LifeTek-TLE 6

Practical Skills for Home and Livelihood

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Making learning a great experience

Mylene D. Lico
Rondi Daryl Reyes
AUTHORS

BUY

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FOREWORD

A livelihood is a necessity in life for adults anywhere in the world. While most people are content to earn a living as employees, there are those who want to be self-reliant where their livelihood is concerned. Hence, the reason for the creation of the LifeTek-HELE and LifeTek-TLE courseware series by TechFactors Inc. (TFI)

TechFactors understands that it takes both knowledge and skill – applied knowledge – to be able to earn a living on one's own efforts. Without these, it won't be easy to make products or provide services for potential customers and clients. The LifeTek-HELE and LifeTek-TLE courseware teach livelihood education in a way that enhances both; adding information to knowledge that students may already know by way of discussion and using performance-based lessons to develop skills that students can employ later on in their work.

With the use of the Techfactors LifeTek-HELE and LifeTek-TLE courseware, livelihood educators would be able to focus on their ultimate goal for every Filipino student—to make them productive and contributing members of Filipino society.

About the Authors

Mylene Lico

Mylene D. Lico is a licensed professional teacher who has been teaching in the public school sector for almost 21 years, including a tenure in the Department of Education since 1999. She graduated from the Polytechnic University of the Philippines in 1988 and majored in Business and Distributive Arts, eventually earning her a Bachelor in Business Education degree. She is currently enrolled at the University of Perpetual Help System Dalta, taking up Master of Arts in Education and has so far earned a total of 30 units. She is presently teaching Drafting to Grade 10 students, and concurrent subject coordinator for TLE at the San Isidro National High School in Antipolo City, where she had served as Year Level Coordinator in 2007 and 2011 as well as TLE Department Chairperson from 2002-2003 and 2014-2020.

Rondi Daryl Reyes

Rondi graduated from the Polytechnic University of the Philippines with a degree in Journalism. Currently working as a content developer with TechFactors Inc., he has also worked as a social media content producer for a broadcasting company and as a writer for a video game blog. He has a diverse range of interests, including news, technology, popular culture and cycling.

About this Resource

The LifeTek-TLE 6 module teaches the skills needed for specific industries that can make students more proficient in these areas helping them acquire 21st century skills. This will enable the learners to be productive in daily aspects of life and work and improve their chances of succeeding in the future. Subjects include ICT and Entrepreneurship, Home Economics, Industrial Arts and Agriculture, all of which revolve around related technologies.

Learning Outcomes

At the end of this courseware, the learners will be able to:

1. Acquire livelihood know-how that can used at home and in everyday life situations.

2. Practice learned skills that are essential in life.

3. Develop awareness in achieving a healthy family and community relationship.

4. Demonstrate the ability to produce products by providing learners a meaningful and productive learning experience.

HOW TO USE THIS RESOURCE

LEARNING OUTCOMES

Each lesson has its own set of learning goals. This informs the readers on what is expected to be learned by the end of the lesson.

ENGAGE

This is a brief and fun activity that is related to the topic that can help in attracting the attention of the students.

EXPLORE

This is an assessment tool that is administered before the discussion and is used to determine the student's prior knowledge on the subject matter.

RESEARCH

This is an activity for the student's additional knowledge and information before the lesson discussion.

EXPLAIN

This is where the main content of the lesson is found.

EXERCISE

This contains exercises after the discussion.
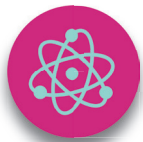
SUMMARY

This is a synopsis of the lesson.

LESSON OUTPUT

This is an individual project to determine the student's practical mastery of the subject matter.

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Social Networking Platforms and Online Collaboration

TRIVIA

According to www.statista.com, as of the 3rd quarter of 2019, Facebook was the most used social networking platform in the Philippines, followed by YouTube. Filipinos spent about four hours a day on it.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define what Social Networking is.

2. Identify some of the different social networking platforms.

3. Demonstrate how to use a social networking platform.

4. Learn to use audio and video conferencing tools in collaborating with others online.

5. Discuss use of e-groups in sharing and working with others online.

ENGAGE

Facebook and YouTube are examples of social networking platforms. You might have used them before, but have you ever wondered what social networking is? Let us find out.

Look at the following pictures.

Questions:

1. Do you know of any social media influencers who use social networking platforms? Who are they? What do they usually do on the social networking platform that they are on?

2. Which of the social networking platforms, whose images are above, have you used? What did you use it/them for? Tell about your experiences to the class.

EXPLORE

Write **T** on the blank if the statement is **True** and **F** if it is **False**.

_____ 1. Social networking is about using certain websites and applications to build relationships with other people and communities.

_____ 2. Twitter is a social networking platform that allows its users to broadcast short posts, called tweets, to share their feelings and thoughts.

_____ 3. Social networking sites are websites designed to enable its users to use, create and maintain social networks.

_____ 4. Social networking sites that cater to kids 13 years old and below do not require a parent's permission for these sites to be used.

_____ 5. You can create a social network by meeting people face-to-face, or you can do it online.

_____ 6. Keep your username and your password secure so that no one else will be able to use your account without your knowledge.

_____ 7. When using a social networking platform, be cautious when chatting online or when joining forums.

_____ 8. Facebook is the most popular free social networking website, which enables its members to create their own profile, share their thoughts, upload photos and videos, and create and send messages to keep in touch with their families and friends.

_____ 9. Your personal information should remain private while using a social networking platform.

_____ 10. The global reach of social networking attests to its effectiveness as a means of establishing, enhancing, and maintaining communication.

RESEARCH

Research the following:

1. What are some of the things you can do on social networking platforms?
2. What are some of the benefits of social networking to the students who use it?
3. Give at least two (2) examples of safe and responsible use of social networking platforms.

EXPLAIN

Definition of terms

Social networking – The use of websites and applications which are specifically dedicated to having their users interact with other users. Also, to use such websites to find people with similar interests.

Social networking platforms – The websites and applications used for social networking.

Hacking – Gaining unauthorized access to data in a computer or a system, such as those used by social media.

Computer virus – A piece of computer code which is harmful to a computer or a system.

Spamming – Indiscriminately sending the same message to a large number of people on the Internet.

E-commerce – Refers to all forms of business transactions conducted electronically over the Internet.

What is Social Networking?

Social networking basically refers to building relationships with other people. You can create a social network by meeting people in real life, or you can do it online, which is another popular way to do so. Social networking online is done through social networking platforms, which are websites and applications which are specifically designed to enable people to connect with others, such as friends, family, classmates and teachers. These websites and applications provide venues to share

your interests with others and to find possible friends. Social networking platforms allow their users to share ideas, opinions, post pictures and videos and even sell to those in their network. Most social network services are open to the public, but some have age requirements, such as the user needing to be at least 18 years old.

Different Social Networking Platforms

Different social networking platforms allow people to do different things. Some are used for entertainment, others are used for business, and others can do both.

The following are some of the most popular social networking platforms today.

1. **Facebook**
   This is the most popular free social networking platform at present. It enables its users to create their own profile, share their thoughts, upload photos and videos, play mini games, join in Facebook groups and group chats for a mutual discussion, and create a page for themselves or for their business. Some people use this platform to do live broadcasts to sell products.

2. **Facebook Messenger**
   This platform lets you create and send messages to keep in touch with your family and friends. One of the features of Messenger is for creating a group chat where you and your friends can call and collaborate with each other. Messenger can also be used by groups of people to do video calls and watch a video together. It is a means to communicate with your friends even if you are not in the same place.

3. **YouTube**

This platform lets users watch videos uploaded by other users, upload a video of their own, and even start a livestream video. Many people use this platform for their business by showing an advertisement or by regularly posting new video content. Communication and social interaction happen in the Comments and Community sections.

4. **Instagram**

This platform enables the user to upload photos and videos which are just 3 to 60 seconds long. Users can add a caption to their posts, as well as hashtags and the location where they took the photo. Users can also do videos where they invite a guest to be on a live broadcast. During live broadcasts, followers can comment on anything. Instagram can also be used for business, as people can promote their products and create an advertisement using this platform to reach others who are not following them.

5. **Twitter**

This is a platform where the users can post and interact with each other. The posts on Twitter are called tweets. Users can also retweet, quote a tweet, and fleet (the term used for the users who share a 24-hour story) on Twitter. People also use Twitter for their business, in the same way as other social media platforms.

6. **LinkedIn**

This social networking platform allows the users to have professional networks. Many of this platform's users are professionals, graduates, job seekers and recruiters. This social networking platform helps build a professional community where you can exchange ideas and get information on jobs and other career opportunities.
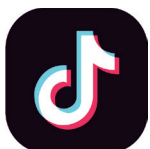
7. **TikTok**

This is a video-sharing social networking service where users can post different kinds of short videos, like dances, skits, tutorials, trivia and information.

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8. **Zoom**
   This is one of the most used audio-video conferencing platforms, where the users can collaborate through voice and video calls. Users are also allowed to share content from their own computer screens during discussions.

Online Collaboration

As broadband Internet has become more widely available, collaboration and real-time interaction over the Internet have also become bigger and more frequent. **Online collaboration**, simply put, refers to how people work together over the Internet, usually at the same time, and on the same projects and documents. It uses platforms that allow teams to work together in a digital environment, whether these may involve text documents, PowerPoint presentations, video chats, or brainstorming sessions.

Audio and video conferencing is one category of online collaboration tools that offers online spaces like virtual chat rooms, video calls, and online meetings where teams can collaborate efficiently and effectively. In audio conferencing, several people connect with their phones on the same call and can hear and speak to others on the same line. Video conferencing, on the other hand, involves a face-to-face setup and includes audio conferencing by default. Video conferencing tools usually come with many useful features like screen-sharing, annotating, text chat, video conference recording, and file sharing.

# Steps to Use Zoom Video Conferencing App

One of the more popular video conferencing tools being used today is the app called Zoom. You can download the app on your computer or phone, or simply access it from your browser. Once you have it on your device, you can host free video calls limited to 40 minutes and 100 participants. Paid plans let you chat with no time limit and with as many as 1000 participants.

Joining a Zoom meeting:

1. Download the Zoom app on your laptop or phone, then click the Zoom icon on your device.

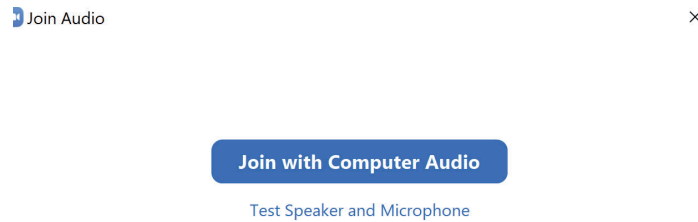2. On the **Home tab**, click **Join**.
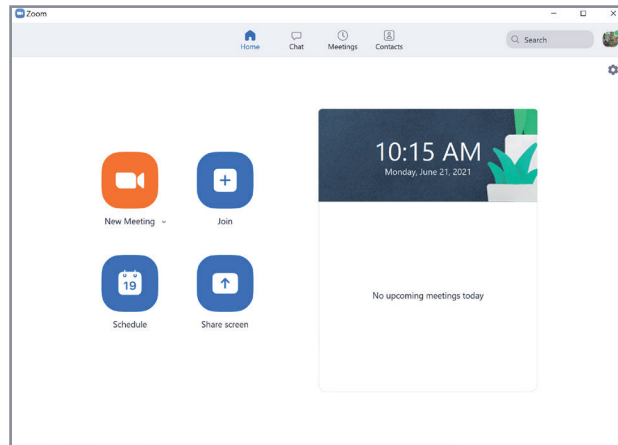
3. Type in the **Meeting ID Number** and **your name**. Then click **Join**.

4. Enter the passcode provided by the host. Then click **Join Meeting**. Wait for the host to let you in.

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5. Click **Join with Computer Audio**.

6. Once inside the Zoom room, participants have access to these features:
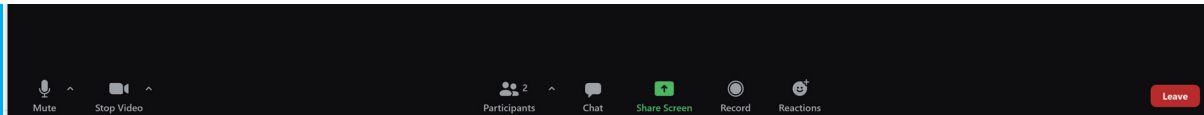
- **Join Audio or Unmute/Mute:** Mute or unmute microphone.
- **Start/Stop Video:** Turn the camera on or off.
- **Participants:** See who's currently in the meeting.
- **Chat:** Open the chat window to chat with other participants.
- **Share Screen:** Start share screen (if the host allows).
- **Record:** Start or stop a recording (if the host allows).
- **Reactions:** Send emojis and other icons to the host or presentor to give feedback without disrupting the meeting.
- **Leave:** Leave the meeting while other participants are still in the room.

Hosting a Zoom meeting:
A. If you want to host an instant Zoom meeting, click the Zoom icon on your device and do the following:

1. On the **Home** tab go to **New Meeting** and click the **Down arrow** for options:
   - **Start with video:** Enable video as you enter the meeting room.
   - **Use My Personal Meeting ID (PMI):** Access the personal meeting room that is permanently reserved for you.

2. Hover cursor over PMI for more options:
   - **Copy ID:** Choose this to copy and paste PMI as text if you want to provide meeting ID only to other participants.

- **Copy Invitation:** Choose this to copy and paste invitation as text and send to other participants. This includes the Zoom link, meeting ID and passcode.
- **PMI Settings:** Choose this to make changes to PMI settings like passcode, waiting room, and video options.

3. Click **New Meeting**.
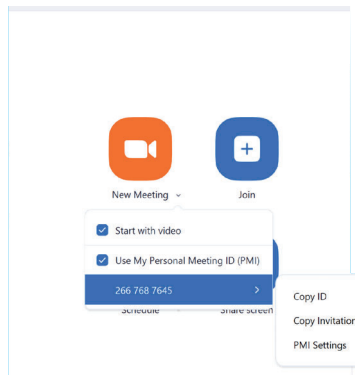
B. If you want to host a scheduled Zoom meeting:
   1. Click **Schedule**.
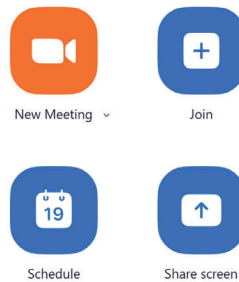
   2. When the scheduler window opens, select your meeting settings.

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- **Topic:** Enter a topic for your meeting.
  - **Start:** Enter date and time of meeting.
  - **Duration:** Enter how long your meeting will take (in hours and minutes).
  - **Recurring meeting:** Enable this if you want the meeting ID to remain the same for each session.
  - **Time Zone:** Click the Down arrow to choose the time zone for your scheduled meeting. Default is the computer's time zone.
- **Meeting ID**
  - **Generate Automatically:** Generate a random unique meeting ID.
  - **Personal Meeting ID:** Use your Personal Meeting ID.
- **Security**
  - **Passcode:** Enter a meeting passcode that participants will input to join the meeting.
  - **Waiting Room:** Enable this if you want to screen participants logging in so that they are only allowed to enter the meeting room if you admit them.
- **Video**
  - **Host:** Choose whether you want the host's video on or off when joining the meeting.
  - **Participants:** Choose whether you want the participants' video on or off when joining the meeting.
  - **Calendar:** Select the calendar service where you will add the meeting and send invites to participants.
- **Advanced Options**
  - **Allow participants to join anytime:** Enable this to allow participants to join before the Start time.
  - **Mute participants upon entry:** Enable this to mute participants as they join the meeting room.
  - **Automatically record meeting on the local computer:** Enable this to record the meeting on your local computer.
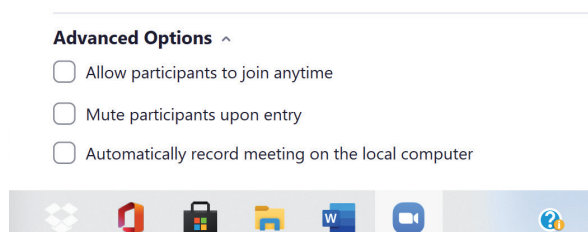
3. Click **Save** when done.

