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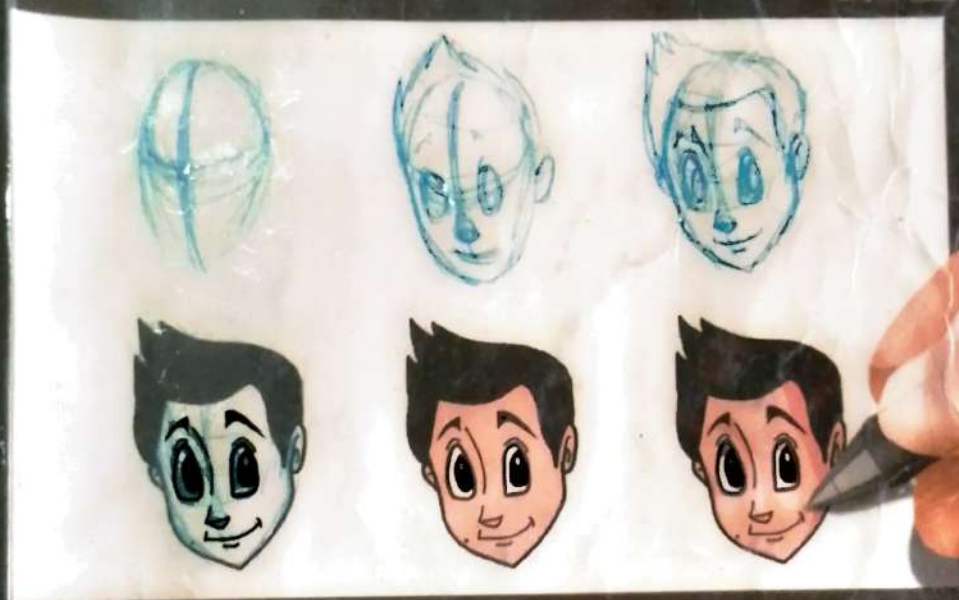
Volume I

Innovative Training Works, Inc.



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Volume I

Innovative Training Works, Inc.

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Preface

Animation Volume I by Innovative Training Works, Inc. is a specialized module designed to develop and hone the knowledge, skills, and attitudes of students on competencies leading to 2D-Animation National Certification II (NC II). It aims to equip the students with computer skills and knowledge needed to be competent individuals in the field of animation.

This course provides the competencies that are most important to animators, such as Personal Entrepreneurial Competencies (PECs), Environment and Market, Tools and Equipment used in Animation, and Clean-Up and In-Between Drawings, which are aligned to the standards set by the Department of Education for the senior high school level.

This book is divided into four units: Unit I covers Personal Entrepreneurial Competencies and Environment and Market that will develop student's attitudes, skills, knowledge, and ability required to run a business in the field of animation. It also prepares student animators for the modern world of animation as they adhere to the core principles and basic planning in animation filmmaking. Unit II covers the animation design elements and principle as core knowledge needed in developing a simple animation. Unit III tackles the basic knowledge in computer-generated animation using an animation software. A walk-through to the core techniques and approaches needed to become an animator is covered as well. Unit IV is the final stage in producing the final output, a short clip animation.

This book consists of:

- **Lesson Objectives** – a list of milestones to be achieved in every lesson. This is an effective way to make sure that the path to learning has been achieved.
- **Pre-Test/Post-Test** – set of questions administered prior to and after every lesson to determine the baseline knowledge and the effectiveness of the lesson in increasing the students' knowledge of content.
- **Lesson Discussion** – where the topics are presented according to the objectives to be attained per lesson.
- **Key Terms** – terms learned with definitions. This will help the students remember the terms that were newly introduced, uncommon, or specialized in the lesson.
- **Questions for Discussion** – set of questions that encourages the students to participate in the discussion which shows multiple viewpoints.
- **Learning Activity** – culminating activities for the lesson, which enhance the creativity and critical thinking skills of the students.
- **Lesson Summary** – a summary of topics given in each lesson. At a glance, the students will be able to recall the main points covered in the lesson.
- **Self-Evaluation** – examines the understanding of the lesson. It helps the students assess their strengths and work on their weaknesses about the lesson.

UNIT I

Basic Competencies

Lesson 1: Introduction to and Developing Personal Entrepreneurial Competencies (PECs)

- Personal Entrepreneurial Competencies (PECs)
- Environment and Market
- Core Competencies in Animation
- Opportunities in Animation

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. develop one's character into Personal Entrepreneurial Competencies in locality or town;
2. identify the core competencies of an animator; and
3. identify opportunities for business or career as an animator.

PT Pre-Test

Multiple Choice: Circle the letter that corresponds to the correct answer.

1. Based on its definition, what best describes an entrepreneur?
   a. innovator, team leader, facilitator
   b. organizer, innovator, facilitator
   c. organizer, manager, risk-taker
   d. risk-taker, organizer, facilitator

2. What are the three clusters of PECs?
   a. achievement, planning, power
   b. achievement, persistence, power
   c. persistence, goal setting, self-confidence
   d. persistence, planning, risk-taking

3. Which of the following belongs to the power cluster?
   a. persistence, self-confidence
   b. persuasion and networking, self-confidence
   c. persistence, risk-taking
   d. goal setting, systematic planning

4. Which of the following refers to a set of competencies that supports the motive for being successful in the entrepreneurial undertaking?
   a. achievement
   b. planning
   c. power
   d. all of the above

5. Which of the following set of competencies is under the Planning Cluster?
   a. goal setting, information seeking
   b. opportunity seeking, demand for efficiency, and quality
   c. persistence, risk taking
   d. self-confidence, networking

6. Which of the following is *not* an environment factor that affects business?
   a. culture
   b. demography
   c. economy
   d. people

7. Which of the following is a set of economic indicators?
   a. inflation, GDP, unemployment rate
   b. demand, market, inflation
   c. inflation, demand, unemployment rate
   d. GDP, market, demand

8. Which of the following is one of the economic indicators that drives up inflation?
   a. demand
   b. supply
   c. unemployment
   d. poverty

9. What is the process of creating transitional frames for a character's movement?
   a. clean-up
   b. in-between
   c. background
   d. none of the above

10. What is a summary that defines what one thinks is needed to launch one's business?
   a. business plan
   b. action plan
   c. all of the above
   d. none of the above

LD Lesson Discussion

In recent years, the Philippines has been the subject of attention of many well-known international animation studios. This is not to say that we are a new player in the animation industry. Animation in the Philippines has been around since the 1950s through animated advertisements until in 1979, a 60-minute animated feature was produced based on a local folklore called *The Adventures of Lam-Ang*. In 1983, Burbank Studios of Australia was the first to sub-contract animation production in the Philippines, setting up its studio in Manila. The prospects and potentials for Filipino animators has been established since then.

Nowadays, more than ever, with the help of technology, animation has never been more promising to our Filipino animators. The rise and expansion of the BPO industry has been a significant factor in the demand for animation professionals in our country. But what does it really take to succeed as an animator whether you decide to work for a company or start a company of your own?

Personal Entrepreneurial Competencies (PECs)

To learn what PECs is and to be able to explain why we need to have, or at least examine one's self to develop PECs, let us first break down and define significant terms so we can better understand PECs in layman's terms.

First, what is an "entrepreneur"? Taking from Merriam-Webster's definition, an entrepreneur is "one who organizes, manages, and assumes the risks of a business or enterprise."

Second, to be successful in this undertaking, it is suggested that one must be competent enough to handle its rigors. But what exactly is being "competent"? According to the Merriam-Webster's definition, it is "having the necessary ability or skills: able to do something well or well enough to meet a standard."

There is no exact definition for "entrepreneurial competency" but by combining the two definitions taken from Merriam-Webster, it follows that entrepreneurial competency or competencies is a concept of a collective set of abilities (could be non-academic or a person's inherent positive character, trait, attitude) and/or skills, sufficient enough or more than sufficient to organize, manage and assume the risk of a business or enterprise (profitably).

In 1988, the United Nations Conference on Trade and Development (UNCTAD), through its Empretec program, identified and introduced behavioral patterns inherent and consistent to successful entrepreneurs, worldwide. These were subsequently identified as "entrepreneurial competencies." This was based on Professor Donald McClelland's research through his McBer Company and MSI. Professor McClelland is a psychologist at Harvard University who has done extensive research work on entrepreneurship since the late 1950s.

Empretec presented these entrepreneurial competencies in three clusters, namely, achievement, planning, and power.

Table 1. Summary of Entrepreneurial Competencies

Achievement	Planning	Power
• Opportunity seeking • Persistence • Commitment to work contract • Risk-taking • Demand for efficiency and quality	• Goal setting • Information seeking • Systematic planning and monitoring	• Persuasion and networking • Self-confidence

Achievement Cluster

This refers to a set of competencies that supports the motive for being successful in the entrepreneurial undertaking. Under this cluster are the following competencies:

- *Opportunity seeking.* A successful entrepreneur is observant or always on the lookout for any opportunity to create a profitable business venture at a given situation or for a given product or service. This includes the ability to be innovative and sometimes to be inventive in order to capitalize on such opportunity.

- *Persistence.* This refers to the characteristic of an entrepreneur of being steadfast in his/her decisions and cannot be easily dissuaded when faced with difficulties.
- *Commitment to work contract.* This refers to the ability to do whatever it takes, even to the point of making certain sacrifices, to make sure that he/she delivers on time or on the agreed period with his clients.
- *Risk-taking.* Though it is expected that an entrepreneur must be able to take certain risks at times—if not most of the time—to be able to capitalize on a given opportunity, he does not do this blindly but rather on a more intelligent or calculated basis. Remember that while the main objective of taking risk is to be able to make a more profitable venture, one must recognize as well, when to act in order to prevent further loses.
- *Demand for efficiency and quality.* A good or a successful entrepreneur always demands good, if not better quality of products or services, and keeps on improving from there. This will allow him/her to position his/her venture at a more profitable situation. After all, consumers or your clients will demand the same. If they will not find quality and efficiency from your goods or services, or something better, they will be quick to look for it somewhere else. Perhaps a good practice to this competency is to put yourself in your clients' shoe. As an entrepreneur, you are also a consumer in one way or the other and therefore must be sensitive about your clients' satisfaction.

Planning Cluster

This refers to a set of competencies that allows the entrepreneur to organize and prepare procedures to ensure that his/her venture will keep moving forward. This will also allow the entrepreneur to be prepared and react well enough on any eventuality or set back that he/she might encounter along the way

Competencies identified with this cluster are:

- *Goal setting.* One of the first steps that an entrepreneur does is to set a goal for his venture. This could be one simple goal or a greater one that could be divided into different sub-goals. This goal will serve as the guide and the direction on where and how far you want to take your venture. In setting a goal, a good rule of thumb is to do it SMART (**S**pecific, **M**easurable, **A**ttainable, **R**ealistic, **T**ime-bound).
- *Information seeking.* A successful entrepreneur is always keen about information, has an open mind and always strives to seek for more information about the market, competition, and more importantly, about his customers. A well-informed entrepreneur can create better ideas about how to improve his/her product or service—*information to innovation.*
- *Systematic planning and monitoring.* This refers to the entrepreneur's ability to create a well-organized and efficient plan that is logically sound yet simple or practical. This plan must lead him/her to achieve his/her goals and should keep him moving forward. He/she must also have the ability to track (monitor) if the plan is working or not and be ready to take alternative strategies when it becomes necessary.

Power Cluster

Perhaps one of the most rewarding aspects of being an entrepreneur is being your own boss. But this does not come until after you have worked hard enough to set up your business efficiently and get it running smoothly enough to profit and to endure. After all, as they say, "with great power comes great responsibility."

The power cluster identifies two competencies that one might say, most personal to an entrepreneur. This will mostly define the true character of a successful entrepreneur.

- *Persuasion and networking*. One of the most challenging tasks and maybe exciting to others is making people believe in you (or your products and services). By influencing other people's minds and making them spread the word for you to make them believe in you as well (networking), that your product or service is better than others, could be a daunting task that will test your persistence, among other things. But by being successful in this task, you will be able to build your patrons or client base.
- *Self-confidence*. Perhaps one of the most observable traits of a person, this refers to a strong belief upon one's self that you can complete a task no matter how difficult it might become. In the context of entrepreneurship, especially on the start-up stage of your venture, you are your own boss indeed. Ironically, most of the time, you are your only worker as well. So, having a strong belief in your own capabilities and hanging on to it might spell the difference between success and failure.

  In the Learning Activity section of this lesson, you will find a self-assessment document that should allow you to identify the key competencies where you are probably the strongest, and key competencies where you could be the weakest. Depending on the specific competency that you identified to be weaker, you may create an action plan on how you can improve on such competencies. In most cases, improving one's PECs will either require you to acquire more skills that you can get through education or training while in some instance may require you to change your attitude or practice toward improving your character as an entrepreneur. This will be the first step in aligning your PECs to gain better chance of being a successful entrepreneur in the animation industry.

Environment and Market

Whether you decide to work for a company or be your own boss, it is essential to be able to identify and study the environment and market of animation industry in your area or in the Philippines. This way, you can also identify options or alternatives if your original plan will not work and work around your situation to be able to move forward.

Assuming you have decided and taken on the challenge of being your own boss, one of your first steps is to identify where you would like to physically set up your business. A lot of things have to be considered when trying to find the right environment for your business. Environment in the business context does not necessarily mean the physical location alone. Business environment encompasses how you would like to run or operate your business internally and externally, tangible and intangible.

Examples of tangible factors are the physical location, like a particular economic or business zone in your area; accessibility of the location, as in availability and sufficiency of transport mode or network, especially of public ones; proximity to your suppliers and clients, as well as to your competitors; and the physical layout and structure of your office. Is it presentable enough?

On the other hand, examples of intangible factors are the provisions for government regulations pertaining to your chosen business; the political situation in the locality and surrounding areas; the culture and demography of the people—population, economic and social status can greatly affect your market; and the technology available to support the distribution of your products or services all play a great role in identifying the kind of environment you would like your business to be in.

Environment Factors

The following are essential environment factors an entrepreneur should consider when setting up a business:

1. Natural and physical environment – refers to the actual, physical location of the business, whether it is a store outlet or an office. Ideally, your business address should be situated in a location that will be clearly visible and, as much as possible, in close proximity to your target market. It should be located in an area that is conducive to transact business, ambient surrounding should be appropriate; and easily accessible to your target or potential market.
2. Demography – refers to the size or population of your potential market and the diversity of their socio-economic grouping (i.e., class, size, status, beliefs, age, and gender). Such factors will influence the kind of product or service you may want to offer. Or, such information would allow an entrepreneur to find out what kind of improvements he/she needs to make on his/her product or service and adjust his/her marketing and pricing strategies accordingly.
3. Culture – refers to the people's way of life. It is important to consider this because, as an entrepreneur, you need to create products or services that match the needs of your target market based on their way of life. One good way of ensuring a repeat business with your clients is to create a need for your product or service so you can make them come back over and over. Also, you have to consider the culture of the people around your business area. For instance, if you put up your business in a place where crime is rampant and therefore the security of your potential market is at risk, then you cannot expect your clients to come and do business with you all the time.
4. Government regulations – the very first thing you need to consider and do is to legalize your business. This will allow you to freely transact and dispense your products or services. But of course being a legal entity also means that you will have to comply with all the regulations and policies set by the different government agencies concerned, both local and national. These include the appropriate permits to the establishment or store, any safety and sanitary regulation or procedure that has to be practiced, etc.
5. Economy – can be interpreted as the effective management of production, consumption and trade of limited goods and services. By and large, economy influences how well goods and services are traded in the market. This could be in terms of local or global market. The amount of taxes that you pay, the quality of life of the

people, and the cost of living are some of the things that are influenced by economy. As an entrepreneur, being sensitive and observant to economic indicators may prove to be quite essential and useful especially when making critical business decisions. Generally, these indicators, among others, are:

- Inflation – the increase of the general price level of goods and services that could be sustained over a period of time, usually annual. This determines the buying or spending power of the consumers. The ideal situation is to have a low inflation rate as much as possible. Low inflation means consumers can buy more goods for their money while high inflation means less goods for your money.
- Gross Domestic Product (GDP) – one of the primary indicators about how well or poor a country's economy is doing within a certain period, usually annual. It reflects the gross domestic income derived from salaries and wages, profits from businesses, and even the taxes collected by the government. An ideal situation in terms of GDP is to keep it high. The higher the GDP, the more spending power a consumer has.
- Unemployment Rate – the percentage of people who are actively seeking a job but could not find one. A high unemployment rate means there is less income for consumers to spend. Less spending means less business. So, like inflation, the ideal situation is to keep the unemployment rate low enough, at the "natural level," so that it will not drive up inflation.

Core Competencies in Animation

Now that you have identified your entrepreneurial competencies, you must be able to identify the competencies that are expected of your chosen career or business, in this case, animation. A lot of people may think that animation could be easily done nowadays because of computers. Truth is, animation production can be harder than it looks even with the use of computers or technology, in general. The principles and the processes involved in creating animation stay the same and the technology or the computer is nothing but a tool to hasten the process.

The key competencies in animation may be summarized through the following and will be discussed in detail in the following lessons:

1. Principles of Animation – refer to the skills, processes, techniques, and styles in creating animation materials, such as:
   - Drawing Skill (Talent) – characters, backgrounds and scenes, and other objects in an animation material
   - Compositing through computer graphics
   - Coloring – understanding of the color psychology either to create a theme or set the mood
   - Storyboarding – as a means to outline and plan the direction of the story and scenes of an animation material
   - Use of technology (computers and software) as a tool to produce animation materials more efficiently
   - Creating animation effects and special effects
   - Documentation of materials

2. Principles of Cinematography or Film-making – refer to the skills, processes, and techniques in creating motion pictures or movie such as:
   - Staging and blocking of characters
   - Lighting and angles
   - Shot construction
   - Character performance

Opportunities in Animation

The Internet has created such a great impact in the way we do business or work today. After you have assessed and aligned your PECs and decide to start up your own animation business, you can do so even in the comforts of your own home… or room. However, it is always preferable to have your own and proper office when transacting and doing business with your clients. But if you do have to start small and could not afford to lease an office space, you can still move forward in starting up your own animation business. Here is a sample action plan that could give you an idea to be able to jump start your plan.

1. **Identify and decide the kind of work or service you want to do.** Ideally, you may want to be able to provide a whole animation production service. Being the case, you need to make sure that you have the knowledge and complete understanding of all the processes involved in producing animation films from pre-production to post-production stages.

   If a full service animation production seems to be a big chunk to chew for you, for whatever reason, do not fret. You can actually decide to provide specialty animation service like "in-betweening" and clean-up or even just coloring. It is just a matter of convincing clients to see why it is more profitable for them to avail of your specialty service than doing it on their own.

   Remember though, that whatever you decide on doing, you must think of that one thing that makes your service not only unique but more valuable than your competitors. This is your unique selling proposition (USP). This will give your clients a good reason to use or avail of your service rather than someone else's.

2. **Build a team.** Whether you opt to provide full animation services or create a niche in specializing on a specific production step, you will need to build a team to either simply assist you in different tasks or to create a specialist out of each one. You cannot know everything. Even if you do, it is always good to have someone who knows every little detail of a specific task to ensure the quality of the job.

   When building your team, make sure to find someone you can trust and complements your strong abilities. What good is it to have two people in the same team who knows only as much as you know? You want someone who can add up or contribute to what you can do to expand or broaden your abilities as a team.

3. **Create a working name.** A working name or your business name is what people will have to remember when referring to your service. Although thinking about a good working name can be difficult sometimes, here are a few guidelines about what your working name should be:
   a. It should reflect what your business is all about.
   b. It should create a good impression and can easily be remembered.
   c. It should suggest that you are running a company and not just a one man show.

4. **Create a business plan.** A business plan does not necessarily have to be long but rather should contain a summary that defines what you think is needed to launch your business. It has the following elements.

   a. Business concept – defines the business as a whole and gives insight on what product or service will be sold, its target market, the product's USP, and how you achieve it

   b. Financial overview – a projection or estimate of your yearly income and expenses to see if in fact the business will be profitable and worthwhile

   c. Capital requirements – states the amount of money you will need to start the business, and to operate or expand it as well as the source. If the source will be a loan, it has to state on what terms the loan has to be repaid and when it will be repaid

   d. Company's legal status – states relevant information about the company itself. The kind of business entity it will have whether proprietary, partnership, corporation, etc

   e. Goals and milestones – refers to the targets and indicators that the company must achieve in order to manifest any development or if the business has become a success

If in case entrepreneurship is not your cup of tea and are wondering what other options you may have to start a career in animation, you must know that you can always turn to other industries that uses animation. They may use animation on a different discipline but the process of creating and producing it will virtually stay the same. Other animation careers you may look into and perhaps get interested are:

a. Mechanical animation – is all about modeling parts and pieces of different objects or machinery before it goes to production

b. Science and engineering – more on 3D animation production

c. Forensic animation – uses mostly 3D animation production as well, to recreate crime scene or events to help in criminal investigations

d. Medical animation – can sometimes be more demanding in terms of accurate modeling and also mainly uses 3D animation

e. Architecture and landscaping – more on the design discipline for environments and technical modeling

f. Computer game animation – perhaps still on the entertainment side of the industry but nevertheless more exciting to do

g. Web and graphic design animation – perhaps one of the most common and easiest to start on your own

If, on the other hand, you are quite bent on landing a job and starting a career in the animation industry itself, here are some positions or jobs that you can get into:

a. In-between artist – creates the transition images for the character's movement between two key frames

b. Character rigger – manipulates the geometry of the character as it moves or interacts within the scene

c. Render-wrangler – monitors and controls the rendering process with either one or few rendering computers up to hundreds of computers as in a "rendering farm"

d. Stop motion animator – uses different modeling media like puppets or clay to produce animated films

e. Background painter – as the name suggests, is responsible for creating backgrounds for the animated film

f. Lighting Technician – creates light rigs for shots and is responsible for ensuring the correct lighting and shadow effects in the animated film

g. Color key artist – develops the color scheme for the backgrounds used in the animated film

h. Storyboard artist – responsible for drawing the scenes that will be used in the animated film

i. Concept artist – creates the overall visual concept for an animated film

j. Independent film-maker – produce animated films outside of major animation studios

KT Key Terms

- **Animator** – a person who creates or is involved in the process of creating an animated film
- **Blocking** – the precise positioning and movement of an actor or character in a stage or in an animated film
- **Competency** – the minimum skill required to perform a specific job function
- **Compositing** – the process of combining different images or visual elements from different sources into a single image
- **Demography** – statistical population characteristics of a group of people
- **Entrepreneur** – a person who organizes, operates, and assumes the risk in creating a business
- **Inflation** – the decreasing value of money over time
- **In-between** – the process of creating transitional frames for a character's movement
- **Staging** – the process or method of presenting a scene in an animated film

LA Learning Activity

The following is the self-assessment test used in the APEC Conference in Manila (2009). This was based on the assessment or system used by Management Systems International (MSI) and McBer, consulting companies in their study of the PECs as sanctioned by the UNCTAD through its Empretec program (1988). *(Source: http://unctad.org/en/Docs/diaeed20093_en.pdf)*

The following questions will allow respondents to assess their Personal Entrepreneurial Competencies. Rate each statement based on how it best describes you by using the rating guide below. Write your rating on the space provided.

