Unit: 2

B. Tech Syllabus

Second Unit

ENGLISH AS A LANGUAGE OF SCIENCE AND TECHNOLOGY

Scientific method and Engineering Design Process

Definition of scientific method

principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses

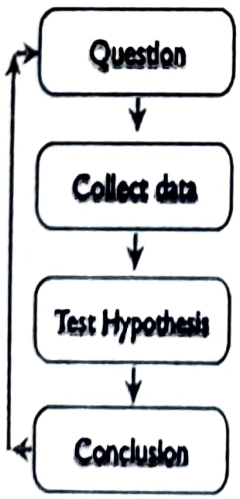
(Scientific method." Merriam-Webster.com Dictionary, Merriam-Websterhttps://www.merriam-webster.com/dictionary/scientific%20method.)

What is Scientific Method?

The Scientific method is a process with the help of which scientists try to investigate, verify, or construct an accurate and reliable version of any natural phenomena. They are done by creating an objective framework for the purpose of scientific inquiry and analysing the results scientifically to come to a conclusion that either supports or contradicts the observation made at the beginning.

Scientific Method Steps

The aim of all scientific methods is the same, that is, to analyse the observation made at the beginning. Still, various steps are adopted per the requirement of any given observation. However, there is a generally accepted sequence of steps in scientific methods.



Observation and formulation of a question: This is the first step of a scientific method. To start one, an observation has to be made into any observable aspect or phenomena of the universe, and a question needs to be asked about that aspect. For example, you can ask, "Why is the sky black at night? or "Why is air invisible?"

Data Collection and Hypothesis: The next step involved in the scientific method is to collect all related data and formulate a hypothesis based on the observation. The hypothesis could be the cause of the phenomena, its effect, or its relation to any other phenomena.

Testing the hypothesis: After the hypothesis is made, it needs to be tested scientifically. Scientists do this by conducting experiments. The aim of these experiments is to determine whether the hypothesis agrees with or contradicts the observations made in the real world. The confidence in the hypothesis increases or decreases based on the result of the experiments.

Analysis and Conclusion: This step involves the use of proper mathematical and other scientific procedures to determine the results of the experiment. Based on the analysis, the future course of action can be determined. If the data found in the analysis is consistent with the hypothesis, it is accepted. If not, then it is rejected or modified and analysed again.

It must be remembered that a hypothesis cannot be proved or disproved by doing one experiment. It needs to be done repeatedly until there are no discrepancies in the data and the result. When there are no discrepancies and the hypothesis is proved, it is accepted as a 'theory'.

Scientific Method Examples

Following is an example of the scientific method:

Growing bean plants:

What is the purpose: The main purpose of this experiment is to know where the bean plant should be kept inside or outside to check the growth rate and also set the time frame as four weeks.

Construction of hypothesis: The hypothesis used is that the bean plant can grow anywhere if the scientific methods are used.

Executing the hypothesis and collecting the data: Four bean plants are planted in identical pots using the same soil. Two are placed inside, and the other two are placed outside. Parameters like the amount of exposure to sunlight, and amount of water all are the same. After the completion of four weeks, all four plant sizes are measured.

Analyse the data: While analysing the data, the average height of plants should be taken into account from both places to determine which environment is more suitable for growing the bean plants.

Conclusion: The conclusion is drawn after analyzing the data.

Results: Results can be reported in the form of a tabular form.

Engineering Design Process

The engineering design process is a series of steps that engineers follow to find a solution to a problem. The steps include problem solving processes such as, for example, determining your objectives and constraints, prototyping, testing and evaluation.

The process is important to the work conducted by TWI and is something that we can offer assistance with.

While the design process is iterative it follows a predetermined set of steps, some of these may need to be repeated before moving to the next one. This will vary depending on the project itself, but allows lessons to be learnt from failures and improvements to be made.

The process allows for applied science, mathematics and engineering sciences to be used to achieve a high level of optimisation to meet the requirements of an objective. The steps include problem solving processes such as, for example, determining your objectives and constraints, prototyping, testing and evaluation.

The steps of the engineering process are not always followed in sequence, but it is common for engineers to define the problem and brainstorm ideas before creating a prototype test that is then modified and improved until the solution meets the needs of the engineers project. This is called iteration and is a common method of working.

TRANCODING

Bar diagram

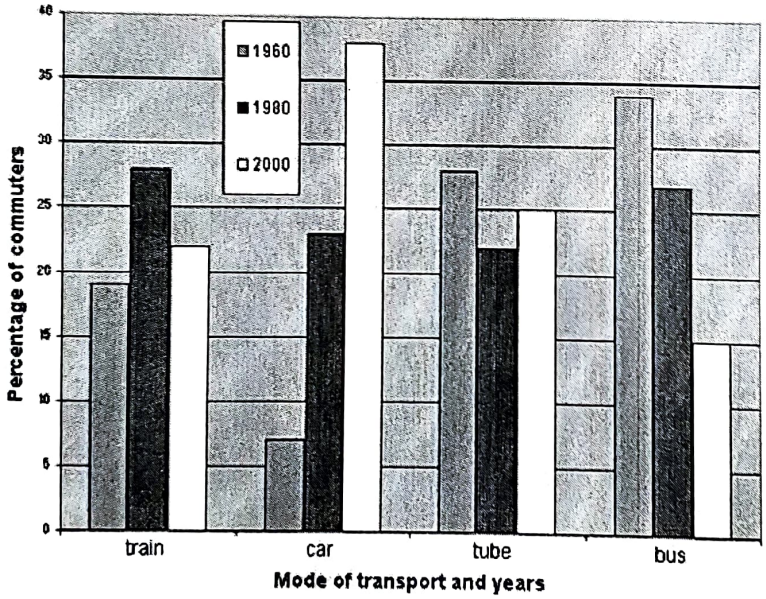
Some tips for describing data

•Coherence –use sequencing words e.g. Firstly, Secondly, Finally
•Cohesion –use anaphoric reference e.g. "this", "it", "they", "and", "but" and synonyms
•Vocabulary –use a wide range of appropriate and academic vocabulary
•Sentence Structure –short and compact but not simplistic e.g. correct use of relative clauses.

The main writing skills includes

•Describing numerical data
•Identifying differences and similarities
•Comparing and contrasting
•Identifying and describing trends

Question: **Traveler transport in London**



Preparation

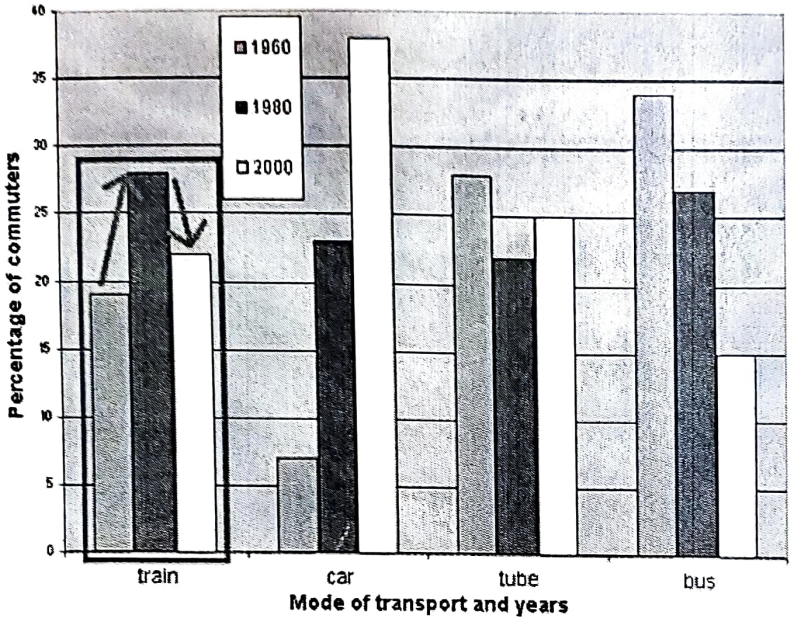
•Identify the main trends for each mode.
•Identify any sudden change in increase or decrease.
•Are there any consistent increase or decrease?
•Does anything seem particularly significant?
•Are there any clear relationships between mode sand percentages of commuters?