4. Go to the **Meetings** tab.

5. Click the scheduled meeting on the left panel to see the details of the meeting.
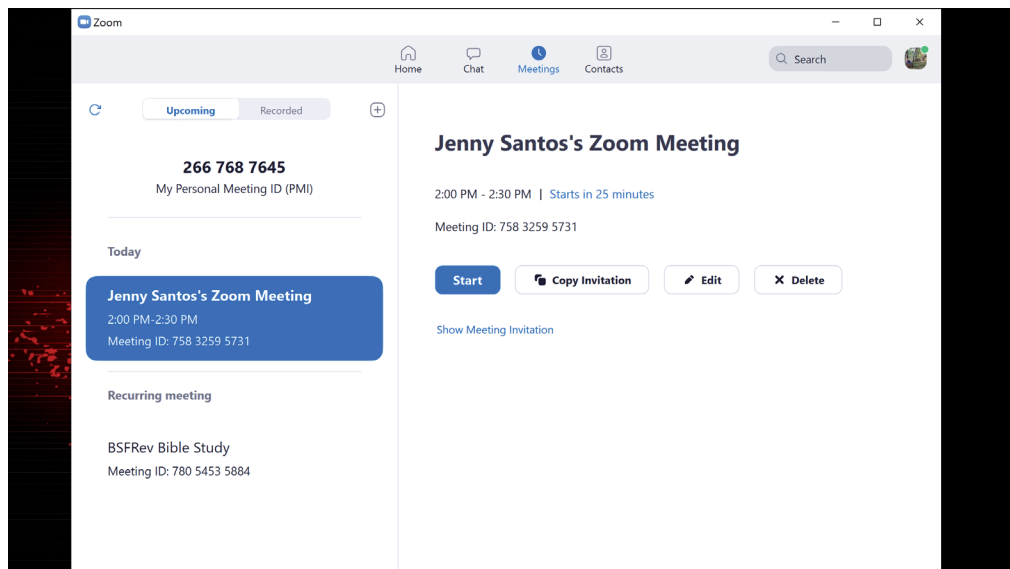
- Click **Start** to enter the meeting room.
- Click **Copy Invitation** to copy and paste the invite as text and send to participants. (Note: You may click **Show Meeting Invitation** just below it to check the information on the invite.)
- Click **Edit** if you want to edit details of your scheduled meeting.
- Click **Delete** to remove the scheduled meeting from your list of meetings.

E-Groups

E-groups are online communities wherein people gather virtually to chat, share, post, comment, contribute and collaborate.

E-groups are common on social networking websites; they are a smaller network of people under the umbrella of the larger and more diverse website. They can be formed by people with shared interests so they could bond over things that they like, or created for the simple reason of meeting other people.

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Aside from reconnecting with old friends and making new ones, e-groups are a great platform for initiating projects and engaging members to participate and contribute to discussions, organize activities, and work together to complete tasks.

Many e-groups are text-based, although, depending on the website, they might be able to access a few other features, such as video calling to allow members to talk to each other personally. Because they allow constant communication and can be accessible anywhere as long as there is an Internet connection, this makes them a very useful tool for collaboration. Unlike verbal communication, online discussions in e-groups can be revisited and stored for a long time.

Safe and Responsible use of ICT on Social Networking Platforms

Not everyone who uses a social media platform has good intentions. There are some people who use social networking platforms to take advantage of or even harm others. Some of them might ask a user to give personal information, such as their home address, where they go to school, or what the bank account numbers of their parents or guardians are. To avoid situations like this, you need to know some of the different safety precautions you need to take when using a social networking platform.

1. **Create a strong password that will not be easily guessed.**
   Creating a strong password will help you secure your account. Hacking is a major issue of social networking platforms. Hacking lets others use your account without your permission, so they can use your name to harm, stalk and get information from other users. Creating a strong password will keep other users from hacking your account.

2. **Use different passwords for different social networking platforms.**
   This will keep other users from hacking all of your accounts. If one of your accounts is hacked, it isn't likely that your other accounts will also be hacked, because these would have different passwords.

3. **Add a password to your device.**
   Make sure your phone is encrypted when you installed a social networking app on it. You might also want to tell your parents about your phone password in case anything goes wrong.

4. **If your age is not yet appropriate in the social networking platform that you want to use, do not use that platform yet.**
Every social networking platform has an age requirement because there might be some content on that platform which might not be appropriate for the younger age group. If you make an account on that platform, it could be suspended if your age is less than what is required for that platform.

5. **Think before you click.**
What we post online cannot be undone, especially when it has a big effect on other users. There are users who use social networking platforms to bully others for instance. Always be aware of what you post online. Here in the Philippines, if you bully someone online, legal action can be taken against you under Section 2 of Republic Act 10627, or the Anti-Cyber bullying law.

6. **Limit what you share and post.**
Do not share and post everything in your social networking accounts. Do not reveal personal information, like where you live, your phone number, your personal e-mail address and your financial information. Posting such personal information makes it easy for hackers to steal your identity. Keep your personal information personal.

7. **Do not accept a friend request from a stranger.**
If you do not know the person who wants to be your friend online, do not engage with them without your parent's advice. The "person" could be a fake account that can harm and bother you.

8. **Do not click on the links that are randomly messaged to you, even if it is from your closest friend.**
Be wary of links which are sent in messages whose sender is someone you don't know. That message link is most likely a computer virus or a spam message. A computer virus can destroy your files, get personal information, or worse, disable your computer or mobile phone system. Spamming, on the other hand, is about sending a single unsolicited message to a lot of people. Spammers are those which promote or advertise a product or service to multiple recipients.

9. **Keep your audio and video conferences private.**
When video chatting with others, make sure that no participant can look at your private things or files, such as a portrait of your family or any secret blueprints of your house. Find a place that has a plain background or use a

virtual background if the platform allows for this. If you want to record your video conferences, make sure that all participants are aware that you are doing so. If possible, do not post your recorded video conference online, especially when there is some personal information that can be leaked. You can also add a privacy lens cover (this could be a piece of paper that can cover your laptop camera) to maximize your privacy, particularly when you're not using your camera.

10. **Be careful when sharing your invitation link.**
Do not publicize or share your video conference link to strangers. Only invite those people you are acquainted with. Also, remind other participants to do the same thing.

Tools and Materials Used to Access Social Networking Platforms
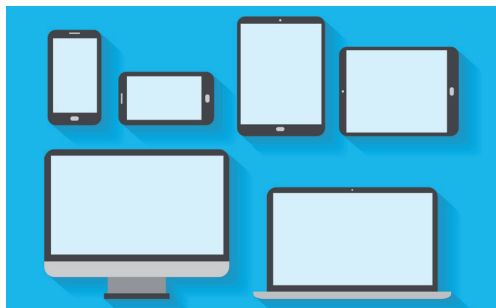
Desktop, Laptop, Tablet or Mobile Phone – Any of these devices are needed for you to get on social networking platforms.

Wi-Fi Router – This forwards the data packets you use to connect with the others on the Internet to computer networks.

Social Media Applications – These are the apps that you need to install in your mobile phone or open in your browser.

Steps to Create a Social Networking Page on Facebook

1. Go to https://www.facebook.com/, then log into your account.

2. Once logged in, you will see "Pages" on the left side part of your screen.

3. Click "Pages" then "+ Create New Page".

4. Fill up all the information needed for your page, like the Page name, Category and Description. When creating a page, keep your target audience in mind. A page about cats, for example, will likely not be clicked on if your target audience hates cats.

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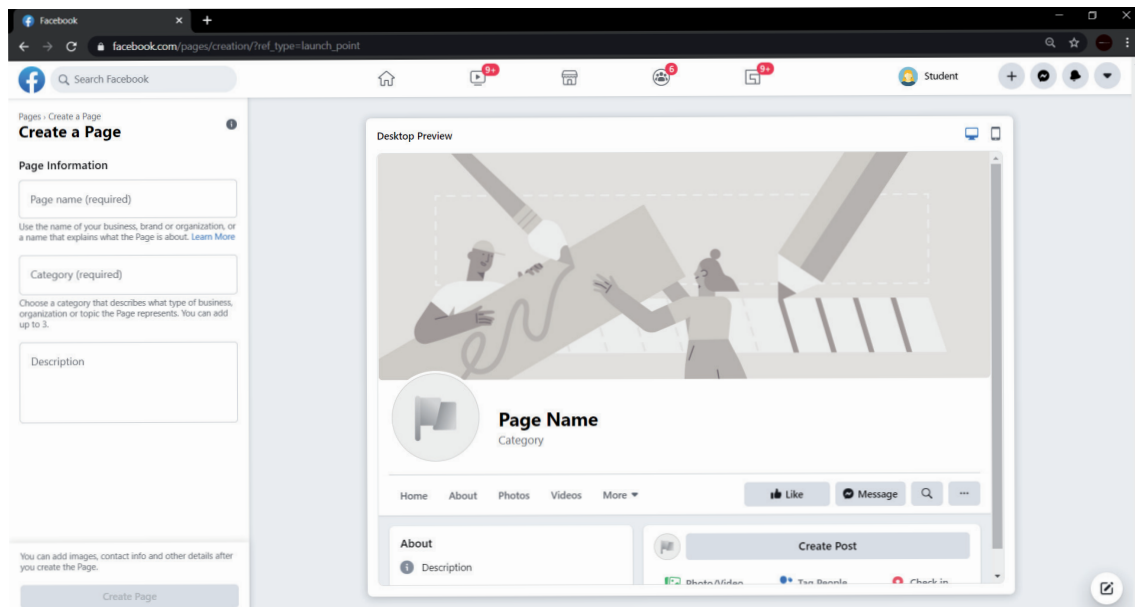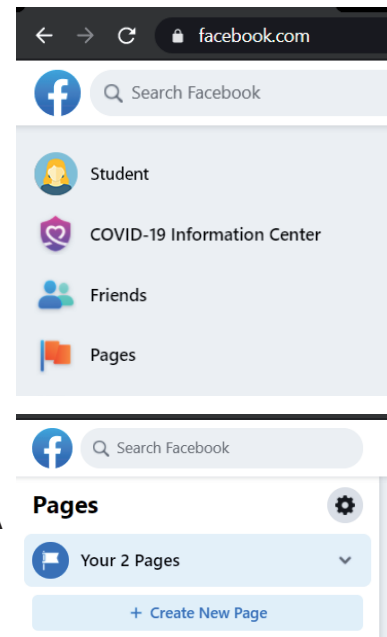
5. After filling up all the information needed, click "Create Page."
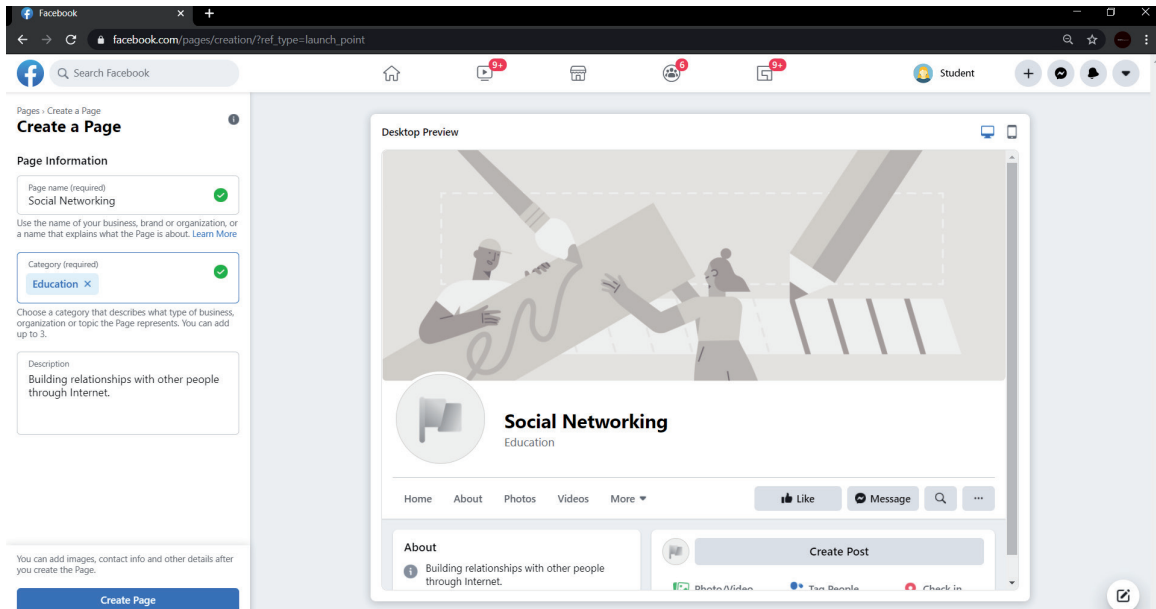
You can also see the preview of your page. You can change this preview to mobile phone view by clicking on the mobile phone icon ▯ on the top-right side of the Desktop Preview. The following image is thus how your page will look like on a mobile phone.
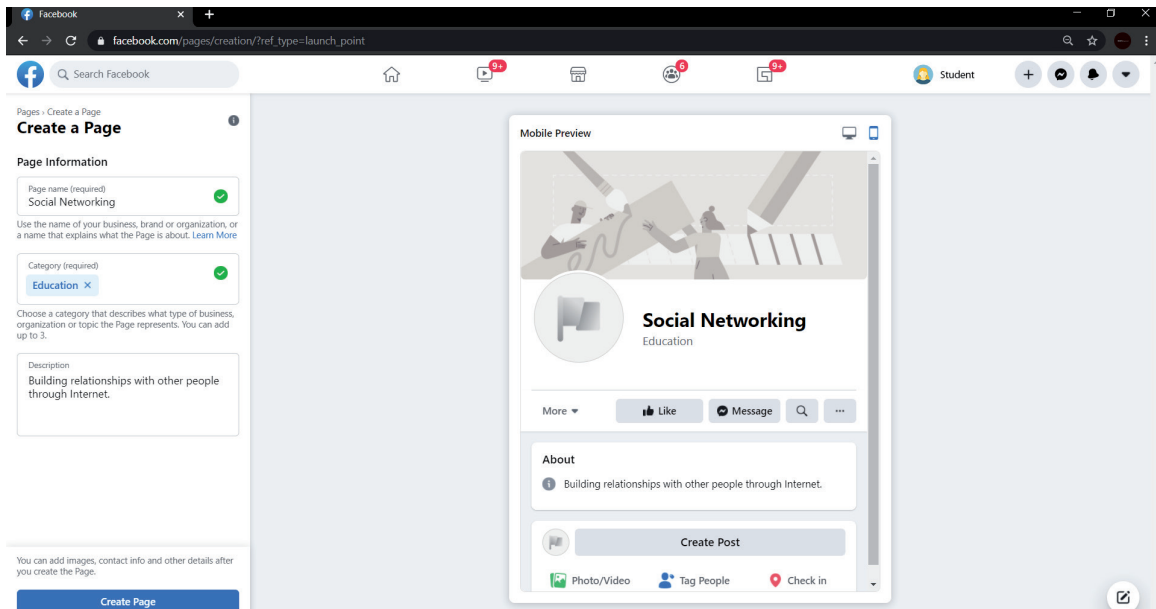
6. Now that you have a Facebook page, click "Add Profile Picture" and "Add Cover Photo" to add a profile picture and cover for your page. This will make your page look more attractive.
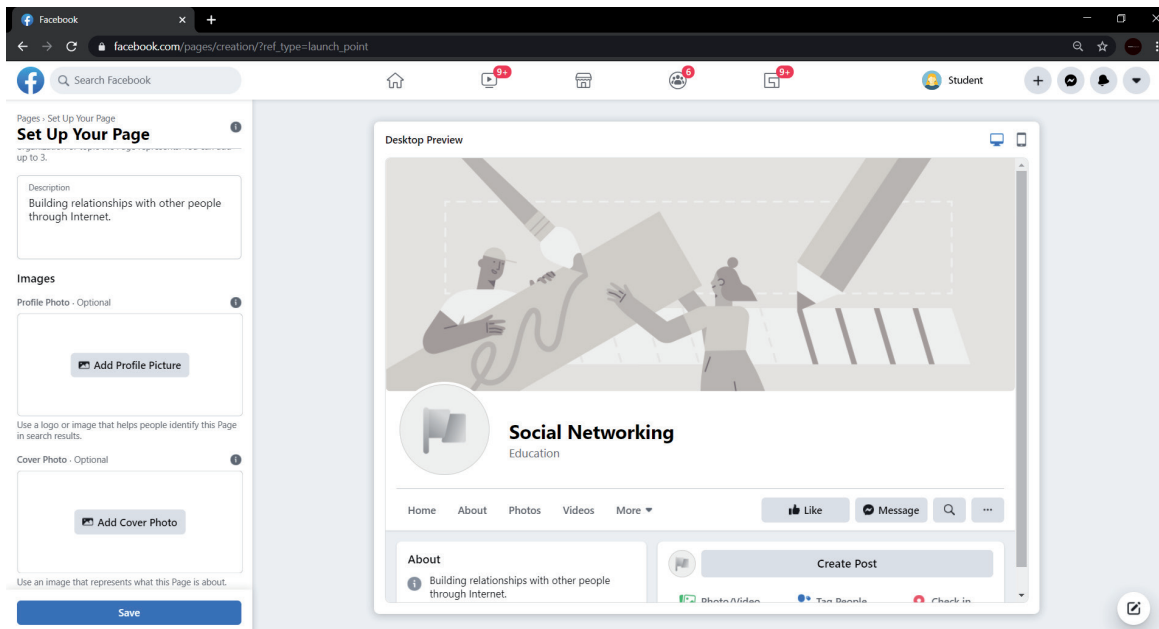
7. Once you click the Add Profile Picture button, a pop-up Windows menu will appear. Locate where you saved your profile picture and cover photo, then click "Open."