5	Always
4	Usually
3	Sometimes
2	Rarely
1	Never

____ 1. I look for things that need to be done.

____ 2. When I am faced with a difficult problem, I spend a lot of time trying to find a solution.

____ 3. I complete my work on time.

____ 4. It bothers me when things are not done very well.

____ 5. I prefer situations in which I can control the outcomes as much as possible.

____ 6. I like to think about the future.

____ 7. When starting a new task or project, I gather a great deal of information before going ahead.

____ 8. I plan a large project by breaking it down into smaller tasks.

____ 9. I get others to support my recommendations.

____ 10. I feel confident that I will succeed at whatever I try to do.

____ 11. No matter with whom I'm talking to, I'm a good listener.

____ 12. I do things that need to be done before being asked by others.

____ 13. I try several times to get people to do what I would like them to do.

____ 14. I keep the promises I make.

____ 15. My own work is better than that of other people work with.

____ 16. I don't try something new without making sure I will succeed.

____ 17. It's a waste of time to worry about what to do with your life.

____ 18. I seek the advice of people who know a lot about the tasks I am working on.

____ 19. I think about the advantages and disadvantages of different ways of accomplishing things.

____ 20. I do not spend much time thinking how to influence others.

____ 21. I change my mind if others disagree strongly with me.

____ 22. I feel resentful when I don't get my way.

____ 23. I like challenges and new opportunities.

____ 24. When something gets in the way of what I'm trying to do, I keep on trying to accomplish what I want.

____ 25. I am happy to do someone else's work if necessary to get the job done on time.

____ 26. It bothers me when my time is wasted.

____ 27. I weigh my chances of succeeding or failing before I decide to do something.

____ 28. The more specific I can be about what I want out of life, the more chances I have to succeed.

____ 29. I take action without wasting time gathering information.

____ 30. I try to think of all the problems I may encounter and plan what to do if each problem occurs.

____ 31. I get important people to help me accomplish my goals.

____ 32. When trying something challenging, I feel confident that I will succeed.

____ 33. In the past, I have had failures.

____ 34. I prefer activities that I know well and with which I am comfortable.

____ 35. When faced with major difficulties, I quickly go on to other things.

____ 36. When I am doing a job for someone, I make a special effort to make sure that person is happy with my work.

____ 37. I am never entirely happy with the way things are done; I always think there must be a better way.

____ 38. I do things that are risky.

____ 39. I have a very clear plan for my life.

____ 40. When working on a project for someone, I ask many questions to be sure I understand what that person wants.

____ 41. I deal with problems as they arise, rather than spend time trying to anticipate them.

____ 42. In order to reach my goals, I think of solutions that are beneficial for me and my plans.

____ 43. I do very good work.

____ 44. There have been occasions when I took advantage of someone.

____ 45. I try things that are very new and different from what I have done before.

____ 46. I try several ways to overcome things that get in the way of reaching my goals.

____ 47. My family and personal life are more important to me than work deadlines I set for myself.

____ 48. I find ways to complete tasks faster at work and at home.

____ 49. I do things that others consider risky.

____ 50. I am as concerned about meeting my weekly goals as I am for my yearly goals.

____ 51. I go to several different sources to get information for tasks or projects.

____ 52. If one approach to a problem does not work, I think of another approach.

____ 53. I am able to get people who have strong opinions or ideas to change their minds.

____ 54. I stick with my decisions even if others disagree strongly with me.

____ 55. When I don't know something, I don't mind admitting it.

How to Score

In the PECs Scoring Sheet below, the numbers enclosed in parentheses in the shaded rows indicate the item number on the questionnaire. Write down the corresponding rating you gave for each item in the box right above each of the item numbers. Then, perform the indicated operation for the series of rating for each row. Write the total on the score column. Note that the item numbers on the scoring sheet are arranged sequentially per column.

The last row on the scoring sheet indicates a correction factor score. The correction factor will determine if the respondent may have attempted to build himself up in trying to get a high overall assessment. If the score on the correction factor row is greater or equal to 20, then you will need to fill out the "Correction" column and perform the indicated operation to get the "Corrected" score. Otherwise, the original score will be used.

The following correction factors will be used against the original score for each PEC:

Correction factor score	Subtract from PECs score
24 or 25	7
22 or 23	5
20 or 21	3
19 or less	0

PECs Scoring Sheet

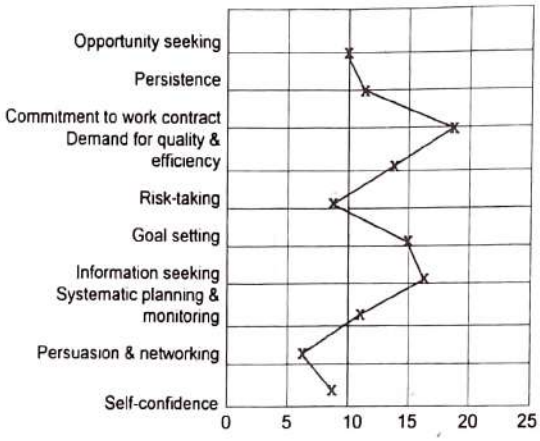
Rating of Statements												Score		Correction		Corrected Score	PECs
	+		+		-		+		+	6	=		-		=		Opportunity Seeking
(1)		(12)		(23)		(34)		(45)									
	+		+		-		+		+	6	=		-		=		Persistence
(2)		(13)		(24)		(35)		(46)									
	+		+		+		-		+	6	=		-		=		Commitment to Work Contract
(3)		(14)		(25)		(36)		(47)									
	+		+		+		-		+	6	=		-		=		Demand for Efficiency and Quality
(4)		(15)		(26)		(37)		(48)									
	-		+		+		+		+	6	=		-		=		Risk-Taking
(5)		(16)		(27)		(38)		(49)									
	-		+		+		+		+	6	=		-		=		Goal Setting
(6)		(17)		(28)		(39)		(50)									
	+		-		+		+		+	6	=		-		=		Information Seeking
(7)		(18)		(29)		(40)		(51)									
	+		+		-		+		+	6	=		-		=		Systematic Planning and Monitoring
(8)		(19)		(30)		(41)		(52)									
	-		+		+		+		+	6	=		-		=		Persuasion and Networking
(9)		(20)		(31)		(42)		(53)									
	-		+		+		+		+	6	=		-		=		Self-Confidence
(10)		(21)		(32)		(43)		(54)									
	-		-		-		+		+	18	=						Correction Factor
(11)		(22)		(33)		(44)		(55)									

Interpreting the Score

Create a PECs Profile Sheet to help you interpret the result of your assessment. Plot your score or corrected score, with an "X" mark, for each of the competencies listed on the worksheet. Then, connect each of the "X" marks with a heavy line to outline a pattern or graph. The highest possible score you may get for each of the competencies is 25. It is suggested that a rating higher than 15 for each of the competencies indicates an average to high entrepreneurial competency level.

Suggestion: Perhaps it would be more interesting to try to replicate the assessment using a spreadsheet application to automate the whole process. This would also allow you to create a more interesting profile pattern through the chart feature of the spreadsheet application.

Sample PECs Profile Sheet



LA Learning Activity

Activity 1.2. *Research Work*

1. Look for three Filipino animators who made it big in the global animation industry or in the Hollywood. Write about their roots, how they started in the animation industry, how they got in to the international scene, and what is their famous or recent work.
2. Find at least five jobs that are related to animation and give the job description for each.

S Summary

Entrepreneurship is one of the important tools in empowering the Filipinos of today. It is hoped that through entrepreneurship, more Filipinos will have a better chance of improving their lives. In this lesson, we have learned what it is and what it takes to be one. We have studied the characteristics of a good entrepreneur and assessed ourselves to see if we have what it takes or how close we are to being one. By studying and assessing our PECs, we are able to find out the improvements that we need to develop and the character of being an entrepreneur.

We have also covered the topic on how to start a business in relation to being an animator. We started by looking at the market and studied the different factors that affect a business, such as physical location, people, economy, and regulations. Aside from these factors, we also studied about how good communication skills affects our chances of succeeding in the business. Competencies and opportunities in the animation industry were also discussed.

PT Post-Test

Multiple Choice: Circle the letter that corresponds to the correct answer.

1. Based on its definition, what best describes an entrepreneur?
   a. innovator, team leader, facilitator
   b. organizer, innovator, facilitator
   c. organizer, manager, risk-taker
   d. risk-taker, organizer, facilitator

2. What are the three clusters of PECs?
   a. achievement, planning, power
   b. achievement, persistence, power
   c. persistence, goal setting, self-confidence
   d. persistence, planning, risk-taking

3. Which of the following belongs to the power cluster?
   a. persistence, self-confidence
   b. persuasion and networking, self-confidence
   c. persistence, risk-taking
   d. goal setting, systematic planning

4. Which of the following refers to a set of competencies that support the motive for being successful in the entrepreneurial undertaking?
   a. achievement
   b. planning
   c. power
   d. all of the above

5. Which of the following set of competencies is under the Planning Cluster?
   a. goal setting, information seeking
   b. opportunity seeking, demand for efficiency and quality
   c. persistence, risk-taking
   d. self-confidence, networking

6. Which of the following is *not* an environment factor that affects business?
   a. culture
   b. demography
   c. economy
   d. people

7. Which of the following is a set of economic indicators?
   a. inflation, GDP, unemployment rate
   b. demand, market, inflation
   c. inflation, demand, unemployment rate
   d. GDP, market, demand

8. Which of the following is one of the economic indicators that drives up inflation?

a. demand
b. supply
c. unemployment
d. poverty

9. Family, friends, and acquaintances are examples of what factor that drives business ideas?

a. one's self
b. social ties
c. issues
d. none of the above

10. What does SWOT mean?

a. strengths, weaknesses, opportunities, threats
b. strengths, weaknesses, opportunities, treats
c. strengths, willingness, opportunities, threats
d. strengths, weariness, opportunities, threats

11. Which of the following is *not* included in the roles of a team leader?

a. communicate a vision
b. create demand
c. develop strategy
d. serve the team

12. Which of the following is perhaps one of the well-used and most sought-after communication skill?

a. listening
b. reading
c. speaking
d. writing

13. What do you call the main reason why an issue or a problem occurs?

a. problem root
b. root cause
c. root issue
d. root problem

14. Which of the following is also known as the Fishbone Diagram?

a. Ishigawa diagram
b. Ishikawa diagram
c. Kaoru diagram
d. Kauro diagram

15. Which of the following are tools used to identify the root cause of a problem?

a. 5 whys
b. fishbone diagram
c. both a and b
d. none of the above

SE Self-Evaluation

Evaluate yourself against the entrepreneurial qualities listed below. Check the option that you think describes your own PECs.

Personal Entrepreneurial Characteristics	Weak	Good	Excellent
Opportunity seeking			
Persistence			
Commitment to work contract			
Risk-taking			
Demand for efficiency and quality			
Goal setting			
Information seeking			
Systematic planning and monitoring			
Persuasion and networking			
Self-confidence			

Lesson 2: Animator's Fundamental Toolkit

- Types of Animation
- Tools and Equipment

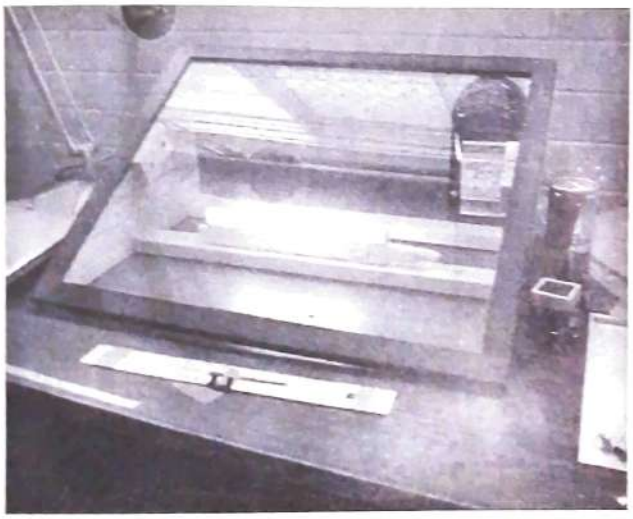
LO Lesson Objectives

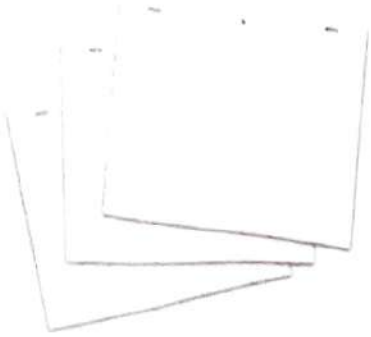
At the end of this lesson, students should be able to:

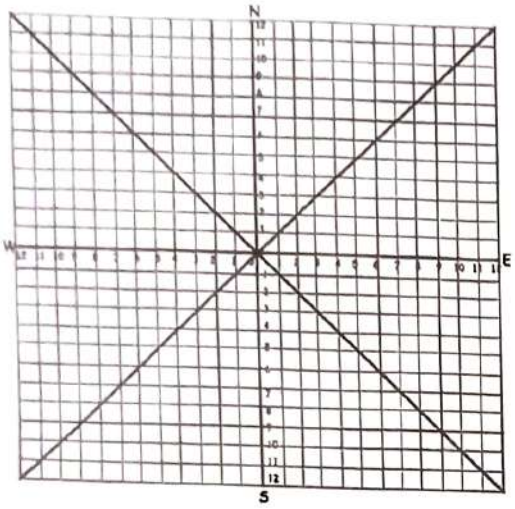
1. learn the types of animation;
2. enumerate the tools used in creating an animation; and
3. understand the function of each tool in the animation process.

PT Pre-Test

Identification: Identify the pictures below and give a short description of its function in the animation creation process.




N
W
E
S

eca
animation inc.

LD Lesson Discussion

Creating animation like in the movies and TV series requires extensive collaborations that involve a long process and a lot of work. In creating an animation, animators must use a collection of equipment that helps process and create the graphics and content. These equipment depend on which type of animation is used, and may cost a big amount of money for independent animators.

The following are the two types of animation:

- Traditional Animation – an animation technique where each frame is drawn by hand. This is also called *classical animation* or *cel animation*. This type of animation uses specialized materials and equipment for artists and animators.
- Computer-Generated Animation – an animation technique that is purely digital and created primarily with computers. CG animators use high-powered computers to create 3D animations.

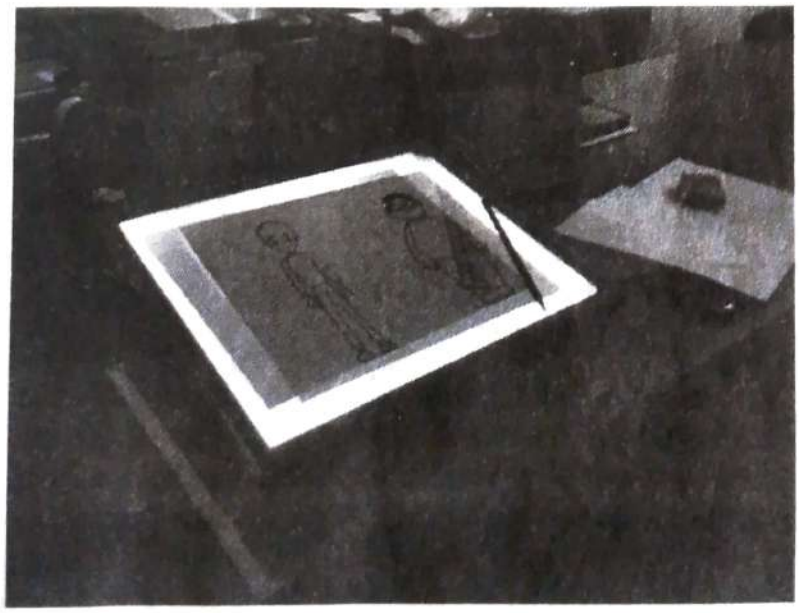
These two types can be combined in this book for faster processing of the projects. Let us now study the tools and equipment requirement in creating an animation.

Tools and Equipment

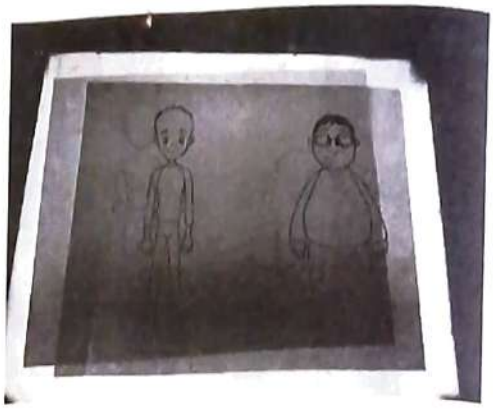
In computer-generated animation, most tools needed are software-based. However, the drawing stage that uses paper is still preferred by most animators. So the drawing paper and pen, special pencils, and other traditional tools can still be useful in your goal of developing your own animation film. Below are the tools used in traditional animation:

1. **Lightbox**

   Animation work is concerned with slight changes of movement from drawing to drawing. Therefore, it is necessary to see two or more drawings in relation to each other at the same time.



The animator's lightbox is very ideal for the animator to work with. It has been improved as years go by. There are grand lightboxes that are used in Disney or other big animation companies. In our case, the small customized ones can do.



The essential feature of this equipment is to have the light shine through different layers of paper for tracing the in-betweens, thus the term *lightbox*.

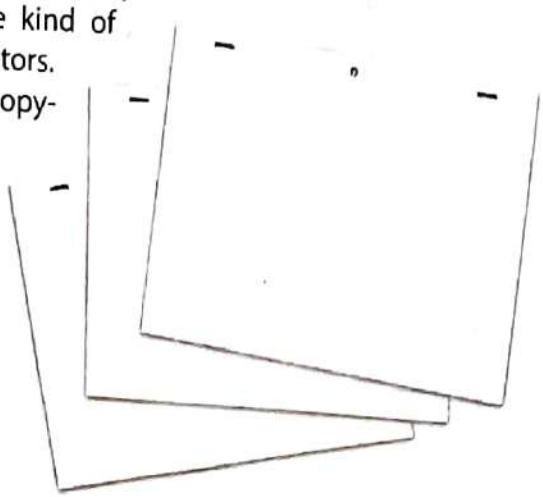
2. **Peg Bar**

Some lightboxes has a peg bar where paper is attached to the device so that the paper will not move as the animator is doing the artwork. Usually, a peg bar is made of plastic and can actually be improvised using a three-hole office punched paper.

3. **Paper and Cel**

There is no specific paper on which animation should be drawn as long as it is big enough to flip. The paper should also be translucent enough for you to see the essentials of the next drawing through the top sheet. Whatever paper is used, it should be punched to fit the peg bars.

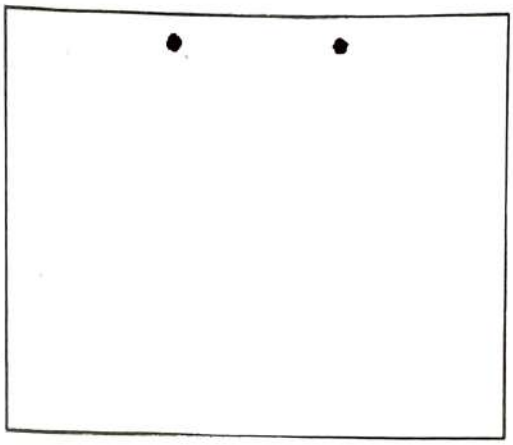
Once the drawing stage is done, you will need to transfer your artwork from paper onto cels, so they can be painted and then placed against a separate background. However, you can use copy-safe transparency films as alternative. These are the same kind of transparencies used on overhead projectors. Choose the ones that are heat-safe or copy-safe since the easiest way to transfer from paper to transparency is by using a copier.



Acetate of cel can be bought in various degrees of thickness. Remember, if it is too thick, it will not allow sufficient light through for you to see the artwork placed below several levels of paper.

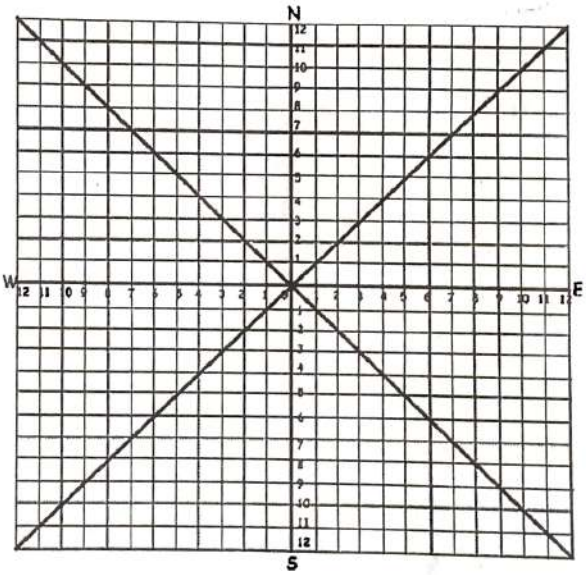
4. **Paper and Cel Punch**

Each animation is registered by placing each sheet or cel consecutively on standardized registration pegs so it does not move in relation to other sheets. If you will not use ready-punched animation paper and cel, you may use a peg-hole punch for registration. For beginners, it is possible to construct a system using an ordinary office hole puncher, available from any office supply stores.



5. **Graticule or 12" Field Chart**

It is a grid system used to accurately create field guides in the layout. These guides are what the camera will see in the scene. The area chosen for the camera to cover in any piece of art is known as the *field size*. There are traditionally two standard field sizes for animation (12 inches and 15 inches) and are suitable graticules for both are readily available.

