out effort. In strength training terms, it's your one-rep max.

#### 3. Muscular endurance

- Is one of the two factors that contribute to overall muscular health. Think of muscular endurance as a particular muscle group's ability to continuously contract against a given resistance.

#### 4. Flexibility

- The range of motion you have around a given joint. Like muscular strength and endurance, flexibility is joint-specific. For instance, you may have very flexible shoulders, but tight and inflexible hamstrings or hips.

#### 5. Body composition

- Body's ratio of fat mass to fat-free mass, is the final component of health-related fitness. Because high levels of fat mass are associated with negative health outcomes.

## C. Use and purpose of M.V.P.A.

### What is M.V.P.A.

#### Moderate and Vigorous Physical Activity

- A category of activity intensity that has been consistently shown to benefit and/or reduce the risk of many chronic disease states.

### What is M.E.T.

#### Metabolic Equivalents

- METs are used to estimate the energy expenditure for many common physical activities. One MET is an individual's resting metabolic rate (RMR) and is approximately 3.5 milliliters of oxygen consumed per kilogram bodyweight per minute (mL/kg/min) and represents the amount of oxygen used by the body while at rest.
- An activity that is 4 METs requires the body to use approximately four times as much oxygen than when at rest, which means it requires more energy and burns more calories.
- Examples of M.V.P.A. with M.E.T.

Light <3.0 M.E.T.'s	Moderate 3.0 – 6.0 M.E.T.'s	Vigorous >6.0 M.E.T.'s
Slow walking	Brisk walking	Hiking
Playing computer games	Badminton	Jogging
Standing light work	Table tennis (doubles)	Basketball

## D. Personal Safety Protocols

### Prevention of dehydration, overexertion, hypo- and hyperthermia

#### Dehydration

- Occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. If you don't replace lost fluids, you will get dehydrated.
- Signs and symptoms
  - Increased thirst
  - Light-headedness
  - Headache
  - Dry mouth and tongue
  - Lethargy/tiredness
  - Muscle cramps
  - Confusion
  - Dark colored, strong-smelling urine
- Causes
  - Diarrhea
  - Vomiting
  - Fever
  - Excessive sweating
  - Increased urination
- Prevention
  - Drink plenty of water, as directed by your doctor.
  - Eat foods with high amounts of water like fruits and vegetables.
  - Avoid or limit drinks with caffeine like coffee, teas, and soft drinks.
  - Avoid or limit drinks with alcohol

#### Overexertion

- The state of being physically and mentally pushed beyond one's limits. This relates to your physical capability, age, strength, and tolerance. As a non-impact injury of excessive physical effort, it is linked to pulling, pushing, lifting, carrying, turning, and throwing.
- Signs and symptoms
  - Difficulty speaking
  - Overuse injury
  - Pain
- Causes
  - Extreme physical labor at home
  - Sports

- Exercise
- Motion-control video games
- Woodworking hobby
- Handling heavy objects
- Prevention
  - Take frequent breaks when performing repetitive tasks.
  - Get proper rest and sleep every night.
  - Maintain a healthy diet.
  - Keep hydrated by drinking water throughout the day.
  - Maintain proper posture when walking, sitting, and standing.
  - Stretch before and after exercise workouts.
  - Exercise regularly, including strength training.
  - Use appropriate equipment or machinery for task.
  - Use ergonomic workstations.
  - Avoid working or exercising in extreme temperatures.
  - Follow proper procedure when working with machines and large objects.
  - Plan and understand the job or task before attempting it.
  - Limit the weight of any objects you are handling, especially when carrying or lifting.
  - Push instead of pulling when possible.

### Hypothermia

- Occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 37 degrees. Hypothermia occurs as your body temperature falls below 35 degrees.
- Sign and symptoms
  - Shivering
  - Slurred speech or mumbling
  - Slow, shallow breathing
  - Weak pulse
  - Clumsiness or lack of coordination
  - Drowsiness or very low energy.
- Causes
  - Wearing clothes that aren't warm enough for weather conditions.
  - Staying out in the cold for too long.
  - Being unable to get out of wet clothes or move to a warm, dry location.
  - Falling into the water, as in a boating accident.
  - Living in a house that's too cold, either from poor heating or too much air conditioning.
- Prevention
  - Always remember C.O.L.D.
    - **Cover.** Wear a hat or other protective covering to prevent body heat from escaping from your head, face and neck. Cover your hands with mittens instead of gloves.

- Overexertion. Avoid activities that would cause you to sweat a lot. The combination of wet clothing and cold weather can cause you to lose body heat more quickly.
- Layers. Wear loose fitting, layered, lightweight clothing. Outer clothing made of tightly woven, water repellent material is best for wind protection. Wool, silk or polypropylene inner layers hold body heat better than cotton does.
- Dry. Stay as dry as possible. Get out of wet clothing as soon as possible. Be especially careful to keep your hands and feet dry, as it's easy for snow to get into mittens and boots.

### Hyperthermia

- Occurs when the body's heat-regulation system becomes overwhelmed by outside factors, causing a person's internal temperature to rise.
- Signs and symptoms
  - Heat cramps
  - Heat exhaustion
  - Heat stroke
- Causes
  - Overexertion or extended periods of time spent in hot conditions. In rare cases, it may be caused by medication or a medical condition, but usually, the temperature is just too hot, and you're pushing yourself too hard.
- Prevention
  - Sipping cool water or an electrolyte drink
  - Loosening or removing excess clothing
  - Lying down and trying to relax
  - Taking a cool bath or shower
  - Placing a cool, wet cloth on the forehead
  - Running the wrists under cool water for 60 seconds
  - Not resuming activity until symptoms have gone away
  - Placing ice packs or compresses under the arms and groin
  - Using a fan to cool the skin

## E. Fitness event for a specific health concern

### Steps on creating a fitness event

#### 1. Identify your goal

- Before you start organizing the event, set your goals. The function can have more than one focal point, but you should have goals in mind that you want to achieve. This will help navigate the planning process.
- Goals should be realistic and attainable. It should also be based on your vision focusing on the end in mind.

#### 2. Choose your participants

- In choosing participants it should be based on their age, sex, and/or health status. Fitness events should focus on the specifics based on their participants.

### 3. Create a program

- Create an event program based on your goals and participants. Always see through the program from plan A to Z if necessary, to avoid delays by nature or man-made disasters.

### 4. Identify weaknesses

- Making a SWOT analysis for your event is a good way on looking for weaknesses on your event. Identifying weaknesses helps on improving your event specially making it more fun for your participants.

### 5. Execute the program

- On executing the program always put in mind the time and the person-in-charge for a better flow of your event. Always remember to enjoy and have fun on your event.

## F. Fitness event for a specific health concern

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## G. Managing stress through physical activities

### Different types of stress

#### 1. Acute stress

- It is the most common and frequent presentation. Acute stress is most often caused by reactive thinking. Negative thoughts predominate about situations or events that have recently occurred, or upcoming situations, events, or demands in the near future.

#### 2. Episodic acute stress

- When acute stress happens frequently, it's called episodic acute stress. People who always seem to be having a crisis tend to have episodic acute stress.
- They are often short-tempered, irritable, and anxious. People who are "worry warts" or pessimistic or who tend to see the negative side of everything also tend to have episodic acute stress.

#### 3. Chronic stress

- This is the grinding stress that wears people away day after day, year after year. Chronic stress destroys bodies, minds and lives. It wreaks havoc through long-term attrition. It's the stress of poverty, of dysfunctional families, of being trapped in an unhappy marriage or in a despised job or career.
- Chronic stress comes when a person never sees a way out of a miserable situation. It's the stress of unrelenting demands and pressures for seemingly interminable periods of time. With no hope, the individual gives up searching for solutions.

### Benefits of physical activities

#### 1. It pumps up your endorphins

- Physical activity helps bump up the production of your brain's feel-good neurotransmitters, called endorphins. Although this function is often referred to as a runner's high, a rousing game of tennis or a nature hike also can contribute to this same feeling.

#### 2. Medication in motion

- As you begin to regularly shed your daily tensions through movement and physical activity, you may find that this focus on a single task, and the resulting energy and optimism, can help you remain calm and clear in everything you do.

#### 3. Improves your mood

- Regular exercise can increase self-confidence, it can relax you, and it can lower the symptoms associated with mild depression and anxiety. Exercise can also improve your sleep, which is often disrupted by stress, depression and anxiety. All of these exercise benefits can ease your stress levels and give you a sense of command over your body and your life.

## Pagsulat sa Filipino sa Piling Larangan (Akademik)

### A. Introduksyon

- Ang pagsulat ay isang pangangailangan. Nagsusulat ang tao upang tugunan ang mga personal na pangangailangan. Nagsusulat ang tao hindi lamang upang magpahayag ng saloobin at bumuo at magpatatag ng mga ugnayan, bagkus ay upang mapabuti ang

sarili. Nagsusulat din ang tao upang tugunan ang mga akademiko at propesyal na pangangailangan.