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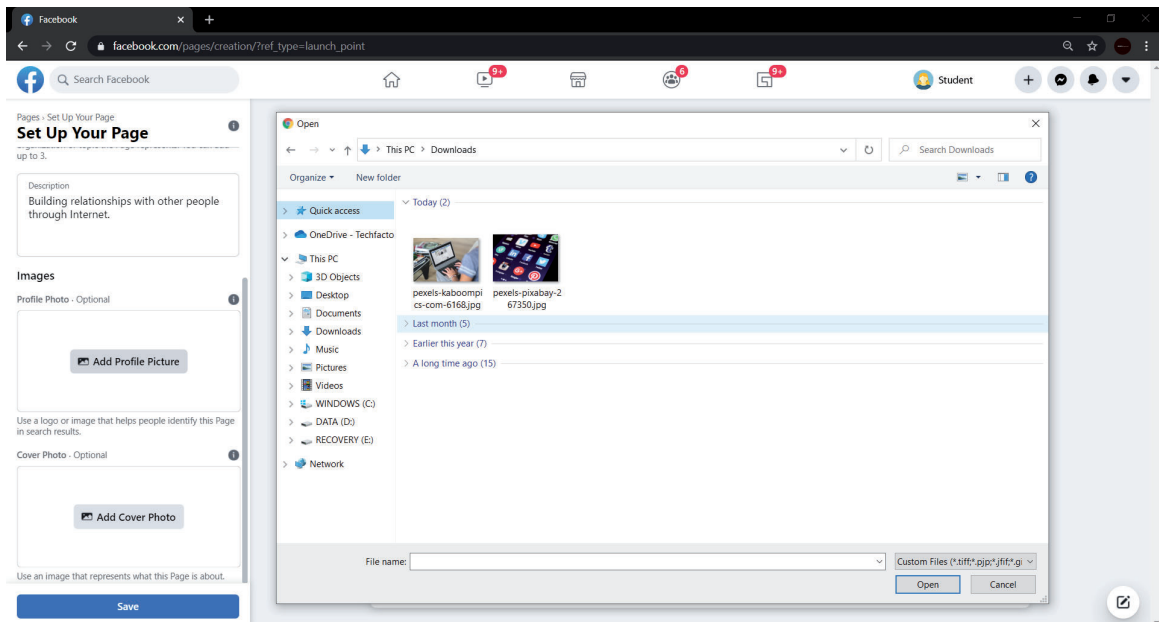
The following image is how your page will look like after you finish uploading your page profile and cover images.
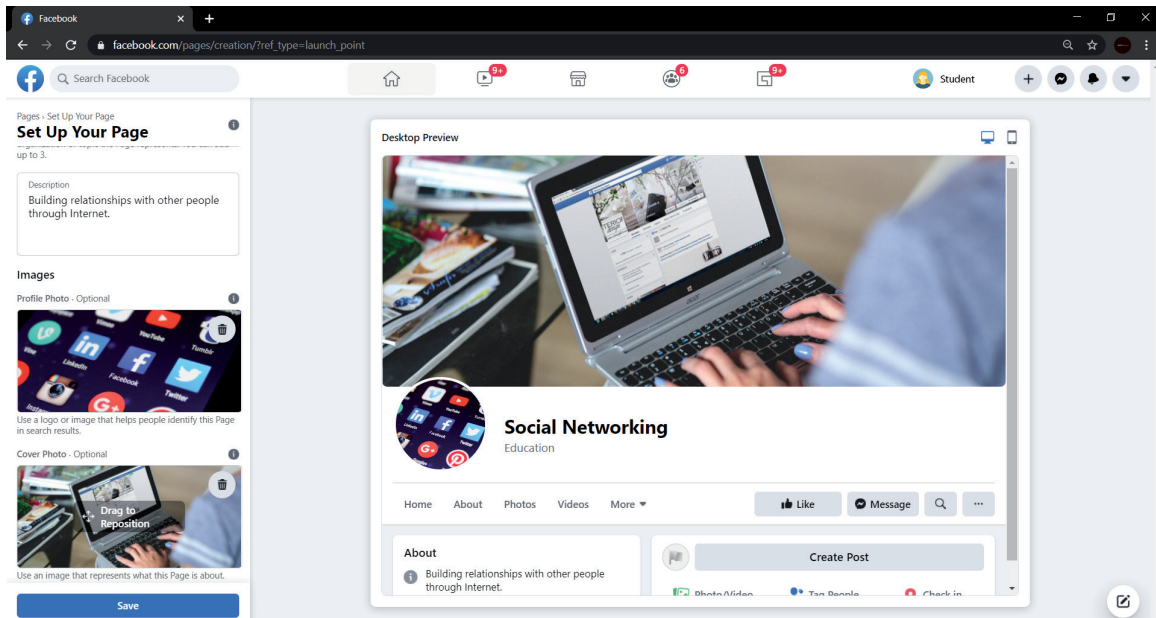
Click "Save."

8. After saving, you can now post any content you want onto your page. Congratulations on making your first Facebook page!

In Business

Most social networking platforms nowadays are used for e-commerce. E-commerce refers to all forms of business transactions conducted electronically over computer networks, and over the Internet in particular. Many online businesses now have a presence on different social networking platforms to reach as many customers as they can. These businesses sell many different goods, such as clothes, food, your favorite band album and merchandise, or accessories for people and animals.

As a child, if you want to have a small online business, you can start by using your Facebook page or any other social networking platform you might have. Before doing so, always ask your parent's or your guardian's approval first. You will also need to ask for their advice, because there are many things you need to know when setting up and running a business, which your parent or guardian might know.

As a consumer, or someone who buys things, always remember to be careful when buying things online. Always ask your parents or guardians for advice before making an online purchase because not all people on social networking platforms are honest.
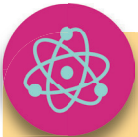
SUMMARY

Social networking refers to building relationships with other people. This can be done face-to-face or through the Internet. Social networking platforms provide a venue to share your interests with others and to find possible friends. Different social networking platforms can be used to interact online. Social networking platforms are also used by businesses to sell their products.

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EXERCISES

Exercise 1

Directions: Give five examples of social networking platforms and define each one.

Social Networking Platform	Definition

Exercise 2

Directions: Fill in the blanks with the correct steps in creating a Facebook page.

1. Go to _____, then log into your account.

2. Once logged in, on the left side part of your screen, you will see "_____".

3. On "Pages," click on "_____".

4. Fill up all the information needed for your page like the _____, _____, and _____.

5. After filling up all the content needed for your page, click "_____."

6. On your newly-created Facebook page, click "_____" and "Add Cover Photo" to add a profile picture and cover photo to your page and a cover photo.

7. A window menu will pop up. Locate where you saved your desired profile picture and cover photo. Click "Open," then click "_____."

8. After clicking on the _____ button, you can post content onto your page.

Exercise 3

Directions: Write **True** if the statement is about the safe and responsible use of ICT on social networking platforms, and **False** if it is not.

_____ 1. Share and post everything about yourself onto your social networking accounts.

_____ 2. Do not publicize or share your video conference link to strangers.

_____ 3. Do not give your phone password to you parents if they ask for it.

_____ 4. Creating a strong password will help you secure your account.

_____ 5. If you have many social networking platforms, you should create a different password for each one.

_____ 6. If you do not know the person who wants to be your friend online, accept that person's friend request immediately.

_____ 7. Check and click on links that are randomly messaged to you.

_____ 8. Use social networking platforms to bully others.

_____ 9. If your age is not yet appropriate for the social networking platform that you want to use, do not use it yet.

_____ 10. While having a good time in talking and video chatting with our friends online, do not set aside all the private things that can be seen in your video chat.

LESSON OUTPUT

Create a simple Facebook page on an interest you have, such as an artist that you admire. Use a unique name and description for your page. You must also create at least 3 posts for your page. Submit your output to your teacher by sharing your page link.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student created a page which is suited to the target audience.	The student created a page which is suited to the target audience.	The student created a page which is suited to the target audience.	The student created a page, but the page isn't suited for the target audience.	The student created a page but there's nothing in it.	
2. Creativity	The approach of the student is unique and fulfills the requirements of the project. The page is attractive to look at.	The project's requirements are met. The student referenced elements from existing sources on the Internet, and built on these. The images used were interesting.	The project's requirements are somewhat met. The student took some elements from one source and built on these. The images used weren't interesting.	At least one of the project's requirements aren't met.	The student directly copied from another person or from the Internet.	
3. Promptness	The project was completed two days ahead of the given deadline.	The project was completed one day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed one day after the given deadline.	The project was completed two days after the given deadline.	
TOTAL						

TRIVIA

Did you know that using all capital letters in an email is considered rude? How this came to be is not clear. But based on a study on typographical tone conducted by linguist Maria Heath, certain emotions, such as happiness and anger, are emphasized when conveyed through words written in capital letters, more so when the tone of the email implies anger.
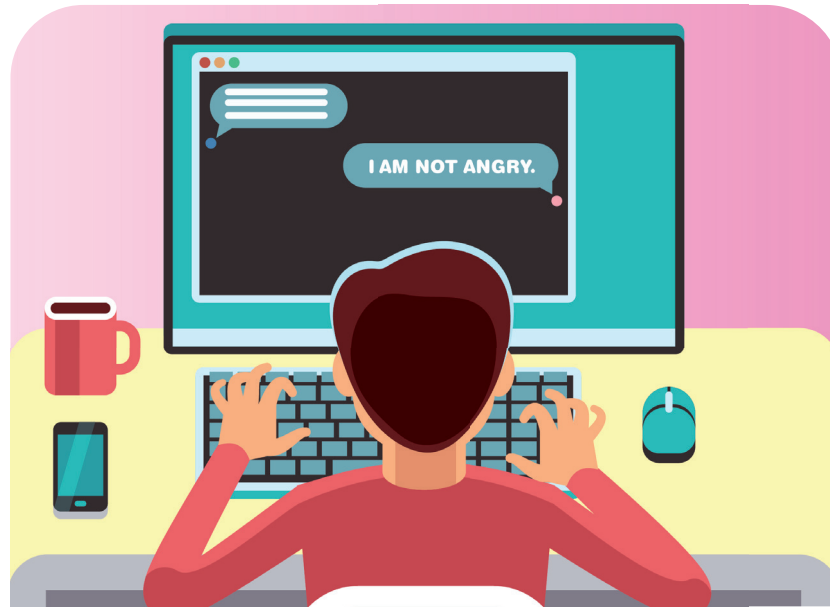
LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define Internet and ethics
2. Define Internet ethics.
3. Apply Internet ethics.

ENGAGE

Watch the following video about netiquette.
https://bit.ly/3e0jP7q

EXPLORE

True or False: Answer **TRUE** if the statement is correct, and **FALSE** if it is not.

_____ 1. The Internet is a safe place for children even without adult supervision.

_____ 2. An ethical person makes choices that benefit people around them.

_____ 3. A person with a strong moral compass means that his decisions are based on a good sense of right and wrong.

_____ 4. Polite behavior is needed even in virtual environments such as the Internet.

_____ 5. We as Internet users are responsible for our actions online.

RESEARCH

Research the legend of the Ring of Gyges. Afterwards, write an essay which describes what you will do if you were placed in a similar situation in the story, and your reason for doing so.

EXPLAIN

Definition of terms

Ethics – a branch of the art of philosophy that is concerned with how people make decisions, decide what is good for them, what is right and wrong, and how they live their lives.

Hacking – The unauthorized access of computer systems and networks.

Phishing – The illegal and unauthorized collection of sensitive or private information.

Imagine yourself in this situation.

It's recess time, and you are very hungry since you didn't get to eat before going to school. However, you forgot to bring food, and you didn't have money as well. You saw your classmate leave his lunch box open, and there were two sandwiches inside. What do you do? Do you wait for him to return and ask him for a sandwich, or do you take one and tell him later? What if he doesn't share his extra sandwich with you? Is he a bad person for doing so if he really is hungry and wants to eat his sandwiches?

Ethics

Every action that a person does is connected to a decision—what clothes to wear, what food to eat, what movie to watch, and so on. Most of these actions only affect the person doing that action, but sometimes, their actions affect the people around them, for good or bad.

But what makes a choice "good" or "bad"? What makes a person pick one choice over another? Most importantly, what decision would be the best one to make if you had to choose from many possible decisions? These are some of the questions that **ethics** tries to give answers to.

Ethics is a branch of the art of **philosophy** that is concerned with how people make decisions, decide what is good for them, what is right and wrong, and how they live their lives. It comes from the Greek word *ethos*, which can mean **custom**, **character**, or **habit**. In a way, ethics could be thought of as the philosophy of how a person thinks and acts in relation to the wellbeing of other people in their community.

PURPOSE
PRINCIPLES
VALUES

Actions and decisions that follow the concepts of ethics are said to be **ethical**.

The Ethics Centre, an Australian consultancy dedicated to the promotion of ethics, considers three things to be at the center of a person's ethical system.

Values - the beliefs and things which are important to us and guide our decisions.

Principles - help us identify what's right from wrong.

Purpose - connects our values with our principles.

A student like you, for example, might consider getting high marks on your exams to be important. You don't want to cheat, so you study before the exams. The high marks are part of your values, honesty is your principle, and advance reading is your purpose.

The Importance of Ethics

Why do people need ethics in their daily lives?

As you grow older, you will get to know more about the problems and issues that people face. In this regard, ethics can work like a map, guiding your thoughts and actions as you face the challenges of growing up. This is why someone with a strong sense of right and wrong is said to have a strong moral compass—just as a compass always points North and lets you figure out the other directions easily, ethics can do the same thing for your decisions.

In addition, ethics are important to us as people because we live alongside others in our communities. People living in communities have different opinions and ways of thinking and looking at situations because of their different backgrounds, beliefs, and experiences. This diversity can be the source of disagreements and sometimes, fights. Ethics can help us understand other people's points of view, and not be offended if they are different from ours. By extension, it makes us do things without offending or hurting others.
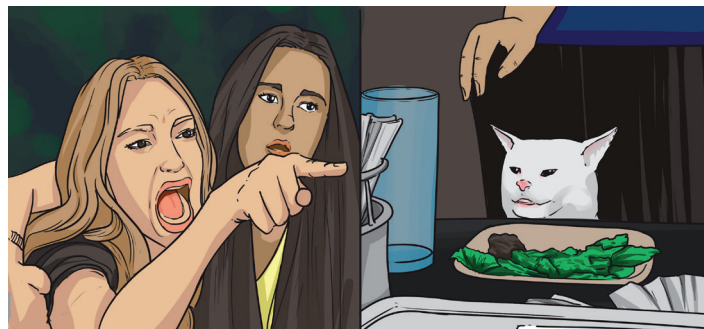
Some jobs, especially those that deal with the welfare of other people, consider ethics as very important, so much so that they have adopted a code of ethics and professional conduct that all practitioners are required to follow. Examples of these are doctors', teachers', and journalists' codes of conduct.

Internet Ethics

In your earlier grades, you have learned about the things that you should or should not do when working with computers. Those rules were made to keep you and your classmates safe. Those rules also keep the computers you use safe from getting damaged so other children may get to use them.

Now that you're a little older, you've probably accessed the Internet to do lots of things—for researching in school, watching videos, or playing games. However, did you know that aside from your needing an adult to supervise you when accessing the Internet, there are also rules that you need to follow by yourself?

Yes, you need to follow rules when accessing the Internet—not only in order to keep yourself safe from potential dangers, but to respect the rights of other Internet users as well. These rules are known as **netiquette**, a shortened combination of the words "Internet" and "etiquette", which means polite social behavior. These are similar to the rules that your parents tell you to follow when talking to other people—in other words, netiquette is polite behavior online.

You may ask, why do you need to be polite and respectful to other people even if you are behind your computer or device? Some people are terrible to others when they are online—why should you be any different?

The answer is ethics. As the writer C.S. Lewis once said, "**Integrity is doing the right thing even when there's no one watching.**"

TechTerms, a website defining technology-related words, cites some examples of netiquette that Internet users must observe.

- Avoid posting inflammatory or offensive comments online (a.k.a. flaming).
- Respect others' privacy by not sharing personal information, photos, or videos that another person may not want published online.
- Never spam others by sending large amounts of unsolicited email.
- Show good sportsmanship when playing online games, whether you win or lose.