Answer

•Paragraph -1 Introduction

•The graph shows the changing patterns in commuting by train, car, tube or bus for commuters in London in the years 1960, 1980 and 2000.
•The introductory paragraph states the main purpose of the chart, paraphrasing the writer's own words

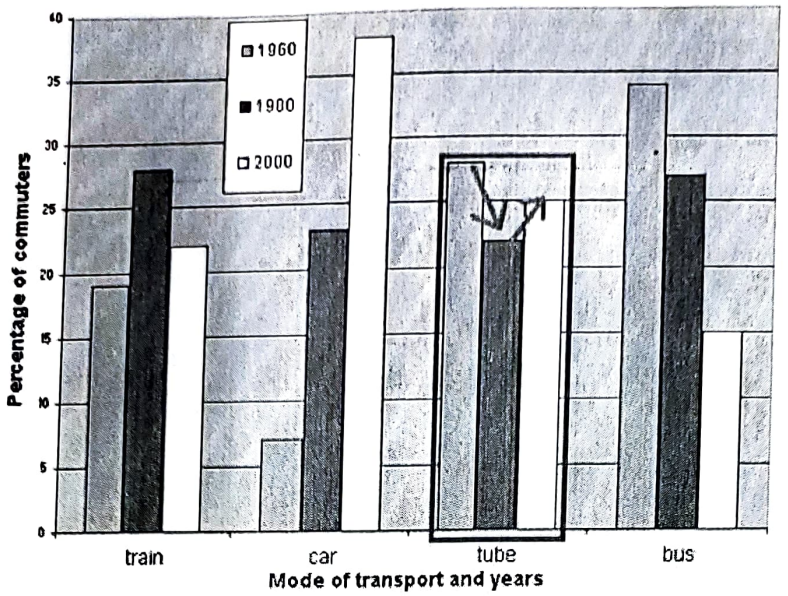
Use of trains



Paragraph 2 –Trains

•The number of people using trains at first rose from just under 20% in 1960 to about 26% in 1980, but then fell back to about 23% in 2000.

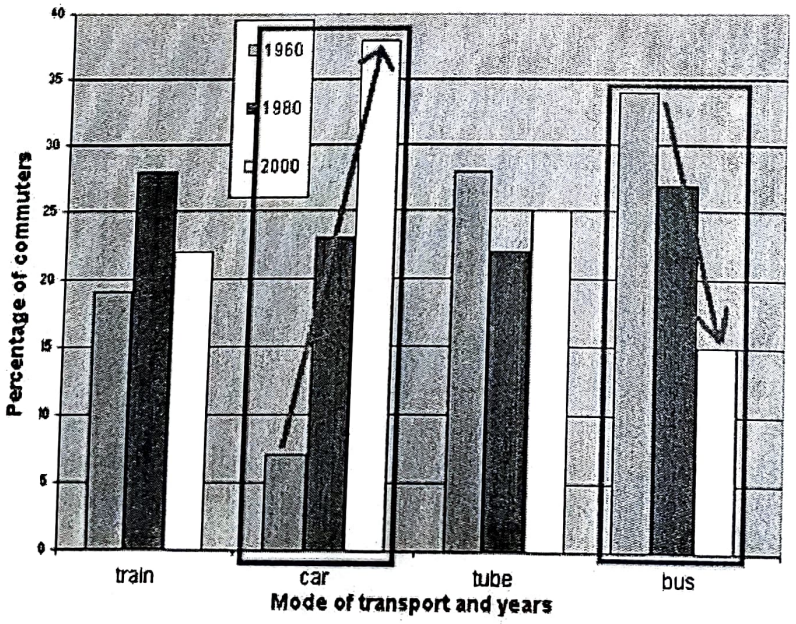
Use of Tubes



Paragraph -3 Tubes

•Use of the tube has been relatively stable, falling from around 27% of commuters in 1960 to 22% in 1980, but climbing back to reach 25% by 2000.

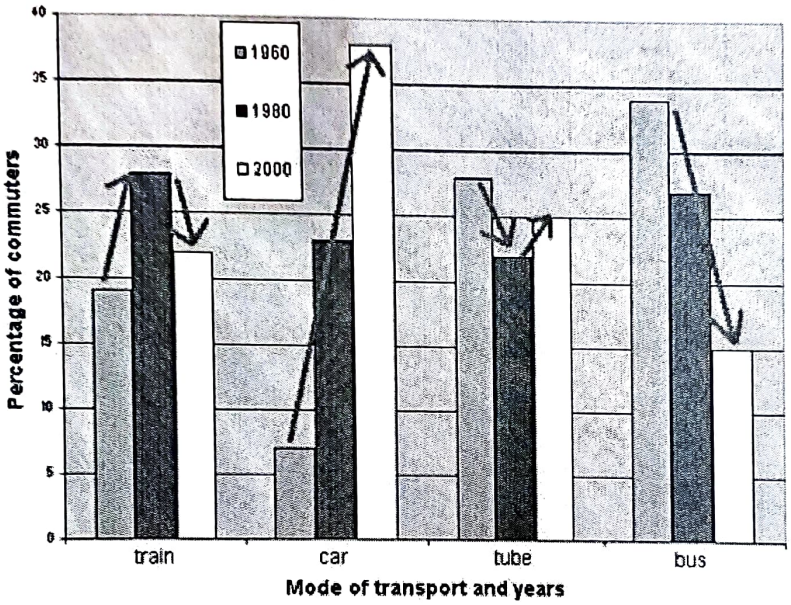
Use of Cars and Buses



Paragraph - 4 Uses of Buses and Cars

•On the other hand, the use of cars in creased steadily from just over 5% in 1960 to 23% in 1980, reaching almost 40% by 2000, where as the popularity of buses has declined since 1960, falling from just under 35% in 1960 to 27% in 1980 and only 15% in 2000

Conclusion



Paragraph - 5

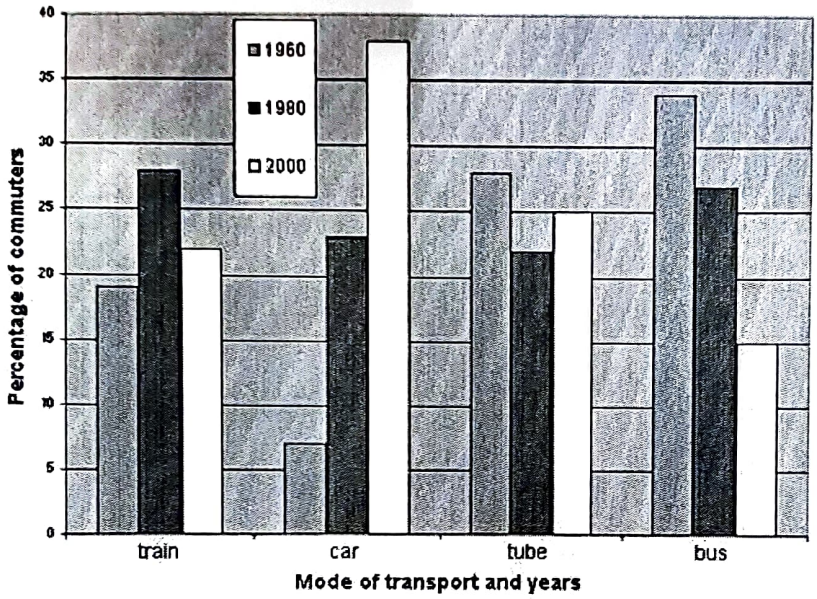
•The concluding paragraph summaries the main findings of the chart

•The graph indicates the growing use of cars for commuting to work between 1960 — 2000, and the corresponding decline in the popularity of buses from being the most popular mode of transport in 1960 to the least popular in 2000.

TRANCODING

(Bar diagram)

Question:. **Traveler transport in London**



Answer:

The graph shows the changing patterns in commuting by train, car, tube or bus for commuters in London in the years 1960, 1980 and 2000.The introductory paragraph states the main purpose of the chart, paraphrasing the writer's own words. The number of people using trains at first rose from just under 20% in 1960 to about 26% in 1980, but then fell back to about 23% in 2000. Use of the tube has been relatively stable, falling from around 27% of commuters in 1960 to 22% in 1980, but climbing back to reach 25% by 2000.On the other hand, the use of cars in creased steadily from just over 5% in 1960 to 23% in 1980, reaching almost 40% by 2000, where as the popularity of buses has declined since 1960, falling from just under 35% in 1960 to 27% in 1980 and only 15% in 2000.