#### B. Ang Akademikong Pagsulat

- Intelektuwal na pagsulat na nag-aangat sa antas ng kaalaman ng mga mambabasa. Hindi ito opsyon para sa mga akademiko at propesional. Ito ay isang pangangailangan.
- Sa isang globalisadong mundo, nakaangat ang mga indibidwal na may kasanayan sa akademikong pagsulat o intelektuwal na pagsulat. Isa itong uri ng pagsulat na kailangan ang mataas na antas ng pag-iisip.
- Ang mahusay na manunulat ng akademikong teksto ay may mapanuring pag-iisip. May kakayahang mangalap ng datos o impormasyon, mag-organisa ng ideya, mag-isip nang lohikal, magpahalaga sa oriinalidad at inobasyon, at magsuri at gumawa ng sintesis.

#### C. Mga katangian ng Akademikong Pagsulat

- Magkaiba ang personal at akademikong pagsulat. Sa personal na pagsulat, maaaring impormal ang wika nito. Maaari ding magaan ang tono at kumbersasyonal ang wika. Madalas ay maligoy ang paglalahad ng personal na pagsulat na karaniwan ding nangangailangan ng hindi literal na pagbasa.
- Ngunit dahil ang pagsulat ay patuloy na nagbabago, may ilang manunulat na pinagsasanib ang mga kumbersasyonal sa akademikong pagsulat at malikhaing pagsulat sa pagbuo ng akademikong teksto.
- Walang isang paraan sa pagsusulat ng mahusay na akademikong teksto. Depende sa sitwasyon o kahinginan, nagbabago-bago ang mga pamantayan kung ano ang mahusay na estilo o nilalaman.
- Mahalagang malaman kung sino ang mambabasa o potensiyal na mambabasa ng isusulat na akademikong teksto.

#### D. Mga katangian ng Akademikong Sulatin

- Formal na tono
- Karaniwang sumusunod sa tradisyunal na kumbersyon sa pagbabantas, balarila, at baybay
- Organisado at lohikal ang pagkakasunod-sunod ng mga ideya
- Hindi maligoy ang paksa
- Pinahahalagahan ang kawastuhan ng mga impormasyon
- Karaniwang gumagamit ng mga simpleng salita upang maunawaan ng mga mambabasa
- Hitik sa impormasyon
- Bunga ng masinop na pananaliksik

#### E. Mga katangian ng Akademikong Sulatin

##### Kahalagahan ng pagbabasa

- Ang pagbasa ay mabisang paraan ng pagpapalawak ng kaisipan ng tao.
- Ito ay pinapangunahan ng pakikinig, pagsasalita, at pagsulat.
- Pagsasama-sama ng pang-unawa ng mga salita at diwa nito.
- Ang pagkatuto ay nakasalalay sa kakayaan sa pagbasa.
- Napapalawak at napapalim ang kaalaman ng tao sa mga konsepto, ideya, at impormasyon.
- Isang kakayanan ng tao na dapat paunlarin sa pamamagitan ng mapanuring pag-iisip.

- May mga pangyayaring ang pagbabasa ay batay sa kagustuhan ng tao kung ano ang kanyang nais malaman sa kanyang komunidad.
- Ang pagbasa ay ang pagkilala at pagkuha ng mga ideya at kaisipan sa mga sagisag na nakalimbag.

#### Mga hakbang sa pagbasa ayon kay William S. Gray (Ama ng pagbasa)

- Persepsyon** - Ito ay pagkilala sa mga nakalimbag na simbolo at kakayahang mabigkas ang salita bilang mga tunog.
- Pag-unawa** - Ito ang pagbibigay daan upang iproseso ang ideya at kaisipan ng mga simbolong nakalimbag.
- Reaksyon** - ang pagpapasya at paghahatol ukol sa tekstong binasa.
- Integrasyon** - ang pagsasama-sama ng mga nakaraang nabasa sa bagong karanasan.

#### Mga paraan sa pagbabasa

- Iskimming** - ang pagkuha ng impormasyon o ideya ay isinasagawa sa mabilisang pagbasa. Ginagamit ito sa pagkuha ng ideya, materyal o teksto. Ang ilang salita o bahagi ng materyal ay di gaanong binibigyang pansin. (**Mabilisang pagbasa**)
- Iskaning** - ang mahalagang mensahe ng akda ay binibigyan pansin sa ganitong paraan. Ang mga tiyak na impormasyon tulad ng pangalan ng tao, lugar, numero ng telepono, mga classified ads ay nalalaman ay tiyak na tinandaan. (**Mahalagang mensahe**)
- Pre-viewing** - sinusuri ang **pangkalahatang anyo ng akda** sa paraang ito.
- Pang-impormasyon** - isinasagawa ito para **makakuha ng kaalaman** sa iba't ibang larangan.
- Pagtatala** - ang pagtatakda ng mga **pangunahing kaisipan o datos** ay isinasama habang ginagawa ang pagbabasa. Maaaring gamitan ng marker ang mga mahahalagang bahagi ng binabasa.

#### Metakognitibong pagbasa

Ito ay kaugnay ng **transactional reader-response theory** na kung saan ang mambabasa ang lumilikha ng kahulugan sa teksto mula sa mga kaalaman at karanasan.

Sa teoryang ito ay nabubuo ang interaksyon sa pagitan ng teksto at mambabasa.

#### Deskripsyon ng paksa

Ang **pagkuha sa depinisyon**, paglilinaw at pagpapaliwanag na karaniwang makikita sa simula ng teksto.

Halimbawa: Tumutukoy ang salitang "shotah" sa isang taong lagi mong kasama sa iyong paglalakad na hindi mo naman basta kaibigan lamang pagkat madalas kayong magkasama sa lahat ng lakaran sa excursion, parties, aklatan at kung saan-saan pa. Ang shotah na maaari mong layasan, layuan o i-drop kapag nagsawa ka na o nakakita ng pamalit. – Rizalina Valencia

#### Problema at solusyon

Binibigyang pokus dito ang pagkuha sa paksang pangungusap upang alamin ang tema ng teksto, punto at layunin ng paksa. Nililinaw ang gustong patunayan, ilahad, isangguni at kung paano ito lubos na mauunawaan.

Halimbawa: May mga paraan upang mapakinabangan ang cellphone na kinagigiliwan ng mga mag-aaral at itinuturing ng mga guro na sagabal sa kanilang pag-aaral. – Jen Abunda

#### Sekwensyal ng mga ideya

Ang pagkakasunod-sunod sa mga pangyayaring nagaganap sa kabuuhan ng teksto at maari itong kronolohikal.

#### Sanhi at bunga

Madalas ito gamitin para pagbatayan ng ebidensya at katuwiran sa teksto.

#### Paghahambing

Binibigyan tuon dito ang pagkakapareho at pagkakaiba ng mga datos upang pagtibayin ang katuwiran.

#### Aplikasyon

Ang mga pangyayaring nagaganap sa buhay, paksa at ideya ay pinag-iisa.

#### F. Mga kailangan sa isang pagsusulat

##### Kaisahan

Dapat ang bawat pangungusap ay umiikot sa pangunahing paksa. May isang ideya na pinag-uusapan at may pagkakaugnay-ugnay.

##### Kalinawan

Ipinaliliwanag nang malinaw at maayos ang mga salitang ginagamit sa talataan. Tiyak ang ipinapahayag. Hindi nakalilito ang impormasyon at malinis na naiisa-isa ng mambabasa ang ipinahihiwatig.

##### Diin

Binibigyan ng pansin at pagpapahalaga ang tampok sa isinusulat.

##### Mga paraan sa pagsulat

- Paghahanda sa pagsulat
  1. Pagbuo
  2. Pangangalap ng impormasyon
  3. Pagpaplano ng lawak at sakop ng isusulat
    - Pagtuklas ng hilig at interes
    - Paglikha ng pamagat
    - Pagbuo ng pamagat
  4. Pagtuklas

- Aktwal na pagsulat
  - Pagsisimula ng istruktura (panimula, katawan, at konklusyon)
  - Isinusulat ang ideya at binubuo sa talata
  - Nag-eeksperimento sa pagbuo ng sulatin
  - Gumagamit ng estilo
  - Inaalam kung may kaisahan ang sulatin
- 1. Istilo
- 2. Detalye
- 3. Pag-unlad
- 4. Kaisahan
- 5. Ideya
- Pagrerebisa
  - Muling binabasa at binubuo ang mga kaisipan
  - Inaayos ang istruktura
  - Nagdadagdag ng mga detalye at muling isinasaayos ang buong sulatin
  - Maging obhektibo sa pagwawasto ng sariling sulatin
- 1. Paghinuha
- 2. Pagwawasto
- 3. Pag-uulit
- Editing
  - Maiwasto ang ispeling, bantas, at gramar
  - Magkaroon ng pokus sa kabuuan at kahulugan ng pangungusap
- 1. Ispeling/baybay
- 2. Bantas
- 3. Gramatika

#### Estruktura at proseso sa pagsulat

**Pinakatesis ng pag-aaral o paksa.** May gustong patunayan ang paksa at makakatulong kung sa bahaging ito nillinaw na ang nais patunayan sa pamamagitan ng paksang pangungusap. Dito napakikitid ang isang malawak na paksa.