- Don't troll people in web forums or website comments by repeatedly nagging or annoying them.
- Stick to the topic when posting in online forums or when commenting on photos or videos, such as on YouTube or Facebook.
- Don't swear or use offensive language.
- Avoid replying to negative comments with more negative comments. Instead, break the cycle with a positive post.
- If someone asks a question and you know the answer, offer to help.
- Thank others who help you online.

Considering that Internet users come from every part of the world and have different cultures, it's easy to see how the rules of netiquette help build and keep good relations with other Internet users. However, netiquette is just part of the philosophy of ethical behavior done in an electronic or online setting, called **Internet Ethics**, or simply **Cyberethics**.

Cyberethics came about because of the increase in the number of Internet users worldwide as it grew out of its beginnings from simple web pages. Once people became aware that they could use the Internet as a tool to communicate quickly and privately with other people, some tried to apply it to malicious and illegal means. In 1992, a Washington, D.C.-based research organization called the **Computer Ethics Institute** published the **Ten Commandments of Computer Ethics**, patterned after the original Ten Commandments in the Bible. These are:

- Thou shalt not use a computer to harm other people.
- Thou shalt not interfere with other people's computer work.
- Thou shalt not snoop around in other people's computer files.
- Thou shalt not use a computer to steal.
- Thou shalt not use a computer to bear false witness.
- Thou shalt not copy or use proprietary software for which you have not paid.
- Thou shalt not use other people's computer resources without authorization or proper compensation.
- Thou shalt not appropriate other people's intellectual output.
- Thou shalt think about the social consequences of the program you are writing or the system you are designing.
- Thou shalt always use a computer in ways that ensure consideration and respect for your fellow humans.

Compared to the simple rules of netiquette, the Ten Commandments of Computer Ethics put more focus on crimes and illegal acts done using computers and the Internet, like **hacking** (the unauthorized access of computer systems and networks), **phishing**, or the illegal and unauthorized collection of sensitive or private information, **online scams and extortion, threats, cyberbullying, misinformation or false news**, and **creating malicious software** like computer viruses that could interfere with work as well as destroy data and hardware components.

Furthermore, the commandments forbid users about **software piracy**, or using illegally-acquired copies of computer programs that you haven't paid the developer for, and claiming other people's work as your own.

It also tells developers to think about the potential after-effects that the software they are making will have on their users, or on society.

Finally, the last commandment tells users to be respectful of other users when communicating online, and be courteous, especially with new users who might not be familiar with how the computer system works.
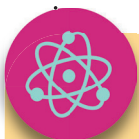
SUMMARY

Ethics deals with how people make decisions, decide what is good for them, what is right and wrong, and how they live their lives. The practice of ethical behavior online can be called netiquette or cyberethics.

EXERCISES

Identification: Give the word or group of words asked for in each sentence.

1. According to an Australian organization, _____ are part of a person's ethical system that helps them identify right from wrong.

2. A strong _____ is another term for the quality of having a strong sense of right and wrong.

3. This is the word used to describe polite social behavior _____.

4. When polite social behavior is practiced online, it is called _____.

5. The _____ published the Ten Commandments of Computer Ethics.

Exercise 2

Identification: Complete the different examples of netiquette by filling in the blanks.

1. Show good _____ when playing online games, whether you win or lose.

2. Don't _____ people by repeatedly annoying them.

3. Respect others' _____ by not sharing personal information that other people may not want published.

4. Don't _____ or use offensive language.

5. If someone asks a question and you know the answer, _____ .
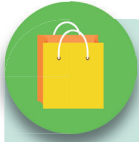
LESSON OUTPUT

Pick one of the rules of netiquette, and design a poster promoting the rule to your fellow students. Use a productivity software or graphic software to make the poster. Enhance your design using images, slogans, and additional text. At the bottom of the poster, write a short description on why you chose that particular rule and the reason for the design. Save it as an image file.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The poster follows all the specifications thoroughly; the description explains the rule shown in the poster and the design of the poster very well.	The poster follows all the specifications thoroughly; the description only explains the rule shown in the poster.	The poster follows most of the specifications; the student did not submit a description.	The poster loosely follows the specifications; no description was submitted.	The poster did not follow specifications.	
2. Creativity	The poster's creative design effectively communicates its message at a glance.	The poster's creative design communicates its message well with minimal reading.	The poster's creative design communicates its message with careful inspection.	The poster's creative design communicates its message with some difficulty.	The poster is lacking in creative design elements and only partially communicates its message.	
3. Promptness	The output was completed and submitted two or more days ahead of the given deadline.	The output was completed and submitted one day ahead of the given deadline.	The output was completed and submitted completed by the given deadline.	The output was completed and submitted one to two days after the given deadline.	The output was completed and submitted three days after the given deadline.	
TOTAL						

TRIVIA

The term *word processor*, which refers to a program used to create text documents, originally referred to a device much like a typewriter. The first software-based word processor, called the **Electric Pencil**, was created in 1976 by a programmer named Michael Shrayer. The first best-selling word processing program was introduced three years later, in 1979. The program was called **WordStar**, and was created by Seymour Rubenstein and Rob Barnaby. It was released for MS/PC-DOS, an operating system released by Microsoft.
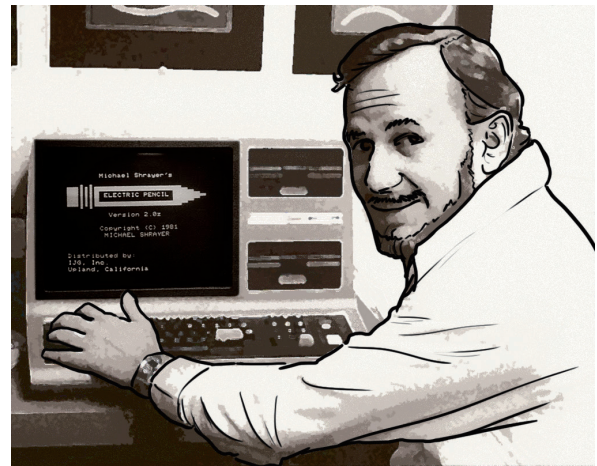
LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Understand the concept of productivity.
2. Identify the different office productivity tools used in ICT.
3. Demonstrate the uses of each of the office productivity tools.
4. Demonstrates knowledge and skills in using online survey tools.

ENGAGE

Ask the help of your parents or older siblings with Google accounts if they can help you access the Google Docs Editors suite. Using the Docs word processor, write down what you have noticed about using a web-based word processor compared to one that is installed in your computer.

EXPLORE

True or False: Answer TRUE if the statement is correct, and FALSE if it is not.

_____ 1. Office suites are used to make different kinds of documents.

_____ 2. All office suites are payware.

_____ 3. Web browsers are part of office suites.

_____ 4. Spreadsheets are used to display slideshows.

_____ 5. Apple's presentation program is called Keynote.

RESEARCH

Ask your parents and/or older siblings about the productivity programs they use in their offices, and what those programs are used for.

EXPLAIN

Definition of terms

Productivity – the practice of completing tasks quickly and efficiently so that you're able to do more things in the remaining time.

Office suite – a package of several kinds of programs designed to create different kinds of documents.

Payware – programs that require payment before you can use them.

Do your parents ever tell you to do your homework and your school projects early and ahead of submission time? What happens if you follow them? What about if you don't?

If you finish your homework earlier, you usually have more time to do other things that you want to do, like watch TV or videos, or play games. If you do the opposite, you might end up spending too much time on other things, so your homework might be left unfinished. By telling you to do you schoolwork ahead of everything else, your parents are teaching you how to manage a very precious resource—time.

Working people also need to manage their time in doing things they have to do, such as time spent for work and for their families, and time for personal rest and recreation. To get as many things done in a day, some people practice what is called productivity.

Productivity is the practice of completing tasks quickly and efficiently so that you're able to do more things in your spare time. If your parents tell you to do your homework early so you'd have more time to do the things that you want to do.

Office Productivity

Offices and workplaces around the world consider productivity as very important. Because computers increase the productivity of employees, they are regarded as essential office equipment by almost every industry. Computers are considered **productivity tools** because they can perform operations much faster than humans do, they're teaching you to be more productive.

Of course, computers require software—programs—before they can work with any kind of data, and the kind of data that the computer will work with determines the programs that will get installed into them. For example, architecture and engineering firms will have CAD, or computer-aided design programs on their computers because they are used to create building plans and layouts. Computers in a film production company commonly have video editing programs and 3D modeling programs because they work with data in the form of video and 3D models. Computers used for forecasting the weather usually have software that collects and analyzes the data coming from multiple sensors to give people an idea of what the weather would be like in the coming days.

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However, if there is one kind of program that could be considered as universal, it would be **office productivity programs**, or **office suites**.

Office suites are software packages that are used to create and design different kinds of documents. They were named as such because they were originally intended for use by office workers, but they are also used by students and in home computers.

Office suites are available for different operating systems. Some office suites are free, while others are **payware**, meaning you need to pay the developer before you can use the software package. Some are even subscription-based payware, which means you can use the software package for a certain amount of time after paying a certain amount of money. Some office suites are installed on the user's computer or mobile device and work both online and offline, while others are purely web-based, and accessed with web browsers.

The following table names some office suites, the operating system/s they are present on, and whether or not they are payware.

Microsoft Office	Windows, macOS, Android, web version	Desktop version is subscription payware, mobile edition is free but has limited functions.
iWork	macOS, iOS, web	Free for MacOS and iOS users
LibreOffice	Windows, macOS, Linux, Android, iOS, Chrome OS, web version	Free
Apache OpenOffice	Linux, macOS, Windows	Free
Collabora Office	Windows, macOS, Linux, Android, iOS, Chrome OS, web version	Free
Google Docs Editors suite	Web version, Android, iOS, desktop version for Chrome OS	Free

NeoOffice	macOS	Source code is free but software package is payware.
MobiSystems Office Suite	Windows, Android, iOS	Freemium (Basic package is free but has limited functions)
Polaris Office	Windows, macOS, Android, iOS	Payware
ThinkFree Office	Windows, Linux, macOS, Android, iOS	Payware

Components of Office Suites

As mentioned, office suites are used to create the different kinds of documents that offices and workplaces usually need.

The majority of office suites have three kinds of programs making up their base package:

- A **word processor** to type and edit text documents, as well as perform basic desktop publishing operations;
- A **spreadsheet program** to handle computations and numbers presented in table format;
- A **presentation program** to design and show slideshows.

For example, these are the programs: **Word, Excel** and **PowerPoint** in Microsoft Office, and **Pages**, **Numbers**, and **Keynote** for **iWork**.

Aside from the three main program types, office suites may have the following kinds of programs in the package.

Database management software	Desktop publishing software	E-mail client
Graphics editor	E-mail client	Communication software
Diagram drawing software	Note taking	Project management software
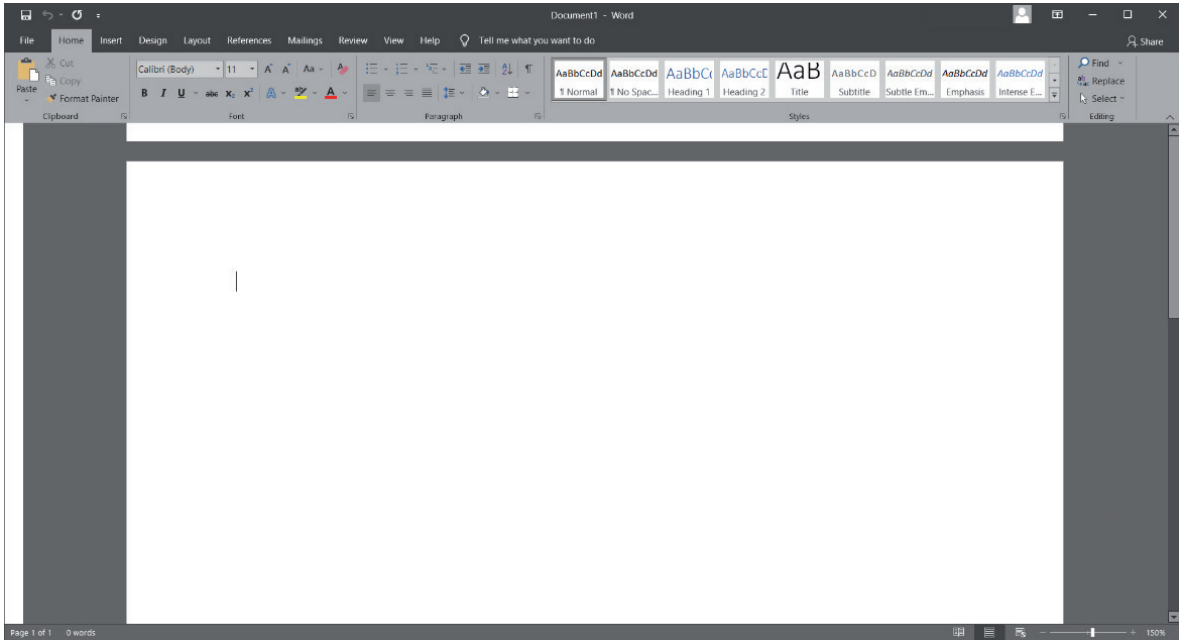
Screenshots of the Microsoft Word (top image) and LibreOffice Writer interfaces (bottom image)
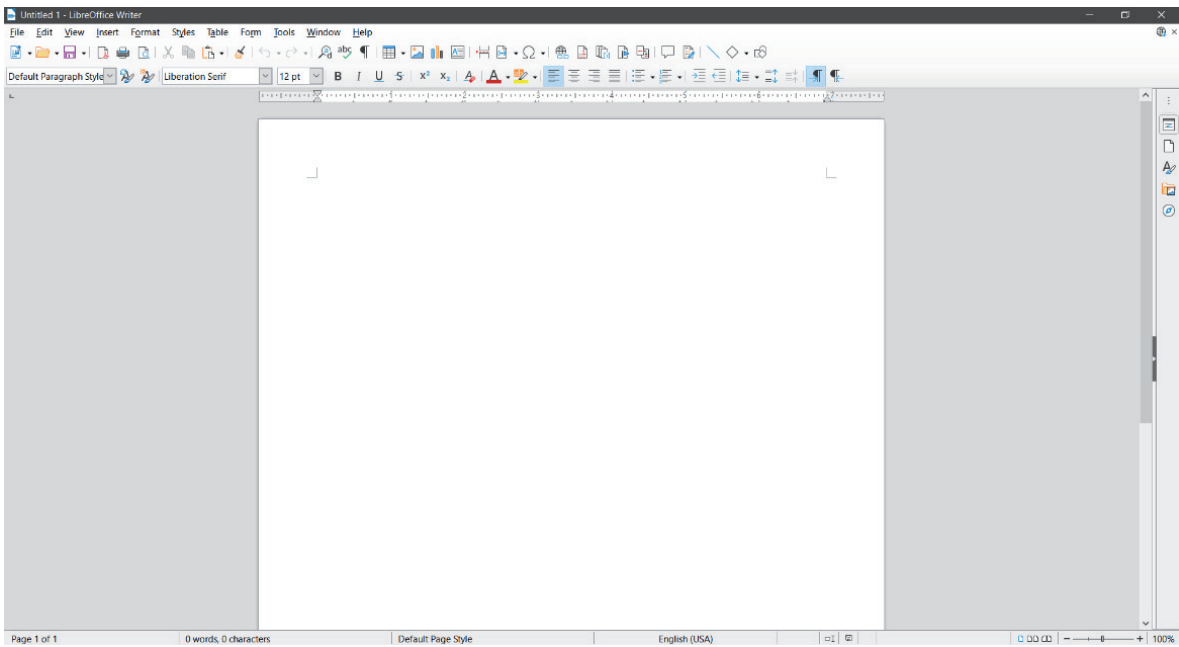
Online and Offline productivity

People and offices were already using productivity software even before they had access to the Internet. This means that all of their work needed to be saved on hard drives and USB sticks so that they could work on different computers. Before that, people used plastic cards with a flat magnetic disk inside called floppy disks or diskettes to store data. (Your parents may have used these while they were in school!) This is also why many programs still use the icon of a diskette as a symbol of the Save function.

Using data devices on different computers may be convenient, but it also led to the spread of computer malware like viruses. Some data devices were also prone to getting corrupted and losing data completely.

Software companies took advantage of developments in technology in order to make productivity software available anywhere, as long as the user has a way to access the Internet. This opened the door to **online office suites**, productivity software that is stored online instead of on a local computer, and accessed through a web browser. Another term for online office suites is cloud, or cloud-based, office suites.

The Google Docs Editors suite is an example of an online office suite. It has the core apps which include a word processor, spreadsheet, and presentation software. It also has diagramming software, a web survey form builder, a web page and wiki creator, and a note-taking app. The Google Docs Editor comes in web app form and a mobile app for smartphones. There is also a desktop version of the office suite for Chromebooks, which are laptops with the Google Chrome operating system.