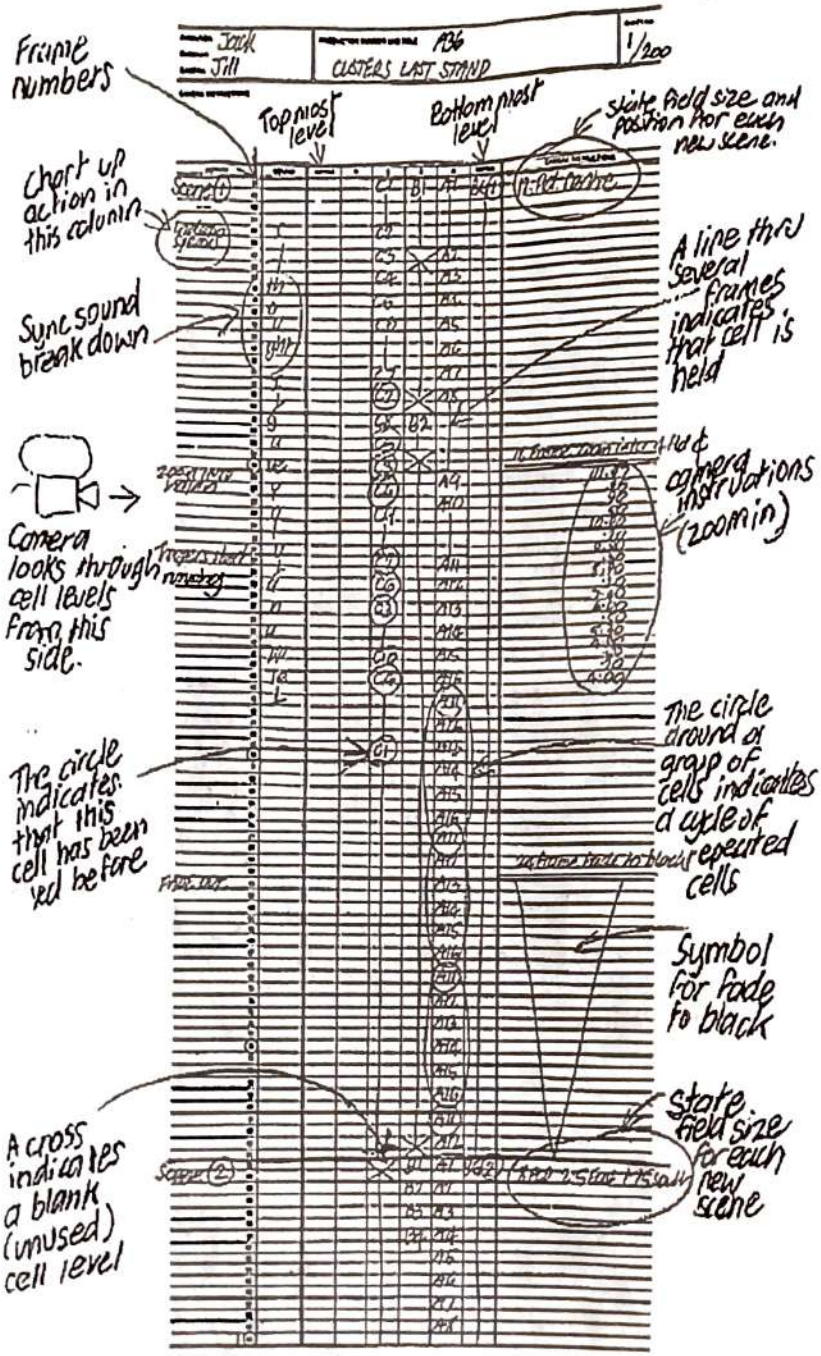


Example of a typical 12" Field Graticule

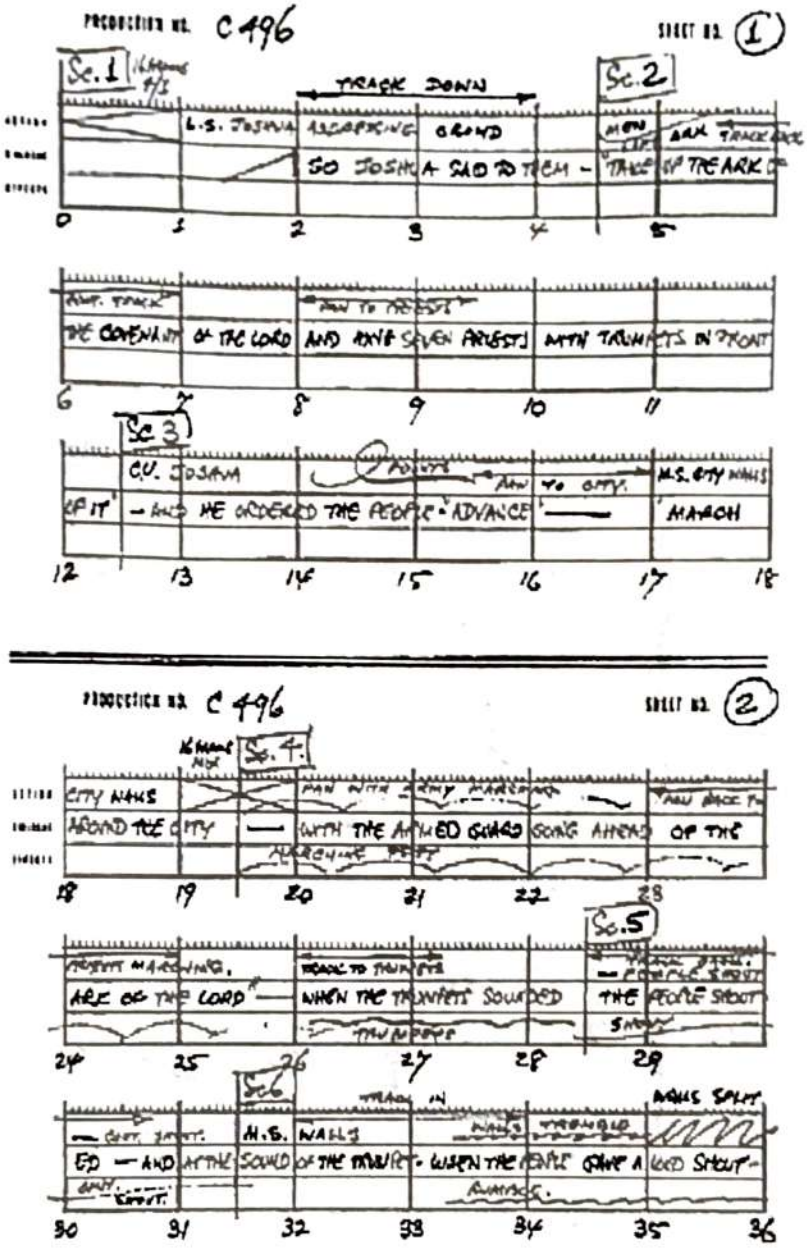
There are two portions to the field guide. The outer line shows the field size while the inner line shows the television cut off. This will be explained later in the book.

6. **Bar Sheets and Dope Sheets**

It is a traditional animation tool that enables an animator to organize his/her thinking and give instructions to the cameraman on the shots needed. Also known as x-sheet or exposure sheet, it consists of five sections and is usually A4 paper sized and every eight line of an x-sheet is marked thicker than the others because it shows half foot of film.



One second of animation would take three of these sections. As for the sound of the animation, it is often shown on a different sheet which are bar sheets.

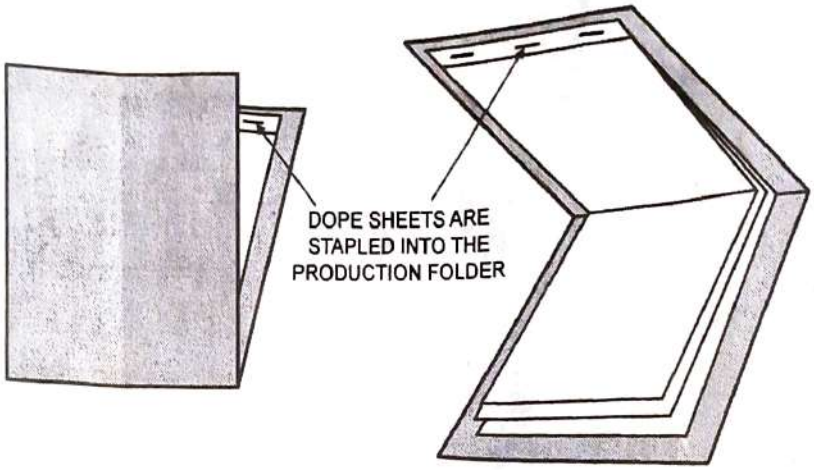


The director refers to the bar sheets when he/she has given some thought to the overall timing of a film. Bar sheets have more detailed timing and are much like music manuscript paper with several horizontal lines having spaces for dialog, sound effects, music, and action.

Bar sheets are standard kit in the editing room; however, the animator is expected to have a supply of dope sheets. For beginners, a simple dope sheet arrangement can be drawn up and photocopied, according to the needs.

7. **Production Folder**

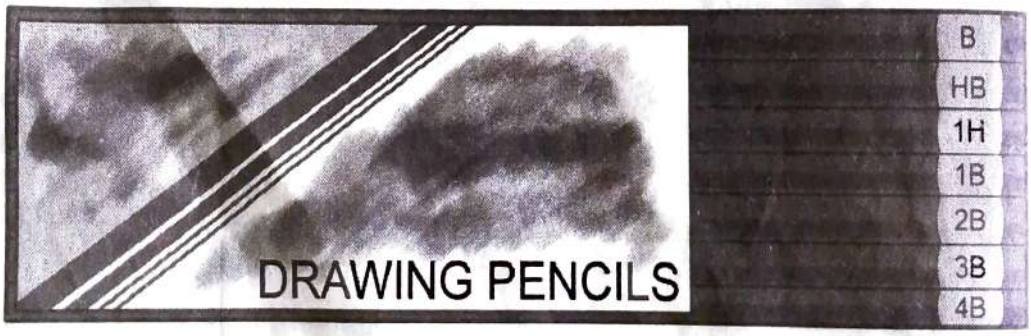
It is an essential for large-scale studio productions that the dope sheet instructions for each scene be kept separate from each other. Dope sheet information can be stapled into the folder and on the outside of each folder should have relevant information like title, sequence number, scene number, scene title footage length, animator's name, as well as stages in production work.



After the work is completed, it can be signed by a representative of the department concerned. In this way, if any problem crops up relating to a particular scene, it can easily be addressed by the person concerned with the work. All artworks for each scene, as well as all the information relating to that scene, should be kept in the production folder at all times. Failure to do this can cause a great deal of trouble especially on a large production, which has to run smoothly and economically. On a small production, this may not be absolutely necessary if the animator is reasonably well-organized.

8. **Drawing Kit**

There are different kinds of pencil that you may use in the drawing stage of the animation process. Each pencil type allows the animator to easily perform his/her task. Below are some recommended types:



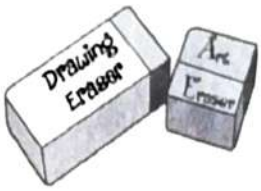
a. Non-Photo Blue Pencils – are great for initial sketches. The right shade of pale blue tends to not show up on copies when transferred from paper to clear cels.

b. Drawing Pencils – mechanical pencils may be used but for animation work, a regular wooden pencil is best. 2B is usually the best hardness and are good for making dark lines.

c. Paint, Brush, Pastels, and Watercolors – used mostly for the background and the final stages of the process.

9. **Art Gum Eraser**

These erasers are far superior to standard erasers because they rub out lead cleanly without smudging away actual paper surface.



10. **Digital Camera and Video Camera**

After all the pencil drawings are done, it is essential to test the full animation to check its movement. In professional studios, big heavy duty camera facilities are readily available, but for the student or amateur, any standard camera with enough pixels will do.

In this book, traditional animation will be combined with computer-generated. Some editing will be easier using a computer which will also be part of the discussion.

KT Key Terms

- **Traditional Animation** – animation process that uses paper, pen, and camera
- **Computer-Generated Animation** – animation that uses computer in moving characters and objects
- **Lightbox** – an animator's equipment that allows light to shine through different layers of paper for tracing the in-betweens
- **Peg Bar** – holds the paper in place as the animator draws an artwork
- **Cel** – a transparent film where colors can be painted to combine as one film
- **Graticule** – grid system to accurately create field guides in the layout
- **Exposure Sheets or X-Sheets** – also known as dope sheets that enable animator to organize and help the cameraman on the shots needed

QD Questions for Discussion

1. What are the tools in creating an animation?
2. Are the tools used in traditional animation still needed in CG animation? Explain your answer.

LA Learning Activity

Make your own 2D Animation Lightbox

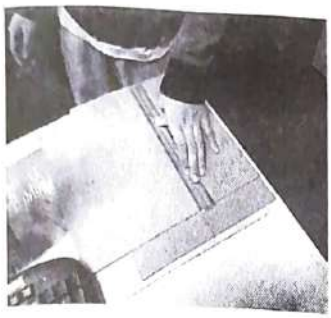
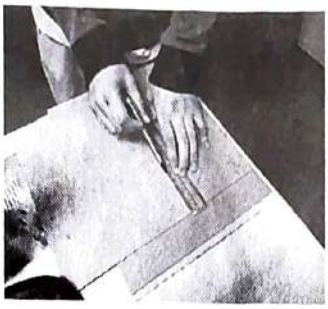
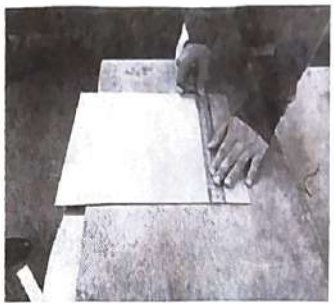
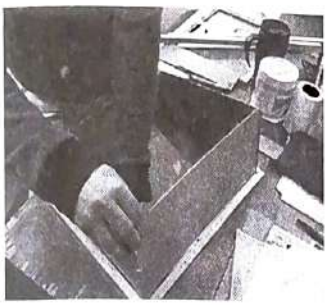
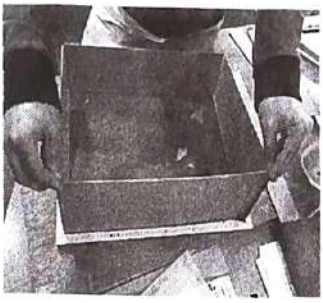
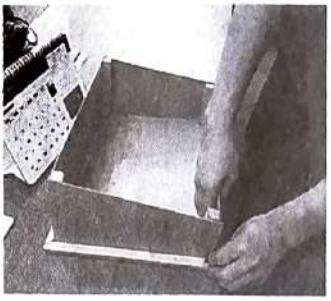
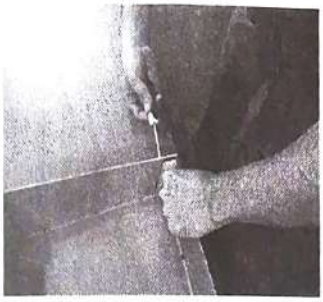
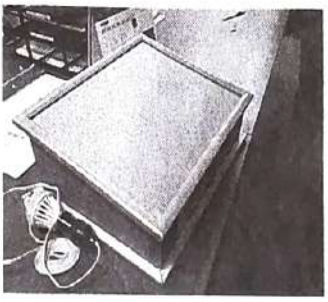
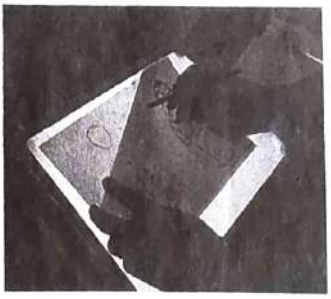
Materials:

- 2 picture frames (identical)
- sharp knife
- screwdriver
- steel ruler
- tracing paper
- woodscrews
- clear tape
- piece of wood (at least 1 meter)
- light bulb with socket and cable

Instructions:

1. Remove the glass from the frame. Then put aside the wood behind the frame.
2. Put the tracing paper behind the glass using the clear tape.
3. Put the other glass on the other side.
4. Secure them in place by putting clear tape on each side.
5. Put back the frames.
6. Get the back wood of the frame and remove other unwanted elements to make it smooth.
7. Measure the halfway point of the wood and put a marking.
8. Cut the wood into half.
9. Now, for the top part. Measure then cut the wood to fit the top part.
10. Get the small wood and cut it according to the correct measurement of the panel.
11. Connect the wooden pieces to the long side panel.
12. Use the woodscrews and screwdriver to put them together. Repeat the process to the other side panel.
13. Put all the panels together.
14. Screw them together that makes up a see-through box.

15. Get the light bulb with the socket and cable attached to it. Then make a small hole on the box that would match the size of the cable.
16. Put the bulb in and screw on one of the panel side.
17. Put the glass top and tape or use glue to attach them together. Now, you have a lightbox.

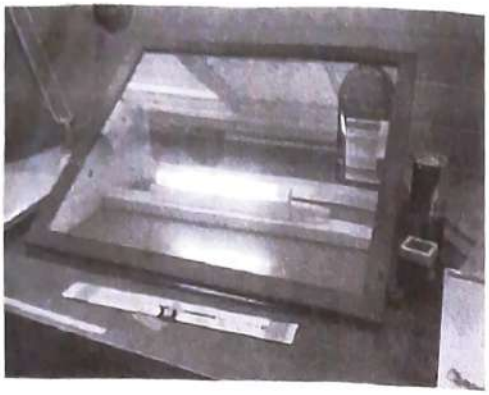
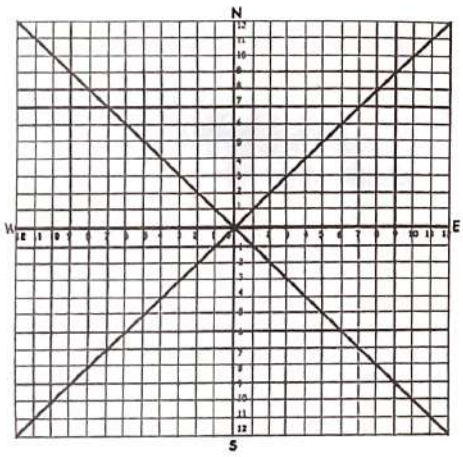
Summary

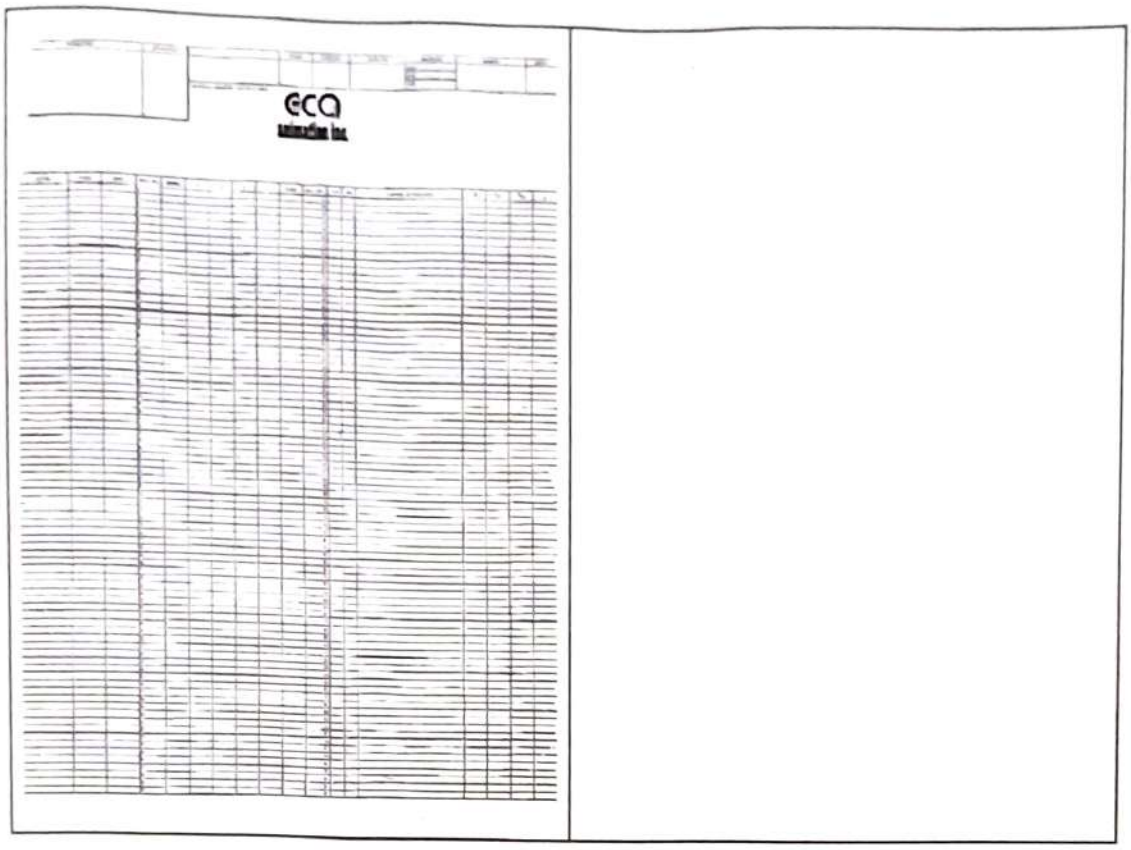
In traditional animation, there are tools used to prepare the characters and objects for the actual animation. Some of the tools used are: lightbox, peg bar, paper and cel, and bar sheets or dope sheets. These are toolkits used by animators to create main poses and in-between drawings that make up the movements.

You also have learned how to make a do-it-yourself lightbox, which you can use as you learn more about animation.

PT Post-Test

Identification: Identify the pictures below and give a short description of its function in the animation creation process.



SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Skills	Weak	Good	Excellent
Understand the difference between the two types of animation process			
Familiar with the tools used in creating a 2D Animation			
Able to classify which tool can be used on a certain process			

Lesson 3: Technical Drawing and Design

- Equipment and Materials
- Line Drawing and Scales
- Projection
- Simple Geometric Shapes
- Freehand Sketching
- Sketching Techniques

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. understand drafting concepts;
2. use and understand geometry in relation to technical drawing; and
3. use proper dimensioning and sectioning practices.

PT Pre-Test

I. Identify the following and write your answer on the blank provided.

_____ 1. A drawing tool used to draw all horizontal lines and to support the other pieces of equipment used to draw angles lines

_____ 2. A drawing tool with set angles

_____ 3. A drawing tool used to draw any angle

_____ 4. The ratio of the length and size of an element of an object in the drawing to the real length and size of the same element of the object

_____ 5. Regular rectangles with all sides equal and all angles right angle

_____ 6. Four-sided figures which opposite sides are parallel but do not have right angles

_____ 7. Type of triangle with three equal sides and three equal angles

_____ 8. Type of triangle with two equal sides and two equal angles

_____ 9. Type of triangle with two sides at right angles to each other

_____ 10. Type of triangle with unequal sides and unequal angles

II. Draw a perfect circle below using a technical drawing technique.

LD Lesson Discussion

One way to communicate our ideas is through some form of picture or drawing. *Technical drawing,* sometimes called drafting, is the act and discipline of composing plans that visually communicate how something functions or is to be constructed. Using simple lines should give a figure a life, with movements and personality. In animation production pipeline, one can be working as pre-production where drawing skill is a must. Drawing basic shapes would be a great help in designing the shape of a character.

Equipment and Materials

There are types of drawing equipment and materials that you can use. Some of them are the following:

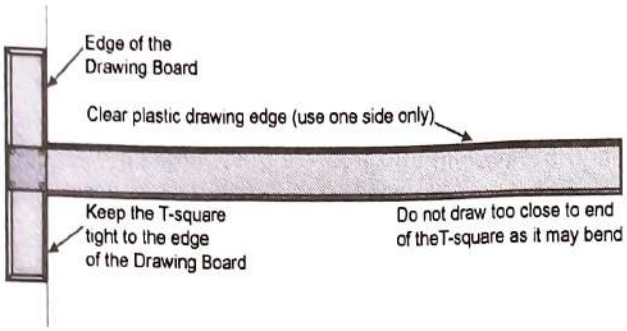
1. **Pencils** – extensively used in drawing and are very familiar to all students. However, choosing the right pencil is important to accomplish a certain drawing task. Pencils are available ranging from 9H to 6B that is from extremely hard to extremely soft. The type of paper to be drawn on also affects the grade of pencil to be used; the rougher the paper, the harder the lead should be used. Different grades of pencil may be used on each type of paper.

Table 3.1. Grades of Pencil

4H	Hard and Dense	- for accurate layouts - not for finished drawings - do not use with a heavy hand as it grooves the paper and may not be erased easily - does not print well
2H	Medium-hard	- hardest grade feasible for finished drawings - does not erase easily if used heavily

F and H	Medium	- excellent general purpose lead weight - for layouts, finished drawing and lettering
HB	Soft	- for dense, bold lineworks, and lettering - requires control for fine work - erases easily - prints well - tends to smear easily
B-range pencils		- tend to smear too easily for use with T-square and set squares but can be used to shade areas of the drawing to give effects

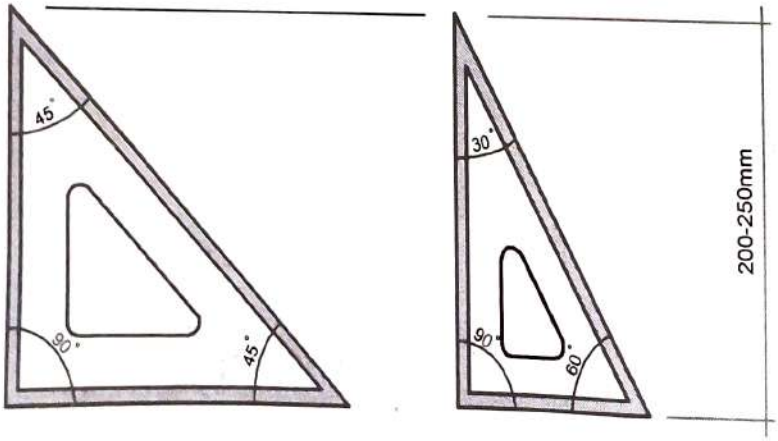
2. **T-squares** – used to draw all horizontal lines and to support the other pieces of equipment used to draw angled lines. It enables lines to be parallel and horizontal.