- Pagpapatunay bilang tesis ng pag-aaral
  - Maaari itong patunayan batay sa sumusunod
    - a. Fact o opinion
    - b. Sanhi at bunga
    - c. Halaga
    - d. Solusyon at patakaran
- Paksang pangungusap
  - Ang pagkakaroon ng **malakas na paksang pangungusap** ang magpapalakas sa mga argumento at batayan.
- Atensyon sa simula

- Dito binibigyang tuon **ang pagkuha sa atensyon ng mambabasa** sa pamamagitan ng mga sumusunod
  - a. Tanong
  - b. Impormasyon, pigura
  - c. Depinisyon
  - d. Sipi
- Katawan
  - Ang pagpapaunlad ng mga talata ay nasa bahaging ito. Ang tuloy-tuloy, organisado, maayos at makinis na daloy ng ideya kung saan **ang unang pangungusap ng talata ay kaugnay ng unang talata**. Ang mga sumusuportang ideya ay magkakasama sa loob ng talata.
- Konklusyon
  - Ito ang huling bahagi ng teksto na isinasagawa sa pamamagitan ng **pagbubuo, pagrebyu ng mga talakay, paghahawig, paghamon, pagmungkahi o resolusyon**.

Ang introduksyon, katawan, at konklusyon ay dapat na magkakaugnay. Dapat tiyakin ng magsusulat ang kaisahan, kabuuan, at kaugnayan ng mga ideya. Ang pagkakaugnay ng mga pangungusap na binubuo ng mga angkop at wastong mga salita ay dapat na makompleto ang kahulugan sa loob ng talata.

#### G. Etika sa pagsulat sa akedemya

- Ang etika at pagpapahalaga ay dalawang bagay na dapat na katangian ng isang manunulat.
- Ang pagkilala sa mga katangiang ito ay dapat na mapalalim upang maging malinaw ang kanyang pagtahak sa mundo ng pagsulat.
- Ayon kay Chris Newton ([www.ehow.com](http://www.ehow.com))
  - Ang etika ay tumutugon sa ma halagang tanong ng moralidad, konsepto ng tama o mali, mabuti o masama, pagpapahalaga, pagtanggap o di-pagtanggap ng lipunan na siyang nagtatakda ng mga batayan sa mga ito
- Ang salitang etika ay galing sa salitang ethos na may kahulugang "karakter". Ang ethos ay mula sa salitang-ugat na ethicos na nangangahulugang moral.
- Ang pagpapahalaga (values) ay isang istandard o batayan ng mga ideyal, gawi, at institusyon na pinagbabatayan natin kung tama o mali ang ating mga desisyon.
- Isa itong paniniwala ng tao na sangkot ang damdamin at emosyon sa pagdedesisyong.
- Bawat sektor ng lipunan, sa trabaho, o anumang propesyon siya nbibilang laging kaakibat ang mga etika at pagpapahalaga na dapat bigyan ng pansi.

#### Copyright

- Ang Republic Act no. 8293 (Intellectual property code of the Philippines) ay naglilinaw ng Karapatan at obligasyon ng mga may-akda upang maiwasan ang di pagkakaunawaan para sa mga pagsipi at pagbubuo, lalo na sa mga layuning akademiko.

#### Plagiarismo

- Pangongopya ng datos, mga ideya, pangungusap, buod o balangkas ng isang akda, programa, himig at iba pa na hindi kinikilala ang pinagmulan. Maihahalintulad ito sa pagnanakaw. (Atienza, et al 1996)
- Ang paglabag ng plagarismo ay mauuri sa tatlo
  1. Ang hindi pagbanggit sa may-akda ng bahaging sinipi at kinuhanan ng ideya
  2. Hindi paglagay ng panipi sa hiniram na direktang salita
  3. Hindi ginamitan ng sariling pananalita ang mga akdang binuod at hinalaw

#### H. Pagbubuod

- Sa larangang akademya ang pagbasa at pagsulat ang higit na gamitin.
- Ang pagbasa ang nagiging daan upang ang tao ay magsulat sa tulong nito ang mga bagay na ating natutuhan mula sa pagbasa ay maingat natin itong isinusulat upang balikan sa oras na ito ay kailangan.
- Ang pagsulat ay walang katapanan, paulit-ulit na proseso sa layuning makalikha at makagawa ng maayos na sulatin, maituturing itong napakahalagang salik ng pagkakatuto ng gawaing pagsulat na siyang magpapatunay na naisagawa ng tao sa lipunan na kaniyang kinabibilangan.

#### Pagbubuod o sintesis

- Paraan ng pag-uugnay-ugnay ng mga impormasyong nakuha mula sa pagbabasa.
- Mahahabang tala na nalikom ay maaaring ibuod.
- Siksik sa impormasyon at pinaiksing bersyon ng teksto.
- Ang teksto ay maaaring nakasulat, nakapanood o napakinggan. Pinipili rito ang mga pinakamahalagang ideya at sumusuportang ideya. Napakahalaga ang pagtutok sa lohikal at kronolohikal na daloy ng mga ideya ng binuod na teksto.

#### Mga hakbang sa pagbubuod

1. Basahin, panoorin, o pakigangan muna ng pahapyaw ang teksto.
2. Sa mga nakasulat o pinanoodm tukuyin ang paksang pangungusap o pinakatema higit sa lahat ang pagtukoy sa mga susing salita.
3. Pag-ugnay-ugnayin ang mga ideyang ito upang makabuo ng tesis.
4. Tiyakin ang organisasyon ng teksto at isulat ang buod at siguraduhing huwag kumuha ng mga pangungusap mula sa teksto.
5. Iwasan ang paglalagay ng mga detalye, ebidensiya at halimbawa.
6. Ang paggamit ng mga salitang nagbibigay transisyon ay mainam tulad ng kung gayun, samakatuwid, sa kabilang dako at iba pa.
7. Iwasan ang pagsingit ng opinyon.

#### Sintesis

- Sa larangang pagsulat, ito ay anyo ng pag-ulat ng mga impormasyon sa maikling paraan upang ang sari-saring ideya o datos mula sa iba't ibang tao, libro, pananaliksik, at iba pa ay mapagsama-sama at mapag-isa tungo sa malinaw na kabuuhan.

- Isinasagawa ang sintesis para sa introduksyon ng mga artikulo sa libro o journal, report sa komperensya, pulong, rebyu ng mga literaturang pinagkunang tesis at disertasyon at dokumentaryo.

- Tatlong hakbang upoang maging organisado ang paggawa ng sintesis

1. Introduksyon - Simulan sa isang paksang pangngusap na magbubuo sa pinakapaksa ng teksto, banggitin ang pangalan ng may-akda, pamagat at impormasyon tungkol sa may-akda, teksto, at paksa.
2. Katawan - Surrin ang mga ideya kung may pagkakapare-parehom suriin ang koneksyon ng bawat isa. Ibigay ang mga impormasyon muila sa iba't ibang hanguan, ipakita ang pagkakapare-pareho at pagkakaiba-iba ng mga ideya, opinyon, at paniniwala.
3. Konklusyon - Ibuod ang nikitang impormasyon at pangkalahatang koneksyon ng iba't ibang pinagsamang ideya.



## I. Mga Uri ng Pagsulat

Ang pagsulat ay isang sining na malinaw na nagtatala ng mga simbolo upang makabuo ng mga salita at maibigay ang mga impormasyon, ideya, o kaisipan sa mambabasa. Ito ay isang paraan ng pagtatala ng ideya sa araw-araw na pangyayari, bunga nito ay naging pangangailangan ng sibilisadong lipunan. Ang pagsulat ay isang pisikal at mental na gawain dahil isinasatitik ang mga impormasyon ayon sa wastong paraan, maayos na mga pangungusap at sumusunod sa mga tuntunin ng gamatika ng wikang ginagamit.