Online office suites have a few advantages over office suites that are installed on the user's computer.

- **Some online office suites are free** – You can use some online office suites without having to pay anything, with all features unlocked and available to use. You only need an account in order to have access to the service.

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- **Saving while you work** – With online office suites, you won't have to worry about losing your work because you forgot to save it, as they save every change to a file as soon as it is made.
- **Working with other users on the same document at the same time** – Certain online office suites allow you to share documents with other people, and have them make changes that will show up immediately, even while you yourself are working on the document. You can even chat with the people working on the document from inside the office suite. This is called **real-time collaboration**.
- **No programs to install** – Office suites typically consume several hundred megabytes of hard disk space because of the number of features in each program. In comparison, online office suites are accessed using web browsers.
- **Cross-compatible file formats** – Some online office suites can export documents into files that can be used by other office suites. However, this may result in different formatting compared to the original file.

On the other hand, online office suites do have some disadvantages, such as:

- A stable Internet connection is needed when using online office suites. Changes made to a document may not be saved if the user's Internet connection is unstable.
- Some online office suites only have basic functions to keep the size of their apps down and let them load quickly, even on slow connections.

Some office productivity suites have adopted a combination of letting users work offline, and being able to work online as needed. For example, Microsoft Office users can work on an online file using its web version, and shift to the local version at any time.

Other office software

While office suites are considered as the "main" type of software when it comes to productivity, other kinds of software can also be considered as productivity software, depending on the needs of the workplace.

Web browsers – used to open and display web pages and access web-based services like online office suites. Some examples of web browsers are **Google Chrome**, **Mozilla Firefox**, **Microsoft Edge**, and **Safari for iOS**.

PDF viewers – These are software that are used to open and view PDF files.

PDF (Portable Document Format) files are used to present documents consistently and exactly as they were created, even across different operating systems and devices. PDFs can be thought of as an image of a document, because it preserves the exact formatting and design of the document—even some fonts which may not be present on the device the PDF is being viewed on.

Because they can show a document as it was designed to look like, PDF is the format used for **paperless billing**, in which companies like banks and service providers like electricity, water and communications send PDF bills to their subscribers.

PDFs can do more things aside from just showing documents. Some government agencies use interactive PDFs with blank spaces and buttons that users can fill out or select using a computer, so they won't have to do so using a pen. Not only does this save on paper and printing costs, but also makes text editable and easy to read.

Note that PDF *viewers* like **Adobe Reader** and **Foxit Reader** are used to open PDF files, and can only make small changes to the document. A PDF *editor* like **Adobe Acrobat** is needed to make large changes to a PDF document.

E-mail clients – Some companies use these programs to send and receive e-mails instead of using web e-mail services. Certain e-mail clients can fetch e-mail from web-based e-mail accounts. E-mail clients can back up e-mails to the computer, meaning they can be read even if the computer is offline. Sending e-mails will require an Internet connection, however.

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Some examples of e-mail clients are **Microsoft Outlook**, **Mozilla Thunderbird**, **Mailbird**, and **Spark**.

Graphics editors – These are programs that are used to edit images, as well as perform common image operations such as **retouching** (fixing damaged images), **compositing** (combining different images into one) and even **drawing**. Graphics editors are classified into **raster** and **vector** graphics editors; **raster editors** are used to edit pixel-based images like JPEG, BMP, and PNG, while the other is used to draw and edit **vectors**, which are shapes formed by geometric objects.

In payware, **Adobe Photoshop** is the most well-known raster graphics editor, and **Adobe Illustrator** is its vector counterpart. There are free raster and vector graphics editors as well, like **MS Paint**, **Paint.NET**, and **GIMP for raster**, and **Inkscape** for vector.

Messaging software – These programs are used to communicate with customers and between employees. They may include a combination of video and text chat features, file sharing, and in some cases, they may even have light versions of office apps. A few examples of this kind of program are **Microsoft Teams**, **Google Duo**, **Slack**, and **Zoom**.

Desktop publishing (DTP) software – These programs are used to design, or make layouts, of documents by allowing different combinations of text and images, as well as the control of different elements on a page. DTP software can be used to make both print and digital documents. It can also be used to make display signs and other graphic material.

Adobe InDesign is currently the most widely-used DTP software; other examples of DTP programs are **QuarkXPress** and **Microsoft Publisher**.

Online Survey Tools

A survey is a set of questions, which, when answered by a group of people, is used to collect information and opinions.

Online survey tools are a kind of productivity software that you can use to make a survey, send it to the respondents, and collect and even analyze their answers without printing a single questionnaire.

The survey makers first create a set of questions like a traditional survey, but instead of paper forms, the respondents are given a link to the survey. The survey creators can also share links through different channels like social media, emails, and web sites in order to get more respondents to their question, as well as collect their answers faster.

Online survey forms are much more convenient than the traditional paper questionnaires, and are more likely to get replies than phone calls, text messages, or personal interviews. Some kinds of online form software are free, while others are paid services. However, the use of online survey tools can only be considered in areas where the target audience has internet access as well as the necessary skills to complete them.

Here are some well-known online survey tools and their features:

Google Forms – it is part of the free web-based Google Docs Editors suite and has no restrictions on the number of surveys and questions you can make, or the responses you can get. It can also be used to create other kinds of forms including quizzes, polls, and evaluations, among others.

SurveyMonkey – it is a well-designed, easy-to-use survey tool that lets you create a simple survey which can be embedded directly to the website. The free version allows unlimited surveys, 10 questions, and 100 respondents.

Typeform – it offers a wide variety of question types such as short and long text responses, dropdown lists, dates, multiple choice, yes/no questions, and ratings, among others. The free version allows an unlimited number of surveys and questions, but only 100 responses a month.

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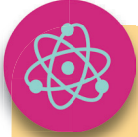
SUMMARY

Computers are considered as essential productivity tools in offices and workplaces worldwide. A big part of this is because of office productivity programs, otherwise known as office suites. Office suites are software packages that are used to create the different kinds of documents that are usually needed by offices and workplaces. Office suites can have online or offline versions, but most commonly have a combination of both working modes.

LESSON OUTPUT

Choose an office suite that you have access to, and pick from any one of its component apps (word processor, spreadsheet, presentation software). Choose a menu option from that app, and make a slideshow explaining the tools found in it.

For example, you picked Microsoft PowerPoint, then selected the Transitions menu. Your slideshow should be about the options in the Transitions Menu.
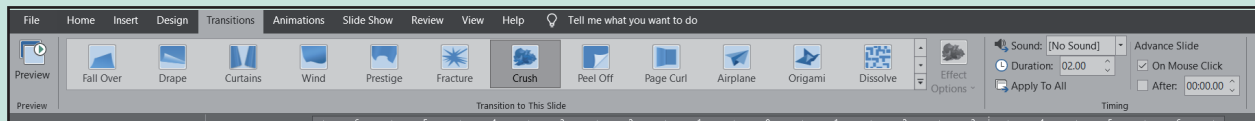
The slideshow's specifications are:

- It must have the name of the program, as well as the specific menu option you are presenting in the slideshow.
- Each slide must contain the name of the option, a screenshot of its button/icon, and an explanation of what it does.
- Ideally, each option must be shown on its own slide, but you can combine two options on the same slide if the options are simple enough to explain.
- You must include all sub-options if available.
- You can use any function in the program EXCEPT Help-related functions.
- You may add design elements to the slideshow to make it look better.

Refer to the following example to get an idea about the slideshow.

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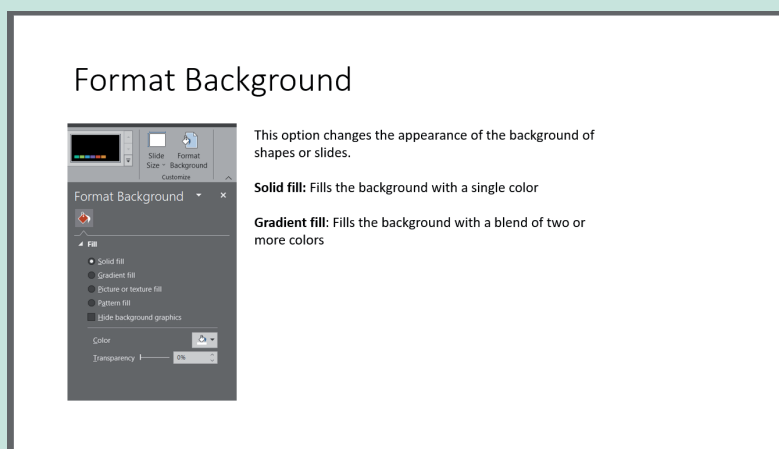
EXERCISES

Exercise 1

Matching Type: Match the definitions in column A to the words in column B.

Column A

_____ 1. This is a program used to type and edit text documents.

_____ 2. This is a package of different kinds of software that are used to create and design different kinds of documents.

_____ 3. This program is the spreadsheet program in Apple's iWork.

_____ 4. This is the practice of completing work or tasks quickly and efficiently in order to do more things.

_____ 5. This is Microsoft Office's presentation program.

Column B

A.   Numbers

B. Productivity

C. word processor

D. PowerPoint

E. office suite

Exercise 2

Multiple Choice: Select the letter of the correct answer.

1. A program that requires you to pay the developers before using it is also known as _____.

   A. Paywall
   B. Prepaid
   C. Payware

2. A program that handles computations and numbers presented as a table is called _____.

   A. calculator
   B. spreadsheet
   C. abacus

3. This kind of program can sometimes be included in an office productivity suite.

   A. Database management software
   B. Games
   C. video editing software

4. _____ is the name of the Apple presentation software.

   A. Keyhole
   B. Keynote
   C. Keyslide

5. In online office suites, real-time collaboration means _____.

   A. It can produce files that are compatible with other office suites.
   B. It allows saving as changes are made.
   C. It allows working with other people on a single document at the same time.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The slideshow follows all the specifications thoroughly; the content of the slideshow is free of mistakes and explains the selected menu option accurately, clearly and completely.	The slideshow explains the selected menu option clearly and completely but has 1-2 mistakes.	The slideshow explains the selected menu option clearly and completely but has 2-3 mistakes.	The slideshow explains the selected menu option, but has more than 3 mistakes, and has incomplete details.	The slideshow explains the selected menu option but fails to explain the selected menu item clearly, some details are incomplete, and more than 3 mistakes were made.	
2. Creativity	The slideshow's design is creative and well-designed, and does not affect the presentation of information. A sense of unity is also present in the design.	The slideshow's design is clean and does not affect the presentation of information for the most part.	The slideshow has a simple design scheme that works with the information being presented.	The slideshow has a design scheme that affects the presentation of content.	The slideshow did not use any design scheme to enhance its appearance.	
3. Promptness	The output was completed and submitted two or more days ahead of the given deadline.	The output was completed and submitted one day ahead of the given deadline.	The output was completed and submitted on the given deadline.	The output was completed and submitted one to two days after the given deadline.	The output was completed and submitted three days after the given deadline.	
TOTAL						

TRIVIA

Did you know that in the Philippines, there is an inventor named Kyxz Mendiola, who has been working on flying drones that are big enough to ferry people in the air? He has already made a drone that's like a flying car and also a stand-on hovercraft that's similar to flying vehicles of science fiction and fantasy. Mendiola is creating products that will hopefully sell one day and benefit lots of people. He is an entrepreneur of the computing age.
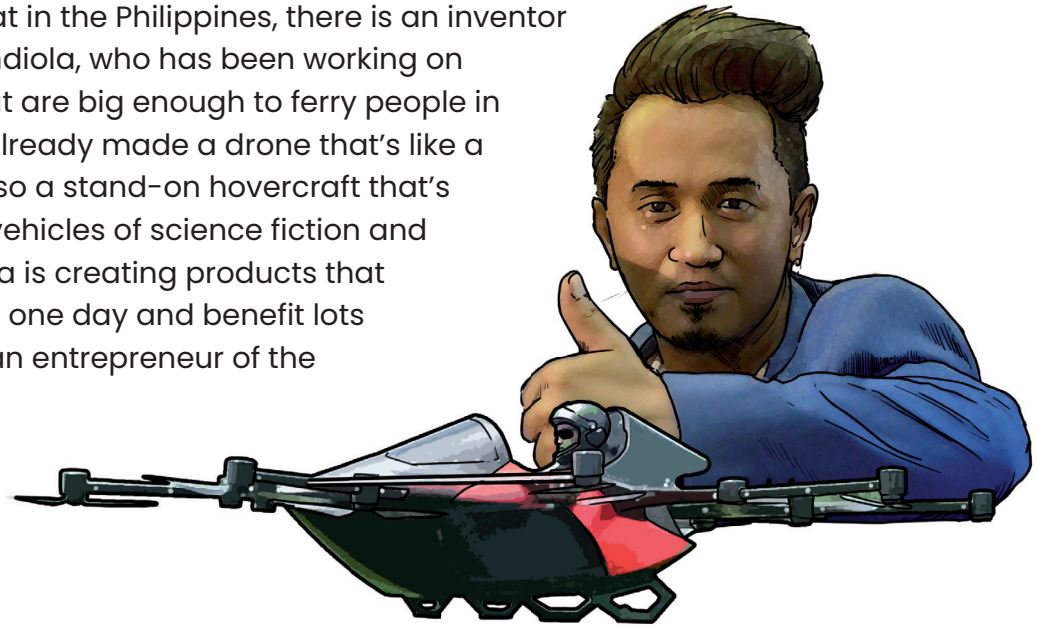
LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Demonstrate knowledge and skills that will lead to becoming an ideal entrepreneur.
2. Produce a simple product.
3. Buy and sell a product based on need and demand in school and community.

ENGAGE

1. Ask the students to think for a moment what their ideal business would be if they were given the chance to provide a service or sell something online.

2. Ask them how they would sell it if the Internet or Facebook did not exist. Then ask them again what they would do now that they have the Internet and social platforms.

3. Ask them if they are familiar with live selling and what their experiences are regarding this activity.

4. Show them an actual live selling event or let a student show one that's in progress in class.

5. Tell the students that in this lesson, they will be learning how to buy and sell online as well as create a service or product of their own which can be a foundation for a business.

EXPLORE

Let the students explore and experience live selling events and sites of entrepreneurs such as Filipino inventor, Kyxz Mendiola, on their own. Let them be inspired by what they will discover.

RESEARCH

Instruct the students to research on ways to sell online, specifically on the use of social platforms like Facebook and YouTube. Ask them to find out how Filipino inventor Kyxz Mendiola is able to create his personal transport drones and promote them online.

Questions:

1. What makes Kyxz Mendiola an ideal entrepreneur?

2. How is this inventor able to make specialized products?

3. What does he do which could increase his products' potential sales in the future?

EXPLAIN

Definition of terms

ICT – acronym for Information and Communications Technology which is used nowadays for anything that relates to computing.

Entrepreneurship – the act of envisioning a product or service and making a business out of it with the intent of gaining profits and/or purposely fulfilling a purpose.

E-commerce (electronic commerce) – all forms of business transactions conducted electronically over computer networks, the Internet in particular.

E-business (electronic business) – a term used interchangeably with e-commerce.

Did you know that Facebook, which started out as a platform for connecting students at Harvard, has evolved into something that's very useful for would-be businesspersons and entrepreneurs? Unlike traditional sellers who set up their business in a store, businesspeople on Facebook sell and transact in a virtual environment online where the products are shown and anyone interested can claim or "mine" it, after which they can pay for it and the item may then be delivered later. Such buying and selling activity online is now called electronic commerce or e-commerce.

E-commerce, unlike traditional commerce, includes both tangible (food clothing, real estate, etc.) and digital goods (software, audio, video, ebooks, etc.). Services which may be rendered online are also what make e-commerce different from the usual

brick and mortar shops since the resulting output may not necessarily be physical but digital such as a computer program that helps in the accounting process or a book that's readable on the Internet. The term electronic business, or e-business, is often used interchangeably and essentially mean the same thing and of course, selling online always involves a computing device, such as a mobile phone.

Entrepreneurial Business Models

Entrepreneurial business models can be categorized into four major models.

Business to Business (B2B)
This refers to electronic trade that takes place between companies and does not involve individual consumers.

Business to Consumer (B2C)
This is the basic and most recognizable form of e-commerce where businesses sell goods and services to the general public.

Consumer to Business (C2B)
In this model, consumers empowered by social media and platforms to communicate directly with businesses. Rather than passively choose a product from a given catalog, customers can directly express their needs and sentiments. In this model, e-commerce has become a two-way street.

Consumer to Consumer (C2C)
C2C showcases the egalitarian side of e-commerce. In C2C, consumers are given a venue to trade among themselves. It is not required to set up a proper business to sell. It's not even necessary to put up an online store. Anybody can sell anything using platforms like Facebook, YouTube, and Instagram. All the seller has to do is post whatever it is that he or she has for sale or do a live selling event wherein participants can make their "claim" on an item and buy the item through online electronic transfers to digital wallets or bank accounts using their device.