The graph indicates the growing use of cars for commuting to work between 1960 — 2000, and the corresponding decline in the popularity of buses from being the most popular mode of transport in 1960 to the least popular in 2000.

TRANSCODING

(Flow Chart)

In the current world of incessant changes and booming development, communication needs to be fast and effective. Graphics, namely, charts and tables are the tools that transform extended information into succinct codes. Let us learn how to draw a basic flow chart from listening to speeches / presentations on the descriptions of various processes.

Flow chart is a diagrammatic sequential representation of a process. Any complicated process can be explained in a series of steps which makes it easy for us to understand the process. Engineers like you would be dealing with various processes, and representing them as flow charts is an integral part of your profession.

Objective:

1) To make the learners aware of the importance of various types of diagrams used in presentations.
2) To prepare them to draw different types of diagrams for use in various occasions.
3) To give them enough exposure to transcode the data in the diagrams using grammatically correct and meaningful sentences.

Steps use in flow chart:

Step I Read the flow chart carefully and understand the process depicted in the codes correctly.

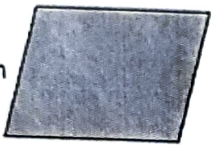
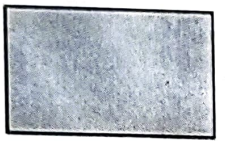
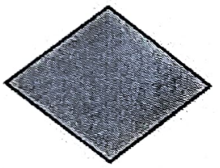
Step II Open the paragraph with introduction of the codes. E –g "The given flow chart is about the process of preparing lime juice"

Step III Use simple present tense throughout and whenever necessary use impersonal passive in present tense form. Avoid using any other tense form.

Step IV Use connectives like, then, now, initially, finally and consequently to establish continuity.

Step V If any inference could be drawn from the flow diagram uses it in the conclusion.

Different shape of boxes use in Flow chart:

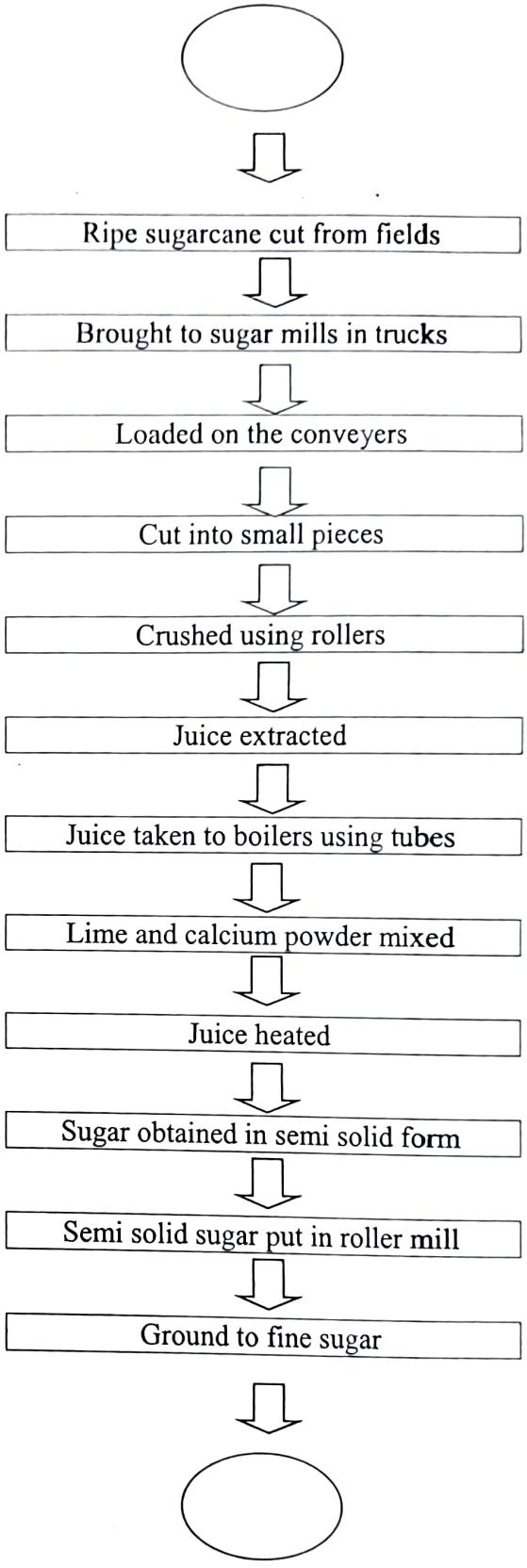
Name	Symbol	Use in flowchart
Oval		Denotes the beginning or end of a program.
Flow line		Denotes the direction of logic flow in a program.
Parallelogram		Denotes either an input operation (e.g., INPUT) or an output operation (e.g, PRINT).
Rectangle		Denotes a process to be carried out (e.g., an addition).
Diamond		Denotes a decision (or branch) to be made. The program should continue along one of two routes (e.g., IF/THEN/ELSE).

Question:

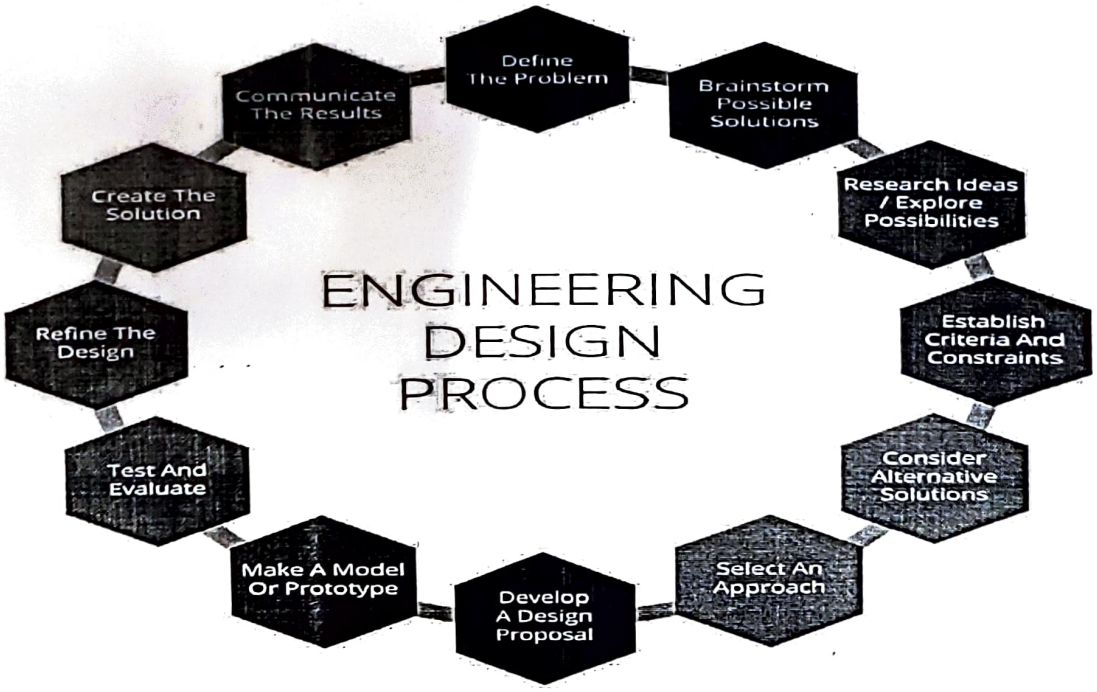
Extraction of sugar

Sugar is one of the most essential commodities (Products). It is not very easy to get the sweet product. The farmers have to wait for one year to cut the ripe (mature) cane. Using huge manpower, the cane is shredded (cut) and loaded in trucks. They carry the cane to the nearby sugar mills. Large cranes unload the cane and put it on the moving conveyers. The conveyers take the cane to the moving blades. The heavy blades cut the cane into small pieces and same is taken to crushers. Juice is extracted by pressing. The juice is than piped to the hot boilers. After being heated for some time the semi solid sugar is dried and then transported to roller mill. The dried sugar cubes are ground to granule (small pieces, grain) and filled in bags.