Maraming uri ng pagsulat, ito ay dumedepende sa pangangailangan ng mga tao sa lipunan. Bilang isang pangangailangan saan man dumako ang isang tao kaakibat lagi ang pagsusulat. Ang mga uri ng pagsulat ay ang mga sumusunod:

### 1. Akademikong Pagsulat

- Ito ay isang intelektwal na pagsulat dahil layunin nitong pataasin ang antas at kalidad ng kaalaman ng mga mag-aaral sa paaralan. Formal ang istruktura ng

sulating ito, maayos na inihahanay ang mga pangungusap upang malinaw ang takbo ng pagkakabuo ng mga ideya. Ang pamanahong papel, tesis, disertasyon, suring basa, panunuring pampanitikan, malikhaing pagsulat o anumang sulating may paksang pang-akademya ay nabibilang sa uring ito.

2. Teknikal

- Ang espesyalisadong uri ng pagsulat na tumutugon sa mga kognitib at sikolohikal na pangangailangan ng mga mambabasa. Nagsasaad ito ng mga impormasyong maaaring makatulong sa pagbibigay solusyon sa isang komplikadong suliranin. Maraming tao sa iba't ibang larangan ang bumabasa ng mga kanilang report. Manedyer, teknisyen, doktor, analist, at iba pa. Ang teknikal na sulatin ay kinabibilangan ng proyekto, proposal, progress report at feasibility studies.

3. Reperensyal

- Ito ang madalas na makita sa mga teksbuk na tumatalakay sa isang paksang ganap na ang saliksik at literature mula sa mga awtoridad. Ito ay naglalayong magrekomenada ng iba pang reperens hinggil sa isang paksa.

4. Jornalistik

- Uri ito ng pagsulat na hango sa mga pahayagan, gaya ng balita, na sumasagot sa lahat ng mga tanong na pangjornalistik: sino, ano, saan, bakit, at paano. Pinipili nang maingat ang mga salita at pinanatiling simple at tuwiran ang estilo ng pagsulat.

5. Malikhain

- Ang tawag sa genreng may kaugnay sa malikhaing pagsusulat. Ang pokus dito ay ang imahinasyon ng manunulat. Layunin nitong pukawin ang imahinasyon at damdamin ng mambabasa. Kadalaan iyong nasa anyo ng panitikan matatagpuan. Tulad ng tula, idyoma, maikling kuwento at iba pa.

## J. Larangan ng pagnenegosyo sa pagsulat ng bionote

### Ano ang pagnenegosyo?

Ang pagnenegosyo ay isang organisasyong kaugnay ng pakikipagpalitan ng produkto at serbisyo sa mga consumers. Ang pagnenegosyo ang pangunahinh pinanggagalingan ng kita ng mga mamamayan na kung saan lahat ng negosyo ay pagmamay-ari ng pribadong sektor.

### Dalawang klase ng pagnenegosyo

1. Pagnenegosyo dahil sa kapakinabangan
2. Pagnenegosyo hindi dahil sa kapakinabangan

Negosyo at kalakalan ang nagpapaikot sa mundo. Saanmang parte ng daigdig ngayon, lugmok ang bansang walang negosyo sapagkat nananatili lamang siyang konsyumer. Dito makikita ang malalakas at mahihina; may puhunan o wala; multinasyunal at ordinaryong entrepreneur. Mahirap makipagsabayan sa mga higanteng kompanya; sa isang iglap, malulunod ka't tataob.

### Mga karaniwang anyo ng pagnenegosyo

1. Sole proprietorship
  - Ang negosyo ay pagmamay-ari lamang ng iisang tao.

- Hal: Personal blog
- 2. Partnership
  - Ang negosyo ay pagmamay-ari ng dalawa o higit pang katao na pantay-pantay ang karapatan at responsibilidad.
- 3. Korporasyon
  - Pagmamay-ari ng dalawa o higit pang katao ngunit hindi pantay-pantay ang karapatan at responsibilidad.
  - Mayroong pwedeng magdesisyon at mayroong hindi maaaring magbigay ng desisyon na miyembro.
- 4. Kooperatiba
  - Ang negosyong ito ay iba sa korporasyon sa pamamagitan ng karapatang magdesisyon lahat ng miyembro.

### *Apat na global I's sa negosyo*

1. Investment
  - Salapi o puhunang gamit sa pag-nenegosyo kung walang salapi, walang negosyo.
2. Industriya
  - Mas maraming negosyo, mas maunlad ang bansa
3. Information technology
  - Kapag I.T. ang lahat ng impormasyon ay maaaring matamo, gaano man kalayo ang bayan sa pinagnenegosyoahan.
4. Indibidwal konsyumer
  - Bawat isang tao ay konsyumer sa dami ng mapagpipiliang produkto.

## Practical Research 1

### **A. Characteristics of a good researcher and research paper**

#### Characteristics of a good researcher

Good decision maker

Problem solver

Critical and creative thinker

Contributor of knowledge

#### Characteristics of a good research paper

Research is empirical: uses fact and data that are obtained through a thorough investigation.

Research is analytical: the research carefully analyzes and interprets the gathered data before arriving at a conclusion.

Research is systematic: follows a certain method or procedure in order to obtain objective results.

Research is cyclical: it begins with a problem and ends with the resolution or tentative answers to the problem to complete the cycle; every step in the research process is vital to the success of the research.

Research is original: research output is a product of novel ideas and shows originality.

## B. Research Process

### 1. Define your topic

- Choosing and defining your topic
- Topic directly affects the research process

### 2. Write your problem statement

- Statement that describes what is to be tested during the entire research process or the general problem or question that the research aims to answer

### 3. Make an outline

- Serves as the first draft of your paper
- Start by writing down all the relevant information you have gathered in line with your research topic

### 4. Develop a research strategy

- Minimizes the time you will be putting in your paper.

### 5. Evaluate your sources

- The quality and credibility of the sources should be checked
- Consider the authority, currency, and purpose of the material

### 6. Write and revise your paper

- Check the content of your paper
- Contents must be in line with your chosen topic and problem statement

### 7. Document your sources

- Documentation shows the credibility of the writer
- Shows whether the ideas or information are taken from another source or the author himself/herself

## C. Ethics in Research

Ethics: norms for conduct that distinguish between acceptable and unacceptable behavior.

It establishes the moral integrity of the researchers which is crucial as it ensures the research findings are valid and trustworthy.

Responsible conduct of research, 2<sup>nd</sup> edition New York: Oxford University Press, 2009

### 1. Honesty

- Strive honesty in all scientific communications.
- Honestly report data, results, methods, and procedures and publication status.
- Do not fabricate, falsify, or misinterpret data.

### 2. Objectivity

- Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personal decisions, grant writing, expert testimony, and other aspects of research where objectivity is required.

### 3. Integrity

- Keep your promises and agreements; act with sincerity; strive for consistency of thought and action.

#### 4. Carefulness

- Avoid careless errors and negligence

- Be open to criticisms and new ideas

#### 5. Openness

- Share data, results, ideas, tools, resources

- Be open to criticisms and new ideas

#### 6. Respect intellectual property

- Honor patents, copyrights and other forms of intellectual property.

- Do not use unpublished data, methods, or results without permission.

- Give credit where credit is due

- Never plagiarize

#### 7. Confidentiality

- Protect confidential communications and personal information of your respondents.

#### 8. Social responsibility

- Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

#### 9. Competence

- Maintain and improve your own professional competence and expertise through lifelong education and learning.

#### 10. Legality

- Know and obey relevant laws and institutional and government policies.

#### 11. Animal Care

- Show proper respect and care for animals when using them in research.

- Do not conduct unnecessary or poorly designed animal experiments.

#### 12. Human subject protection

- Minimize harms and risks and maximize benefits, respect human dignity, privacy and autonomy; take special precautions with vulnerable populations; and strive to distribute benefits and burdens of research fairly.

## D. Quantitative and Qualitative Research

	Qualitative	Quantitative
Forms of data collection	Open-ended interviews, observations, notes, and reflection	Based on precise measurements using structured and validated data instruments
Role of researcher	Biases may be known to participants and vice versa	Biases are not known to participants
Results	Less generalizable	Generalizable findings that can be applied to other populations

Research design	An educated research in which the researchers decides what to study	Relies on the views of the participants
Purpose	To understand and interpret social interactions	To test hypotheses, look at cause and effect and make predictions
Group studied	Smaller, not randomly selected, purposive sampling	Larger, randomly selected
Type of data collected	Words, images, and objects	Numbers and statistics
What is to be observed?	Qualities, behavior, complexities	Quantities, scales, trends
Question asked	Why? How?	How many? What?
Method	Descriptive – is used to describe characteristics of a population being studied	Experimental – to support, refute, or validate a hypothesis
Final Report	Narrative report with contextual descriptions and direct quotations from the participants	Statistical report with correlations, comparisons of mean and statistical significance of finding

## E. Comparing qualitative and quantitative methods

### Foundational similarities

- All qualitative data can be measured and coded using quantitative methods.
- Quantitative research can be generated from qualitative inquiries.
- Ex: One can code an open-ended interview with numbers that refer to data specific references, or such references could become the origin of a randomized experiment.