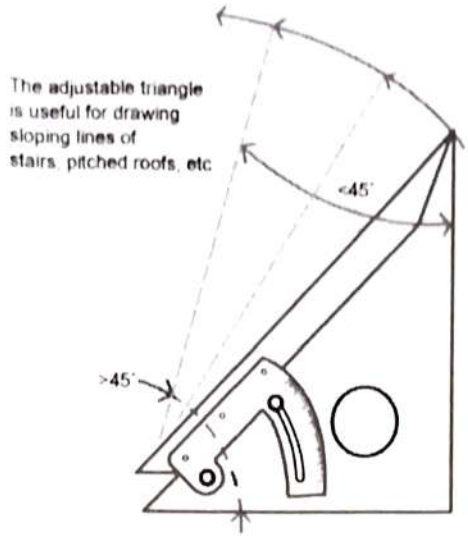
3. **Set Squares or Triangle** – clear plastic triangles with set angles. There are two types of set squares:

   a. 45 set squares – where angles are 45 degrees and 90 degrees

   b. 30/60 set squares – where angles are 30 degrees, 60 degrees, and 90 degrees



4. **Adjustable Set Square or Compass** – used to draw any angle

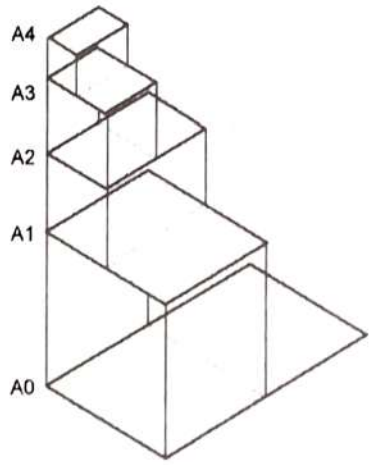


5. **Rulers** – used to measure drawing for proportioning
6. **Drawing Paper** – has different sizes to choose from. The advantage of standard sizes for drawings is that they enable a more economical use of drawing and tracing paper that the binding and storing of the drawing become easier.

- Trimmed paper of a size A0 - A4.
- Standard sheet size (JIS)

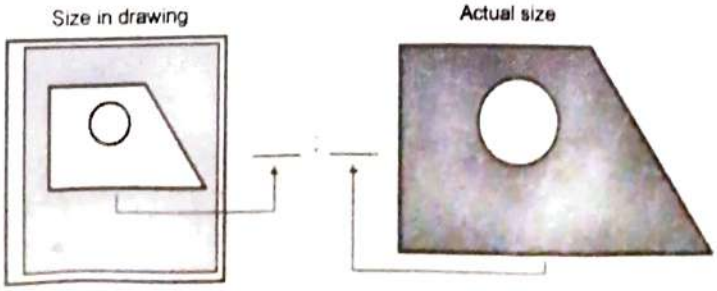
A4	210 x 297
A3	297 x 420
A2	420 x 594
A1	594 x 841
A0	841 x 1189

(Dimensions in millimeters)



Line Drawing and Scales

A *scale* is the ratio of the length and size (linear dimension) of an element of an object in the drawing to the real length and size of the same element of the object.



Designation of a scale consists of the word "SCALE" followed by the indication of its ratio:

SCALE 1:1 for full size

SCALE X:1 for enlargement scales

SCALE 1:X for reduction scales

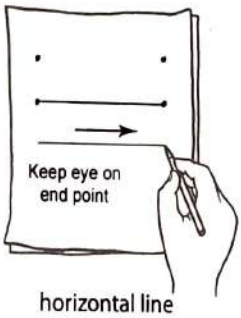
Line weight helps to convey meaning to a technical drawing. The production of good quality lines may range from correct weight to the correct size. It could give a more professional look and make the more important parts of the drawing stand out. There are rules as to the actual weight of lines but you are left to apply judgment as to what is suitable.

Line weight gives meaning to a technical drawing:

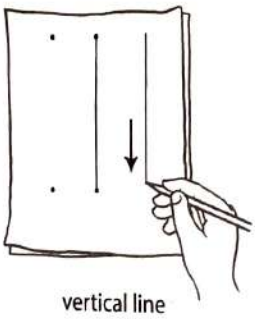
- Important objects in the drawing can be highlighted by using heavier outlines.
- Elevations on the objects nearer to the viewer can be darker to make them appear closer.
- Grid lines may be drawn faintly so as not to overcrowd the rest of the drawing.
- Dimension lines can be drawn in very fine line.

Drawing a Straight Line

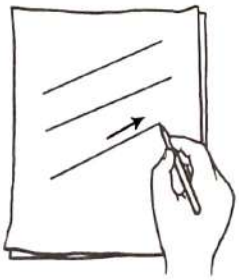
1. Hold the pencil naturally.
2. Spot the beginning and end point.
3. Swing the pencil back and forth between the points, barely touching the paper until the direction is clearly established.
4. Draw the line firmly with a free and easy writ-and-arm motion.



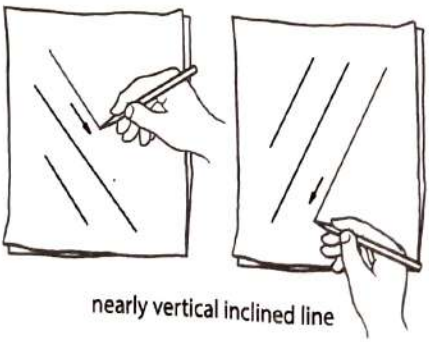
horizontal line



vertical line



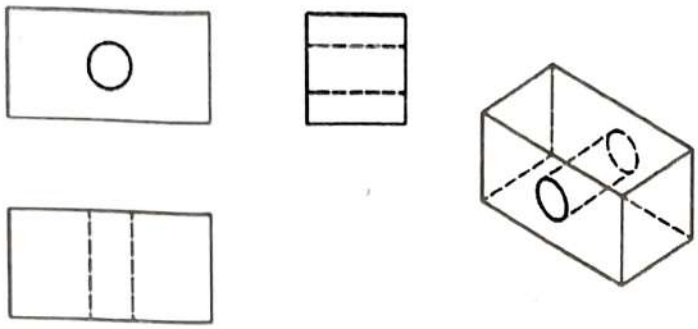
nearly horizontal inclined line



nearly vertical inclined line

Projection

Technical drawing is the representation of a three-dimensional component on a two-dimensional drawing. The three typical views expressed in a projection are called three-panel image. Three-panel screen with front view, side view, and top view as shown below.



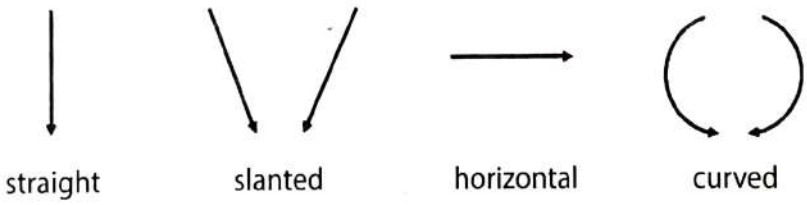
To be able to draw a technical drawing, you should understand projection.

Types of View

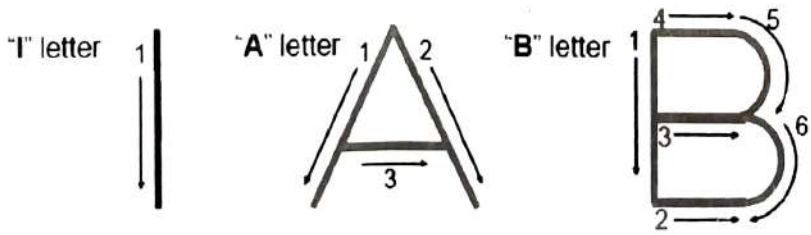
The views may differ in the angle in which you are trying to project.

- *Isometric view* is a view in which the component edges at a 30-degree angle to the horizontal line drawn.
- *Front view* is a view in which a component edge in a 7-degree angle to the horizon, the other edge in a 42-degree angle.
- *Planometric view* is in which both parts edge at 45-degree angle to the horizontal line drawn.

Basic Strokes



Examples of Basic Stroke Application



Simple Geometric Shapes

Technical drawing consists of various simple geometric shapes arranged in several ways to create other complex shapes. These complex shapes are combinations of simple shapes such as line, arcs, circles, rectangles, and triangles.

- Squares – regular rectangles with all sides equal and all angles right angles. Meaning, there are a number of ways in which a square can be drawn. There are many combinations of ways to draw shapes and you may modify a method to suit your conditions.

- Rectangles – four-sided figures with all internal angles being kept right angles. They can be drawn in similar ways to squares.

- Triangles – three-sided figures. To draw a triangle, you should consider:
  - the sizes of the three sides
  - the sizes of two sides and the included angle
  - the sizes of the angles and one side

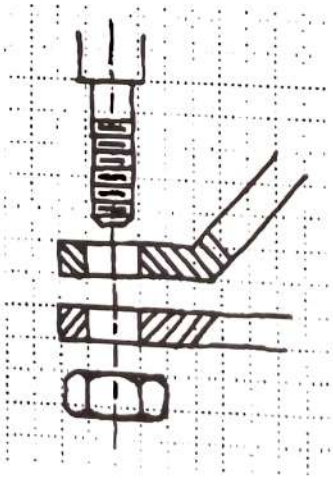
- Circles – or arcs and other related shapes such as ellipses form important parts of drawings even though a lot of shapes are straight lines. It is useful to have knowledge of terms used in relation to circles and curves.

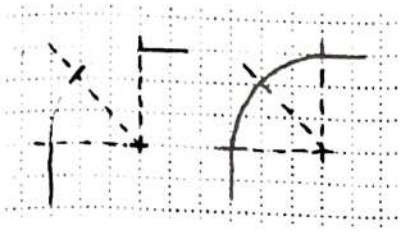
Freehand Sketching

This technique is very relevant for technical communication. It is sometimes called "thinking with a pencil" as you are free to bring your ideas into mental pictures on paper.

Sometimes the grid technique can be used to sketch. The grids serve as guides that help keep the lines straight and proportioned.

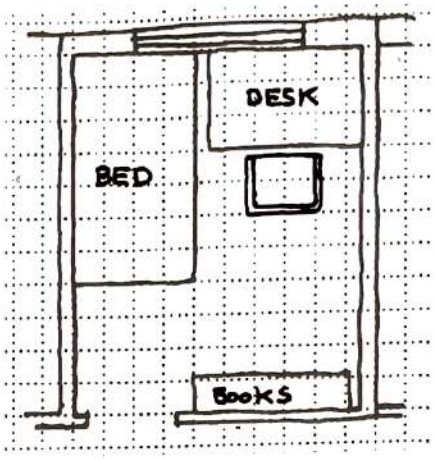
To draw a rounded corner using a grid, the corner is measured three units horizontal and three units vertical then join them together by an arc.



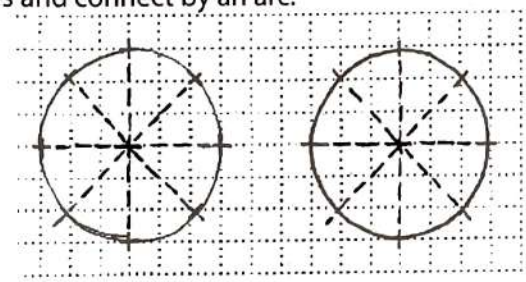


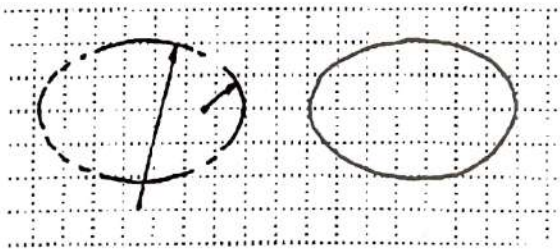
Be sure to sketch object neatly and proportioned to the object it is referring to. This is very important in engineering and architecture.

Grids are also useful in making freehand circles in proportion.



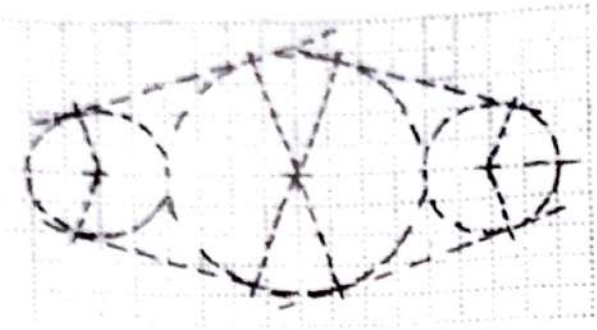
Ellipses can be sketched the same as the circle. Make small arcs on each grid that is occupied by the ellipses and connect by an arc.





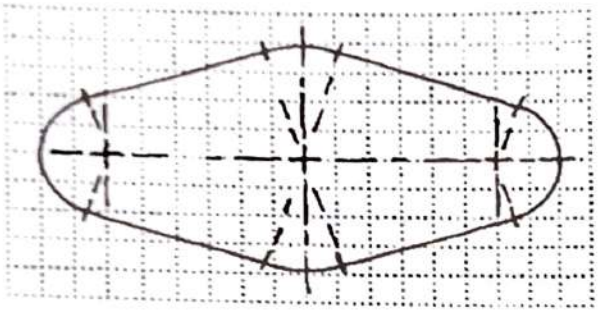
Sketching Techniques

Creating proportional objects can be achieved using the circle technique.

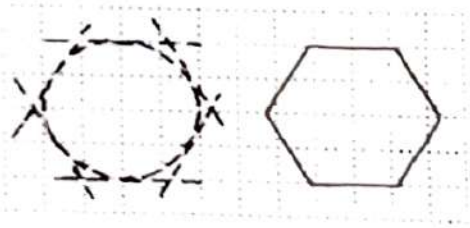


1. Draw three circles.
2. Draw the tangent lines to the circles.
3. Connect by line each radius perpendicular to the tangent lines.

You can then easily identify the connection points. Just sketch the final shape with a darker pencil.



Geometrical shapes like hexagon can be achieved using the circle and grid technique. The circle will serve as guide on the surface of the shape.



To draw an octagon using the same technique:

1. Draw a circle.
2. Identify the horizontal and vertical lines tangent to the circle.
3. Draw the line from the center of the circle at 45 degrees. The diagonals of the grid boxes may serve as guide.
4. Draw the lines perpendicular at each diagonal.
5. Darken the final lines with pencil.

KT Key Terms

- **T-Square** – used to draw horizontal lines and to support the other pieces of equipment
- **Set Square** – clear plastic triangles with set angles.
- **Adjustable Set Square** – used to draw any angle.
- **Freehand Sketch** – a sketch technique that allows you to freely bring ideas into mental pictures on paper.

QD Questions for Discussion

1. How does basic drawing skills help you?
2. If you were to choose between freehand sketching and technical drawing, which one would you prefer? Why?

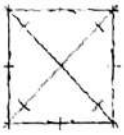
LA Learning Activity

Activity 3.1. *Technical Drawing Techniques: Small Circle*

A. For Method 1

1. Lightly sketch the square and mark the midpoints.

2. Draw light diagonals and mark the estimated radius.

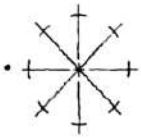


3. Draw the circle through the eight points.

B. For Method 2

1. Lightly draw a center line.

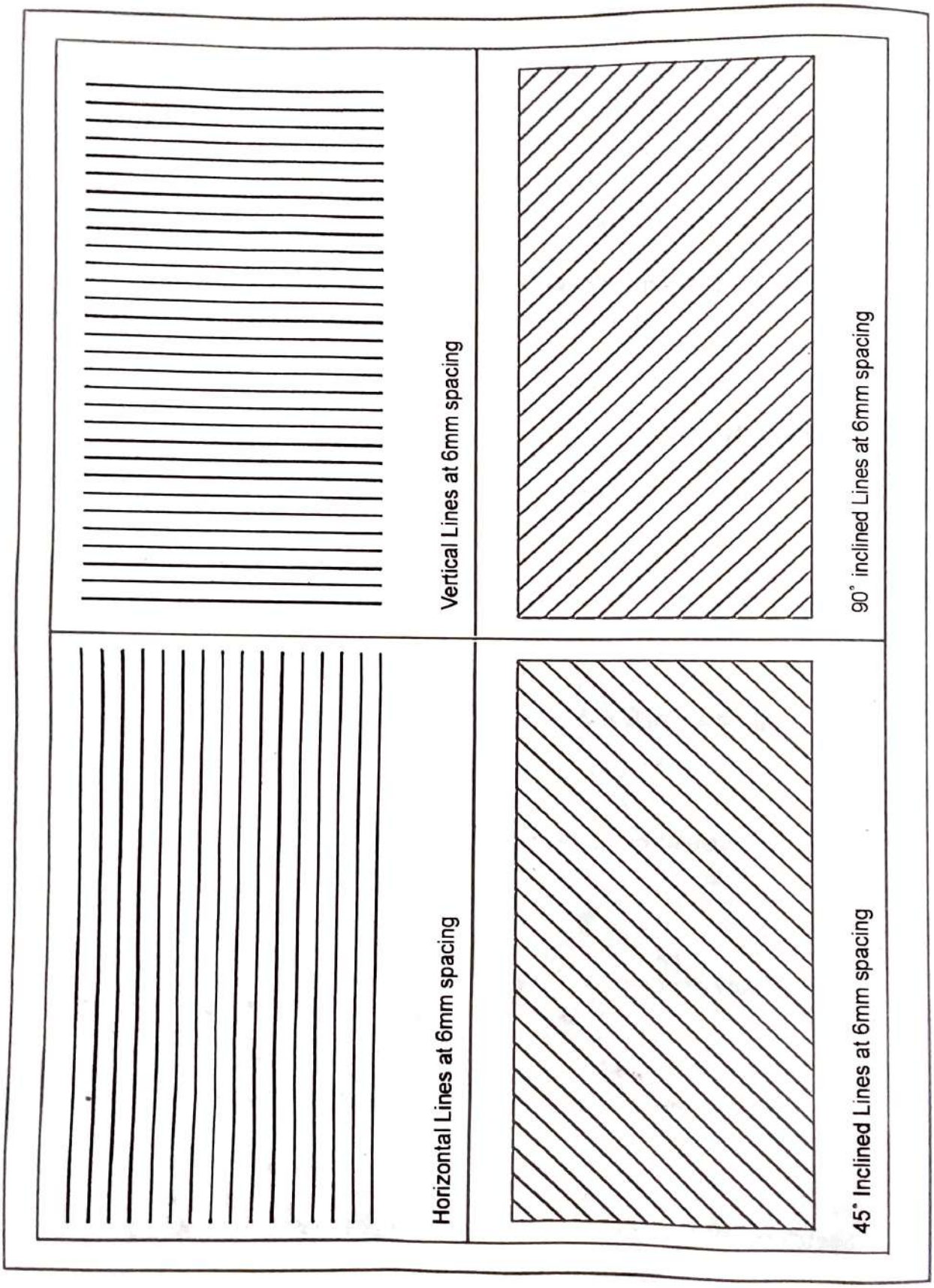
2. Add light radial lines and mark the estimated radius.



3. Sketch the full circle.

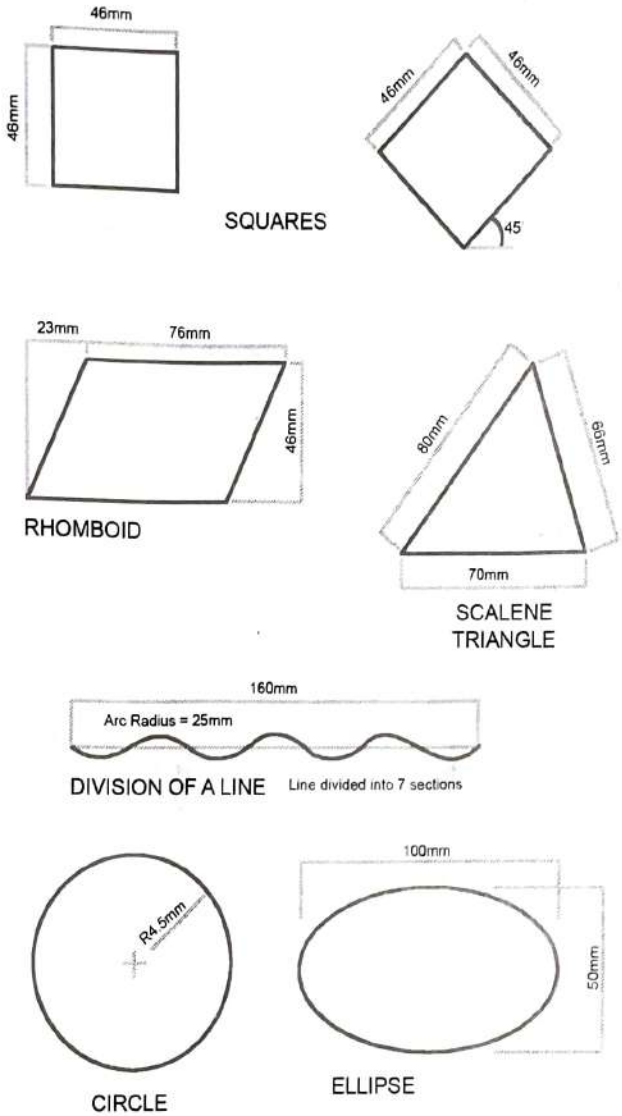
Activity 3.2. *Line Drawing*

Draw the lines on separate bond papers for each sample output below. Maintain the spacing throughout and keep the line density constant.



Activity 3.3. *Simple Geometric Shapes*

Draw the shapes shown to the sizes given. Follow the dimension of the shapes as shown below and add the text under each shape.



S Summary

Drawing is a type of communication that uses graphic illustrations. There are proper equipment and materials used in technical drawing that allows one to draw proper projection, scale, and proportion. Drawing basic geometric shapes has proper steps to keep it in proportion. Freehand sketching can transfer ideas, instructions, and information in a clear concise form.

Basic shapes, when learned to draw properly, will enable one to draw more complex shapes. Technical drawing consists of various simple geometric shapes arranged in several ways to create other complex shapes. These complex shapes are combinations of simple shapes such as line, arcs, circles, rectangles, and triangles.