Answer:



Engineering Design Process Steps



1. Define the Problem

What is the problem that needs to be solved? Who is the design product for, and why is it important to find a solution? What are the limitations and requirements? Engineers need to ask these types of critical questions regardless of what is being created.

2. Brainstorm Possible Solutions

Good designers brainstorm possible solutions before opting to start a design, building a list of as many solutions as possible. It is best to avoid judging the designs and instead just let the ideas flow.

3. Research Ideas / Explore Possibilities for your Engineering Design Project

Use the experience of others to explore possibilities. By researching past projects you can avoid the problems faced by others. You should speak to people from various backgrounds, including users or customers. You may find some solutions that you had not considered.

4. Establish Criteria and Constraints

Having listed potential solutions and determined the needs of the project alongside your research, the next step is to establish any factors that may constrain your work. This can be done by revisiting the requirements and bringing together your findings and ideas from previous steps.

5. Consider Alternative Solutions

You may wish to consider further solutions to compare the potential outcomes and find the best approach. This will involve repeating some of the earlier steps for each viable idea.

6. Select an Approach

Once you have assessed your various options you can determine which approach best meets your requirements. Reject those that don't meet your requirements.

7. Develop a Design Proposal

Having chosen your approach, the next step is to refine and improve the solution to create a design proposal. This stage can be ongoing through the length of your project and even after a product has been delivered to customers.

8. Make a Model Or Prototype

Use your design proposal to make a prototype that will allow you to test how the final product will perform. Prototypes are often made from different materials than the final version and are generally finished to a lesser standard.

9. Test and Evaluate

Each prototype will need testing, re-evaluation and improvement. Testing and evaluation allows you to see where any improvements are needed.

10. Refine the Design

Once testing has been completed, the design can be revised and improved. This step can be repeated several times as more prototypes are created and evaluated.

11. Create the Solution

After your refinements have been completed and fully tested, you can decide upon and create your finished solution. This may take the form of a polished prototype to demonstrate to customers

12. Communicate the Results

The final stage is to communicate your results. This can be in the form of a report, presentation, display board, or a combination of methods. Thorough documentation allows your finished product to be manufactured to the required quality standards.

Engineering Design vs. Scientific Method: What Are the Differences?

The engineering design process is so comprehensive and versatile that some people wonder what are the differences between engineering design and the scientific method. The truth is that while both concepts are extremely useful, there are important differences between them.

Let's begin by defining what the scientific method is. The online dictionary Merriam-Webster offers a good working definition: Scientific method is a set of "principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses."

As you can see, the scientific method entails a series of steps. In this regard, the scientific method is similar to the engineering design process. In both cases, there is no "official" number of steps, as many authors offer different versions.

As we have seen in a previous post, engineering design is defined as "the organized development and testing (through the use of creativity as well as mathematical and scientific knowledge) of products and processes that perform a desired function within specified limits."

Engineering Design vs. Scientific Method

When we compare both definitions, it's easy to see the differences between engineering design and scientific method.

Above all, while the goal of the scientific method is the pursuit of knowledge in general, engineering design is focused on the development of products and processes.

In short, while a scientist aims to answer a question about nature, an engineering designer creates solutions that satisfy the needs of users and consumers.

Comparing the Engineering Design Process and the Scientific Method

While scientists study how nature works, engineers create new things, such as products, websites, environments, and experiences. Because engineers and scientists have different objectives, they follow different processes in their work.

Scientists perform experiments using the scientific method; whereas, engineers follow the creativity-based engineering design process.
Both processes can be broken down into a series of steps, as seen in the table below.

Scientific Method

State your question

Do background research

Formulate your hypothesis, identify variables

Design experiment, establish procedure

Test your hypothesis by doing an experiment

Analyze your results and draw conclusions

Communicate results

Steps of The Scientific Method

Engineering Design Process

Define the problem

Do background research

Specify requirements

Create alternative solutions, choose the best one and develop it

Build a prototype

Test and redesign as necessary

Communicate results

Steps of the Engineering Design Process

Keep in mind that although the steps above are listed in sequential order, you will likely return to previous steps multiple times throughout a project. It is often necessary to revisit stages or steps in order to improve that aspect of a project.

Why are there two processes?

Both scientists and engineers contribute to the world of human knowledge, but in different ways. Scientists use the scientific method to make testable explanations and predictions about the world. A scientist asks a question and develops an experiment, or set of experiments, to answer that question. Engineers use the engineering design process to create solutions to problems. An engineer identifies a specific need: Who need(s) what because why? And then, he or she creates a solution that meets the need.

Which process should I follow for my project?

In real life, the distinction between science and engineering is not always clear. Scientists often do some engineering work, and engineers frequently apply scientific principles, including the scientific method. Much of what we often call "computer science" is actually engineering—programmers creating new products. Your project may fall in the gray area between science and engineering, and that's OK. Many projects, even if related to engineering, can and should use the scientific method.

However, if the objective of your project is to invent a new product, computer program, experience, or environment, then it makes sense to follow the engineering design process.

What Is a Simple Sentence?

A simple sentence contains a subject (a person or thing performing an action) and a predicate (a verb or verbal phrase that describes the action) and expresses a complete thought as an independent clause. Simple sentences do not contain dependent or subordinate clauses.

An independent clause contains a subject and a predicate and expresses a clear meaning on its own. By contrast, dependent clauses and subordinating clauses might contain subjects and predicates, but they do not express complete thoughts. Therefore, they only make sense when paired with independent clauses.

Simple sentence structures can contain punctuation, such as commas, in addition to a period, exclamation mark, or question mark at their end. Simple sentences can also contain modifiers like adjectives (which describe nouns) and adverbs (which complement verbs). Prepositions and prepositional phrases are additional parts of speech in English grammar you can use to create basic sentences.

Simple Sentences vs. Complex Sentences

Simple sentences and complex sentences differ mainly in the types of clauses they include but still share commonalities.

1. Compounds: Independent clauses can contain compound parts of speech, which occur when two words or phrases perform the same function in a sentence. Examples include compound subjects, compound verbs, or compound predicates. Since both simple sentences and complex sentences contain independent clauses, both types of sentences can contain compound parts of speech.

2. Clauses: A simple sentence contains a single independent clause and must not include any dependent or subordinate clauses. By contrast, a complex sentence includes at least one dependent or subordinate clause that you must pair with an independent clause.

3. Conjunctions: Simple sentences and complex sentences can both use conjunctions, albeit different types. While simple sentences use coordinating conjunctions (examples include: and, but, or), complex sentences use subordinating conjunctions (examples include: although, unless, whereas).

How to Identify a Simple Sentence

A simple sentence contains a subject and a verb and communicates a single, complete thought. Here are steps to take when you're trying to identify a simple sentence.

1. Identify the subject and the predicate. A simple sentence must have at least one subject (someone or something performing an action) and a predicate (a verb or verbal phrase describing that action).

2. Look for a conjunction. You might have a simple sentence if a coordinating junction (and, but, or) joins two words or phrases that are equal parts of speech performing the same function in a sentence—for example, a compound subject. (If you identify a subordinating conjunction, then it is not a simple sentence but instead a complex sentence.)

3. Note any mid-sentence punctuation. A simple sentence contains at most one clause, but punctuation can indicate the joining of two clauses. For example, if a colon, a semicolon, or a comma paired with a coordinating conjunction appear mid-sentence, you have a compound sentence (the pairing of two independent clauses) rather than a simple sentence.

4. Check for a complete thought. If the clause ends with punctuation and needs no additional supporting material to communicate its message, the sentence is an independent clause and therefore a simple sentence.

3 Examples of Simple Sentences

There are many different ways to construct simple sentences, but a simple sentence must always contain a subject and a predicate in addition to expressing a complete thought. Here are a few examples:

1. The car drove fast and erratically. This sentence has a single subject ("car"), a single verb ("drove"), and a compound adverb ("fast" and "erratically") in its predicate.