### Foundational differences

- Major difference between qualitative and quantitative research stems from the researcher's underlying strategies.
- Quantitative research is viewed as confirmatory and deductive in nature.
- Qualitative is considered to be exploratory and inductive.

### Terminology

#### a. Grounded theory

- Refers to an inductive process of generating theory from data.
- This is considered ground-up or bottom-up processing.
- Grounded theorists argue that theory generated from observations of the empirical world
- may be more valid and useful than theories generated from deductive inquiries.
- Grounded theorists criticize deductive reasoning since it relies upon a priori assumptions about the world.
- However, grounded theory incorporates deductive reasoning when using constant comparisons.
- In doing this, researchers detect patterns in their observations and then create working hypotheses that directs the progression of the inquiry.

#### b. Ethnography

- Emphasizes the observation of details of everyday life as they naturally unfold in the real world.
- This is sometimes called naturalistic research.
- Is a method of describing a culture or society. This is primarily used in anthropological research.
- Indigenous groups

#### c. Phenomenology

- A school of thought that emphasizes a focus on people's subjective experiences and interpretations of the world.

- Phenomenological theorists argue that objectivity is virtually impossible to ascertain, so to compensate, one must view all research from the perspective of the researcher.
- Phenomenologists attempt to understand those whom they observe from the subject's perspective.
- This outlook is especially pertinent in social work and research where empathy and perspective become the keys to success.
- Common in sociology.

d. Field research

- The natural environment is the priority of the field researcher. There are no implemented controls or experimental conditions to speak of.
- Such methodologies are especially useful in observing social phenomena over time.
- General term that refers to a group of methodologies used by researchers in making qualitative inquiries.
- The field researcher goes directly to the social phenomenon under study and observes it as completely as possible.

Methods

a. Participant observation

- The researcher literally becomes part of the observation.

b. Direct observation

- The researcher observes the actual behaviors of the subjects, instead of relying on what the subjects say about themselves or others say about them.

c. Unstructured or intensive interviewing

- This method allows the researcher to ask open-ended questions during an interview.
- Details are more important here than a specific interview procedure.
- Here lies the inductive framework through which theory can be generated.

d. Case studies

- A particular case study may be the focus of any of the previously mentioned field strategies.
- The case study is important in qualitative research, especially in areas where exceptions are being studied.

Strengths and weaknesses

a. Objectivity

- It is given that objectivity is impossible in qualitative inquiry. Instead the researcher locates his/herself in the research.
- Objectivity is replaced by subjective interpretation and mass detail for later analysis.

b. Reliability

- Since procedure is de-emphasized in qualitative research, replication and other tests of reliability become more difficult.
- However, measures may be taken to make research more reliable within the particular study (such as observer training, or more objective checklists, and so on).

c. Validity

- Qualitative researchers use greater detail to argue for the presence of construct validity,
- Weak on external validity.
- Content validity can be retained if the researcher implements some sort of criterion settings.

- Having a focused criterion adds to the study's validity.

d. Generalizability

- Results for the most part, do not extend much further than the original subject pool.
- Sampling methods determine the extent of the study's generalizability.
- Quota and purposive sampling strategies are used to broaden the generalizability.

Summing up

- Remember that there are always trade-offs in research
- Are you willing to trade detail for generalizability?
- Will exploratory research enable you to generate new theories?
- Can you ask such sensitive questions on a questionnaire?
- Will the results add any evidence towards any pre-existing theory or hypothesis?
- Is funding available for this research?
- Do you really need to see numbers to support your theories or hypotheses?
- Are there any ethical problems that could be minimized by choosing a particular strategy?

## F. Methods in educational research

### What is action research?

- Any systematic inquiry conducted by teacher, researchers, principals, schools, counselors, or other stakeholders in the teaching-learning environment to gather information about how their particular schools operate and how well their students learn.
- Can be done by anyone

### Principles of good research

1. The problem should be clearly defined.

- All terms significant to the research should be clearly defined.
- Make sure the implicit assumptions are valid.

2. Research procedures used should be described in sufficient detail to allow other researchers to replicate the research.

- Must be well documented.
- Methodology must be transparent.

3. The researcher should report, with complete frankness, flaws in procedural design and their effect upon the findings.

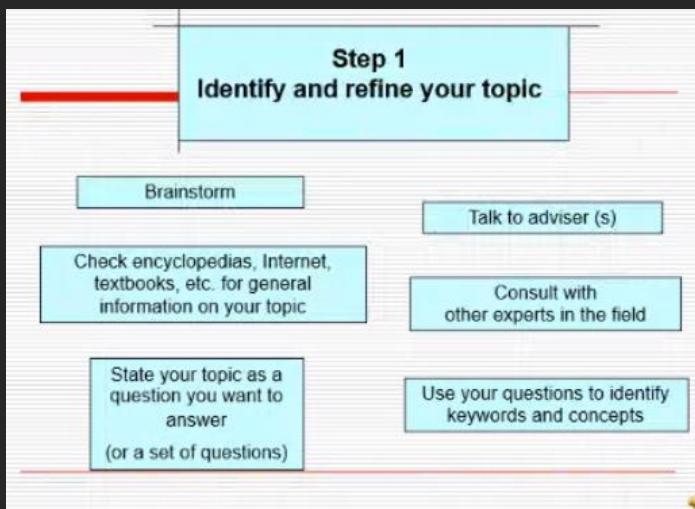
4. The method of analysis used should be appropriate.

5. Conclusions should be confined to those justified by the research data and limited to those for which the data provide an adequate basis.

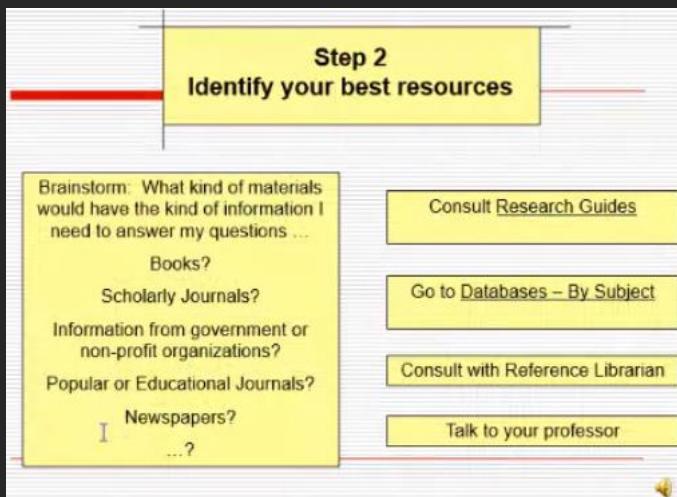
- Never make unwarranted cause and effect relationships
- Make generalizations on the proper population

### Steps

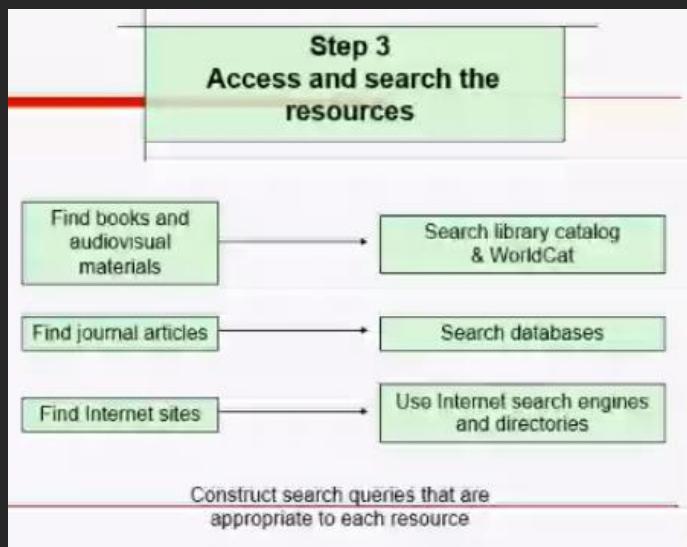
Step 1: Identify and refine your topic



Step 2: Identify your best resources



Step 3: Access and search the resources



#### Literature map of the research

- Organizing literature map enables researchers to understand how their study of a certain topic adds to, extends, or replicates research already completed. The central idea is that the researcher begins to build a visual picture of existing research about the topic.
- Literature maps are organized in different ways. One is hierarchical structure with a top down presentation of the literature ending at the bottom with a proposed study that will extend the literature.
- Another might be similar to flowchart in which the reader understands the literature unfolding from left to right and ending with a proposed study that adds to the literature.
- A third model might be composed of circles, with each circle representing a body of literature and the intersections of the circles indicating the place at which future research is needed.

#### Developing the conceptual framework

- A concept is an image or symbolic representation of an abstract idea. Chinn and Kramer (1999) define a concept as a "complex mental formulation of experience".
- While the theoretical framework is the theory on which the study is based, the conceptual framework is the operationalization of the theory.