PT Post-Test

I. Identify the following and write your answer on the blank provided.

_____ 1. A drawing tool used to draw all horizontal lines and to support the other pieces of equipment used to draw angles lines

_____ 2. A drawing tool with set angles

_____ 3. A drawing tool used to draw any angle

_____ 4. The ratio of the length and size of an element of an object in the drawing to the real length and size of the same element of the object

_____ 5. Regular rectangles with all sides equal and all angles right angle

_____ 6. Four-sided figures which opposite sides are parallel but do not have right angles

_____ 7. Type of triangle with three equal sides and three equal angles

_____ 8. Type of triangle with two equal sides and two equal angles

_____ 9. Type of triangle with two sides at right angles to each other

_____ 10. Type of triangle with unequal sides and unequal angles

II. Draw a perfect circle below using a technical drawing technique.

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Skills	Weak	Good	Excellent
Know the basic equipment and materials in technical drawing			
Learn techniques in drawing basic shapes properly			
Understand how scale and proportion affects technical drawing			

Lesson 4: Design and Development Using Flowchart

- Flowchart Tools and Symbols
- The Process of Animation Flowchart

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. discuss the purpose and use of flowcharts;
2. explain the basic parts and design considerations common to all types of flowcharts; and
3. identify and describe common symbols and information technology tools used in flowcharting.

PT Pre-Test

Use the space provided after each questions for your answers.

1. List and describe the keys to create an effective flowchart.

2. List and explain the meaning and use of five common flowcharting symbols.

3. Create a simple flowchart below explaining the process of your routine every morning.

LD Lesson Discussion

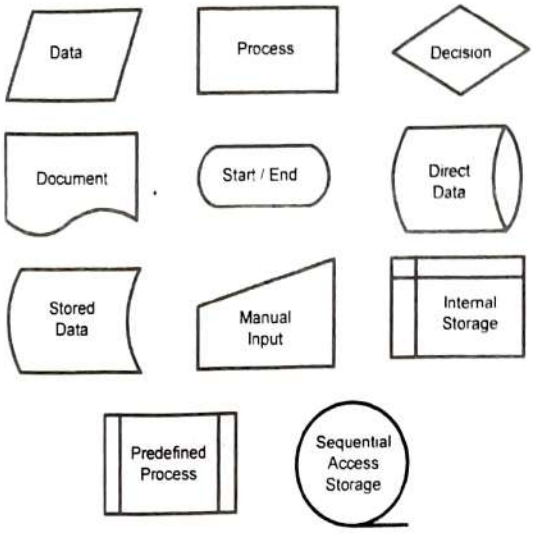
Flowchart is a graphical representation of some parts of an information system. In animation, there is a process to follow in developing film animations. This flow can be plotted into a flowchart so everyone knows what task is next to work through. Flowcharts are classified by their purpose and function: systems flowchart, program flowchart, document flowchart, and hardware flowchart. Some habits of good flowcharting consist of analyzing from top to bottom and left to right, it should have plenty of white space and not too crowded, and it should have an appropriate title that describes the diagram.

Flowchart Tools and Symbols

There are varieties of tools in designing a flowchart, both high-tech and low-tech. On the low-tech end, you can use paper and pencil to draw a flowchart. You can also use a flowchart template that already has the common flowcharting symbols. On the high-tech end, there

are a lot of software programs that facilitate the preparation of good flowcharts. Some software is solely for flowcharting and some may just have graphics capability that could make a flowchart. However, programs made specifically for flowcharting have a wider variety of flowcharting symbols than other programs designed for different purposes.

Since flowcharts represent a kind of universal standard in information systems design, implementation, and evaluation, they have some common symbols with specific meanings. Flowchart symbols can be divided into four groups: data, process, line, and special. These processes are based on the American National Standards Institute (ANSI).

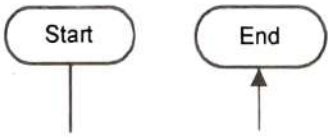


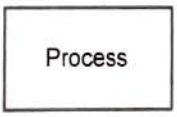
Flowcharting Symbols

Before you draw a flowchart, you first need to understand the different symbols used in flowcharts. Most people are familiar with the basic symbols like processes and decision blocks, though many more symbols can be used to make your flowchart more informative. However, the standard symbols are enough for most flowcharts. Let us get to know the flowchart symbols in detail.

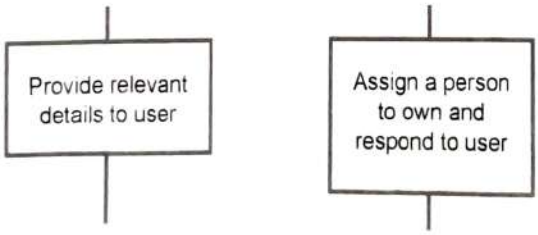
1. **Terminal/Terminator**

This shape is used to show where the flow begins or ends. It usually has the text "Start" and "End."

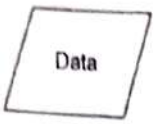


2. **Process/Rectangle** 

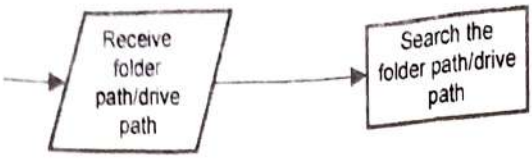
This shape is used to illustrate an action or an operation. These are represented by rectangles and a text containing the action to take.



3. **Data**

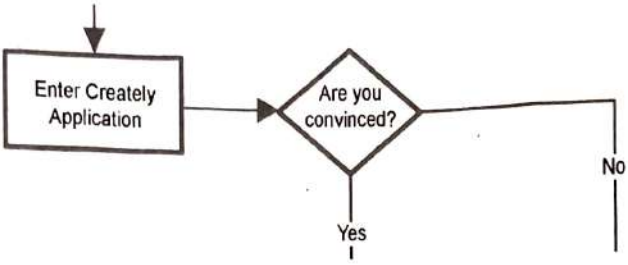


This shape shows the input to and output from a process.

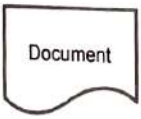


4. **Decision/Conditional**

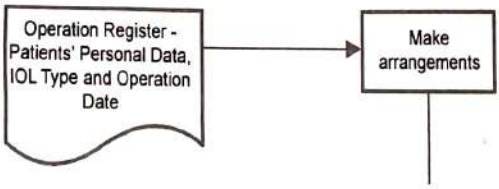
This shape is used in a process flow to ask a question.



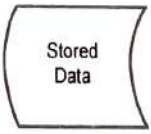
5. **Document**



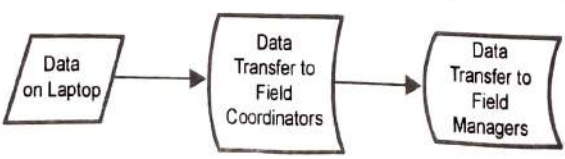
This shape is used to represent a decision point in the process, usually requiring a 'yes' or 'no' response then branching to different parts of the flowchart.

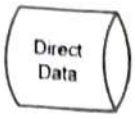


6. **Stored Data**

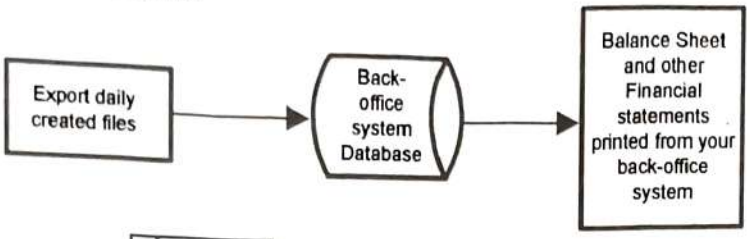


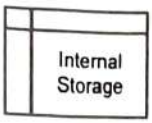
This shape is a general data storage as opposed to data which could be also stored on a hard drive, magnetic tape, memory card, or any other storage device.



7. **Direct Data** 

This shape represents information stored that can be access directly. It represents a computer's hard drive.

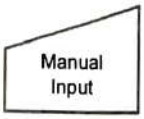


8. **Internal Storage** 

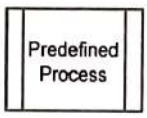
This shape is commonly found in programming flowcharts to illustrate the information stored in memory.

9. Sequential Access Storage

This shape represents information stored in a sequence, such as data on a magnetic tape.

10. **Manual Input** 

This shape signifies an action where the user is prompted for information that must be manually input into a system.

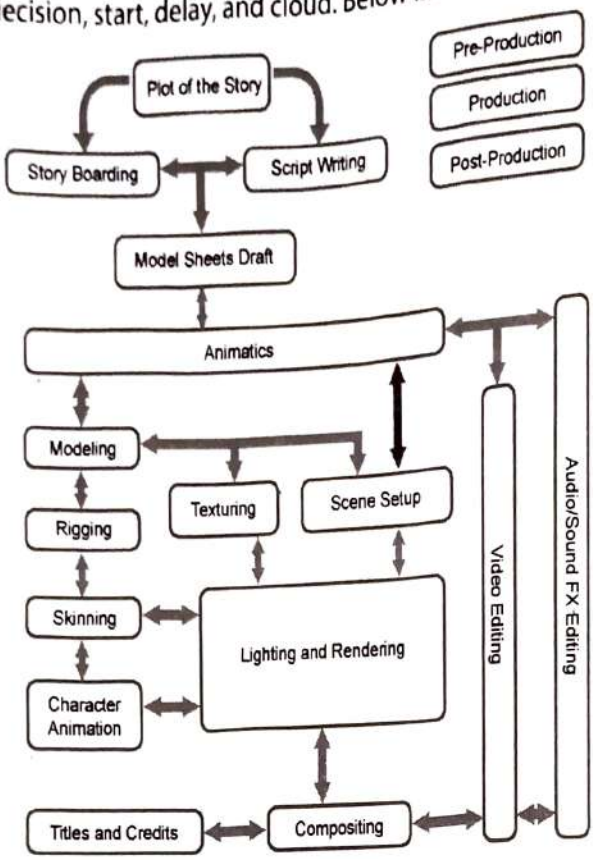
11. **Subroutine/Predefined Process** 

This shape is used in flowcharting a software program. It allows you to write one subroutine and call it as often as you like from anywhere in the code. This means that the predefined process has already been drawn when referenced in a flowchart.

The Process of Animation Flowchart

A good flow chart helps to ease the process of understanding the whole procedure. If a flowchart is not created properly, it may lead into confusion.

Although there are many elements that can be used in a flowchart to represent different kinds of steps, an effective flowchart can be created by just using few elements such as process, decision, start, delay, and cloud. Below is an example of a simple flowchart



Flowcharting is important for determining the system needed. At first, it may be challenging but by time and practice, you can learn the art of developing a clear and meaningful flowchart to use as an analytic tool in animation process.

KT Key Terms

- **Flowchart** – a graphical representation of a program logic sequence
- **Systems Flowchart** – shows the key inputs and outputs associated with the process
- **Process** – represents a process, action, or function
- **Data** – the document symbol represents the input or output of a document
- **Terminal/Terminator** – used to show where the flow begins or ends
- **Decision/Conditional** – indicates a question that needs to be answered
- **Subroutine/Predefined Process** – used in flowcharting a software program

QD Questions for Discussion

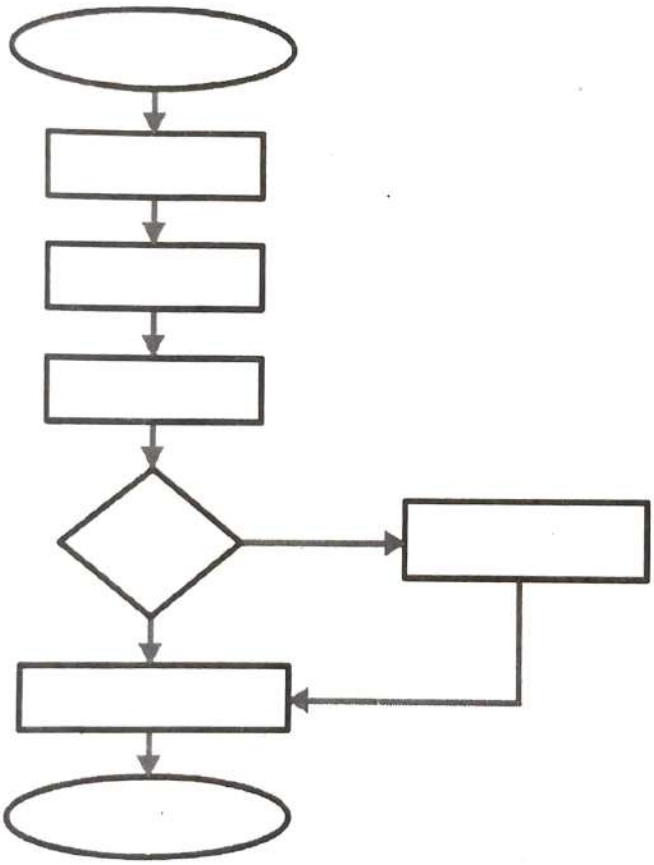
1. What is the key to create a successful flowcharting?
2. Why do you think it is important to create an effective flowchart?

LA Learning Activity

Activity 4.1. Arrange the steps below in the correct flowchart sequence and symbol then put an appropriate title.

Steps in Developing a Linear Flowchart

1. Assemble the right people.
2. Assign flowchart symbols.
3. Establish process boundaries (start and end).
4. Are steps in sequence?
5. Put steps in sequence.
6. Define the process and the purpose.
7. Review and label flowchart.
8. List steps, activities, and decisions.



Activity 4.2. Make a flowchart to create a solution to the following problems.

1. How to advice a friend to choose a profession
2. How to help a smoker to stop smoking

S Summary

Flowcharts can be classified according to purpose and use—systems flowchart, document flowchart, program flowchart, and hardware flowchart. Though flowcharts have many symbols, there are basic symbols used that can easily make up the process. In general, a flowchart should be read from top to bottom and left to right. Since flowcharts are communication tools, they should be easy to read.

A good flowchart helps ease the process of understanding the whole procedure. A simple and effective flowchart can be created by just using a few elements such as process, decision, start, delay, and cloud.

PT Post-Test

Use the space provided after each question for your answers.

1. List and describe the keys to create an effective flowchart.

2. List and explain the meaning and use of five common flowcharting symbols.

3. Create a simple flowchart below explaining the process of your routine every morning.

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Skills	Weak	Good	Excellent
List and discuss the purpose and use of flowchart types			
Identify proper symbol to a flowchart event			
Create and interpret a flowchart			

Lesson 5: Occupational Health and Safety (OHS)

- Hazards and Risks
- Identifying Hazards
- Systems for Controlling Hazards
- Maintaining Workplace Health and Safety
- Emergency Assistance

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. learn how to practice Occupational Health and Safety;
2. identify hazards and risks present in an office environment;
3. evaluate and control hazards and risks;
4. maintain occupational health and safety; and
5. understand the effects of hazards and risks.

PT Pre-Test

Matching Type: Match column A with column B. Write the letter of the correct answer on the space provided before each number.

A. *Identifying Hazards*

A	B
___ 1. Tripping	a. Electrical faults ranging from equipment failure, overloading of convenience outlets and extension cords, frayed cable or exposed wiring
___ 2. Slipping	b. Loose overhead fixtures; tossing tools and objects between co-workers
___ 3. Falling	c. Allergies, chemical sensitivity, occupational asthma, and respiratory disorder
___ 4. Fire	d. Wires running down near or through the walkways or aisle
___ 5. Ergonomic Injuries	e. Spills on the floor leaving it wet and presence of small objects like pen caps or paper clips that are left scattered
___ 6. Eye Strain	f. Staring at computer screens for long periods of time
___ 7. Indoor Air Quality	g. Painful condition of hands, hips, or back due to poor posture

B. Controlling Hazards

A	B
___ 1. Engineering Controls	a. A well-defined system of identifying, tracking, and documenting hazards, and the corrections made to reduce, if not to completely eliminate it
___ 2. Safe Work Practices	b. Helmets, gloves, and safety shoes or rubber boots
___ 3. Administrative Controls	c. Conducting or participating in fire and quake drills
___ 4. Personal Protective Equipment (PPE)	d. Use of ergonomic seats and tables or other office equipment that can be adjusted to reduce physical stress while performing the work
___ 5. Systems to Track Hazard Correction	e. Programs control and promote, the general health of the workers in an organization
___ 6. Preventive Maintenance Systems	f. Additional measures or organizational policies that aim to reduce hazards and risks organization-wide
___ 7. Emergency Preparation	g. Establishing certain rules and regulations regarding carrying out all task in a safe manner
___ 8. Medical Programs	h. Strict, regular monitoring and replacements of controls that are in place even before it needs repair

LD Lesson Discussion

Occupational Safety and Health (OSH) is defined as the a) promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations; b) prevention among its workers of any departures from health caused by their working conditions; c) protection among workers in their employment from risks usually from factors adverse to health and d) placing and maintenance of the worker in an occupational environment adapted to his/her physiological ability. (Rules and Regulations Implementing Executive Order No. 307)

Source: http://www.oshc.dole.gov.ph/122

In this lesson, we will discuss the different hazards commonly found in an office environment. We will also look into its common causes and ways of controlling or avoiding them. Believe it or not, an office, no matter how comfortable and convenient, still presents a lot of hazards that could prove detrimental to the workers. Let us examine the kinds of hazards that could be present in the office.

Hazards and Risks

Before we can fully understand what safety in the workplace really means to us and to appreciate it better, we must first be comfortable about the definition of hazards and risks. Oftentimes, these two words are used interchangeably. Unfortunately, even the dictionaries would define one using the other in their definition, creating confusion.

Let us use a simple scenario to differentiate between hazards and risks, for instance, a water spillage along the walkway that was left without regard. In this simple example, the *hazard*, the source of potential injury or threat, is the water spillage itself as it might cause someone to slip and get injured. On the other hand, the probability that someone will actually slip because of the water spillage is the risk. In other words, what are the chances that a person or few people will step over the spill and slip and fall because of it? To reduce the risk, if not to eliminate it, you must eliminate the source of threat (hazard) or work around it. In this case, to completely eliminate the risk, you wipe the floor dry from the spillage (hazard); or put a marker or sign to alert anyone who might step on it, to avoid it, thereby reducing the risk. In general, a risk can be classified as low, medium or high. Low being the least probable and high being most likely to happen.

Identifying Hazards

Slips, Trips, and Falls

This kind of hazard may perhaps be the most common of all, whether you are working in an office or in a construction site or other heavy industry job site. Common causes contributing to this hazard, especially tripping, are wires running down near or through the walkways or aisle; drawers that are not kept completely closed or simply left open without regard; frayed or buckled carpet, as well as obstructions left unattended along the walkways. Slipping is commonly caused by spills on the floor leaving it wet and presence of small objects like pen caps or paper clips that are left scattered.

Falling accidents are usually caused by improper use of office furnishing or equipment being used as step ladder when working or reaching objects at height. On the other hand, causes of being hit by falling objects can range from improper stacking of storage boxes making it top heavy, loosely stored objects on overhead cabinets or shelf tops, loose overhead fixtures, and tossing tools and objects between co-workers.

Generally, this kind of hazard could cause minor to major injuries to a person or minor to major damage to properties. The key to controlling or avoiding this kind of hazard is by doing the practice of good housekeeping. Housekeeplng, as defined in the Merriam-Webster's dictionary, is "the routine tasks that must be done in order for a system to function or to function efficiently." When we say routine, it is being done regularly on a continuous basis. In layman's term, it is the practice of tidying up or putting everything clean and in proper order. Makes sense because once your workplace is all tidied up and in order, there should be no reason for you to slip, trip, or fall or you lessen the chance for this kind of hazard to occur. Other ways of controlling these kinds of hazard is by careful planning of the layout of the workplace by simply being mindful and considerate of the welfare of others.

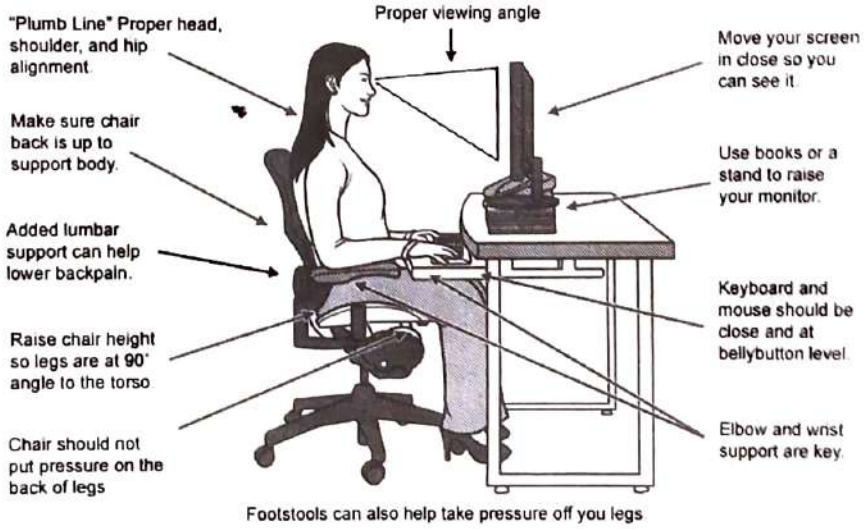
Fire

This kind of hazard is the most dreaded because of its potential to cause heavy to catastrophic damage, or even total loss to properties and lives. This is also the reason why fire safety is a strict requirement in the building code. Every workplace is required to have a full fire safety inspection and is required to keep and ensure that the fire safety equipment (usually fire extinguishers) are in good working condition. Common cause of fire in the office is generally electrical faults. This could range from equipment failure, overloading of convenience outlets and extension cords, frayed cable or exposed wiring to poor maintenance. Other causes are storage of highly combustible materials or human error.

Because of its catastrophic potential, ways of controlling this kind of hazard is highly standardized and involves not only private individual effort but rather one that is a concern by the public, as a whole, and enforcement by the government, thus the Fire Code of the Philippines.

Ergonomic Injuries

This kind of hazard is often ignored but perhaps the one that most causes long-term injuries if not addressed. It is quite difficult to detect since this is one that does not manifest instantly, unlike accidents. The risks involved in this kind of hazard develop over time. For instance, while you are conveniently seated inside the office the whole day, doing your work, ergonomic injuries may happen to your hips and back due to poor posture. On the other hand, if your job requires you to do repetitive movements to specific region of your body like wrists, back or hips, this causes repeated trauma which could be negligible while doing the actual work but gradually and increasingly worsens over time until it manifests in a discomforting, or worse, painful manner.



Proper Workstation Ergonomics

The very workstation you are using can present a number of risks if not corrected. Correcting or controlling this kind of hazard generally involves making use of ergonomically adjustable office furnishings and equipment such as chairs, tables, computer monitor, and keyboard, to as simple as a copy holder for documents while you are typing. While these things may seem as some sort of hype for novelties and conveniences, they do allow to

minimize the risks of long-term injuries that may not be life-threatening but definitely discomforting. Remember that safety is not only concerned about reducing the risk of accidents in the workplace but also to protect the welfare of the workers. A workplace that may not have all the convenience but free from discomfort is a happy workplace.

Injuries related to this kind of hazard is generally called "work-related musculoskeletal disorder (WMSDs)." This is also commonly called by many names:

- Repetitive motion injuries
- Repetitive strain injuries
- Cumulative trauma disorders
- Occupational cervicobrachial disorders
- Overuse syndrome
- Regional musculoskeletal disorders
- Soft tissue disorders

Eye Strain

Now, more than ever, eye strain is one [illegible] most common risks present in the workplace even at home. No matter what ind[illegible]y you work in, you use your eyes looking at what you are doing, more so when working in an office. Most, if not all, office workers stare at computer screens for long periods of time doing their daily tasks. This causes your eyes to get dry and irritated and worse, you might have trouble fo[illegible]ng. While this kind of hazard could be inevitable, there are still some things or practices we can do to minimize it, especially in the workplace.