2. Tom and Mary walked to the store. The compound subject here consists of both Tom and Mary. The predicate is "walked to the store," with "walked" as the verb.

3. The bagels smell and taste fresh. This simple sentence contains a subject ("bagels") and a compound verb ("smell" and "taste").

A single sentence is one sentence. You always need a subject and a verb to complete a sentence. You have simple sentences and complex sentences.

Simple sentences include just one subject/ verb agreement and punctuation to end it (such as periods. exclamation points! or question marks?)

An example is: I like cake. Subject - I Verb in simple present - like object - cake punctuation - period.

Complex sentences have two or more clauses; there is more than one subject.

An example is: She likes cake, but her brother enjoys cookies!

There are two subjects here (she and her brother) and there are two conjugated verbs in the simple present (like and enjoy). I used an exclamation point to emphasize the sentence.

Extended Definition of Technical Terms

What is a technical term?

A technical term is a word, phrase or acronym that professionals use in their specific field to help save time when communicating with other knowledgeable professionals. These terms can develop and become abbreviated as the phrases become more common.

Technical terms in technology

Here are some technical terms used in the technology field:

Abstraction

Abstraction is the practice of simplifying data by removing unnecessary information.

ACID

ACID is an acronym that describes the four things a database needs in order to be secure: atomicity, consistency, isolation and durability.

Ad hoc network

An ad hoc network is a network that is established for a single use, instead of an ongoing connection. An example would be a connection between your phone's hotspot and a friend's computer.

Affiliate marketing

Affiliate marketing is when a company offers incentives to third-party affiliates like influencers or bloggers to sell the company's products on their website or social media channel.

Analog

Analog is a way of transferring data that depends on physical limitations. It was predominate before digital technology.

Assistive technology

Assistive technology is any software or hardware that is used to provide help for people with disabilities, including wheelchairs, prosthetics or text to speech technology.

Attachment

A file that a person sends through a messaging service like email. These attachments can be documents, pictures, audio or video files.

Authentication

Authentication is the process of verifying a person's identity or device.

Back-end

Back-end refers to any process that software or applications perform that are not about of the user experience, meaning they are not visible to the user. For example, a website encrypts your credit card data in the back-end of the checkout page, so that information is not visible to third parties.

Bandwidth

Bandwidth refers to the amount of data that can travel along a connection per second.

Big data

Big data is a term used to describe collections of data that are too big to be processed by traditional databases. Businesses usually collect big data from devices and applications to get information about their consumers' buying patterns.

Binary

Binary is a code of ones and zeros that creates a language computers can use to understand commands and execute programs.

Biometrics

Biometrics is technology that uses physical characteristics of a human to identify them.

Technical problem definition: A problem is a situation that is unsatisfactory and causes difficulties for people.

Although technology is undoubtedly making out lives easier, the ease of access to shared information presents a wide range of legal implications for businesses.

1. DATA SECURITY

Data security concerns posed by advances in technology and the manner in which consumers, businesses and other organizations use that technology will be a significant concern in the year ahead. Data-related issues permeate virtually all evolving technologies. With huge amounts of business and personal data transmitted and stored electronically, the opportunities for data breaches are dramatically increased and businesses must anticipate quick responses to satisfy a patchwork of state and federal data breach regulations. While those regulations continue to raise the standards for data security practices, contracting parties also expect greater accountability for these standards. Enhanced encryption and biometrics may also provide solutions for some of these problems.

2. BIG DATA

By one estimate, computer and device users create over 2.5 quintillion bytes of data daily! This is the world of Big Data. Technologies to analyze, use, and, in some cases, commercialize such vast amounts of data are beginning to be more widely deployed. However, the significant productivity gains and commercial opportunities are offset by serious security concerns and encroachments on privacy. Major issues will include who should control and be compensated for such data.

3. CLOUD COMPUTING

Cloud computing continues to show great promise for major cost savings for businesses and convenience for consumers. Yet, as more software applications and other computing resources are hosted and accessed online in the "cloud," data privacy and security risks are increasing, and contracting and licensing norms are evolving and becoming more difficult to manage.

4. OPEN SOURCE SOFTWARE

Non-proprietary open source software applications offer many benefits and costs savings, but compliance with open source license terms can be tricky. If not handled properly, use of open source software can compromise ownership of company software and jeopardize acquisitions and other significant business transactions.

5. MOBILE PAYMENTS

Several consumer surveys suggest that we keep better track of our mobile devices than we do of our wallets, so the rapid spread of mobile payments is no surprise. However, liability issues remain to be worked out for many transactions – misdirected payments, unauthorized access and account balance mistakes, among others – that may not go as intended.

6. SOCIAL MEDIA RELATED LIABILITIES

Widespread business use of social media tools means that companies must maintain and communicate clear policies of acceptable practices and ensure compliance with applicable terms. Many legal pitfalls exist, including running afoul of state-level sweepstakes regulations with online promotions; failure to comply with relevant FTC guidelines when using social media for online marketing programs; inadvertent infringements of third-party intellectual property rights when posting content; and contract breaches because of noncompliance with social media platform rules.

7. WEARABLE COMPUTING

Google Glass, computer watches (more elaborate than what Dick Tracy might have imagined) and other wearable computing devices push the boundary of mobile computing even further than the still recent wonders of smartphones and tablets. The tie-in of these devices with biometric monitoring, access and control offer potential conveniences while also presenting additional risks. The privacy, security and liability issues with such devices will likely dwarf the similar concerns (e.g., texting while driving) raised by our non-wearable mobile appendages.

8. THE INTERNET OF THINGS

Electronic tagging and tracking of objects and people with bar codes, RFID devices and other technologies and communicating the resulting data about locations, movements and status – the so-called "Internet of Things" – is on the cusp of becoming reality. While this technology may offer many benefits to businesses and consumers, the privacy issues posed by the Internet of Things are similar to the issues surrounding "Big Data."

9. VIRTUAL CURRENCIES

Offering convenience for many online transactions, virtual currencies (such as Bitcoin) fill a growing marketplace niche. However, unlike sovereign currencies, which are subject to varying degrees of regulation, virtual currencies do not fit neatly into existing legal frameworks. In addition, this fact has not gone unnoticed by criminal elements, and provides another reason that mainstream consumers and businesses are wary about the acceptability of digital currencies.

10. REMOTE AUTOMATION AND CONTROL

The remotely automated, controlled and monitored "smart office" and "smart home" – even smart cities – are now reality. However, a close look at the fine print about responsibility for accidents and mistakes reveals that disclaimers abound. Still to be sorted out is where the balance of liability will ultimately rest between providers and users of these automation and monitoring technologies.

How to solve Technical Problems-

1. My computer is running slowly

Two colleagues have identical machines, yet one is running at twice the speed. The solution for the slower worker is likely to be better housekeeping rather than an expensive upgrade of memory or the replacement of equipment.

If their computer's hard drive is full, the operating system will struggle to write files quickly. Clear out clutter by deleting unwanted files and moving items into the cloud, if possible.

Similarly, there may be too many processes running in the background draining the machine's short-term memory. Encourage the user to consider whether they really need 50 browser tabs open at the same time and ask them to close programs or applications they aren't using.

It's also worth running a virus scanner in case malware is present and to check whether system scans are running at the wrong time of day.

2. I've got the blue screen of death!

The dreaded error screen is sure to strike at the worst possible time. But once the panic has died down and the machine has restarted, it's unlikely the Windows shutdown will have been as serious as it first appeared.

It's still important to troubleshoot the error by running anti-virus software, checking whether there's enough memory space and identifying the impact of any recent software or hardware changes. Find out whether Microsoft has released patches or service packs that may require attention and be sure to update drivers for the hardware.

3. Downloads are taking too long

Will the egg timer's supply of sand ever run out? This, and the blue bar crawling across the screen at a snail's pace are bound to test the patience of any worker.

First, run a test to find out your download and upload speeds. Are they consistent with those advertised by your internet provider? One way to hit the accelerator involves the Domain Name System (DNS), which converts numerical internet protocol addresses into web names.

There are many useful tools and apps for finding the best DNS server for your location. Once you've changed your router's DNS server, every computer or device using that router will be updated for faster downloads and web browsing.