- How should the conceptual framework be formulated?
  - Cite your conceptual framework or paradigm;
  - Identify your variables;
  - Point out the dependent and intervening variables;
  - Show the direction of the study.
- Once the conceptual framework has been determined, the next step for the researcher is to determine what research methods to employ to best answer the research problem through the proposed framework.

#### Method section

- Method section
  - How the results were achieved: explanation of how data was collected/generated. Explanation of how data was analyzed explanation of methodological problems and their solutions or effects.
- Results and discussion
  - Presentation of results interpretation of results discussions of results (e.g. comparison with results in previous research, effects of methods used in the data obtained)
- Conclusions
  - Has the research problem been solved? to what extend have the objectives been achieved? what has been learnt from the results? how can this knowledge be used? what are the shortcomings of the research, or the research methodology etc.
  - The research process can be simple or complex, quick or lengthy, depending on the complexity of your information needs.
  - Having the "big picture" in mind is helpful... it can keep you from getting bogged down in all the details once you actually start your research.

## G. Parts of Chapter 1

### Introduction

- Most difficult part
- Serves as an advertisement to encourage your readers to read on
  - Cite the findings and recommendations of previous studies done related to your topic.
  - You can place your observations or reasons why you plan to investigate on the proposed topic.
  - More so, make sure to mention that there is indeed a need to conduct the study.
  - Make sure to indicate the objectives of your study in order to condition the readers the direction that you plan to have in developing your paper.

### Background of the study

- Overview of your research problem
- Factors that lead to the conceptualization of the problem
- Justification for considering your chosen topic as a problem for research.

#### Statement of the problem

- It is where you state the general and specific problems
- Also the objectives of the study
- This section states the research question/s that you plan to answer in the research. In some cases, however, some research paper can have the objectives of the study.

#### Theoretical Framework

- Supporting theory
- Where the study is anchored from

#### Hypotheses

- Temporary answer to the specific problems stated.
- Based on the findings of previous studies.
- Hypothesis should be tested using some statistical tools and should be stated in null form.

#### Significance of the study

- Discusses the groups of persons, institutions or offices which will be benefited by the results of the study.
- How these groups are benefited by the results of the study.
- This section enumerates the different groups of people who will benefit from your study.
- It states the specific benefits that these groups will get from your research.
- Citing everyone as beneficiary for your research may prove to ideal.
- The contribution of the study.

#### Scope and delimitation

- Discussion of the inclusive coverage of the study in terms of the population, time frame, variables.
- Discuss the specific terms which should be excluded in the study.

#### Definition of terms

- Terms shall be operationally defined or meaning based on how the words are used in the study

## **H. Chapter II: Review of Related Literature**

### *Literature Review*

- A process of studying what has already been written on a particular topic. The process involves identifying, locating, and analyzing documents that contain information related to a researcher's research topic.

### *Purpose*

- To determine what has already been done or studied about your topic.
- Prevent researchers from unintentionally duplicating another person's research.
- Gives wider understanding of the topic (what has been done and what needs to be done about your topic.)
- Previous studies can provide the rationale for your research hypothesis and can help you justify the significance of your study.
- Review of related literature determines the direction of the research.

- Demonstrates underlying assumptions (propositions) behind the research questions that are central to the research proposal.
- Provides researchers enough knowledge about the research.
- Helps the researcher to refine the research questions and embed them in guiding hypothesis that provide possible directions the researcher may follow.
- Provides researchers with an opportunity to identify any gaps that may exist in the body of the literature and to provide a rationale for how the proposed study may contribute to the existing body of knowledge.

*What documents can be used for literature review?*

- Not limited to books and research journals
- Can include articles, abstracts, reviews, monographs, dissertations, other research reports and electronic media

*Note*

- The skill of identifying or selecting materials or review before doing the actual review is a must for every researcher.
- The material should be relevant or related to the topic or problem that you are studying.
- The material should be recent as much as possible. However, old materials that are pioneer in the topic may sometimes be included.
- Gather materials from varied sources such as previous studies, journals, books, monographs, and even magazines. Additionally, you may take advantage of the information available online (needs to be careful). Make sure that you only use websites.

*Literature Review*

In essence, a literature review is a comprehensive overview of prior research regarding a specific topic. The overview both shows the reader what is known about a topic, and what is not yet known. Thereby setting up the rationale or need for a new investigation. Which is what the actual study to which the literature review is attached seeks to do.

Cresswell (1994)

The literature in a research study accomplishes several purposes:

- i. It shares with the reader the results of other studies that are closely related to the study being reported (Fraenkel & Wallen, 1990).
- ii. It relates a study to the larger ongoing dialog in the literature about a topic, filling in gaps and extending prior studies (Marshall & Rossman, 1989).
- iii. It provides a framework for establishing the importance of the study.

Cresswell (2012) adds

A literature review is a written summary of journal articles, books, and other documents that describes the past and current state of information on the topic of the research study.

It also organizes the literature into subtopics, and documents the need for a proposed study.

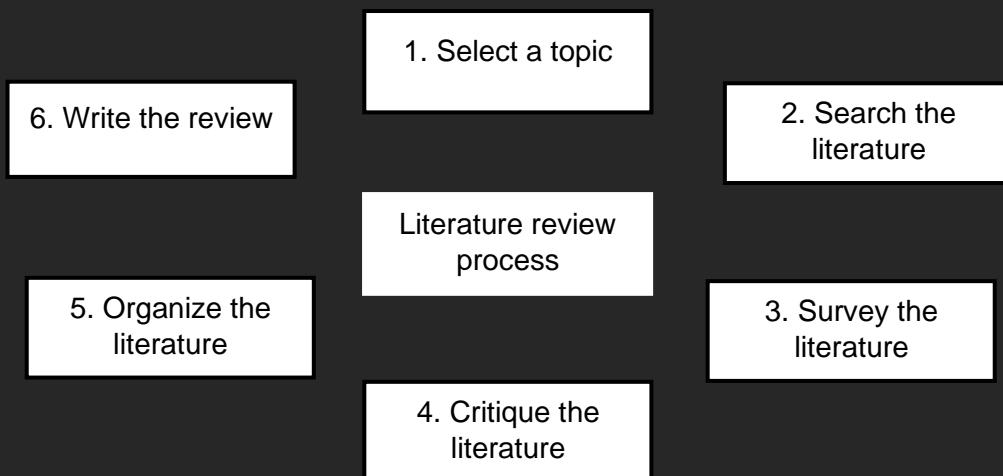
In the most rigorous form of research, educators base this review mainly on research reported in:

- Journal articles
- Conference papers
- Books
- Government documents

### Why is it important?

- To know as many information as possible about the chosen topic.
- To know what has/not been both studied and established as knowledge in prior research.
- To demonstrate to readers that the author has a firm understanding of the topic. This provides credibility to the author and integrity to the work's overall argument.
- To document how your study adds to the existing literature. A study will not add to the literature if it duplicates research already available.
- The weaknesses and shortcomings of prior literature will become more apparent.
- This will not only assist in finding or arguing for the need for a particular research question to explore, but will also help in better forming the argument for why further research is needed.
- "The literature review is where you identify the theories and previous research which have influenced your choice of research topic and the methodology you are choosing to adopt." (Ridley, 2008, p.2)

### Literature review process



### Search and survey

Use primary and secondary sources

- Primary source literature consists of literature reported by the individual(s) who actually conducted the research or who originated the ideas. (Ex. Research articles published by educational journals)

- Secondary source literature is literature that summarizes primary sources. It does not represent material published by the original researcher or the creator of the idea. (Ex. Handbooks, encyclopedia, and select journals that summarizes research)

### Critiquing the literature

- Is it a good/accurate source?
- Is it relevant?

### Write the literature review

How long should my literature be?

- For dissertations and theses, you need an extensive review of the literature, which often comprehensively includes all sources of information.
- For research plans or proposals, it's less comprehensive and guidelines may be set by reviewers.
- Typically, literature reviews for proposals run from 10 to 30 pages in length, although this can vary.

### Citing and Referencing

- In writing the references, use an accepted style manual.
- Headings, tables, figures, and the overall format also requires the use of a specific style manual.
- A style manual provides a structure for citing references, labeling headings, and constructing tables and figures for a scholarly research report.
- End-of-text references are the references listed at the end of a research report. In APA form, they are double spaced and listed alphabetically by author.
- Included in the end-of-text reference list only the references mentioned in the body of the paper.
  - Rizal (1987) said that the children are the hopes of the country.
  - The children are the hopes of the country (Rizal, 1987).