- Reduce glare on monitors by lowering light levels or by closing blinds on windows
- Adjust monitor position slightly below eye level at appropriate angle
- Take a 5- to 10-minute break for every hour spent staring at the monitor, focusing your eyes at varying distances
- Increase computer font size

Indoor Air Quality (IAQ)

Not because you work in an air-conditioned room means that your workplace is safe and free from risks caused by poor indoor air quality. Common risks involved in this kind of hazard ranges from allergies, chemical sensitivity to occupational asthma and other respiratory disorder. This can be caused, generally, by poor housekeeping and maintenance that promotes build-up of harmful gases, particulates, and microbial contaminants.

Overcrowding is also another cause for poor IAQ. It affects the humidity and temperature of the room. Nowadays, overcrowding does not only pertain to people itself. Virtually, each person in the office is assigned at least one computer to do his/her tasks. These computers give off heat, among others, that also affects IQ. Copiers and laser printers give off ozone gas that contributes to IAQ hazards.

Like any other hazards in the office, good housekeeping and maintenance is perhaps one of the most important and simplest ways of controlling it. IAQ is all about cleanliness and hygiene. Other ways of controlling it are through the use of various equipment and appliances like air conditioners, heaters (for cold places), and other ventilating machines. Moreover, you can setup an IAQ policy that everyone can follow.

Systems for Controlling Hazards

There are a lot of kinds of hazards, so too does controlling them use different systems. These include:

- **Engineering Controls**. This involves controlling the hazard right at its source. Whenever applicable and feasible, the equipment and facility used to perform the job is customized, fabricated, or manufactured in such a way that it removes, isolates, or minimizes the risk involved. In an office environment, use of ergonomic seats and tables or other office equipment that can be adjusted not only for convenience but also to reduce physical stress while performing the work is part of an engineering control.
- **Safe Work Practices**. This perhaps is the most cost effective and practical system that can be implemented. It involves establishing certain rules and regulations regarding carrying out all tasks in a safe manner. This may also require training and educating workers to enforce the practice.
- **Administrative Controls**. This type of control goes hand in hand with safe work practices. Though seemingly the same, administrative control may refer to additional measures or organizational policies that aim to reduce organization-wide hazards and risks.
- **Personal Protective Equipment (PPE)**. While the use of PPE may not be a necessity when working in an office environment, it might be noteworthy to know what PPEs are and what kind of PPE applies to specific tasks in the office. Most common PPE that could be found in the workplace, whether in an office environment or heavy industry or construction site are helmets, gloves, and safety shoes or rubber boots.

- **Systems to Track Hazard Correction**. This refers to a well-defined system of identifying, tracking, and documenting hazards and the corrections made to reduce, if not to completely eliminate it. This could be in the form of a simple form document, a spreadsheet, or a database. In large organizations, such systems are mostly in place and maintained. In smaller organizations, however, this may seem and should be more simple to implement, this is often neglected.

System	Hazard Description/Location	Assigned To	Interim Action	Action Completed

- **Preventive Maintenance Systems**. A good and reliable preventive maintenance program should be in place to ensure that hazard controls currently implemented are always functioning well. This involves strict, regular monitoring and replacements (where applicable) of controls that are in place even before it needs repair. A common example of good maintenance practice is the regular monitoring and replacement of fire extinguishers in the office. Again, such practice is highly recommended to be well documented for tracking and reference purposes.
- **Emergency Preparation**. An emergency is a situation where a threat to life or property is present. This is mostly an unsuspecting or unexpected event such as an accident or an event brought by natural calamity or disaster like typhoons and quakes. The

key to reduce or minimize the loss or damage to life or property is by preparing for it. This requires detailed risk assessment and careful planning. Essential part of this preparation is on keeping communication lines open to appropriate parties involved in emergency response and relief. In an office environment, a well-planned and coordinated evacuation plan should also be included in the preparation. Conducting or participating in fire and quake drills is also highly recommended.

- **Medical Programs**. This is an important part of health and safety system. Such program can either be in-house, like in large organizations, or through certain arrangements with local medical facility. Other than medical treatment, in case of emergencies, medical programs control and promote the general health of the workers in an organization, something which is clearly an OHS concern. A company's health maintenance organization (HMO) program, though may not be complete, is a good start for a good medical program.

Maintaining Workplace Health and Safety

Building and maintaining a culture of safety is essential in any organization regardless of the size of the organization. Employers must always think of the safety of their workers in performing their duties and tasks.

An essential element in establishing such culture is by creating a safety committee whose members are coming from both the management team and the employee body. Once this committee is created, certain regulation and policies referring to the health, safety, and welfare of employees can be drawn out. Proper and reliable documentation must be maintained in order to manage and promote the general health and safety of all employees in an organization. Every employee must have his/her own health and safety record and monitored by management through the safety committee. In small organizations, keeping track and maintaining records of an employee's Annual Physical Examination (APE) is a good place to start.

Emergency Assistance

As we have already mentioned, every emergency situation is unexpected. We can only do so much in terms of preventing it but once it happens, there is no better way of handling it than to be prepared for it. One of the best practices in maintaining safety in the workplace is keeping the communication lines open and knowing where and how to get emergency assistance for such eventuality. Whether at home, school, or work, we are constantly reminded and given information about emergency numbers, that we most often ignore until such time that we need it. Keeping such information in mind may spell the difference between life and death. It is best to keep in mind your local Emergency Response Team (ERT) hotline. In most cases, these are hotline numbers for police, fire department, and ambulance services that are commonly posted around your community. If you cannot find such posting around your community, it is best to go to your nearest local government unit and ask for the information.

Knowing how to contact your local ERT is just one part of ensuring emergency preparedness. Knowing exactly where and how to get to key emergency facilities like medical clinics or hospitals is another part of it. Identifying the best as well as alternative routes to get there would be best.

KT Key Terms

- **Occupational Health and Safety (OHS)** – the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations
- **Hazard** – the source of potential injury or threat
- **Risk** – the probability that something bad will happen
- **Ergonomic Injuries** – painful condition of the hands, hips, or back due to poor posture
- **Eye Strain** – caused by staring at computer screens for long period of time
- **Indoor Air Quality (IAQ)** – a kind of hazard that ranges from allergies, chemical sensitivity to occupational asthma, and other respiratory disorder
- **Engineering Controls** – ergonomic seats and tables or other office equipment that can be adjusted to reduce physical stress while performing the work
- **Administrative Controls** – additional measures or organizational policies that aim to reduce hazards and risks organization-wide
- **Personal Protective Equipment (PPE)** – protective equipment, such as helmet, gloves, and safety shoes or rubber boots

QD Questions for Discussion

1. How can you help in maintaining occupational health and safety?
2. At school and at home, how do you think can you help promote OHS?

LA Learning Activity

How many violations of safety standards can you find?

S Summary

"Safety is everybody's concern." It starts with one's self. Risks and hazards are present in the workplace no matter how convenient it looks, as in an office. Hazards that are present in the office can be identified as those causing slips, trips, and falls, fire, ergonomic injuries, eye strain, and indoor air quality. These hazards can be controlled through the use of different systems or a combination of them. Systems that are used to control hazard are engineering controls, safe work practices, administrative controls, using PPE, systems to track hazard correction, preventive maintenance systems, emergency preparation, and medical programs.

PT Post-Test

Matching Type: Match column A with column B. Write the letter of the correct answer on the space provided before each number.

A. *Identifying Hazards*

A	B
___ 1. Tripping	a. Electrical faults ranging from equipment failure, overloading of convenience outlets and extension cords, frayed cable or exposed wiring
___ 2. Slipping	b. Loose overhead fixtures; tossing tools and objects between co-workers
___ 3. Falling	c. Allergies, chemical sensitivity, occupational asthma, and respiratory disorder
___ 4. Fire	d. Wires running down near or through the walkways or aisle
___ 5. Ergonomic Injuries	e. Spills on the floor leaving it wet and presence of small objects like pen caps or paper clips that are left scattered
___ 6. Eye Strain	f. Staring at computer screens for long periods of time
___ 7. Indoor Air Quality	g. Painful condition of hands, hips, or back due to poor posture

B. Controlling Hazards

A	B
___ 1. Engineering Controls	a. A well-defined system of identifying, tracking, and documenting hazards, and the corrections made to reduce, if not to completely eliminate it
___ 2. Safe Work Practices	b. Helmets, gloves, and safety shoes or rubber boots
___ 3. Administrative Controls	c. Conducting or participating in fire and quake drills
___ 4. Personal Protective Equipment (PPE)	d. Use of ergonomic seats and tables or other office equipment that can be adjusted to reduce physical stress while performing the work
___ 5. Systems to Track Hazard Correction	e. Programs control and promote the general health of the workers in an organization
___ 6. Preventive Maintenance Systems	f. Additional measures or organizational policies that aim to reduce hazards and risks organization-wide
___ 7. Emergency Preparation	g. Establishing certain rules and regulations regarding carrying out all task in a safe manner
___ 8. Medical Programs	h. Strict, regular monitoring and replacements of controls that are in place even before it needs repair

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Criteria	Weak	Good	Excellent
Can identify hazards and risks in an office environment			
Can suggest or recommend practical risk reduction methods or procedures			
Understanding the effects of hazards and risks			

UNIT II

Traditional Animation

Lesson 6: Design Elements and Principles

- Steps in Developing a Multimedia Project
- Design Standards
- Design Principles

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. understand the importance of proper planning before development;
2. identify the tasks and responsibilities involved during project development; and
3. demonstrate knowledge of design elements and principles.

PT Pre-Test

I. Fill in the blanks with the correct answers.

1. _____ – defines, coordinates, and facilitates the production of the multimedia project
2. _____ – part of the production team that researches the content necessary for the film development
3. _____ – generates the dialog needed for each scene and how it should be displayed as per the storyboard
4. _____ – ensures that all text must be structurally and grammatically correct including that of any accompanying documentation
5. _____ – responsible for the graphic elements of the program such as background, buttons, characters, and all other graphic elements needed
6. _____ – integrates all the multimedia requirements like graphics, text, audio, music, video, photos, and animation by using an authoring program like Flash®
7. _____ – responsible for the encoding of scripts in the authoring language
8. _____ – a principle design that reuses internal and external components, maintaining consistency with purpose
9. _____ – a principle design that makes simple and common tasks simple to do, communicating simply in the user's own language
10. _____ – a principle design that keeps all needed options and materials for a given task visible without distracting the user with redundant information

II. Enumerate what are being asked in each item.

A. Ten steps in developing a multimedia project

B. Six design principles. Explain how each principle affects the overall project design. (Should be in order. 5pts each.)

LD Lesson Discussion

Planning is probably the most important stage of creating an animation since it sets the groundwork for your tasks and allows you to maximize your assets. It is a process of identifying everything that needs to be done to reach an objective. Here are the steps in developing a multimedia project:

1. **Conceptualizing**

It starts with an "idea" or better described as "the vision," which is the conceptual starting point. To start with, visualize your ending—the multimedia experience that your target audience will have.

Identify a relevant theme for the multimedia title or a theme that is socially important and exciting to work on. You may also consider the availability of content and the copyright issues. You will also need to determine the platform of the content you will be creating. Are you planning to have your content be viewed through mobile or websites?

Jot down in bullets all the ideas you have in mind. After listing them all, start the process of elimination until you have the last idea that is best for you.

After you have finalized the theme for your multimedia project, you have to go through the details of the theme. Define your goal or the general purpose of your anticipated project outcome. List your objectives or the specific statements that define your goal.

Another important element that needs to be identified at this point is the potential target audience for the project proposal. This will determine how the content needs to be presented.

2. **Researching Content**

Content may compose of text, graphics, and backgrounds. Developing this is time consuming. Be sure to identify the references that you need to use in developing the content.

3. **Storyboarding**

You have to pre-visualize your expected output. The graphics and story drafted on paper as to how each scene should be animated/filmed. The story sho easily be seen when a storyboard is reviewed by the team. Skipping this stage may le to a costly editing in the end. So be sure to have this pre-production step complet before diving into the actual animating part.

4. **Project Development**

This is the exciting part wherein the team works together to achieve the fi animation film. Typically, the team consists of:

- Production Manager – defines and coordinates the production of the multimed project
- Content Specialist – responsible for performing all necessary research with rega to content
- Script Writer – generates the dialogs needed for each scene as to how it shou be displayed as per storyboard
- Text Editor – ensures that all text must be structurally and grammatically corre including the documentation part
- Computer Graphic Artists – responsible for the graphic elements of the progra such as background, buttons, characters, and other graphic elements needed.
- Animator – responsible for integrating all the multimedia building block (graphics, text, audio, music, video, photos, and animation) by using an authorin program like Flash®
- Programmer – responsible for the programming of scripts in the authoring language These codes are used for special functions or capabilities for the project

5. **Selecting Music and Sound**

Once your animation has been refined, the audio track may then be inserted Unless you are planning a silent-movie type of animation, adding sound effects and dialogs will certainly enhance the quality of your animation. Adding audio will be discussed later on.

6. **Adding Interactivity**

After the sounds, it is now time to program additional interactivity features of your multimedia project. You may add a "Replay" button or buttons that will allow your users to navigate within your multimedia content. For example in Flash®, it uses ActionScript 3.0 programming language.

7. **Testing Project Output**

Testing a multimedia is important so that the final version follows the quality standards and is not filled with bugs, technical snags, inaccurate information, or grammatical/typographical errors.

Types of Evaluation

a. Internal Evaluation – testing within the multimedia development group, through internal discussions for evaluating the aspects of the application. The checklist at this stage is as follows:

- Application design
- Project goal and objectives
- Content accuracy
- Text and narration
- Sound
- Graphics and navigation
- Delivered via the proposed medium
- Legal considerations

b. Alpha Testing – testing within a known group of people and critics. The product is considered a working model though not finished, but functional. The purpose of alpha testing is to determine if the general direction and structure are adequate.

c. Beta Testing – testing within potential users. The project is in its final version and the copies are made available on a website and/or downloadable. A feedback form should be available that allows the users to send their comments.

8. **Project Revision and Updates**

Since there is something bound to go wrong, this is the stage where you check every detail of your animation. During the beta testing, the team should discuss and revise necessary comments and suggestions gathered.

9. **Developing Documentation**

The documentation is also an important feature of high-end multimedia products. The developer must provide the following information:

- Instructions for installing the application (if the product is downloadable)
- Information about the files needed for installation
- Computer specification requirements
- Content acknowledgment
- Copyright acknowledgment
- Directions for navigation
- Contact details of the developer

10. **Delivering the Multimedia Product**

There are several ways on how you would like to deliver your multimedia project. For high-end multimedia applications, it is best delivered on a CD-ROM or DVD. The other way to deliver and the one that we will use for the book is through the Internet. One major advantage of delivering through the Internet is the continuous update that enables your product content to not get outdated.

These steps are important for you to be successful in your multimedia project. In one of the activities at the latter part of the book, you will be able to work with a team in accomplishing a multimedia project.

Indeed, no man is an island. In animation authoring, it is usually advisable to work in teams since it will save you time and will allow you to finish your project within the timeframe. It also helps to have at least two or more people involved in the project, so they can contribute their opinions and ideas.

Interface design is important for several reasons. For one, the more intuitive the user interface, the easier it is to use. The better your user interface, the more users will like to use it—increasing their satisfaction with the work that you have done. In this lesson, we will discuss the design principles, tips, and techniques in planning your own Flash® game. The "Conceptualize" step from the previous lesson is explained thoroughly.

Design Standards

There are no standards in animation film design. But the generic standards in development can help improve your actual output.

1. Design Outline – a quick discussion of your projected output such as features and target audience
2. Preliminary Design – includes the content of the film
3. Final Design – a rewritten version of the previous document, only more detailed as needed by the development
4. Design Specs – focuses on the implementation of the features in the final design
5. Graphic Bible – a collection of all the artwork needed like the background objects, character drafts and character poses
6. Interactive Screenplay – dialogs and other instructional text needed

Design Principles

The *user interface (UI)* is the manner through which a user interacts with the system. Below are the fundamentals of the user interface design from software design experts.

1. The Structure Principle – clear and consistent for your target audience
2. The Simplicity Principle

   – user-friendly if you plan to include interactions with the audience
3. The Visibility Principle

   – the storyline focus can easily be identified by the audience
4. The Feedback Principle

   – changes on the scene should show connection on previous and preceding scenes

5. The Tolerance Principle – the design should be flexible on minor changes required as the need arises
6. The Reuse Principle – the artwork and other elements should easily be available for other projects

KT Key Terms

- **Conceptualizing** – identifying initial ideas and vision of the project
- **Storyboarding** – pre-visualizing expected output; drafting on paper the scenes for the animated film
- **Alpha Testing** – testing within a known group of people and critics
- **Beta Testing** – testing within potential users

1. During project development, what stage do you think is the most crucial part?
2. If you were to choose among those responsibilities, where do you think you would be most effective?

LA Learning Activity

Research from the Internet about a social issue that you would like to support. Determine the positive results you wish to achieve in support of this issue through your multimedia project. Sketch your ideas on paper and answer the following questions.

1. What is the main goal of your multimedia project?

   _____

   _____

   _____

2. Describe the primary audience for your multimedia project.

   _____

   _____

   _____

3. What do you want to accomplish (what is the "call to action" for your audience)? How do you want your audience to feel or what do you want them to do after viewing your project?

   _____

   _____

   _____

4. Seek feedback from your colleagues. What do they say about your multimedia project?

   _____

   _____

   _____

5. List down questions for your target audience to recognize their needs.

   _____

   _____

   _____

S Summary

An excellent design would involve great planning. It reduces trivial design concerns in the development stage and provides more time to be devoted in enhancing and improving your output during the testing and revising stages. This allows for greater success probability with your users.

The ten steps discussed are essential for the success of a project. Creating captivating animations require good planning and teamwork. The process of creating an animation should always start with the clear identification of your animation's goals and purpose.

There are six user interface fundamental designs from experts that include clear and consistent designs. Making your design simple will allow users to navigate to your project easily. The elements of design include line, form, and color.

PT Post-Test

I. Fill in the blanks with the correct answers.

1. _____ – defines, coordinates, and facilitates the production of the multimedia project
2. _____ – member of the production team responsible for performing all necessary research concerning the content
3. _____ – generates the dialog needed for each scene and how it should be displayed as per the storyboard
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II. Enumerate what is being asked in each item.

A. Ten steps in developing a multimedia project

B. Six design principles. Explain how each principle affects the overall project design. (Should be in order. 5pts each.)

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Skills	Weak	Good	Excellent
Understand the importance of planning and design			
Identify the steps in the planning stage			
List and understand design concepts applicable to task			

Lesson 7: The Process of Animation

- The Traditional Animation Process
- Steps in Animating a Scene

LO Lesson Objectives

At the end of the lesson, students should be able to:

1. understand the importance of following the animation process
2. identify the animation process
3. demonstrate knowledge of animating a scene

PT Pre-Test

Matching Type: Match the description in column A with its corresponding term in column B. Write the letter on the space provided before each number.

	A	B
_____ 1.	This stage is where model sheets are made.	a. Story Sketch
_____ 2.	This stage is where the directors guide artists in drawing images that graphically portray the action described on the script.	b. Storyboard
_____ 3.	This stage is where the assistant editor takes the selected lines after recording and with the cutter, splices them together so they will play like a radio script.	c. Recording
_____ 4.	This stage is where the drawings are given a consistent style especially when several animators are working on the same character or scene.	d. Track Breakdown
_____ 5.	This stage is also known as film script where characters, attitudes, feelings, entertainment, and expressions are drafted.	e. Designs
_____ 6.	This stage is useful for the animators as they use this as guide for accurate timing.	f. Story Reel
_____ 7.	This stage is where the storyboard is being filmed to check if soundtrack is in sync with the pictures.	g. Line Tests

_____ 8. This stage is where the animators are involved where the animation is made for the scene. h. Clean-up

_____ 9. This stage is where the soundtracks are combined into a single track for the filming. i. Trace and Paint

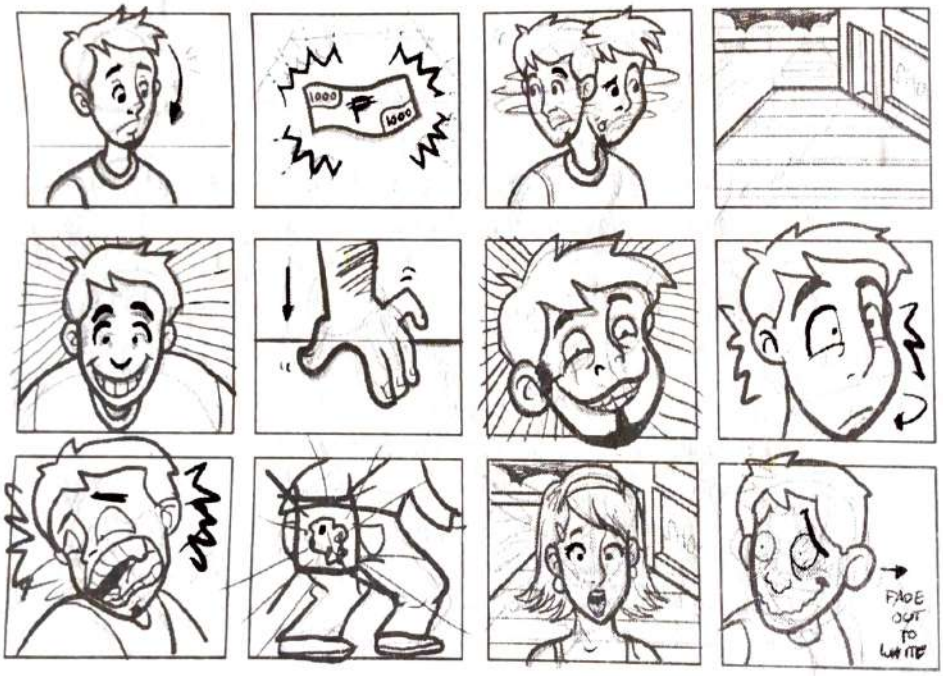
_____ 10. This stage is where the drawing is transferred to a celluloid or acetate. j. Dubbing

LD Lesson Discussion

The first step in learning about animation is to know and understand the procedures involved in making an animated film.

The Traditional Animation Process

1. **Story Sketch**: It is the first and the most important stage. It is also called the film script but it differs from the live-action film script as dialog is less important and complicated dialog should be avoided as much as possible. The story sketch should show characters, attitudes, feelings, entertainment, expressions, type of action, as well as telling the story of what is happening.



The story sketch staff is usually an artist who has a special interest in illustration, design, appearance, and character. His/her staging influences the layouts that will follow, his/her approach will establish a style for the picture, and his/her arrangement of the scenes and story value will serve as a guide to the cutting and presentation of the ideas in the final output.

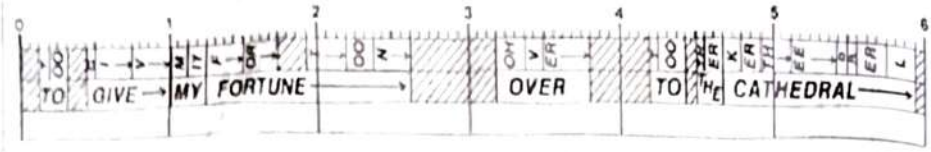
2. **Storyboard**. This is the stage where the director produces the storyboard. A storyboard is a series of drawn images that graphically portrays the action described in the script. Often, when a director works on the storyboard, deficiencies in the structure and format of the story are detected and corrected. The director makes decisions but is aided by his layout man, supervising animators, and possibly, the story sketch man stand by to quickly make changes when needed.