With all the platforms and digital means of transaction, the means by which entrepreneurs conduct business is fast changing and there is no fixed system as everything is constantly evolving with new software, platforms, hardware, and habits. For instance, people are now transacting with cryptocurrencies, which are essentially a kind of digital currency using a system that is still not mainstream but has lots of potential.

Steps to Creating a Business Online
1. Create a product or offer a service.
2. Pick a platform to promote the product or business online.
3. Know how to sell and distribute it online.
4. Know how to deliver it, if it is a physical product, or provide it, if it is a service.
5. Choose a platform for people to pay you digitally.
6. Know how you can get the money paid to you into a bank account.
7. Know the legal requirements in conducting your business and act on them.

Entrepreneurial Safety Procedures

Entrepreneurs often start with a grand vision, but without the proper decisions that would allow them to safely embark on a business with little risk for failure, they have to know the basic Balanced Scorecard Goal Framework (BSC):

- **Financial** – revenue, profitability, and costs
- **Customer** – always value-oriented
- **Internal Processes** – work, production, distribution, and service processes that deliver value to customers
- **Learning and Growth** – skills development for better value to customers

In Business

Being an entrepreneur in this age of computing (ICT) is both easy and challenging at the same time. It's easy because communicating with clients, customers, and other business is now easier using the Internet. To succeed as an e-commerce entrepreneur, you have to learn more than just how to do a live selling event, you will also need to know how to make a product or offer a service that people will buy. You will also need to establish how people will receive your product, how they can pay you and how you can get that money into the bank.
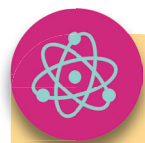
SUMMARY

Businesspeople or entrepreneurs now sell and transact in a virtual environment online. Such buying and selling activity is called electronic commerce or e-commerce and it involves both tangible and digital goods and services. The manner in which people transact online is divided between four entrepreneurial business models which specifies interactions between businesses and customers. Whatever model is applied, a business requires steps to setting up and safety procedures to ensure success.

EXERCISES

Identification.

_____ 1. Term which is used nowadays for anything that relates to computing.

_____ 2. Involves setting up a business.

_____ 3. Refers to transactions that are done electronically.

_____ 4. This means electronic business.

_____ 5. Selling which always involves a computing device.

Exercise 2
Fill in the Blanks.
What is the missing word in each of the entrepreneurial steps?

1. Create a product or offer a _____.

2. Pick a _____ to promote the product or business online.

3. Know how to sell and distribute it _____.

4. Know how to _____ it, if it is a physical product, or provide it, if it is a service.

5. Choose a platform for people to pay you _____.

6. Know how you can get the money paid to you into a _____.

7. Know the _____ requirements in conducting your business and act on them.

LESSON OUTPUT

You are individually tasked to think of a concept for a product or service that may be useful to your fellow students online. You are to **make a 5-slide presentation on how they are to make and sell it**. Make use of text and images creatively to explain your idea. You will be rated according to the following rubrics.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student's presentation contained all that is needed to make a convincing argument about their idea for a product or service in five slides.	The student's presentation fairly explained their idea for a product or service in five slides.	The student reasonably presented their idea for a product or service in five slides with a fair amount of explanation.	The student presented their idea for a product or service in five slides without any usable explanation.	The student presented an idea which did not make much sense or was convicing in the presentation.	
2. Creativity	The student's output was unique and made creative use of text, images, and more.	The student's output was unique and made an attempt to creatively use of text and images to present the idea.	The student's output was based on an existing idea though supported by convincing text and images to present the idea.	The student's output was copied from someone else's idea although supported by fresh text and images.	The student did not attempt to create anything original and submitted work that was all copied.	
3. Promptness	The slideshow was completed more than 3 days ahead of the given deadline.	The slideshow was completed 3 days ahead of the given deadline.	The slideshow was completed by the given deadline.	The slideshow was completed within 3 days after the given deadline.	The slideshow was completed more than 3 days after the given deadline.	
TOTAL						

LifeTek-TLE

Agriculture

Propagation

1

Maintenance and Harvesting

2

Selling

3

Raising and Marketing Livestrock

4
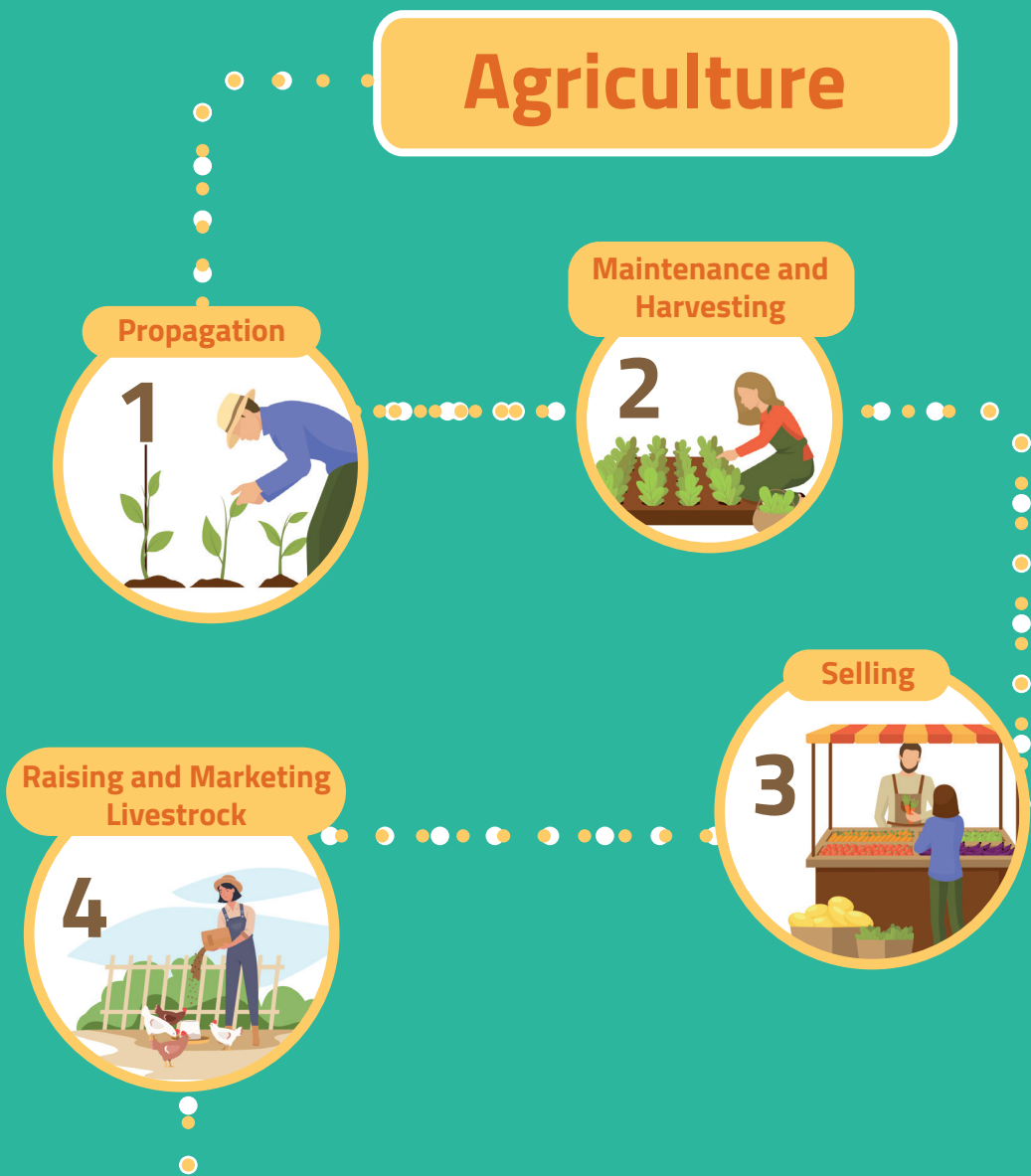
TRIVIA

The **Coco de mer** is the dark brown seed of a palm tree and is known to be the largest seed in the world. It is found in the Republic of Seychelles, an archipelago island country found in the Indian Ocean. The seed can weigh up to 18 kilograms and can reach up to 30 centimeters long. The tree itself can grow up to 31 meters tall and its leaves measure 6 meters long and 3.6 meters wide.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define what propagation is.
2. Identify the different propagation techniques.
3. List various propagation methods.

ENGAGE

CRACK-A-WORD

Directions: Use the given code below to guess the word.

A	B	C	D	E	F	G	H	I	J
1	2	3	4	5	6	7	8	9	10

K	L	M	N	O	P	Q	R	S	T
11	12	13	14	15	16	17	18	19	20

U	V	W	X	Y	Z
21	22	23	24	25	26

16	18	15	16	1	7	1	20	9	15	14

Clue: It is a process by which plants are multiplied.

EXPLORE

Directions: Identify what is being described in each statement that follows. Choose the letter of the answer from the given word pool.

A. budding
B. asexual propagation
C. marcottage
D. rootstock
E. grafting wax

F. grafting
G. sexual propagation
H. plant propagation
I. scion
J. cuttings

_____ 1. It is the part of the plant with the roots.
_____ 2. A kind of asexual propagation where the scion is inserted into the rootstock.
_____ 3. A type of propagation which uses seeds to multiply the number of plants.
_____ 4. A kind of asexual propagation where the leaf, stem or roots are cut from the mother plant to produce a new plant.
_____ 5. It is the young or upper part of the plant.
_____ 6. A kind of sexual propagation where part of the plant is imbedded in soil and allowed to grow roots while it is still attached to the mother plant.
_____ 7. It is a kind of wax which is added to grafted plants to protect these from infection.
_____ 8. It is a kind of asexual propagation where a single bud of a scion is inserted into the rootstock.
_____ 9. A type of propagation which uses a leaf, bud, stem or some roots to grow new plants.
_____ 10. It is the process of increasing, through reproduction, the numbers of those species of plants which have certain preferred characteristics.

RESEARCH

Search the web and look for the different ways in plant propagation.

Questions:

1. What are the two ways of propagating plants?

2. If you are to apply asexual propagation, which method would you use? Why?

Definition of terms

Plant propagation is the activity of increasing, through reproduction, the numbers of those species of plants which have certain preferred characteristics. Plants are living organisms which can be made to reproduce using seeds, leaves, stems, buds, or roots.

Sexual propagation is done when one uses seeds to reproduce a plant species.
Asexual propagation is when plants are reproduced using the plant's leaf, bud, stem, or root. This method is used to maintain and increase the numbers of plant species which have preferable characteristics.

Scion is a young shoot, or the upper part of the plant.

Rootstock, or mother plant, this is the part of the plant with roots.

Kinds of Asexual Propagation

A. **Budding** is a form of vegetative propagation wherein a single bud of a scion is cut and inserted into the desired rootstock to propagate. The different types of budding are: chip budding, patch budding and T-budding.

Chip Budding

1. Pick and cut out a good bud and cut the section of the rootstock or onto which it is to be placed. The bud has to fit perfectly in the cut section.
2. Place the bud onto the cut section of the rootstock.
3. Bind the bud tightly with a strip of plastic or cloth for it to grow onto the rootstock.

Patch Budding
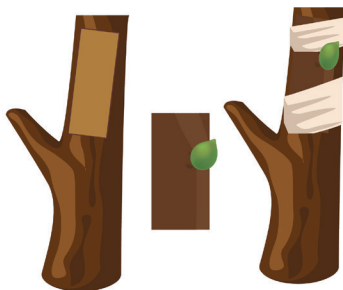
1. Pick and cut out a good bud and make an opening (patch) on the rootstock where it is to be placed.
2. Insert the bud into the patch on the rootstock.
3. Tie the bud securely with a strip of plastic or cloth to make it fuse with the rootstock.

T-Budding

1. Choose and cut out a good bud and then cut a t-shaped opening on the rootstock.
2. Place the bud into the t-cut.
3. Tightly bind the bud onto the rootstock with a strip of plastic or cloth.

B. **Cutting** is a form of vegetative propagation where parts of the mother plant are cut off to produce a new plant. The different types of cuttings are: leaf, stem, and root.

Leaf Cuttings

Stem Cuttings

Budded stems are cut from the mother plant.

Root Cuttings
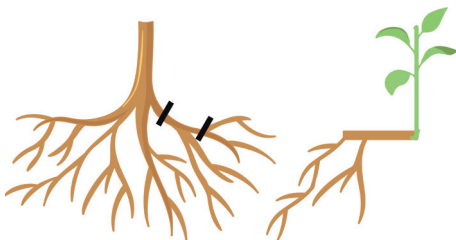
1. Cut the root.
2. Plant the root in soil and it will grow into a new plant.

C. **Grafting** is a kind of asexual propagation wherein the scion is inserted into the rootstock to form a union.

Bark Grafting
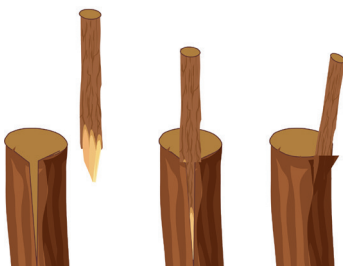
1. Cut out a scion with a good bud, then slice the root stock as shown to form a sleeve where the scion will be tucked in.
2. Insert the scion into the sleeve and tie it securely with a strip of plastic or rag.

Cleft Grafting

1. Pick a good rootstock and cleave the top part.
2. Take the scion and whittle the bottom end forming a wedge.
3. Push the wedged scion into the cleaved rootstock and use grafting wax to seal it.

Tongue or Whip Grafting
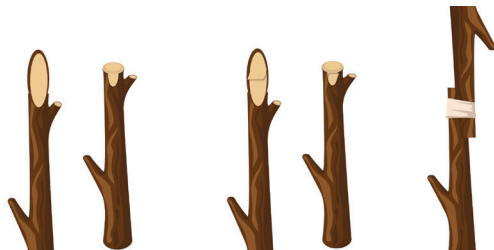
1. Take the scion and rootstock and diagonally chop off the tips of both.
2. Make a downward slit, as shown, in the middle of the diagonal cut of both scion and rootstock.
3. The slits should work to fit the scion and rootstock together.
4. Bring the scion and rootstock together as shown and tie them together with a plastic strip or cloth.
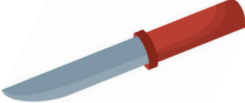
D. **Marcottage**, also called **air layering**, is a method used wherein the stem of the plant grows roots while it is still attached to the mother plant.

Marcottage
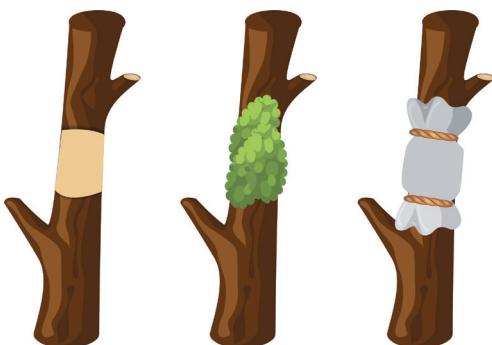
1. Strip a section of the bark of the plant to propagate.
2. Cover the wound with damp moss.
3. Sheath the moss in a plastic wrap tied at both ends. In 2-3 months, roots will grow from the debarked part and the trunk may be cut below the new roots and replanted.

Tools needed to perform asexual propagation.

Image	Name of Farm tools	Function
	Garden scissors	This is a two-bladed tool used to harvest vegetables and herbs with soft and thin stalks.
	Pruning shears	This is a two-bladed tool used to harvest large vegetables and plants that have thick and hard stalks.
	Garden Knife	This is a handheld bladed tool that is used to cut fruit from branches to ensure that the crops are not harmed.
	Grafting knife	This is a handheld single-bladed tool with a straight edge.
	Budding knife	This is a handheld double-bladed tool, where the unsharpened edge is used to open bark so a bud or scion can be inserted.
	Grafting wax	This is made of beeswax, rosin, tallow, and other similar materials. It is used to seal the newly grafted parts of plants to prevent infection.

The safety procedures followed when performing asexual propagation activities are as follows:

1. Use the proper tools for doing a particular job or task.
2. Bladed tools must be kept sharp to make cutting easier.
3. Do not use broken tools.
4. Do not allow young children to play in the area where you are working.
5. Keep your tools clean and dry before storage and away from young children.
6. When in doubt, ask an adult or someone who is experienced with using tools.