### Types of literature review

1. Thematic review of the literature
  - In this type, the researcher identifies a theme and briefly cites literature to document this theme.
  - Summarize the major themes.
  - Ask yourself: "What are the major results and findings from all of the studies I have reviewed?"
  - The summaries should emphasize the major ideas under each major heading in the literature review and highlight what the reader needs to remember from the summary of the review.
2. Study-by-study review of the literature
  - Provides a detailed summary of each study grouped under a broad theme. This detailed summary
    - Includes the elements of an abstract

- Typically appears in journal articles, theses and dissertations that summarize the literature.
- When presenting a study-by-study review, authors link summaries (or abstracts) by using transitional sentences, and they organize the summaries under subheadings that reflect themes and major divisions.
- It may also suggest reasons why the current literature is deficient and why educators need additional research on your topic.
  - These reasons address ways the proposed study will add to knowledge, and they justify the importance of the research problem.

### Concluding the literature review

The concluding statement of a literature review serves several purposes.

- It summarizes major themes found in the literature and it provides a rationale for the need for the study or the importance of the research problem.
- Summarize the major themes.
- Ask yourself: "What are the major results and findings from all of the studies I have reviewed?"
- The summaries should emphasize the major ideas under each major heading in the literature review and highlight what the reader needs to remember from the summary of the review.

## I. Qualitative Research Procedures

### *Ethnography*

- Ethnographic research is a qualitative research method that aims to get holistic picture of a specific group, society, institution or any situation.
- Studies the culture of one group by documenting the everyday experiences through in-depth interviews and continuous participant observation.

### Important things:

- A detailed description of the group being studied.
- Analysis of the group in terms and constructs.
- Interpretations of the researchers to the group as to meanings, symbols, and generalizations.
- Immersion (to obtain first-hand information and become participant of the study)

### *Fraenkel and Wallen (2010)*

#### Important concepts

1. Culture
  - Sums of group's customs and behaviors
  - Ideas and beliefs that describe a specific group of individuals
  - Primary concern: interpretation of the culture based on observation and views about the members of the group.
2. Holistic perspective
3. Contextualization
  - Putting into a larger perspective what is seen, heard and observed.

- You analyze things on the perspective of the people
- 4. Emic and etic perspective
  - Emic perspective: Inside's perspective of reality
  - Etic perspective: External objective on reality
- 5. Thick descriptive
  - Describing what the researcher has seen, heard and observed in details and including quotations directly from the participants in writing the final report.
- 6. Member checking
- 7. Nonjudgmental orientation
  - a. Refrain from making value judgements about unfamiliar practices
  - b. Being completely neutral is almost impossible.

#### *Historical Research*

- Fraenkel and Wallen (2010) asserted that it is a systematic collection and evaluation of data to describe, explain and understand events that occurred in the past.
- Purpose
  - i. To become aware of what happened in the past in order to come up with the best decision in the present
  - ii. To test relationships, trends, and patterns.

#### *Case Study*

- Is a documented study on a particular person, group, institution, or event.
- Done to analyze constructs or themes to identify variables that are important in the study.
- Used to focus on one particular issue.
- Study someone, who experienced the case; or a group of minorities.
- Focused on one person or group so the researchers can have an in-depth investigation and concentrated attention on the study.

### **J. Types of Purposive Sampling**

1. Typical sample
  - Typical representative of that being studied such as the class of Grade 9 students
2. Critical sample
  - Considered to be exceptional or unusual such as a group of high achievers despite physical disabilities
3. Homogenous sample
  - If all the members of the sample have a common characteristic or trait such as a group of singers
4. Theoretical sample
  - Considered in helping the researcher to understand a new concept or theory such as choosing a group of student leaders in assessing student leadership.
5. Extreme case
  - If all the members do not fit with the general pattern or display extreme characteristics such as group of high school students who achieve high grades despite poor social environment.

6. Opportunistic sample
  - To take advantage of new conditions or circumstances that have arisen such as a group of Grade 7 students who are the first to be involved in the implementation of the K-12 curriculum.
7. Confirming sample
  - To validate initial findings such as follow-up interview of a group of teachers to verify the frequent absenteeism of students.
8. Maximal variation
  - Sample is selected to represent wide perspectives or characteristics such as a group of players who possess a wide variety of behavior on the new policy of sports competition.

## K. Data Collection Strategies

### *Interview*

This is usually integrated to observation to validate the information that you have recorded.

Considered as one of the data collection strategies.

#### Types of Interviews

##### 1. Structured

- Verbal questionnaires
- The researcher has a specific set of questions designed to elicit responses from the participants.

##### 2. Semi-structured

- The researcher prepares open-ended questions in which the participants are free to express their responses.

##### 3. Informal interview

- Done to determine how the participants act on certain situations
- Casual conversation and conducted without specific sequence of questions or form of questioning.

##### 4. Retrospective

- Done to recall and reconstruct something that happened in the past.

#### Types of interview questions

##### 1. Background questions

- Routine questions about the background of the participants.
- Ex. Age, education, previous work, etc.

##### 2. Knowledge questions

- Refer to participants' factual information.
- Ex. Asking the participants about school information such as school rules or activities

3. Experience questions

- Focused on what the participant is doing presently or in the past
- Ex. If I were attending your practices in the gym, what experiences would I be likely seeing you having?

4. Opinion questions

- Asked how the participants think on certain topics or issues.
- Aims to get the participants' values, beliefs and attitude.
- Ex. What do you think about the implementation of K-12?

5. Feeling questions

- Pertain to emotional responses of the participants on their experiences.
- Ex. How do you feel when you solve a mathematical problem? Pain.

6. Sensory questions

- Focus on what the respondent has seen, tasted, heard, touched, or smelled.
- Ex. When you enter the room, what did you hear?

Reminders

- Respect the culture of the group being studied
- Respect the individual being interviewed
- Interview should start and end at the scheduled time
- Act naturally
- Develop rapport with the participant
- Ask the same question in different ways
- Ask the interviewee to repeat an answer when there is some doubt
- Vary who controls the flow of communication
- Avoid leading questions
- Do not ask dichotomous questions or questions that can be answered either by a Yes or No
- Ask questions only one at a time
- Do not interrupt when the interviewee is talking

*Observation*

Research questions are answered through observing the actions of the participants (Ex. Attitude).

Types of observation

1. Participant observation

- Involves an intensive interaction between the researcher and the subjects or participants
  - Overt participant observation

- Identity of the researcher is known to the group being studied; likely to inform the members of the group about his or her goal, purpose, scope and length of the observation.
- Covert participant observation
  - Participants are not aware of the identity of the researcher nor that they are being observed for research.

## 2. Naturalistic observation

- Researchers observe the subjects under study in their natural settings; the researcher simply observes and records what is really happening as they occur naturally.
- Laboratory research that is unrealistic in terms of costs or would affect the subject's behavior.

## 3. Simulations

- The researcher simulates or recreates a situation, environment or system and observes the under study in a simulated environment
- The researcher may ask the participants to portray a role individually or by team
- Has no guarantee that the simulated environment would be the same in the natural environment

### *Focused Group Discussion*

- Interview to a small group of people to elicit data on a certain topic
- You ask a small group of people what they think about certain topic or issue

### *Documentary Analysis*

- AKA content analysis
- Technique to study human behavior indirectly by analyzing documents
- These include books, journals, magazines, art works, songs, pictures.

## L. Chapter III

The choice of the subject interest sets limit on the scope of the investigation. Boundaries are formed by determining “what is it you want to be able to say about it at the end of the study (Patton 1980, 100) and clarity to the issue is critical to appropriate sampling.

### *Terms*

- Sampling frame – Target population
- Population – Bigger scope (totality of elements covered by a study)
- Target population – subject of a bigger population
- Elements (Individual people, beliefs, events, places, artifacts, activity and time)
- Qualitative – people by age groups, gender, ethnicity, culture, customers, clients, patients, profession, and geographic area.

### *Note*

- In qualitative research, the size of the population is not as important in quantitative research

- You do not have to come up with a general statement that represents the entire population
- Size of the sample will depend on what type of study you are pursuing, purpose, time constraints and the available resources.
- Purpose: Meet the requirements of the study to answer why, how, what, where and when of the subject subjectively rather than objectively.

### *Probability Sample*

- Peter DePaulo: There are two ways of selecting samples: (1) based on calculated possibilities and the informal “Rule of Thumb” postulated by some authors.
- How large a sample is needed to represent the variation within target population?
  - Sample size may be determined based on the approach of the study or the data collection method used.
- If focused groups are desired (getting an n of 30 from three groups with 10 respondents in each).