If the animation takes more than 30 seconds, a "think tank" comprised of all the contributors involved is set up and the story, content, and ideas are finely polished.

3. **Recording**. Animation relies totally on perfect synchronization of the picture to the soundtrack, the animator must receive the initial recorded track before beginning to draw. The animator will not be able to time the action accurately without it. It is very important that the animators be able to see the attitudes and expressions when they close their eyes and listen to the voice. When the action is in sync with music, it is possible to record a simple guide track to indicate the essential beat and the basic melodies.

4. **Track Breakdown**. After the soundtrack has been made, an editor assembles it into the precise working length of the film and then breaks down the track. A cartoon cutter's job is concerned with keeping, marking, and storing all of the simplest film with four tracks: two dialogs, sound effects, and music. The breakdown is a simple process of analyzing the dialog phonetically (by sound) and documenting the precise position of each sound in relation to the films frames.

The assistant director takes the selected lines after recording and with the cutter, splices them together so they will play like a radio script. The bar sheets are charts on paper of everything on the reels and on the greys as discussed in the previous lesson.



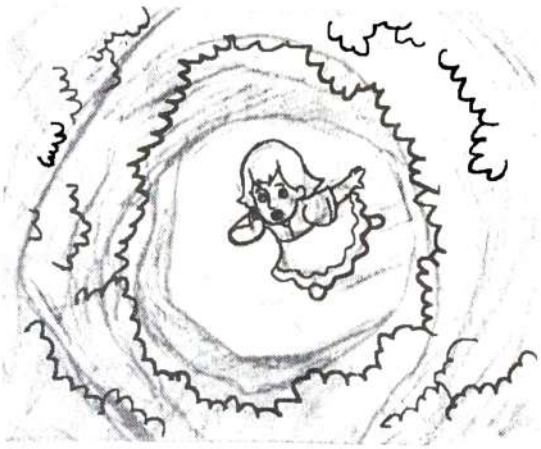
If the bar sheets are accurate, the assistant director does not have to spend time in the Cutting Room. The cutter will just have to follow what is in the sheet. However, in reality, it is seldom easy. What works on paper may sound right to the ear, and after trying a little change and shifting one track to a new location; somehow nothing may seem to fit together anymore. It is a long process.

5. **Designs**. During the track break down, the director selects one or more file designers to produce visual interpretations of all the characters featured in the film. After approval, each character is drawn from a multitude of angles and placed on a single sheet of paper, called the *model sheet*. This will become reference for all animators. Also, the background styling for all the main sequences in the film is produced.

6. **Story Reel**. Under the supervision of the director and using the bar sheets and storyboard, the layout artist proceeds with the story reel of the whole film. In traditional animation, a Leica reel is produced. A *Leica reel* or *animatic* is a filmed storyboard, which can be projected in synchronization with the final soundtrack. Instead of filming the storyboard drawings, the layout artist carefully draws each scene to the size at which it will eventually be animated. Also, the layout artist carefully draws the characterization in the precise style as how the film designer has created. When all scenes have been completed, the director (using the bar sheet timing list) has each shot on film.

During the process, changes in both sound and picture are made. This is the beginning of the continuing changes and they are erased, patched, and revised as the tracks are repaired to match the new drawings that will condense some actions and expand others. The Leica reel viewing is often the last chance the director has to change the film without affecting time and money costs on what is normally a tight schedule and budget.

The name "Leica reel" is derived from the German maker of cameras called Leicas, which was used to make filmed storyboards in the early animation days.



7. **Line Tests**. After the approved Leica reel from the director and producer, the animators finally become involved in the film and begin to produce a line test of each scene. Line tests are animation drawings produced in pencil on paper, filmed to the precise timings of the scene, as indicated on the bar sheet. Sometimes, it is necessary to modify

the animation several times in a particular scene if the line test shows that the action is not quite working. The animator works back and forth through his/her scene until he/she has made the drawings that control the movement. He/she might make a drawing for every frame of film depending on the particular action. Usually, the line test works the first time and the scene can be cut into the Leica reel by the editor and replace the drawings originally produced by the layout artist. Gradually, as each pencil-animated scene is added, a line test of the whole film becomes available for viewing and for fine adjustment. Any major changes from this stage onward may prove extremely damaging to the overall film budget.

8. **Clean-up**. This stage is ideal on a major production to have a team of clean-up artists on staff or sometimes called assistant animator. They take all the animation drawings and clean them up, to give them a consistent style. It is their skill that makes the pictures look so fine. This is important especially when many animators are working on a same character and there is an inevitable variation in the look of the character. After the entire cleanup is completed, it is best to line-test the drawings again, just to check that no additional mistakes have slipped in.

9. **Trace and Paint**. After the cleaned-up line test is finally approved, each drawing is transferred to a thin sheet of celluloid or acetate (a cel) and painted in colors of the original design. In the early days, artists carefully traced each drawing required in a varied range of line techniques. Today, one can quickly photocopy a drawing on the cel or for the cleanup artists and animators to draw directly on the cel itself, avoiding the pencil stage altogether. Of course, now that computers are readily available, animation applications can easily do this. After the animated images is on cel, and in preparation for the final shoot, a team of artists paints the cel in opaque colors on the reverse side to the drawing, thus keeping the paint from going over the lines and producing flatter, smoother colors.

10. **Backgrounds**. Another team of artists produces the background while the animation is being traced and painted. They are responsible for everything behind or sometimes in front of the moving characters that do not move. Each background artist must be consistent in producing his/her drawing task as it needs to be identical to the original film design.

11. **Checking**. After the finished animation cels and backgrounds are completed scene by scene, they are forwarded to the checker who makes sure that everything is correctly drawn, traced, painted, and prepared for the cameraman who is to finally film it. The checker must be efficient in examining incomplete or incorrect output produced.

12. **Final Shoot**. This is the final stage in the actual filming procedure related to the artwork. After the checker's approval, it will be passed on to the cameraman to shoot the complete scene.

13. **Rushes**. Viewing for possible errors. If any are found, the problem must be identified and rectified, and have the scene reshot. If, on the other hand, everything is fine, the rushes are cut by the editor into the final film, replacing the existing line test scenes.

14. **Dubbing**. This is the process of combining all the soundtracks onto a single track, which will be printed on the film along with the picture. Dialog, sound effects, and music should be dubbed together without losing any of the special values that each has brought to the picture. When the chosen sound effects are laid in perfect synchronization with the action, the editor and director will go to the dubbing theater, where the voice track, music, and sound effects are all mixed in one complete soundtrack.

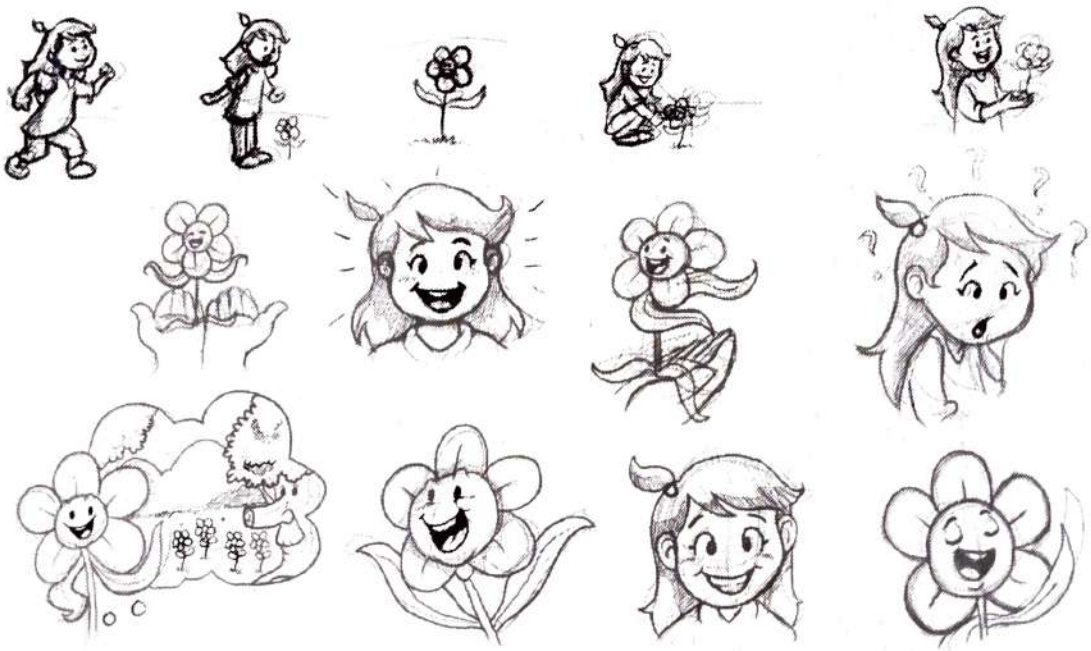
15. **Answer Print**. This is the final stage where sound and picture are merged in one piece of a film. It is now ready for viewing as this serves as the final product. It may be a 30-second animation or longer, the process of animation should follow certain structured procedures. If these procedures are carefully followed, then all will be well. In contrast, failure to respect the guidelines can be very costly in time and money.

Steps in Animating a Scene

1. **Envision**

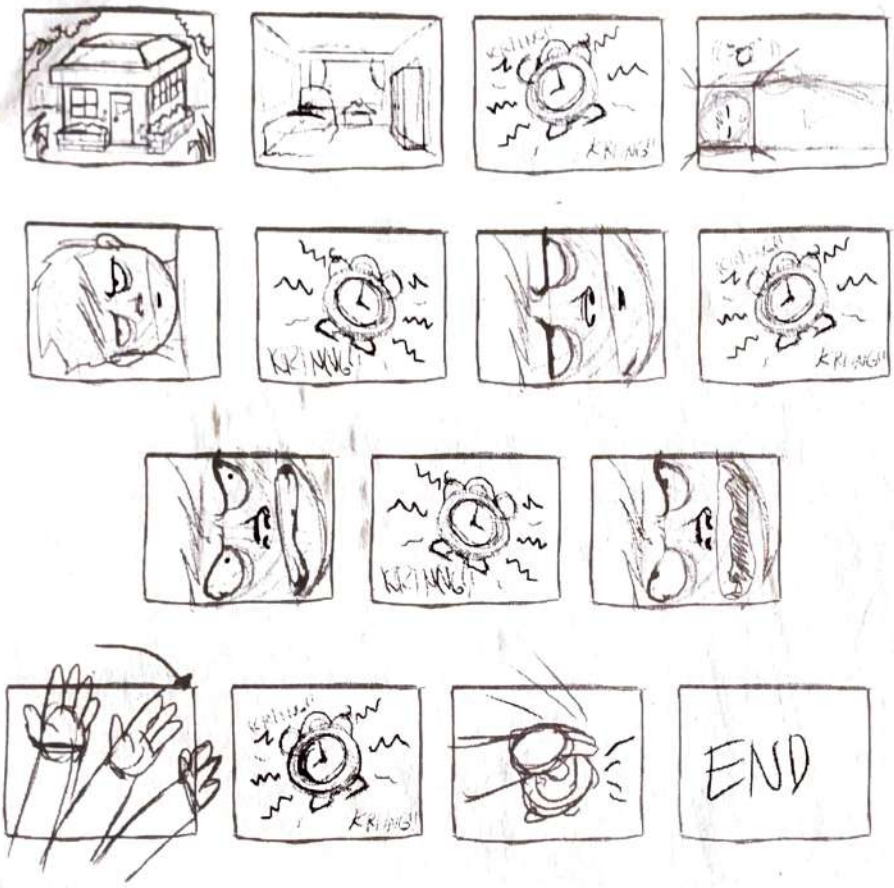
Ask yourself, why is the scene in the story? What should I do with the character? How can I best show it? Make sure that you know exactly what you are going to do before you start. Do not start animating before the idea is worked out.

2. **Sketch**



Note the ideas by making small sketches or thumbnails of the scene. Check the continuity and be familiar with the whole sequence so you know how your scene fits in the entire film. As you sketch:

- carefully plan the camera shot or angles as to which character should it be focused on;
- plan if the camera shot is a long shot or a close-up;
- avoid too many scenes; and
- change angle when it is possible or applicable on the scene.



3. **Perspective and Scale**

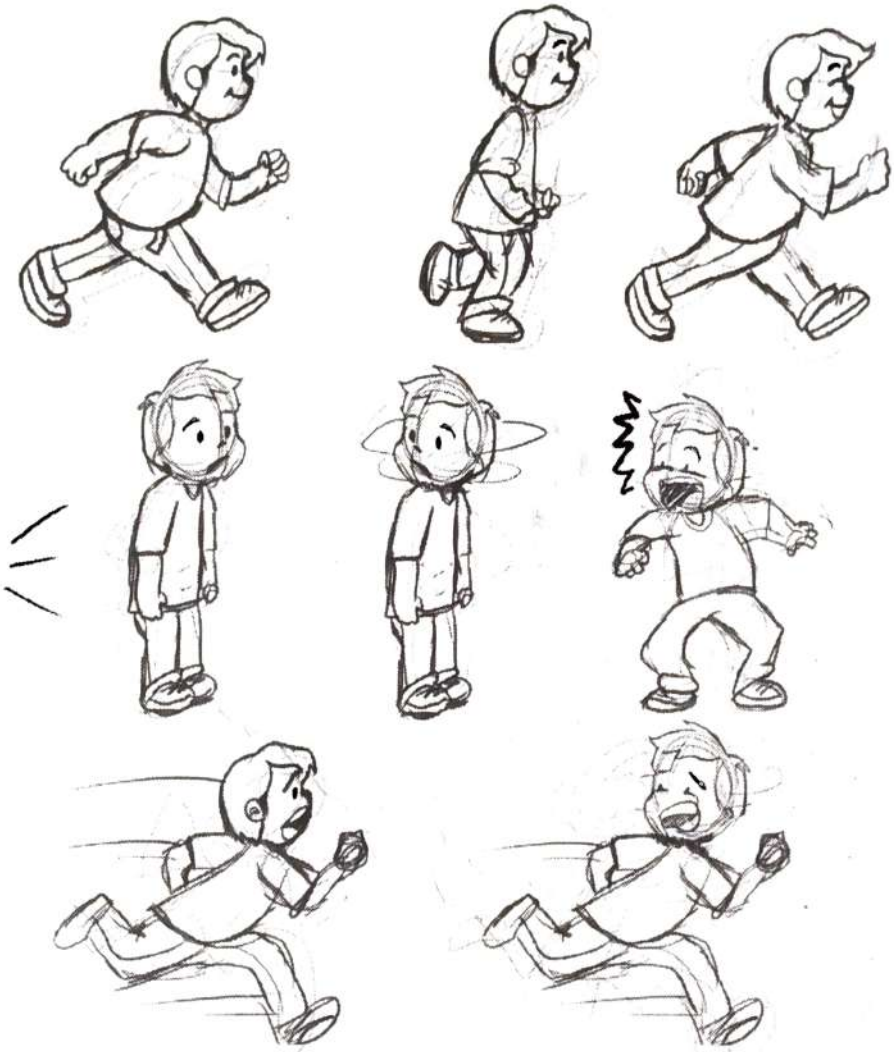
Be sure that the perspective matches the layout. Like if two characters are in a scene, have a good eye contact if they are looking at each other.

4. **Blow Up Sketches**

Draw your mini sketches on a film scale for line testing. Rough out the key positions of the scene using your mini sketches as guide.

5. **Be Creative**

Give life to the action. After the big draft, start focusing on the individual actions, timing, and expressions of each character.



Animation is a costly procedure in both time and money. If the audience only knew all that is involved in any animated production, their respect for probably one of the most creative art forms would increase. On a large-scale production, it is important that the team function efficiently. A typical large-scale production team includes a director, producer, a number of animators and assistant animators, team of in-betweeners, clean-up artists, tracers, painters and renderers, and special effects artists plus several checkers, editors, and cameramen.

KT Key Terms

- **Story Sketch** – shows the character, attitude, feelings, entertainment, expressions, type of action and story minus the complicated dialog
- **Model Sheet** – a collection of character drawing in different angles and sizes, placed on a single sheet of paper
- **Leica Reel** – also called the story reel where the storyboard is filmed in synchronization to the audio or soundtrack
- **Clean-up** – the stage where drawings are drawn in fine outlines to show a consistent look

QD Questions for Discussion

1. During the traditional animation process, what stage do you think is the most important?
2. If you were to rearrange the whole process, what would it be like?

LA Learning Activity

Research a video or animation from the web about "Peer Pressure." You can type "Stand Up to Peer Pressure" from any search engine. Choose a video and view it. After viewing, write your observations about the following:

1. Animator's Vision

_____

_____

_____

_____

2. Camera Angles

_____

_____

_____

_____

3. Perspective and Scale

4. Creativity

5. Strongest Point

Summary

The animation process consists of the following:

1. Story Sketch
2. Storyboard
3. Recording
4. Track Breakdown
5. Designs
6. Story Reel
7. Line tests
8. Clean-up
9. Trace and Paint
10. Backgrounds
11. Checking
12. Final Shoot
13. Rushes
14. Dubbing
15. Answer Print

The following are the steps in animating a scene:

1. Envision
2. Sketch
3. Perspective and Scale
4. Blow Up Sketches
5. Be Creative

PT Post-Test

Matching Type: Match the description in column A with its corresponding term in column B. Write the letter on the space provided before each number.

	A		B
_____ 1.	This stage is where model sheets are made.	a.	Story Sketch
_____ 2.	This stage is where the directors guide artists in drawing images that graphically portray the action described on the script.	b.	Storyboard
_____ 3.	This stage is where the assistant editor takes the selected lines after recording and with the cutter, splices them together so they will play like a radio script.	c.	Recording
_____ 4.	This stage is where the drawings are given a consistent style especially when several animators are working on the same character or scene.	d.	Track Breakdown
_____ 5.	This stage is also known as film script where character, attitude, feelings, entertainment, and expressions are drafted.	e.	Designs
_____ 6.	This stage is useful for the animators as they use this as guide for accurate timing.	f.	Story Reel
_____ 7.	This stage is where the storyboard is being filmed to check if soundtrack is in sync with the pictures.	g.	Line Tests
_____ 8.	This stage is where the animators are involved where the animation is made for the scene.	h.	Clean-up
_____ 9.	This stage is where the soundtracks are combined into a single track for the filming.	i.	Trace and Paint
_____10.	This stage is where the drawing is transferred to a celluloid or acetate.	j.	Dubbing

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Criteria	Weak	Good	Excellent
Understand the importance of planning and design			
Identify the steps in the planning stage			
List and understand design concepts applicable to task			

Lesson 8: Drawing Concepts: Contour Drawing

- Holding Your Pencil
- Understanding Outline Drawing
- Grid Drawing

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. hold the pencil properly when drawing;
2. draw outline drawings; and
3. use grid to draw detailed objects.

PT Pre-Test

1. What type of pencil grip seems to be comfortable for you and why?

_____

_____

_____

2. What object did you choose for the outline drawing practice and why?

_____

_____

_____

3. Do you think the grid technique is helpful? Why?

_____

_____

_____

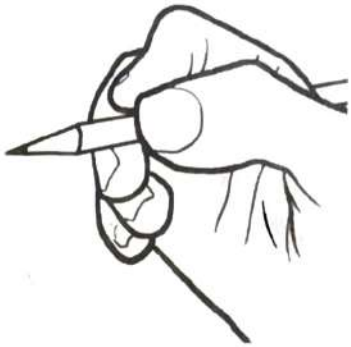
LD Lesson Discussion

To become an animator, you need focus, commitment, and determination. There are too much to learn and cannot be done all at the same time. The first step is enhancing your drawing abilities.

Drawing is the ability to see shape and relationships between shapes. You may already have this ability and would just need practice to enhance. Let us take it step by step and discover the essential drawing skills from how to hold a pencil to sketching. We may not be able to create a perfect drawing but training your eye, hand, and mind is the first step in becoming an artist.

Holding Your Pencil

One of the worst things you can do when you start drawing is trying to force yourself to use an artificial grip with your pen, thus creating stress and upsetting the natural flow of your line. Yes, holding your pencil the right way is important to start with.



The most common way to hold a pencil is the *basic tripod grip*. This grip is the same as what you use for writing. You use your fingers and thumb to control the pencil and the hand can rest on the page.

Another useful way to hold the pencil is the *extended tripod grip*. It is the same as the basic grip where your thumb and forefinger and middle finger forms a triangle except that you further up the pencil.

The extended tripod grip allows you to make small drawing movements of the fingers which produce a much larger movement of the pencil tip. Make sure that you keep a relaxed grip on the pencil for better sketching.

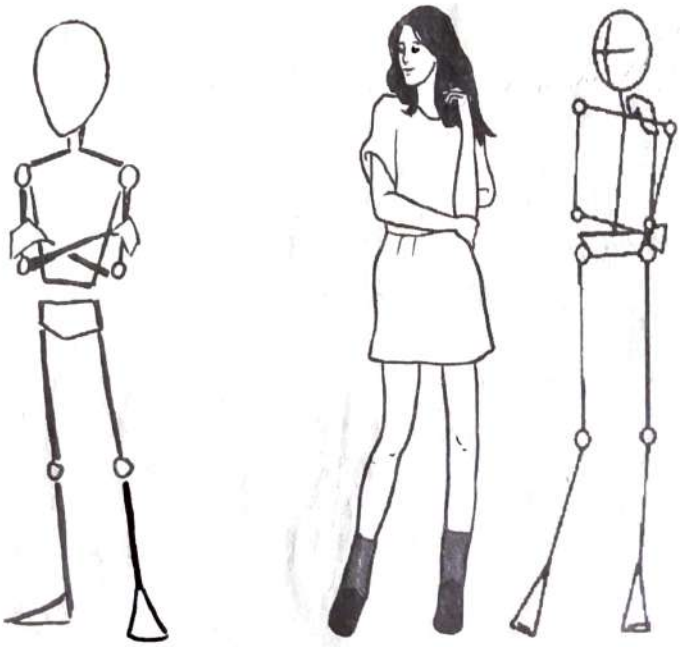
For light sketching, you may also want to try the *overhand grip*. The pencil is braced lightly against the fingers on the thumb. This grip allows you to shade using the side of the pencil.

Now that you know the different ways on how to hold the pencil properly when drawing, let us have a fun exercise to develop your hand-eye coordination. The activity is called the blind outline drawing because you will draw the outline of the subject without looking at the paper. Do not mind the end result; what is important is how you carefully observe the subject.

Understanding Outline Drawing

Outline drawing is the simplest form of linear expression. The focus is on the edges, the outside of an object or the line made by a fold or pattern. In pure outline drawing, you have to avoid the surface details such as color and shadow.

You can start analyzing outlines by practicing wire drawing. First you need to know the joint points that will make up the gesture. Below is an example of wire drawing that you may practice on.

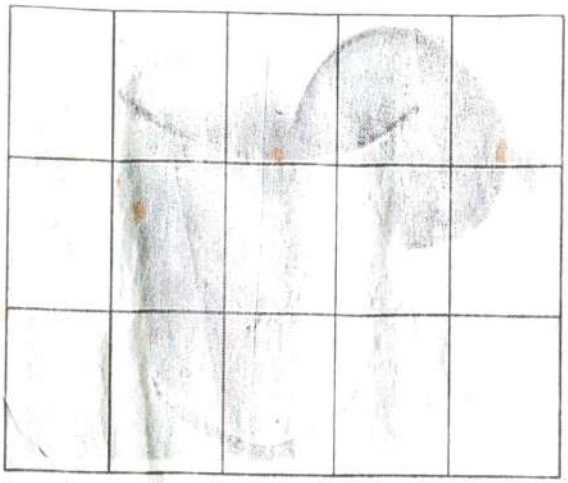


As you look at your subject, the shapes vary depending on your point of view. For example, a glass on top of a table, you know it has a perfectly cylindrical shape, with a circle top and bottom and sides that go straight up. But when you look at it, the circle seems a little flattened, and if you are looking from a higher angle, the top of the glass is nearly circular, the sides seem taper.