The advantages and disadvantages of both sexual and asexual propagation are as follows:

Type of Propagation	Advantages	Disadvantages
Sexual Propagation	• Seeds are easy to store and transport. • Growing a large number of plants is cheaper. • Some plants can be raised only by using seeds. • Simple and fewer planting tools are needed.	• Some seeds die in storage. • Plants can take more time to grow and reach maturity. • Some plants do not grow uniformly, which makes these difficult to sell.
Asexual Propagation	• This method is faster than sexual propagation. • Plants can easily grow more and bear fruit. • Desirable species of plants can easily be multiplied. • Only one rootstock is needed to grow several plants. • It is a time- and energy-saving way to increase the number of plants. • The plant is the same as the mother plant.	• The specific species of plant may only be suited to one location. • You need special planting tools and materials. • Illness in a rootstock can show up in every asexually propagated plant grown from that rootstock.

In Business

Being a plant enthusiast is not just a recreational activity that one can enjoy. It can also be a family's source of food and income. If you want to grow plants and sell them, you can do so. You need to know how much water and sunlight each kind of plant needs to grow and what kind of asexual propagation you can use to grow a plant easier and more quickly, so you can sell it on the market and earn income.

EXERCISES

Exercise 1
Multiple Choice.
Choose the letter of the correct answer.

1. It is a type of asexual propagation also known as air layering. It is when the stem of a plant is allowed to grow roots while the stem is still attached to the mother plant.

    a. Budding
    b. Cutting
    c. Grafting
    d. Marcottage

2. It is a type of asexual propagation where parts of a plant are cut off from the mother plant to produce a new plant.

    a. Budding
    b. Cutting
    c. Grafting
    d. Marcottage

3. It is the young plant or the upper part of the plant.

    a. Bud
    b. Leaf
    c. Scion
    d. Rootstock

4. It is the part of the plant which has roots.

    a. Bud
    b. Leaf
    c. Scion
    d. Rootstock

5. It is a type of sexual propagation wherein a single bud of a scion is cut and then inserted into the desired rootstock or mother plant to propagate.

    a. Budding
    b. Cutting
    c. Grafting
    d. Marcottage

Exercise 2

Sequencing.

Directions: Arrange the actions for when doing tongue or whip grafting in proper order. Write the proper step number in the blank provided.

_____ 1. Create a diagonal cut on both scion and rootstock.

_____ 2. Insert the scion into the rootstock.

_____ 3. Cut both the scion and rootstock in a slanting position.

_____ 4. Use a plastic strip or cloth and tie it firmly.

_____ 5. In making a diagonal cut, make sure that both ends will meet and fit.
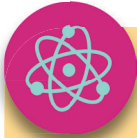
Plant propagation is the process of multiplying species of plants, be it through sexual or asexual propagation. Sexual propagation uses seeds to germinate, while asexual propagation uses different methods, such as budding, cutting, grafting, and marcottage or air layering.

LESSON OUTPUT

The learners are individually tasked to make a slideshow on different propagation methods. The deadline for submission will be given by your teacher. You will be rated according to the following rubrics.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student's presentation showed all five methods of propagation. The tools used are mentioned. The student included some additional information, such as which kinds of plants take well to marcottage.	The student's presentation showed all five methods of propagation. The tools used are mentioned.	The student's presentation showed all five methods of propagation. No mention of tools used is made.	The student's presentation showed two or three different methods of propagation. No mention of tools used is made.	The student's presentation was messy or showed only one method of propagation. No mention of tools used is made.	
2. Creativity	The student's output was unique to the student and based on first-hand research, i.e. he/she interviewed an authority on the topic.	The student's output was in the student's own words and was based on second-hand content researched on the project.	The student's output was essentially rephrased from second-hand research material.	The student conducted research but essentially copy-pasted directly from another source.	The student did not attempt to research for the project.	
3. Promptness	The slideshow was completed more than 3 days ahead of the given deadline.	The slideshow was completed 3 days ahead of the given deadline.	The slideshow was completed by the given deadline.	The slideshow was completed within 3 days after the given deadline.	The slideshow was completed more than 3 days after the given deadline.	
TOTAL						

TRIVIA

Here in the Philippines, Lobo, a town in Batangas, has celebrated the "Anihan Festival" every September since 1999. The festival is a celebration intended to give thanks to God for an abundant harvest, and also serves as a tribute to the efforts of all farmers who play a significant role in the agricultural development in their locality.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define what maintenance and harvesting are.
2. Identify different harvesting techniques.
3. Learn to conduct a survey to have an in-depth knowledge on maintaining and harvesting fruit-bearing trees.
4. Learn what are the considerations in creating a plan for tree planting and seedling production.
5. Present various guidelines on harvesting.

ENGAGE

Rebus

Directions: Solve the given puzzle by adding and subtracting letters to form the correct word. The word refers to what is done to crops one they have grown.

EXPLORE

Identify what is being described in each statement that follows. Choose the letter of the answer from the given word pool.

A. Basket	E. Garden scissors	I. Rice Thresher
B. "Bilao"	F. Garden knife	J. Sack
C. Combine harvester	G. Hand glove	K. Sickle
D. Farming hat	H. Pruning shears	L. Wheelbarrow

_____ 1. It is a piece of equipment used to harvest and thresh at the same time.

_____ 2. It is used to transport harvested fruit and crops from one place to another.

_____ 3. It is a tool used to remove rice husks in raw rice.

_____ 4. It is a two-bladed tool used to harvest vegetables and herbs with soft and thin stalks.

_____ 5. It is made of a woven material and is used to store and carry raw rice, charcoal or vegetables.

_____ 6. It is worn to protect fingers and hands while harvesting.

_____ 7. It is a hand-held bladed tool that is used to reap grain and cut forage.

_____ 8. It is a two-bladed tool used to harvest large vegetables and those crops with thick and hard stalks.

_____ 9. This separates seeds from straw when harvesting.

_____ 10. It is used to store things as well as to transfer harvested lightweight fruits and crops from one place to another.

RESEARCH

Search the web and look for at least three different kinds of farm tools used for harvesting.

Questions:

1. What do you mean by harvesting? Maintenance?

2. What are the different tools used for harvesting?

Definition of terms

The word **harvest** is derived from the word "haerfest," an Anglo-Saxon word which means "autumn." Autumn is the third season of the year, when leaves fall and fruits and crops are collected.

Harvesting is the act of collecting ripe fruits and crops.
Maintenance is the act of taking care of something.
Tool is a hand-held instrument intended to perform a specific function.
Equipment is a power-operated item that is intended to perform certain activities.

Listed here are the different farm tools and equipment needed when harvesting, as well as the ways to maintain them.

Image	Name of harvesting tool or equipment	Function	Maintenance
	Hand glove	Worn to protect fingers and hands when harvesting.	Rubber-insulated hand gloves need to be kept in a cool and dim area, away from direct heat.
	Farm boots	Worn to protect feet from anything that could be stepped on, as well as to protect the feet from heat or burns.	Clean and dry these before storing.
	Farming hat	Protects the neck, ears, and temples from the harsh heat of the sun.	Keep garden hats in a dry place, and away from direct heat.

	Garden scissors	A two-bladed tool used to harvest vegetables and herbs with soft and thin stalks.	Use soapy water and a nail to clean it. Dry properly before storing. Use a grinder to sharpen the blades.
	Pruning shears	A two-bladed tool used to harvest large vegetables and those crops that have thick and hard stalks.	Use soapy water and a nail brush to clean it. Dry properly before storing. Use a grinder to sharpen the blades.
	Garden Knife	A handheld bladed tool that is used to cut fruit from branches.	Use soapy water and a nail brush to clean it. Dry properly before storing.
	Sickle	A handheld bladed tool that is used to reap grain and cut forage.	Use a grinder to sharpen the blade. Dry and clean before storing.
	Wheelbarrow	Used to transport harvested fruit and crops from one place to another.	Clean it using a wire brush, and dry before storing.
	Basket	Used to store things as well as to transfer harvested lightweight fruit and crops from one place to another.	Keep baskets away from direct sunlight, heat and grease. If they are used to carry food, do not use them for another purpose.
	Circular basket or "bilao"	Used to remove husks of rice grains.	Keep in a clean and dry place, and away from heat or direct sunlight.

	Sack	It is made of woven material and is used to store and carry raw rice, charcoal or vegetables.	Store unused sacks properly, such as in a drawer.
	Combine harvester	It is a piece of equipment used to harvest and thresh at the same time.	Blow off dirt from inside and outside the machine. When cleaning the machine, keep water away from the bearings and other moving parts.
	Rice thresher	Separates the seeds from straw when harvesting.	Clean the machine and apply oil to exposed metal parts to prevent rusting. Clean, cover and store the machine in a dry place.

Listed here are some ways plants should be taken care of.

1. Always keep the farm clean. Remove weeds and other unwanted plants on plots.
2. Water the plants regularly.
3. Make sure that the plants get the proper amount of sunlight.
4. Apply fertilizer when needed. If possible, use organic fertilizer, as this is much cheaper than commercial fertilizers and will not harm your health.
5. Apply pesticide or insecticide if needed, to protect the plants from disease.
6. Regularly check on seedlings and fruit-bearing trees.

Here are some safety reminders when harvesting fruits and crops.

1. Use proper tools and equipment.
2. Wear tight and comfortable clothing, hand gloves, farming boots and a farming hat.
3. For people with long hair, securely tie the hair to prevent it from getting entangled.
4. Ask an adult for advice before using any tool or machine.
5. Before using machines, read the operator's manual and be familiar with the buttons or gears to be operated.
6. Keep away from a machine's moving parts.

All the effort placed in taking care of plants pays off when the fruit and crops are harvested.

Here are some things to remember when harvesting.

1. Prepare your storage containers before harvesting.
2. Harvest in the morning, when the weather is cool.
3. When harvesting, handle fruits and crops with care to prevent bruising these.
4. Keep the harvested crops and fruit away from direct sunlight to maintain their good condition.
5. If needed, pre-treat vegetables in iced water to remove heat.

Conducting a Survey on Maintaining Fruit-bearing Trees

The United States Geological Survey defines an orchard as "any non-natural wooded area where trees are planted for the production of fruits, nuts or seeds." When planning an orchard, it is important to conduct a survey to determine and identify the following:

1. Type of orchard farm. There are three types of orchards: (a) fruit orchards that focus on growing fruit-bearing trees; (b) nut orchards that produce trees growing nuts like cashews, almonds, walnuts, including cocoa and coconuts; and (c) seed orchards, that grow trees which produce seeds sold commercially in small seed packets. But there are also other types of orchards that grow trees to produce other products like pine trees (for Christmas trees), maple sugar, and coffee.

2. Trees appropriate for orchard gardening based on location, climate, and market demands. When choosing the type of trees for an orchard, take into consideration a location where soil is suitable, with proper drainage and good quality irrigation water. The climate must also be suitable for growing the chosen fruit crops and there must be an assured demand in the market for the fruits grown.

3. Proper way of planting/propagating trees. Determine the most suitable way of planting and increasing the number of plants in your orchard. Trees can be propagated in many ways, such as by: (a) budding, in which an exact replica of the parent plant is produced; (b) marcotting, which involves rooting a part of the stem while still attached to the parent plant; and, (c) grafting, where plant parts from different plants are joined together so they will grow as one plant.

4. Sources of fruit-bearing plants. Fruit-bearing trees are available for sale in different stages of growth. You may get them from a commercial nursery run by private individuals, an agricultural institution such as a school that offers courses related to agriculture, or government institutions that are responsible for agricultural activities like the Department of Agriculture and the Bureau of Plant Industry.

5. How to care for seedlings. Care and maintenance of seedlings involves: (a) thinning the seedlings, or removing excess seedlings so that the plants have room to grow to their full size; (b) giving them plenty of light; (c) keeping the seedlings moist by watering every couple of days; and, (d) feeding the seedlings through a balanced formula of nutrients in your soil mix and adding liquid fertilizer to the water.

Considerations in Creating a Plan for Tree Planting and Seedling Production

Planning ahead is a very important step in the success of a tree planting project. Whether your plan includes a few trees or a large area, your tree planting project should be planned one to two years in advance. A tree planting plan for an orchard should consider the following:

1. **A map of the property and a site description**

   Make a sketch of your planting site, indicating the orientation, access routes, and boundaries. Note the lay of the land and estimate the total area to be planted to determine the total number of trees that will be required.

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2. **Site assessment**

   Make a thorough inspection of your planting site to appreciate the site conditions and determine how to prepare the site for planting. Site preparation plans include: laying out your site; removing competing weeds; making beds; and, preparing the soil prior to planting. For fruit plants, it is also important to know how much sun the site receives as most fruit trees need at least six to eight hours of direct sunlight for good growth and fruit ripening.

3. **Tree and variety selection**

   Select fruit trees that will grow well or resist pests in your area's climate. Also find out if your preferred fruit will produce on its own or requires a different variety of the same fruit nearby for cross pollination.

4. **Planting arrangement and tree spacing**

   The layout of trees in a planting site must aim at providing the maximum number of trees per hectare, adequate space for proper development of the trees, and ensuring convenience in orchard cultural practices. There are two categories of planting arrangement:

   a. vertical planting pattern – the trees set in a row are exactly perpendicular to those trees set in their adjacent rows (i.e., square or rectangular system).
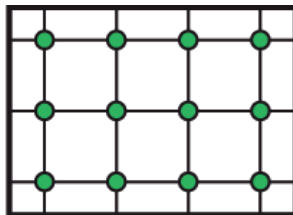
   Square System
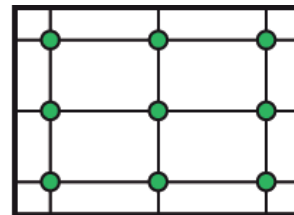
   Rectangular System

   b. alternate row planting pattern – the trees in the adjacent rows are not exactly vertical; instead, the trees in the even rows are midway between those in the odd rows (i.e., hexagonal, diagonal, triangular, or contour system).
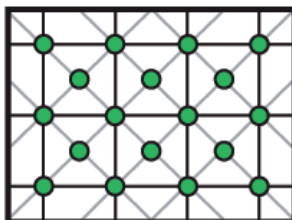
   Diagonal System
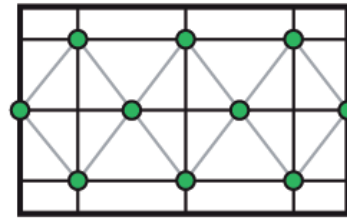
   Triangular System
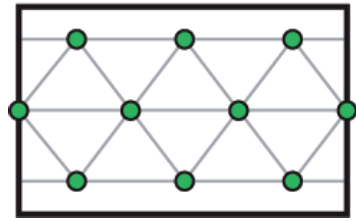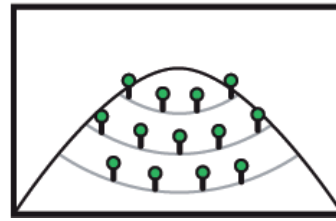
Hexagonal System   Contour System

Optimum spacing of trees is also important to ensure that the trees can grow and bear crops properly. Trees have optimum spacing if, on attaining full size, these do not touch the branches of the neighboring ones and the root system of one tree does not encroach on other trees around it. Factors to consider when deciding tree spacing are: the kind of trees, rainfall, soil type and soil fertility, rootstocks, pruning, and irrigation.

5. **Plans to control unwanted vegetation**

    When inspecting soil conditions, it is important to take note of the vegetation growing in the planting site. Tree seedlings will benefit from the removal of grass, weeds, and shrubs that will compete with your trees for moisture, nutrients, light, and space. Too much competition will reduce the growth of the seedlings or cause them to die.

In Business

The harvesting season varies, depending on the type of fruit and vegetable. Once you harvest your crops, you can sell these in the market to earn income. The things that you need to keep in mind before and after harvesting, include proper handling of crops during transport, in order to bring a good quantity of quality fruit and crops to the market.

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EXERCISES

Exercise 1
Multiple Choice:
Choose the letter of the correct answer.

1. What is the piece of equipment which separates the seeds from straw when harvesting?

   a. Combine harvester
   b. Plow tractor

   c. Rice thresher
   d. Wheelbarrow

2. What is a handheld bladed tool that is used to reap grain and cut forage?

   a. Garden knife
   b. Garden scissors

   c. Pruning shears
   d. Sickle

3. What is the piece of equipment used to harvest and thresh at the same time?

   a. Combine harvester
   b. Plow tractor

   c. Rice thresher
   d. Wheelbarrow

4. What is a two-bladed handheld tool that is used to cut fruit from branches?

   a. Garden knife
   b. Garden scissors

   c. Pruning shears
   d. Sickle

5. What is an object made of woven material that is used to store things as well as to carry raw rice, charcoal or vegetables?

   a. Basket
   b. Bilao

   c. Plastic bag
   d. Sack

Exercise 2
True or False:
Directions: Type in a **T** if the statement is correct and an **F** if the statement is not correct.