4. How can we remove pop-up ads?

Some pop-ups are unavoidable, such as warnings from your operating system highlighting security and performance issues needing attention. But if they come from an unexpected source then that's a sign all is not well and that the machine may be infected with adware.

Run security software that will get rid of this kind of malware, and if any ads continue to appear then encourage users to tick pop-up blocking options.

5. Our machines keep losing wifi

With web and video conferencing now commonplace, the on-off frustrations of an unreliable wireless connection can be a disaster for client relations. The starting point for troubleshooting this problem refers back to the age-old tech support solution of switching the router off and back on again.

If that's not successful then it may be that the wireless router first used to set up the network is overloaded, possibly as a result of growth in the business. There are now so many devices demanding wi-fi access that it's a good idea to avoid bottlenecks by installing multiple access points.

Other fixes might include switching hardware such as desktop PCs and printers on to a wired network. But there are other factors to consider, such as poor positioning of the router or the possibility of frequency interference from other wireless devices.

6. My printer won't print

Do we really need to print that document? The paperless office can't come soon enough for the beleaguered operations manager, whose daily round of tech support solutions is likely to include fixing paper jams and replacing ink cartridges and toners.

Other more mundane printer issues tend to revolve around ensuring that drivers and software are installed on the computer you want to print from. It's possible that the driver has become corrupted, meaning it needs to be reinstalled.

7. My mobile device isn't syncing work emails

The use of personal devices, known as Bring Your Own Device (BYOD), boosts workplace flexibility but presents new challenges in relation to security, connectivity and the pressure these extra systems place on the network.

And office tech support solutions need to cover these additional demands. One of the most common requests involves the syncing of work emails. For this, ensure that "push" is enabled so that new data goes to the user's device from the server. On Android phones, this may mean removing all accounts and clearing data and cache files before restarting the device and re-adding the accounts.

Operations managers have numerous responsibilities, but none is more important than ensuring business continuity. This means having a broad range of tech support solutions at their fingertips, as well as enough patience to help employees whose IT confidence might be lacking.

But with the experience gained of dealing with the same IT issues over a period of time, an SME will soon be able to drive down the number of work hours lost to outages.

Boosting productivity in this way highlights the importance of having a proactive approach to IT, whether it's tackling day-to-day problems yourself or using a specialist IT support service to ensure a quick resolution for issues that may be too big or technical to handle.

What is a task-based activity?

A task-based activity is a procedure in which students have to use the target language in order to achieve a specific outcome. The best TBL activities reflect real-life situations, so the students can see that the lesson is relevant to their own lives.

One of the main task-based learning advantages is that the activities allow students to use the language they know freely and exploratively as long as they are able to complete the overall task. Error correction can be done at the end of the lesson if necessary but not during the activity, so you encourage fluency and motivate students to use the language

Task-based language teaching (TBLT), also known as task-based instruction (TBI), focuses on the use of authentic language and on asking students to do meaningful tasks using the target language.

Task-based language learning is important because:

It is meaning-based but offer opportunities to study language.

It is motivating because it is relevant to learners.

It involves learning by doing..

Why is task-based learning important?

During task-based learning, students solve tasks that are relevant and interesting to them. In order to solve the task, they need to use the target language they're learning to communicate with their peers. They use authentic language instead of answering grammar or vocabulary questions about the language. Students — especially younger learners — don't actually feel that they're studying a language at that moment because they're engrossed in the task they're working on.

Task-based learning is especially conducive to group learning. Learning a language as a group is also a very important contributor to effective retention. Collaborating with others and becoming confident with the language within a group is a key step in acquiring that language. Also, receiving positive feedback from peers and teachers increases confidence and motivation to learn and to communicate with others.

Students' understanding of the language also deepens because the realistic context in which they're learning the language is relevant to their personal lives. It's a good idea to ask your students about their hobbies and preferences at the beginning of a course so that you can include their interests in the tasks you set.

In addition to the benefits for students, solid knowledge of this method will also increase your job prospects as a teacher. Some job ads, like this one from online ESL company Voxy, specifically ask for task-based language teaching experience!

What is the task-based method?

The task-based teaching approach is one of many modern ESL teaching methods and focuses on setting a goal for students — this could be a report, a video, or a presentation — and then following three main steps to achieve that goal.

1. The pre-task

During this stage, which can take up a whole lesson if needed, the teacher introduces the task to the students and gets them motivated to solve it. Once everyone is engaged, the teacher should explain what is expected for the task.

Verbal explanations can be supported by an example from the teacher or by showing a previous student's work. The teacher can then give further instructions if needed and offer advice on how to approach the task.

2. The task

This is the main stage of task-based learning, where students start working on the task, usually in groups or pairs. This stage is done in the target language so that students feel the need to use the language they want to learn in order to solve the task.

The teacher doesn't usually join in the work process. Instead, he or she will monitor the students and offer hints if students really need support.

Find out about teaching English online to groups.

3. The review (or post-task)

Once the students have completed the task and have something to present, the review stage, also known as the post-task, starts.

It's a good idea to let students evaluate each other's work and only offer a teacher review of frequently-made errors during the task. Peer correction could be carried out in the form of comments, feedback discussions, or a checklist with additional room for free commentary.

The review stage offers students the opportunity to reflect on their work and analyze it in order to improve their skills for the future.

Technical Terms

Technical terms are an essential part of all technical and scientific writing. Each field and specialty typically uses a vocabulary that relays a variety of specialized concepts by means of technical language. These special terms convey concentrated meanings that have been built up over significant periods of study of a field. The value of a specialized set of terms lies in the way each term condenses a mass of information into a single word. Technical terminology is often thought of as a shorthand, a way of gaining great depth and accuracy of meaning with economy of words. Technical terms often blend readily into formulae and mathematical manipulation, a term such as force being folded into a formula such as $f = ma$. This quantification allows the concept to be manipulated mathematically.

Technical terms can also lead to a great density of prose that is difficult to understand, even for the specialized reader. Observe these four principles when using specialized terminology:

Match terminology to the ability of the audience. You may use a term with great accuracy and still not reach your audience. It is important that you be aware of your audience's level of understanding. If they are not experts in your field, you will need to substitute more general terms for your specialized terms. That means that you may not be able to write with great accuracy about your topic.

Use terms with consistency. Be sure that you use the same term for a given item each time. If you shift from using mass to using weight in referring to the quantity of an object, if at first you call a tool a spanner and later call it a wrench, or if you shift from the Kelvin scale to Centigrade for measuring temperature, you may confuse the reader.

Provide clear definitions or explanations of unfamiliar terms. If you are using a specialized term that is not widely used in your audience, even if the audience is an expert one, be sure you provide a clear definition of your term.

Use a terminology list when you are introducing a variety of new terms into your discussion. The use of a list, which is generally placed before your introduction or in an appendix, can greatly aid a reader who wants to remind himself or herself of what you mean by the term.

Scientific Term

Scientific terminology is the part of the language that is used by scientists in the context of their professional activities. While studying nature, scientists often encounter or create new material or immaterial objects and concepts and are compelled to name them. Many of those names are known only to professionals. However, due to popularization of science, they gradually become part of common languages. Several categories of scientific terminology can be distinguished.

What is scientific and technical words?

Scientific and technical words describe the subject matter of the particular field of study. There are many scientific and technical words that are hard to understand, so to determine the meaning of these words, we can use context clues.

What Is Skimming?

Skimming is one of the tools you can use to read more in less time. Skimming refers to looking only for the general or main ideas, and works best with non-fiction (or factual) material. With skimming, your overall understanding is reduced because you don't read everything. You read only what is important to your purpose. Skimming takes place while reading and allows you to look for details in addition to the main ideas.

How to skim

Many people think that skimming is a haphazard process placing the eyes where ever they fall. However, to skim effectively, there has to be a structure but you don't read everything. What you read is more important than what you leave out. So what material do you read and what material do you leave out?

Let's say you are doing research on a long chapter or a web site. By reading the first few paragraphs in detail, you will get a good idea of what information will be discussed. Once you know where the reading is headed, you can begin to read only the first sentence of each paragraph. Also called topic sentences, they give you the main idea of the paragraph. If you do not get the main idea in the topic sentence or if the paragraph greatly interests you, then you may want to skim more.