Case study	One case or one person
Phenomenology	Assess 10 people, if you reach saturation prior, you may use fewer
Grounded theory/ethnography/narrative	20-30 people

### *Collecting Pertinent Data*

- Qualitative: observations, participation, interviews, content analysis and techniques normally associated with qualitative research designs/approaches/methods
- Observation
  - Taking field notes
  - Using checklist of important variables
  - Use of audio-video medium (no memory bias involved)
  - Generic Guidelines
    - Be descriptive in taking field notes
    - Gather a variety of information from different perspectives
    - Cross-validate information by gathering other sources like from interviews, program documentation, recordings and photographs
    - Use direct quotations from the participants/respondents
    - Select key informants wisely
    - Be aware of and sensitive to the different stages of field work
    - Build trust and rapport during the early stage of encounter
    - Stay alert and disciplined during the more routine middle-phase of field work
    - Focus on pulling together a useful synthesis as fieldwork draws to a close
    - Be disciplined and conscientious in taking detailed field notes
    - Be as involved as possible in experiencing the observed setting maintaining in the purpose of field work
    - Clearly separate description from interpretation and judgment
    - Provide formative feedback as part of the verification process of fieldwork
    - Include in your field notes and observation reports of your own experiences, thoughts, and feelings.
- Interview

- What is the difference between a personal interview and a self-administered survey questionnaire?
  - The items of inquiry use open-ended questions for the personal interview but not for the self-administered questionnaire
- Qualitative researchers are concerned with making inferences based on perspective, so it is extremely important to get as much data as possible for later analysis.
  - Generate participant perspectives about ideas, opinions, and experiences; only scaling of opinions or providing scores to measure the degree of agreement or disagreement.
- In personal interview, there is a chance for clarification (vague answers from the respondent just as they happen during the interview process which cannot be done through self-administered questionnaire).
- Personal interview doesn't require the respondent to be literate, which is not so in the self-administered questionnaire in a survey.
- It is more expensive to conduct a personal interview than self-administered questionnaire but it is easier to prepare the research instrument than a self-administered questionnaire.
- Guidelines (Patton, 1987)
  - Let the purpose of the study guide you in the interview process
  - Provide a framework within which respondents can express their own understanding in their own understanding in their own terms
  - Understand the different kinds of info one can collect through interviews: behavioral data; opinions, feelings; knowledge; sensory data; and background information
  - Think about and plan how these kinds of questions can be most appropriately worded for each interview topic (past, present, and future questions and the sequencing of questions)
  - Ask truly open-ended questions
  - Ask one question at a time
  - Use probing questions to solicit depth and detail and ask follow-up questions
  - Explain clearly what info is desired
  - Listen attentively and respond appropriately to let the person know he or she is being heard
  - Avoid asking leading questions
  - Understand the difference between a depth interview and an interrogation
  - Qualitative evaluators conduct depth interviews; police investigators and tax auditors conduct interrogations
  - Establish personal rapport and a sense of mutual respect
  - Maintain neutrality toward the specific content of responses
  - Be observant while interviewing
  - Maintain your composure while conducting the interview
  - Tape recording whenever possible to capture full and exact quotations for analysis and accurate reporting.
  - Take note to capture and highlight major points as the interview progresses

- As soon as possible after the interview, check that all items have appropriate responses; verify recordings for malfunctions; review notes for clarity; elaborate where necessary and record observations.
- Take whatever steps are appropriate and necessary to gather valid and reliable information
- Treat the person being interviewed with interest
- Practice interviewing to develop and hone your skills
- Enjoy your interview and thank your respondent for his/her cooperation

### *Coding Qualitative Data*

- When data are already collected, these have to be summarized in understandable and coherent form ready to data analysis
- Coding is a process of breaking down sentences and paragraphs to answer the research problem of what, how, where and when and assigning unique codes so that you can summarize those that are alike

### *Analyzing Qualitative Data*

- Data analysis
  - Is an exercise engaged in establishing meaningful patterns concerned with building theory from "bottom-up" style which is actually an induction method of analysis.
- Coding
  - Used to analyze qualitative within the data
  - Reduce voluminous of data to smaller manageable groupings
  - Organizing data into categories
  - Helps the researcher to make sense of the data especially the result of unstructured interviews and field notes
  - Theme identification is one of the most fundamental tasks in qualitative researcher (task of discovering themes)
    - Come from reviewing the literature

### *Techniques for discovering themes*

- An analysis of words (word repetitions, key-indigenous terms and key-words in contexts)
- Physical manipulation of texts (unmarked texts, pawing and cut and sort procedures)

### *Donald Ratchcliff*

- Typology: This is a classification system derived from patterns, themes, or other kinds of groups of data. Arts, activities, meanings, participation, relationships, settings
- Grounded theory/constant comparison: looks at documents such as field notes, memos; compare codes to find consistencies and differences
- Analytic Induction: looks at the event and develops a hypothetical statement of what happened
- Logical analysis/matrix analysis: outline of generalized causation, logical reasoning process, etc. Flow charts, diagrams are used to pictorially these as well as written descriptions
- Quasi statistics: count the number of times something is mentioned in field notes as very rough estimate of frequency

- Event analysis/microanalysis: It emphasizes on findings precise beginnings and ending of events by finding specific boundaries and things. Film and video
- Metaphorical analysis: try on various metaphors and see how well they fit what is observed
- Domain analysis: describe social situation and cultural patterns within it, semantic relationships. Interrelate the social situation to cultural meanings
- Hermeneutical analysis: making sense of a written text; meaning of text for people in situation
- Cultural analysis: involves looking at documents, texts or speech to see what themes emerge
- Discourse analysis: linguistic analysis of ongoing flow of communication. Tapes are used so they be played and replayed
- Semiotics: is a science of signs and symbols, such as body language

## M. Concluding Qualitative Research

- This is where the researcher pulls together all the new knowledge that arose from the analysis of research data to answer the research questions.
- Conclusions can be difficult to derive, especially because of the subjective nature of the project.
- Requires a step back to take in the totality of the research; relive the "journey" from searching the topic to analyzing your data

### How?

- Review carefully the problem statement, objectives, results or findings of your analysis and how they tie-up together.
- The goal is INTEGRATION to derive a sound, logical, and intelligent answer or explanation to the research question.
- Closing statement should be written with a strong sense of unity, coherence and closure.

### Note

- There are no hard and fast rules in writing the conclusion to the research project
- Aim: logical conclusion that can impart a lasting impression for future researchers and future studies.
- Write in a manner that is comfortable to you.
  - Write in white heat and revise in cold blood
  - Write fast and edit carefully
- Write to be understood. Don't write to impress or to sound smart. Avoid using thesaurus to find big highfalutin words to replace the common but clearer ones. If you must use an uncommon word or term, make sure that you understood all its nuances and meanings.

- Write from an objective distance. Remember that you are writing a formal academic paper. Avoid sentimental arguments or those that appeal to the reader's emotions to believe your conclusions.
- Write with a fresh new style. Avoid old, common, or overused phrases such as, "In conclusion", "In conclusion", "In summary", or "I therefore conclude".
- Write meaningful and logical arguments. Your conclusions need to go beyond a descriptive synthesis of the data. It is important that conclusions have a conceptual significance and can imply, indicate or chart future research directions.

## References & External Links

All references and external links gathered from learning materials

### 21<sup>st</sup> Century Literature from the Philippines and the World

<https://www.slideshare.net/macalaladernest/21st-century-literature-of-the-philippines-and-the-world>

[https://en.wikipedia.org/wiki/Literary\\_adaptation](https://en.wikipedia.org/wiki/Literary_adaptation)

<https://www.write4fun.net/view-entry/155513>

<https://literaridevices.net/context>

<https://en.wikipedia.org/wiki/Poetry/>

<https://prezi.com/nsdtagu2rd-x/the-literary-works-of-region-iv/>

<https://prezi.com/3nhqg2lndlz1/textula/>

<https://www.slideshare.net/Lebomosimango/introduction-to-32027335>

<https://www.slideshare.net/nareshsoni9/self-and-peer-evaluation-20592547>

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<https://www.slideshare.net/jaysonerni/literary-criticism-powerpoint>

<https://www.slideshare.net/gskeesee/writing-a-literary-analysis>

<https://www.slideshare.net/kimberlyn7/types-of-characters-11342419>

<https://www.youtube.com/watch?v=p9km8ks1pXE>

<https://literaryterms.net/characterization/>

### Earth Science

<https://www.scholastic.com/teachers/articles/teaching-content/origin-universe/>

<https://www.slideshare.net/ElnoraTroncoso/earth-science-the-origin-of-the-universe>

<https://www.youtube.com/watch?v=al-do-HGulk>

<https://www.youtube.com/watch?v=C65iqOSCZOY>

## **General Biology**

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Pena, A.R., & Anudin, A. (2016). Oral Communications, p. 45-49, VIBAL GROUP INC.

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## **Practical Research 1**

Pena A., and Anudin A. Practical Research 1. Vibal Publishing House. Quezon City.

This reviewer is not 100% reliable.

There might be inaccuracies and incorrect information in the document.

If you have any concern or corrections, e-mail me through [contentbyelmerf@gmail.com](mailto:contentbyelmerf@gmail.com)

Website (experimental): <https://cbelmerf.wixsite.com/content>