To start drawing an object, focus first on a viewpoint and stick to it then start sketching.

Grid Drawing

Another popular way to ensure that your drawing is proportioned is by using a grid. It is useful when accuracy is important.



You need to photograph your subject and print to draw a grid over it. Decide on your grid size. There is no definite rule as for the size of the grid. However, if the grid is too large, you will have to do too much drawing in between each square. If the grid is too small, you will find it difficult to erase, and it can get very confusing.

KT Key Terms

- **Basic Tripod Grip** – the usual pencil grip used for writing
- **Extended Tripod Grip** – almost similar with the basic grip but the hand is further up the pencil
- **Overhand Grip** – allows you to shade using the side of the pencil
- **Outline Drawing** – the simplest form of drawing that focuses on the edges of an object or subject
- **Grid Drawing** – ensures that your drawing is proportioned in a drawn grid

QD Questions for Discussion

1. Aside from the grid drawing technique, what other technique/s did you use?
2. Other people may not be familiar with a grid guide drawing technique, how would you best describe it?

LA Learning Activity

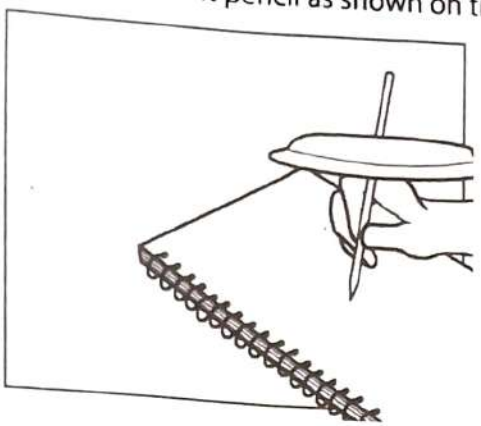
Activity 8.1. *Wire Drawing*

Create a wire drawing based on the image below.

Activity 8.2. *Blind Contour Drawing*

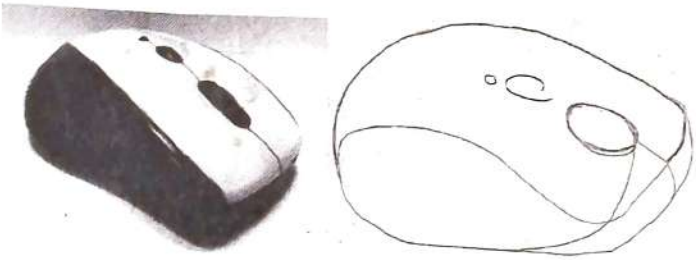
Materials: paper plate or folder, pencil, and bond paper.

1. Make a hole to fit pencil as shown on the picture below.



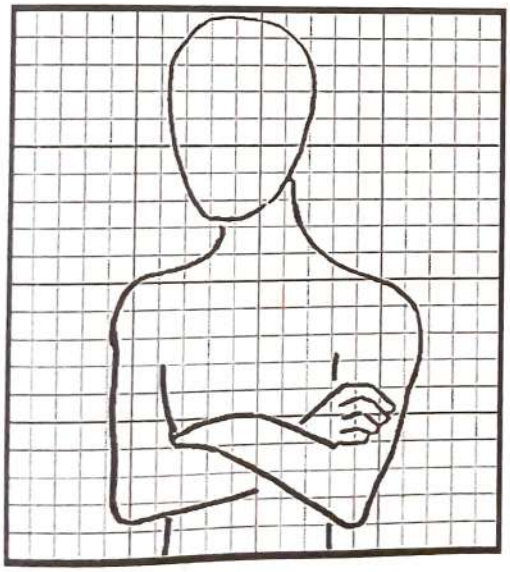
2. Choose a subject to draw near you. You may choose your mouse or any object on your desk.
3. Try to draw the outline of the subject you choose.

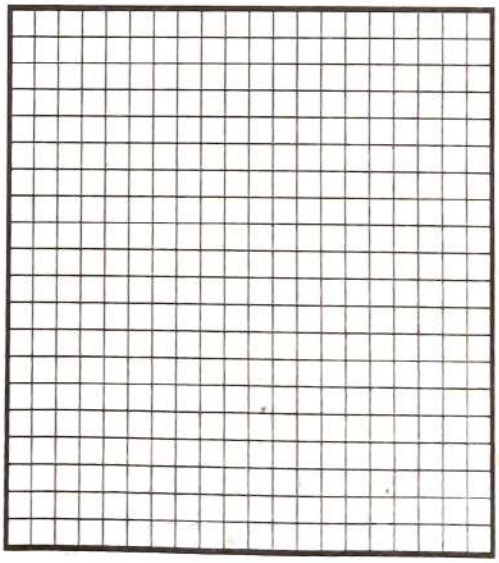
   Sample Output:

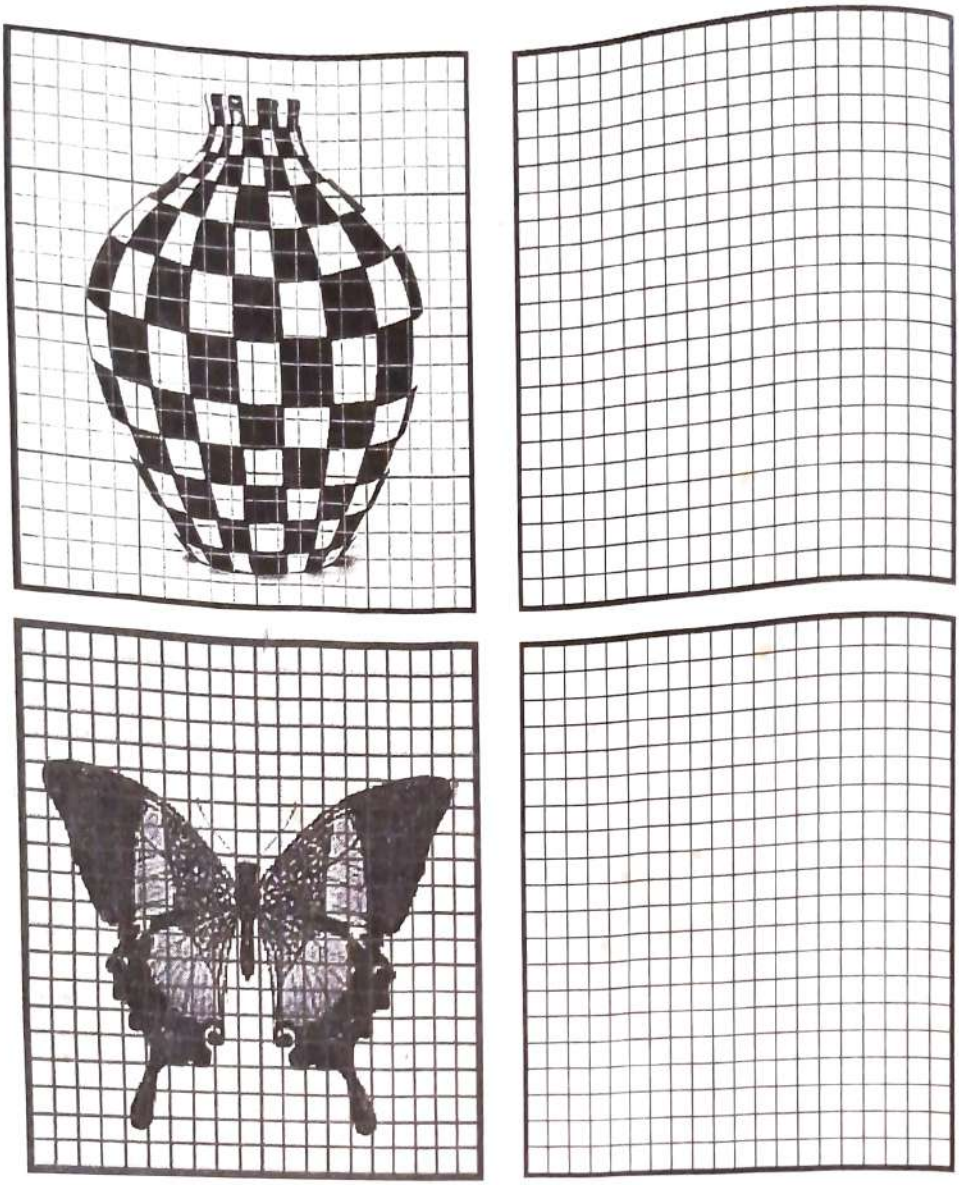


III. Grid Drawing

Copy the grid drawings below on the blank grid provided.







S Summary

In this lesson, you have learned how to hold your pencil properly to whatever is comfortable to you before you start drawing. You have also learned how to observe your subject, follow the outlines while you copy them to your drawing paper. The grid drawing will also help you to draw a more proportioned artwork.

PT Post-Test

1. What type of pencil grip seems to be comfortable for you and why?

_____

_____

_____

2. What object did you choose for the outline drawing practice and why?

_____

_____

_____

3. Do you think the grid technique is helpful? Why?

_____

_____

_____

SE Self-Evaluation

Evaluate yourself against the skills listed below. Check the option that you think is most appropriate to you.

Skills	Weak	Good	Excellent
Properly hold the pencil comfortably for drawing			
Draw outlines of a subject			
Use the grid as guide in drawing			

Lesson 9: Drawing Concepts: Perspective Drawing

- Perspective Drawing
- One-Point Perspective Drawing
- Two-Point Perspective Drawing
- Locating the Center of a Square or Rectangle in Perspective

LO Lesson Objectives

At the end of this lesson, students should be able to:

1. draw a simple and two-point perspective drawing;
2. draw objects in proportion by knowing the center of a drawing; and
3. understand structure and form of an object.

PT Pre-Test

Answer each question and write your answer on the space provided below.

1. What is the difference between a simple perspective to a two-point perspective drawing?

_____

_____

_____

_____

2. How important are vanishing lines and vanishing dots in a perspective drawing?

_____

_____

_____

_____

3. How will you identify the center of a square in perspective?

_____

_____

_____

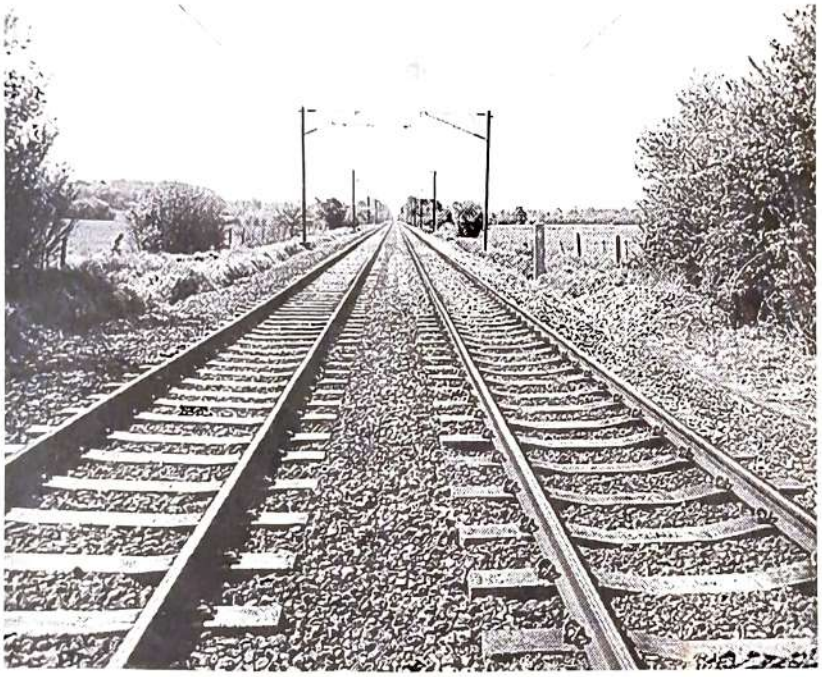
_____

LD Lesson Discussion

Animation needs drawing skills. You must understand your character as you make it. It includes every angle of your character.

Perspective Drawing

Perspective drawing is seeing an object on a different angle in almost a three-dimensional look. There are different kinds of perspective view which we will discuss as we go along the lesson.



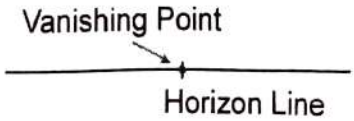
One-Point Perspective Drawing

Remember that perspective drawing has parallel lines with its own vanishing point. The picture above is in one-point perspective.

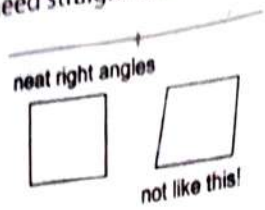
All lines are parallel as if it mirrors the image from left to the right. The lines go straight across or straight up and down then continue at the same distance apart. Until it comes together joining in the middle at a vanishing point.

How to Draw One-Point Perspective

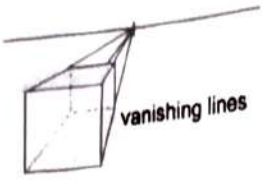
1. Draw a horizon line about one-third down your page. Draw a small dot or line to mark a spot in the middle of the line. That is your vanishing point. Vanishing point is the center where the perspective line meets. The horizon line is the horizontal guide for the perspective.



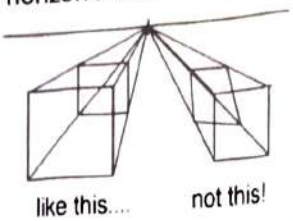
2. Next, draw a square below and to one side of your vanishing point. For a successful perspective drawing, you need straight lines and corners that meet exactly.



3. Now, draw a straight line from each corner of your square to the vanishing point.

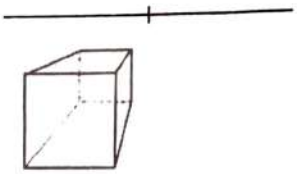


4. Next, draw lines from the vanishing point to each corner of the square. Make sure that it is straight, parallel to the horizon and front edge.

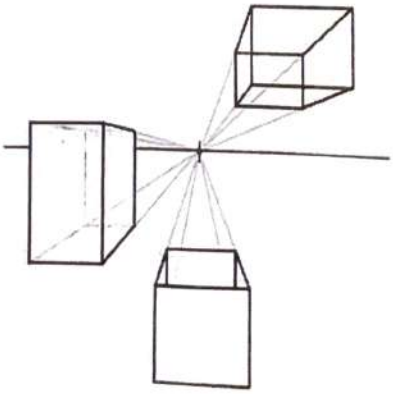


Note: If your box is close to the vanishing point, you might find that the angles are very wide and hard to get right.

5. After constructing the box, carefully erase the vanishing lines. Just keep the lines that would make up your simple perspective box as shown below.

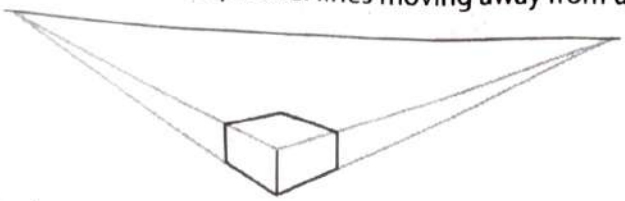


6. To get more practice, try constructing a fish tank, an open box and a solid box as shown below using the same technique discussed.



Two-Point Perspective Drawing

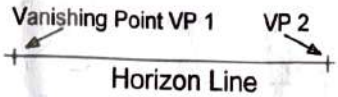
In this type of perspective, we are viewing the object or scene so that we are looking at one corner. This makes two sets of parallel lines moving away from us.



Keeping it simple, two-point, as the name implies, uses two pairs of horizontals on each side which will diminish toward the left or right vanishing point. Looking at the preceding picture of the box, the lines made by the edges of the box, they meet at two points above the table, at the eye level. In drawing a two-point perspective, close vanishing points make your image look compressed as looking through a wide-angle lens.

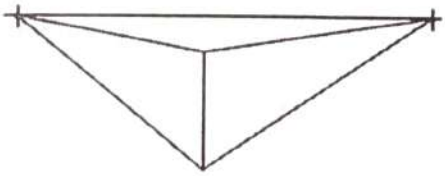
How to Draw Two-Point Perspective

1. First, draw a horizon line about one-third down your page. Then place your vanishing points on the edges of your paper using a small dot or line.

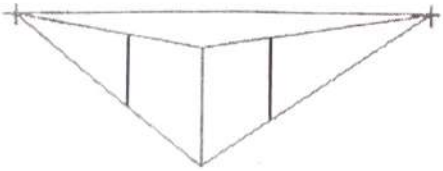


2. Next, draw the front corner edge of your box. Just a simple short line will do. Leaving a space below the horizon line but do not put it too close, or you will end up with corners that are too tricky to draw.

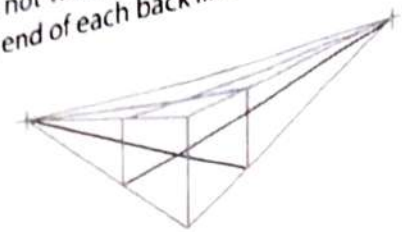
3. Draw a line from each end of the line to both vanishing points. Make sure that they are straight, touch the very end of the line, and finish exactly at the vanishing point.



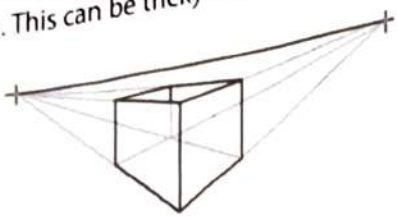
4. To complete the visible sides of the box, draw a straight line on each side of the center line, shown on the illustration below with the dark lines.



5. To draw the back part of the box, draw two sets of vanishing lines as shown below. One set goes from the right-hand corner line to the left. Another set goes from left-hand corner to the right. Do not worry about any line they might pass through. Just draw them straight from the end of each back line to its opposing vanishing point.



6. Next, draw a vertical line from where the lower vanishing lines cross, to the intersection of the upper two lines. This can be tricky as the slightest errors can make them a little off center.



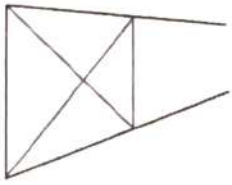
7. Finish off by erasing the excess vanishing lines. You can erase the lines of the box that would be hidden by the closer sides, or leave them visible if it is transparent.

Locating the Center of a Square or Rectangle in Perspective

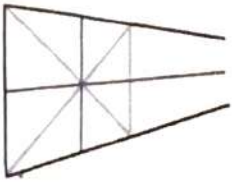
This simple trick will help you to evenly build features like tiles, bricks and windows, or position a door or roof.

Drawing a Box in Two-Point Perspective

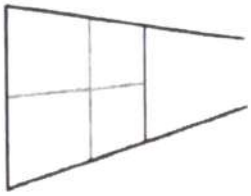
1. Draw your square or rectangle in perspective and then draw two lines joining the corners of the box diagonally as shown below. Where they cross is the center of your rectangle.



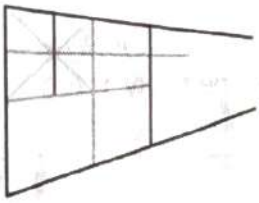
2. Line up your ruler so it meets the center of the square where the diagonals cross, and draw a vanishing line through it to your vanishing point and extend it to the front of the box.



3. Erase your construction lines, leaving your rectangle or square neatly divided into quarters.



You may repeat the steps with the divided rectangle to create smaller divisions.



To be successful in drawing perspective objects, practice… a lot. Do not worry about mistakes, they are part of learning.

Now that you were able to practice drawing in perspective, it is time to start observing objects. Seeing an object's structure is important that it makes sure that an object drawn is in proportion. It resembles the details of a drawing.

To start seeing the structure of an object, you must first need to ignore the surface details and look for the big shapes. Look for three-dimensional objects that you may sketch in perspective. Begin with simple objects like toys made out of cardboard boxes, a rocket made from paper tube and cone.

KT Key Terms

- **One-Point Perspective** – set of parallel lines connect in one vanishing point
- **Two-Point Perspective** – uses two pairs of horizontals on each side that will diminish toward the left or right vanishing point
- **Horizon Line** – serve as a guide to the vanishing point and parallel lines
- **Vanishing Point** – the point at the middle of the vanishing line where the horizontal lines should connect

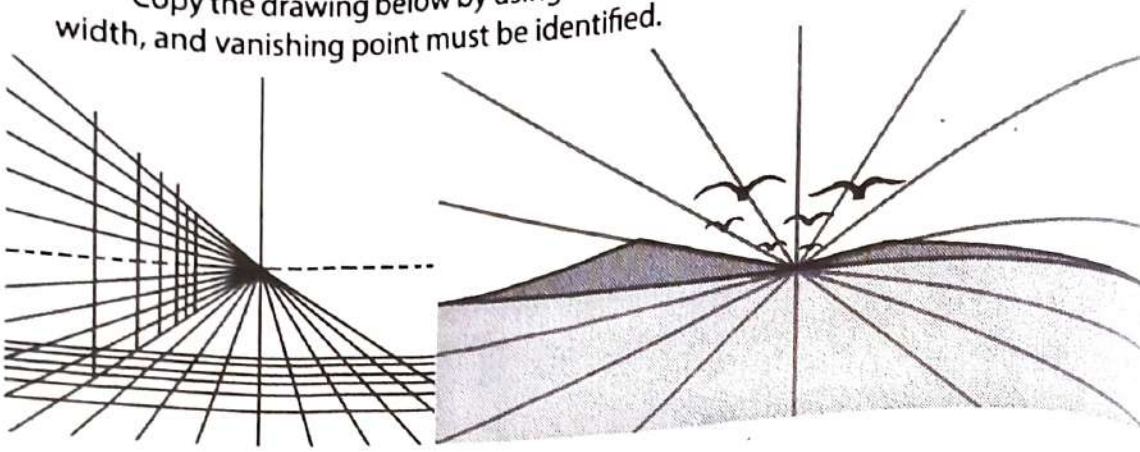
QD Questions for Discussion

1. What is the importance of knowing the perspective drawing?
2. How would you best describe perspective drawing?

LA Learning Activity

Activity 9.1. *Perspective Drawing*

Copy the drawing below by using the perspective technique. The horizon, vert width, and vanishing point must be identified.



Activity 9.2. *Structure*

1. Choose a simple object: an object in the classroom, in your bag, or outside.
2. Imagine that you are going to sculpt it from a piece of stone. Ask yourself wh rough shapes will you carve out first.
3. Start drawing on your paper. Draw the perspective as precisely as you can. It do not have to be perfect.
   - Concentrate on getting the overall proportion and placement.
   - Begin with the largest section of a complex form.
   - Do not use a ruler; train your hand.

S Summary

In this lesson, you have learned how to observe an object and train your eyes and han in drawing. The perspective drawing allows you to draw objects in proportion and be abl to observe angles. You also have learned to see the structure of an object. It allows you t see the details of an object that would make up a realistic drawing.

PT Post-Test

Answer each question and write your answer on the space provided below.

1. Differentiate a simple perspective to a two-point perspective drawing.

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