At the end of each topic sentence, your eyes should drop down through the rest of the paragraph, looking for important pieces of information, such as names, dates, or events. Continue to read only topic sentences, dropping down through the rest of the paragraphs, until you are near the end. Since the last few paragraphs may contain a conclusion or summary, you should stop skimming there and read in detail. Remember that your overall comprehension will be lower than if you read in detail. If while skimming, you feel you are grasping the main ideas, then you are skimming correctly.

When to skim

Because skimming is done at a fast speed with less-than-normal comprehension, you shouldn't skim all the time. There are many times, however, when skimming is very useful.

Suppose you are taking a presentation skills class and have to deliver an oral report in a few days about the first computers ever made. You locate six books and four newspaper articles about this topic. Because you must be ready soon, you do not have time to read each word, but you need a large quantity of solid information.

Skimming will help you locate the information quickly while making sure you use your time wisely. It will also increase the amount of usable material you obtain for your research.

Suppose you have an exam in a few days. You need to review the material you learned, but you don't want to reread everything. By skimming, you can quickly locate the information you haven't mastered yet and study only that material.

While reading, ask yourself the following questions to help you decide whether or not to skim. If you answer yes to any of these, then skimming is a useful tool.

- Is this material non-fiction?
- Do I have a lot to read and only a small amount of time?
- Do I already know something about this?

- Can any of the material be skipped?

If you have sufficient background knowledge or believe you don't need the information, then skip it! That's right—don't read it at all! Believe it or not, skipping material may sometimes be the best use of your time. Just because someone wrote something doesn't mean you have to read it. If you pick and choose carefully what you skim and skip, you will be pleasantly surprised at the large amount of information you can get through in a short period of time.

What Is Scanning?

Scanning is another useful tool for speeding up your reading. Unlike skimming, when scanning, you look only for a specific fact or piece of information without reading everything. You scan when you look for your favorite show listed in the cable guide, for your friend's phone number in a telephone book, and for the sports scores in the newspaper. For scanning to be successful, you need to understand how your material is structured as well as comprehend what you read so you can locate the specific information you need. Scanning also allows you to find details and other information in a hurry.

How to scan

Because you already scan many different types of material in your daily life, learning more details about scanning will be easy. Establishing your purpose, locating the appropriate material, and knowing how the information is structured before you start scanning is essential.

The material you scan is typically arranged in the following ways: alphabetically, chronologically, non-alphabetically, by category, or textually. Alphabetical information is arranged in order from A to Z, while chronological information is arranged in time or numerical order.

Information can be also be arranged in non- alphabetical order, such as a television listing, or by category, listings of like items such as an auto parts catalog. Sometimes information is located within the written paragraphs of text, also known as a textual sense, as in an encyclopedia entry.

Learning to use your hands while scanning is very helpful in locating specific information. Do you do anything with your hands to locate a word in a dictionary? To find a meeting time on your calendar? To read a train or bus schedule? Using your hand or finger is extremely helpful in focusing your attention and keeping your place while scanning a column of material. Your peripheral vision can also help you scan effectively. When your hand moves down a list of names, you see not only the name your finger is pointing to, but also the names above and below. Let your eyes work for you when searching for information.

Keep the concept of key words in mind while scanning. Your purpose will determine the key words. Suppose you are looking for the time a train leaves from New York City for Washington,

D.C. The key words to keep in mind are "from New York City" and "to Washington, D.C." If you are looking for the cost of a computer printer with the code number PX-710, the key word to locate in a list of many printers is "PX-710."

When to scan

You scan when your aim is to find specific pieces of information. If you were doing the research for an oral presentation, you could scan the index of books, web sites, and reference materials. You would discover whether they contain any information you want and the pages where the information can be found.

In the past, you probably scanned without knowing you were doing it. Now with the information provided in this section, you can use scanning more intentionally and frequently. The more you practice, the more effective scanning will become. Finally, the most important benefit of scanning is its ability to help you become a more flexible reader. Scanning adds another high gear to your reading.

Because you may be used to reading every word and may be uncomfortable leaving some words out, you need to give yourself permission to overlook some words by skimming, scanning, and skipping material according to your reading purpose. I give you permission to NOT read everything!

In skimming you ignore the details and look for the main ideas. Main ideas are usually found in the first sentences of each paragraph and in the first and last paragraphs. It is also useful to pay attention to the organisation of the text.

Skimming is a speed reading strategy used as either a pre-reading technique to familiarize yourself with expository reading text before you read in depth or as an end in itself to quickly comprehend the essentials of a reading passage.

As a pre-reading technique, skimming helps to connect the text with any prior knowledge of the reader. Skimming also helps the reader to access the story schema so as to provide a referential context for the reading. In other words, skimming helps the reader to learn in advance what the gist of the reading passage is, while reminding the reader of any background information and knowledge of how the writing is organized that will assist the reader in understanding the text. Used as a pre-reading technique, skimming helps prepare the reader for scanning (reading at 50% comprehension) or further in-depth reading.

As an end in itself, skimming is a very practical and useful skill. As a speed reading technique, it saves time and allows the reader to get the flavor of a reading passage without all of the details. Skimming also permits broader reading, if time is a factor. For example, a reader can certainly skim many articles in the daily newspaper in the time that it might take to fully read a few. Many

books can be skimmed for enjoyment or information now and then read later at a more leisurely rate.

To skim, readers should first search for the expository text clues and signposts for key ideas of the reading passage. Textbooks usually provide important study helps that can build comprehension. The unit and chapter titles give information as to the overall focus of the reading passage. Many times, key chapter ideas are listed in bulleted form or as key questions. In social studies texts, timelines are often helpful.

Next, read the first paragraph of the text. The first paragraph frequently provide an introduction of the chapter main ideas.

Then, read the subtitles and bold print of key terms throughout the reading selection. These act as newspaper headlines to tell the "Who," "What," "Where," "When," and "Why" of the reading. Graphics, such as pictures, photographs, charts and drawings are particularly important to examine. Indeed, "a picture can be worth a thousand words."

Finally, read the concluding paragraph(s) or summary. This paragraph(s) will emphasize the key concepts.

Use these expository text clues or signposts for effective skimming. This speed reading technique is well worth practicing to perfection.

What is scanning and skimming main idea?

Skimming and scanning are reading techniques that use rapid eye movement and keywords to move quickly through text for slightly different purposes. Skimming is reading rapidly in order to get a general overview of the material. Scanning is reading rapidly in order to find specific facts.

Exercise1-

Pulp Friction

Every second, one hectare of the world's rainforest is destroyed. That's equivalent to two football fields. An area the size of New York City is lost every day. In a year, that adds up to 31 million hectares -- more than the land area of Poland. This alarming rate of destruction has serious consequences for the environment; scientists estimate, for example, that 137 species of plant, insect or animal become extinct every day due to logging. In British Columbia, where, since 1990, thirteen rainforest valleys have been clearcut, 142 species of salmon have already become extinct, and the habitats of grizzly bears, wolves and many other creatures are threatened. Logging, however, provides jobs, profits, taxes for the govenment and cheap products of all kinds for consumers, so the government is reluctant to restrict or control it.

Much of Canada's forestry production goes towards making pulp and paper. According to the Canadian Pulp and Paper Association, Canada supplies 34% of the world's wood pulp and 49% of its newsprint paper. If these paper products could be produced in some other way, Canadian forests could be preserved. Recently, a possible alternative way of producing paper has been suggested by agriculturalists and environmentalists: a plant called hemp.

Hemp has been cultivated by many cultures for thousands of years. It produces fibre which can be made into paper, fuel, oils, textiles, food, and rope. For centuries, it was essential to the economies of many countries because it was used to make the ropes and cables used on sailing ships; colonial expansion and the establishment of a world-wide trading network would not have been feasible without hemp. Nowadays, ships' cables are usually made from wire or synthetic fibres, but scientists are now suggesting that the cultivation of hemp should be revived for the production of paper and pulp. According to its proponents, four times as much paper can be produced from land using hemp rather than trees, and many environmentalists believe that the large-scale cultivation of hemp could reduce the pressure on Canada's forests.

However, there is a problem: hemp is illegal in many countries of the world. This plant, so useful for fibre, rope, oil, fuel and textiles, is a species of cannabis, related to the plant from which marijuana is produced. In the late 1930s, a movement to ban the drug marijuana began to gather force, resulting in the eventual banning of the cultivation not only of the plant used to produce the drug, but also of the commercial fibre-producing hemp plant. Although both George Washington and Thomas Jefferson grew hemp in large quantities on their own land, any American growing the plant today would soon find himself in prison -- despite the fact that marijuana cannot be produced from the hemp plant, since it contains almost no THC (the active ingredient in the drug).

In recent years, two major movements for legalization have been gathering strength. One group of activists believes that ALL cannabis should be legal -- both the hemp plant and the marijuana plant -- and that the use of the drug marijuana should not be an offense. They argue that marijuana is not dangerous or addictive, and that it is used by large numbers of people who are not criminals but productive members of society. They also point out that marijuana is less toxic than alcohol or tobacco. The other legalization movement is concerned only with the hemp plant used to produce fibre; this group wants to make it legal to cultivate the plant and sell the fibre for paper and pulp production. This second group has had a major triumph recently: in 1997, Canada

legalized the farming of hemp for fibre. For the first time since 1938, hundreds of farmers are planting this crop, and soon we can expect to see pulp and paper produced from this new source.

(NOTE: This activity was written before 2018, when Canada legalized the sale of recreational marijuana.)

1. The main idea of paragraph one is:
   A. ? Scientists are worried about New York City.
   B. ? Logging is destroying the rainforests.
   C. ? Governments make money from logging.
   D. ? Salmon are an endangered species.
2. The main idea of paragraph two is:
   A. ? Canadian forests are especially under threat.
   B. ? Hemp is a kind of plant.
   C. ? Canada is a major supplier of paper and pulp.
   D. ? Canada produces a lot of hemp.
3. The main idea of paragraph three is:
   A. ? Paper could be made from hemp instead of trees.
   B. ? Hemp is useful for fuel.
   C. ? Hemp has been cultivated throughout history.
   D. ? Hemp is essential for building large ships.
4. The main idea of paragraph four is:
   A. ? Hemp is used to produce drugs.
   B. ? Many famous people used to grow hemp.
   C. ? It is illegal to grow hemp.
   D. ? Hemp is useful for producing many things.
5. The main idea of paragraph five is:
   A. ? Hemp should be illegal because it is dangerous.

B. ? Recently, many people have been working to legalize hemp.

C. ? Hemp was made illegal in 1938.

D. ? Marijuana is not a dangerous drug.

Exercise 2-

Every second, one hectare of the world's rainforest is destroyed. That's equivalent to two football fields. An area the size of New York City is lost every day. In a year, that adds up to 31 million hectares -- more than the land area of Poland. This alarming rate of destruction has serious consequences for the environment; scientists estimate, for example, that 137 species of plant, insect or animal become extinct every day due to logging. In British Columbia, where, since 1990, thirteen rainforest valleys have been clearcut, 142 species of salmon have already become extinct, and the habitats of grizzly bears, wolves and many other creatures are threatened. Logging, however, provides jobs, profits, taxes for the govenment and cheap products of all kinds for consumers, so the government is reluctant to restrict or control it.

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the drug, but also of the commercial fibre-producing hemp plant. Although both George Washington and Thomas Jefferson grew hemp in large quantities on their own land, any American growing the plant today would soon find himself in prison -- despite the fact that marijuana cannot be produced from the hemp plant, since it contains almost no THC (the active ingredient in the drug).

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1. How many species of salmon have become extinct in BC?
   A. ✗ 27
   B. ? 31
   C. ? 137
   D. ✓ 142

2. How much of the world's newsprint paper is supplied by Canada?
   A. ? 31%
   B. ✓ 49%
   C. ? 34%
   D. ? 19%

3. What equipment on a ship was made from hemp?
   A. ? ropes
   B. ✗ waterproof cloth
   C. ✗ engine fuel

D. ✗ life rafts

4. What drug can be obtained from a relative of hemp?
   A. ✗ cocaine
   B. ✗ heroin
   C. ✗ amphetamine
   D. ? marijuana

5. Where was hemp farming recently legalized?
   A. ? USA
   B. ✓ Canada
   C. ✗ Singapore
   D. ✗ Netherlands

Scanning to locate specifically required information.

When you look for a telephone number or a name in an index, your eyes move quickly over the words until you find the particular information you are looking for. You ignore everything except the specific information you want. Scanning is directed and purposeful and should be extremely fast.

Exercise 1

Read the following text quickly and fill in the table. What do the numbers given in the table refer to?

1%	
2%	
6%	
13%	
16%	

30%	
3/4	
86%	

Spoon-fed feel lost at the cutting edge

Before arriving at university students will have been powerfully influenced by their school's approach to learning particular subjects. Yet this is only rarely taken into account by teachers in higher education, according to new research carried out at Nottingham University, which could explain why so many students experience problems making the transition.

Historian Alan Booth says there is a growing feeling on both sides of the Atlantic that the shift from school to university-style learning could be vastly improved. But little consensus exists about who or what is at fault when the students cannot cope. "School teachers commonly blame the poor quality of university teaching, citing factors such as large first-year lectures, the widespread use of inexperienced postgraduate tutors and the general lack of concern for students in an environment where research is dominant in career progression," Dr Booth said.

Many university tutors on the other hand claim that the school system is failing to prepare students for what will be expected of them at university. A-level history in particular is seen to be teacher-dominated, creating a passive dependency culture.

But while both sides are bent on attacking each other, little is heard during such exchanges from the students themselves, according to Dr Booth, who has devised a questionnaire to test the views of more than 200 first-year history students at Nottingham over a three-year period. The students were asked about their experience of how history is taught at the outset of their degree programme. It quickly became clear that teaching methods in school were pretty staid.

About 30 per cent of respondents claimed to have made significant use of primary sources (few felt very confident in handling them) and this had mostly been in connection with project work. Only 16 per cent had used video/audio; 2 per cent had experienced field trips and less than 1 per cent had engaged in role-play.

Dr Booth found students and teachers were frequently restricted by the assessment style which remains dominated by exams. These put obstacles in the way of more adventurous teaching and active learning, he said. Of the students in the survey just 13 per cent felt their A-level course had prepared them very well for work at university. Three-quarters felt it had prepared them fairly well.

One typical comment sums up the contrasting approach: "At A-level we tended to be spoon-fed with dictated notes and if we were told to do any background reading (which was rare) we were told exactly which pages to read out of the book".

To test this further the students were asked how well they were prepared in specific skills central to degree level history study. The answers reveal that the students felt most confident at taking notes from lectures and organising their notes. They were least able to give an oral presentation and there was no great confidence in contributing to seminars, knowing how much to read, using primary sources and searching for texts. Even reading and taking notes from a book were often problematic. Just 6 per cent of the sample said they felt competent at writing essays, the staple A level assessment activity.

The personal influence of the teacher was paramount. In fact individual teachers were the centre of students' learning at A level with some 86 per cent of respondents reporting that their teachers had been more influential in their development as historians than the students' own reading and thinking.

The ideal teacher turned out to be someone who was enthusiastic about the subject; a good clear communicator who encouraged discussion. The ideal teacher was able to develop students involvement and independence. He or she was approachable and willing to help. The bad teacher, according to the survey, dictates notes and allows no room for discussion. He or she makes students learn strings of facts; appears uninterested in the subject and fails to listen to other points of view.

No matter how poor the students judged their preparedness for degree-level study, however, there was a fairly widespread optimism that the experience would change them significantly, particularly in terms of their open mindedness and ability to cope with people.

But it was clear, Dr Booth said, that the importance attached by many departments to third-year teaching could be misplaced. "Very often tutors regard the third year as the crucial time, allowing postgraduates to do a lot of the earlier teaching. But I am coming to the conclusion that the first year at university is the critical point of intervention".

Alison Utley, *Times Higher Education Supplement.* February 6th, 1998.

Exercise 2

Read the following text quickly and answer the questions.

1. When were X-rays discovered?
2. Who discovered them?
3. What are the four characteristics of X-rays?