_____ 1. Arman used a grinder on his sickle's dull blade to make it sharp again.

_____ 2. Ricky prepared all the containers and storage he would need before going out to harvest his crops.

_____ 3. Roy and his father wear farm hats and hand gloves before going out to harvest their crops.

_____ 4. Mang Ambo uses a basket to transport bulky and heavy harvested crops and fruit.

_____ 5. Aling Nita reminded Mario to be very careful when using sharp tools while farming.
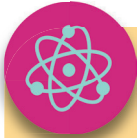
SUMMARY

The harvesting is traditionally done in Autumn when crops are collected. There are many tools for taking care of and harvesting plants and each one should be maintained, stored and used safely for them to be effective in bringing a good quantity of quality crops to the market.

LESSON OUTPUT

Each student will make a slideshow on how rice is harvested in The Philippines. You will be rated according to the rubrics presented.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student's presentation went into more detail on how rice is harvested, such as the different kinds of rice which are harvested in the Philippines. Tools used were mentioned, as well as how these tools should be maintained.	The student's presentation showed the basic process of how rice is harvested. Tools used were mentioned, as well as how these tools should be maintained.	The student's presentation showed the basic process of how rice is harvested. Tools used were mentioned, but no mention was made of how the tools would be maintained.	The student's presentation only showed the basic process of how rice is harvested. No mention of tools used is made.	The student's presentation was messy or partially showed how rice is harvested.	
2. Creativity	The student's output was unique to the student and based on firsthand research, i.e. he/she interviewed an authority on the topic.	The student's output was in the student's own words and was based on secondhand content researched on the project.	The student's output was essentially rephrased from secondhand research material.	The student conducted research but essentially copy-pasted directly from another source.	The student did not attempt to research for the project.	
3. Promptness	The slideshow was completed well ahead of the given deadline.	The slideshow was completed before the given deadline.	The slideshow was completed on the given deadline.	The slideshow was completed right after the given deadline.	The slideshow was completed well after the given deadline.	
TOTAL						

TRIVIA

The **tomato** is the most popular fruit in the world. There are about 7,500 varieties present today, and based on statistics, in excess of 60 million tons of tomatoes are harvested annually which makes it the most popular fruit ever sold.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define what selling is.
2. Identify different ways of selling.
3. Create business or marketing collaterals.

ENGAGE

Picture Puzzle
Directions: Use the clues to guess the words that follow. This refers to a virtual place where products, including agricultural crops, may be sold.

o			i		e		s			p

EXPLORE

Choose the letter of the answer from the given word pool.

> A. Marketing
> B. Wholesale
> C. Online store
> D. Market
> E. Suggested retail price
>
> F. Cooperative
> G. Retail
> H. Selling
> I. Physical store
> J. Markup

_____ 1. This is a commercial establishment where people can physically visit and buy products for sale in small quantities.

_____ 2. This refers to selling items in the marketplace in small quantities.

_____ 3. This is the act of providing products or services in exchange for money.

_____ 4. This is the amount or percentage (%) added to the original selling price so the business can earn some profit.

_____ 5. This refers to any kind of application or site which offers products for sale on the Internet which will be delivered directly to the buyer.

_____ 6. This process includes the planned introduction of a product or service to the marketplace.

_____ 7. This refers to the method of selling items in the marketplace in bulk or in large quantities.

_____ 8. This is the place or the space where commercial products are sold.

_____ 9. This is the monetary amount a product is offered in the marketplace, with the markup already added to the original selling price.

_____ 10. This is an organization which is owned and operated by several people, each of whom have the same shares, profits, and benefits.

RESEARCH

Ask the learners to research the most consumed fruit and vegetable in the Philippine market.

Questions:

1. What is the most consumed fruit in your household?
2. What is the most consumed vegetable in your household?
3. How would you sell crops and fruit you harvested?

EXPLAIN

Definition of terms

Selling is the act of providing products and services in exchange for money.

The **market** or marketplace is the place or the space where commercial products are being sold.

Marketing is the method of promoting both products and services. One of the aspects of this is planning for introducing a product or service to the market.

A **cooperative** is an organization which is owned and operated by several people, all of whom have the same shares, profits, and benefits.

A **physical store** is any commercial establishment where people can physically visit. It offers for sale small quantities of products.

An **online store** is any kind of application or site which offers, over the Internet, products for sale which will be delivered directly to the buyer.

Retail is the method of selling items in small quantities.

Wholesale is the method of selling items in bulk, or in large quantities.

Markup is the amount, or percentage (%), added to the original selling price so a business can earn profit.

Original Selling Price (OSP) is the price of the of product or products without added markup.

Suggested Retail Price (SRP) is the price, or monetary amount, for which a product is offered, wherein the markup is added to the original selling price.

Selling Harvested Crops, Either Retail or Wholesale

After harvesting, the next thing to do is to sell your products. One must think of ways to sell your harvest at the right price and at the right place. Listed here are some ways to sell your products.

1. Sell the harvested fruits and crops to your neighbors and friends at retail price.

2. Sell your harvested fruits and crops wholesale to a farmer's cooperative.

3. Sell your products wholesale to resellers, who are also known as middlemen.

4. Sell your products wholesale to grocery stores or supermarkets. Should you do so, even before you grow your crops, make sure you have contacted the right person in charge of the grocery store or supermarket that you will sell to.

5. Sell your products to restaurants. Before you grow your crops, you must know the restaurant you will deliver to, and sell at prices that are slightly discounted from wholesale prices.

6. Sell your fruits and crops online. This is a popular type of selling during the Covid-19 pandemic, where different products are offered and sold in different online shops and on several social sites.

It is helpful if a seller has the following characteristics.

1. A pleasing personality. This is about how you present yourself to others, such as the way you dress, and includes your observing proper hygiene.

2. Knows everything about the product. A good seller is familiar with every detail about his/her product, including the price.

3. Wears a cheerful smile. Smiling at customers can call their attention so they will be more willing look at and check on your products.

4. Friendly. A good seller is very polite when speaking with customers.

5. Good listener. A good seller listens to every question his/her customer has, so he/she may answer correctly.

In Business

When farming as a business, it is very important to record details of important events, such as the date of planting seeds or seedlings as well as when fertilizer and pesticide were applied. Also, all the expenses, or the cost of materials and supplies, used in farming, should also be recorded, so that you will know how to price your harvested crops. Consider as well the markup percentage to impose.

Formula to get the Suggested Retail Price (SRP)

1. Peso Markup = OSP x Markup %
2. SRP = Original Selling Price + Peso Markup to impose on the product
3. Total cost = SRP x no. of kilos/pcs of harvested crops on sale

Example:

Mang Mario, harvested 100 kilos of mangos. The OSP of mangos is Php 75.00 per kilo, and he wants to impose a 75% markup. How much will be the price, per kilo, of the mangos he sells? How much will be the total cost of 100 kilos of mangos?

Computation:

1. Get the Markup in pesos first.

   Peso Markup = OSP x Markup %
   = 75 x 0.75 (75%)
   Peso Markup = Php 56.25

2. SRP = OSP + Peso Markup

   = 75 + 56.25
   SRP = Php 131.25

3. Total cost of harvested crops for sale

   Total Cost = SRP X No. of kilos of harvested crops on sale
   = 131.25 x 100
   Total Cost = Php 13,125.00
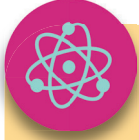
SUMMARY

Properly introducing your product to the market allows you to sell all of your harvested crops. Doing so gives you enough income to recover all your expenses for maintaining your farm, as well as a little profit. There are several ways to sell your products. You can sell your products to middlemen or resellers, as well as to restaurants and to physical stores, wholesale. You can also sell your products on the Internet or to your friends and neighbors in retail. Price crops properly so you can cover all of your farm's expenses.

LESSON OUTPUT

The learners are individually tasked to **make an advertisement on a document file for a new kind of rice**.

The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

EXERCISES

Exercise 1

Multiple Choice:

Choose the letter of the correct answer.

1. What is the method of selling products in the marketplace in bulk or in large quantities?

   a. Discounted   b. Retail   c. Wholesale   d. None of the above

2. What is the place or space where commercial products are sold?

   a. Cooperative   b. Internet   c. Market   d. None of the above

3. What is the price of a product, without added markup, called?

   a. Markup   b. OSP   c. Peso   d. SRP

4. What is the act of providing products and service in exchange for money?

   a. Advertising   b. Marketing   c. Promoting   d. Selling

5. What is the method of promoting products and services, one of whose elements is planning how to introduce these to the market?

   a. Advertising   b. Marketing   c. Promoting   d. Selling

Exercise 2

Identification

Directions: Choose the letter of the answer from the given word pool.

A. Online selling store	D. Php 123.00
B. Php 1,230	E. SRP
C. OSP	F. Cooperative

_____ 1. It is the sum of OSP + Peso Markup.

_____ 2. FB Market place is an example of a/an _____.

_____ 3. Ken sells 15 pcs of suha for 82 pesos each. His total earned cash from the sale is _____.

_____ 4. This is an organization which is owned and operated by all the members, all of whom have the same shares, profits and benefits.

_____ 5. This is the price of a product without added markup.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The output is what is desired, is free of mistakes, and is neatly or clearly presented. The advertisement contains all of these features: –Product Name –SRP –Readable Text –Eye-catching image – Is short and meaningful	The output is free of mistakes and is neatly or clearly presented. The advertisement contains 4 of these features: –Product Name –SRP –Readable Text –Eye-catching image – Is short and meaningful	The output is free of mistakes, but the presentation is not neat or clear. The advertisement contains 3 of these features: –Product Name –SRP –Readable Text –Eye-catching image – Is short and meaningful	Some mistakes are visible. The presentation is messy. The advertisement contains 2 of these features: –Product Name –SRP –Readable Text –Eye-catching image – Is short and meaningful	The output isn't what is desired. The advertisement contains only 1 of the following features: –Product Name –SRP –Readable Text –Eye-catching image –short but meaningful	
2. Creativity	The approach of the student is unique and also fulfills the requirements of the project.	The project's requirements are met, and the student took some elements from several existing sources, such as that from other people or the Internet, and built on these.	The project's requirements are met, and the student took some elements from one existing source, such as a person or from the Internet, and built on these.	Some of the project's requirements aren't met.	The project's requirements are not met, and/or the student directly copied (plagiarized) their project from another source, such as from a person or from the Internet.	
3. Promptness	The project was completed at least two days ahead of the given deadline.	The project was completed one day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed one day after the given deadline.	The project was completed at least two days after the given deadline.	
TOTAL						

TRIVIA

Did you know that the local baboy damo (aka baboy ramo) or Philippiine wild boar (aka native pig) is now being regarded as livestock by some farmers such as Rufino M. Legayo from Pangasinan in the Philippines? Compared to the usual pink pigs, the dark and hairy baboy damo are fairly common in the wilderness (except for rare varieties) and because they are similar to free range chicken (they eat other things aside from commercial feeds), they have a different quality of meat which has less fat and therefore healthier. Legayo has successfully bred and sold baboy ramo to fellow farmers who wanted to start the same livestock business. He now hopes that his baboy ramo farm will be recognized as a good example of native pig farming in the country.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Know about four-legged animals and fish being raised locally.
2. Plan for the family's animal raising project.
3. Manage marketing of raised animal.

ENGAGE

1. Have you ever been to a farm where four-legged animals or fish are raised for food? Narrate your experience.
2. Have you ever eaten baboy damo meat? If so, describe your experience and how it tasted like compared to common pork.
3. Just by looking at these pictures, which would be better livestock? Explain.

Native Pig

Commercial Pig

EXPLORE

1. Watch this video on native pig farming in the Philippines.
    https://www.youtube.com/watch?v=hFiK2dUxGmI

2. Watch this video on the effective management strategies for low-cost organic production of native pigs.
    https://www.youtube.com/watch?v=7YymA1-awVM

3. Watch this video on no-odor piggery system.
    https://www.youtube.com/watch?v=yti1YEQWEUU

4. Watch this video on the culture technology for cream dory (Pangasius fish) production.
    https://www.youtube.com/watch?v=fV-yBfCKnbs

RESEARCH

Some kids who live in the city actually do not know where canned products such as corned beef or meat loaf comes from. See what kids of different ages answer when asked where corned beef comes from. You might be surprised by their answers. How about you? Do you know where canned meat and fish come from?

Questions to Answer:

1. Where do canned meat such as corned beef and bottled fish such as Spanish-style bangus come from?

2. What are the common four-legged livestock in The Philippines?

3. What are the common fish livestock in the Philippines?

EXPLAIN

Definition of terms

LOM – Livestock oksyon (auction) market

Have you ever raised an animal? For most people, the experience of raising an animal likely involves a pet such as a dog, a cat, or a fish. In this lesson, we will not be discussing pet animals but livestock farm animals, specifically the four-legged ones and fish, which are raised as and for food.

Most families who live in the city would have little or no experience in farming livestock animals, but those who live in the countryside or the rural areas in the provinces would likely know how to raise and care for four-legged farm animals such as goats, cattle, and pigs. If you happen to visit a province, you will notice some of these animals more so than others. This will give you an idea on which animals are popularly raised in the area. If you go to Lemery in Batangas province for instance, you will see lots of cattle. This is because a livestock oksyon (auction) market (LOM) is regularly held there with most livestock auctioned, being cattle.

On the other hand, if you go to Dagupan in Pangasinan, you will see lots of fish, such as milkfish (bangus) in the marketplaces. This is because, bangus is a primary fish farming product of the province. In other areas of the country where there are lakes, such as Batangas and Laguna, fish cages are built where fish, such as the popular tilapia, are raised and harvested.

Nile Tilapia image by Germano Roberto Schüür licensed under the
Creative Commons Attribution-Share Alike 4.0 International license.

Did you know that tilapia is actually a type of fish found in rivers, such as the famous Nile River in Africa, which was introduced to other places in the world? including the Philippines? So many varieties and hybrids have come out of the Nile Tilapia line that it is no longer possible to identify commercial tilapia as having originated from a specific place.

Tilapia is such a popular fish to raise, there are ready technologies available for farmers to farm it.

Examples of Tilapia Farming Methods

1. Cage Farming – applicable for any scale of production wherein the growing fish are easily monitored. This makes it easy for fish to be multiplied and grown as desired.

2. Pond Farming (small or extensive) – uses a pond, usually artificial and with a drainage system, to grow tilapia.

3. Tank Farming (intensive) – uses small tanks with water that runs through them to produce quality tilapia.

Planning on Farming Four-legged or Fish Livestock?

If you or your family is planning on starting a four-legged or fish livestock-raising project, it is best to consult with farmers who already have the experience or make inquiries with the local office of the Department of Agriculture to make sure you will be doing it properly. There are also local groups where the members can be of help. Perhaps a simple search on Facebook will produce a list of groups, one of which may interest you. These people can then show you their own system which you can copy with their permission and plan for. You will also be able to get a more accurate cost figure which will enable you to properly prepare a budget.

Simple Farm Planning Table

In planning for a farm, it is best to know and account for all that you will need and how much they cost so you will have all the bases covered. You can modify or add more details to this table as you see fit.

	Quantity	Cost	Selling Price
Animal			
Location			
Feeds			
Equipment			

Let us say you are interested in raising pigs or tilapia for profit. If you live in a suburban area, there are things to consider and address before you can fruitfully start your piggery.

1. Odor which can affect the wellbeing of your community
2. Adequate supply of water
3. Sourcing of feeds
4. Waste disposal
5. Noise
6. Local rules

Managing a Livestock Farm

A farm may be small or big. If you are a beginner with meager funds, you should start small and starting small is perhaps a great way to learn the ropes of managing a farm. Think of it like how you would start an aquarium where you raise fish, wherein you will need capital to buy the materials and also manage recurring costs for such things as:

1. feeds
2. water
3. medicines
4. cleaning implements
5. electricity

Once you start your farm, you will then need to be comfortable with the cycle of raising, selling, and replenishing of livestock.

Safety in Livestock Farming

As in any other venture, safety is important in raising livestock. If the four-legged animal you are farming are crocodiles, for example, extreme caution should be observed such that the caretakers will be protected from the dangerous predatory animals. Whatever the animal is, there should be:

a. a perimeter fence (to protect people from animals, or vice versa)
b. first aid kits (in case someone gets bitten)
c. animal retrieval equipment (in case they escape)
d. a veterinarian on hand (should an animal gets sick)
e. disinfection or cleansing system (in case there's a communicable disease)

In Business

The farming of fish and four-legged livestock for food consumption can be a very profitable business. The reason is because livestock are a basic source of food for many people. The animals themselves may serve as food or they can produce secondary products such as fur and milk. There is always a demand for animal products and as a farmer, you will only need to find the right buyers who can process your livestock as the raw food that people will buy in marketplaces.
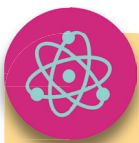
SUMMARY

The raising of livestock, particularly four-legged animals and fish is something that city dwellers might not entirely be familiar with compared to those who live in the countryside. As such, it is important to learn about livestock raising and management since it is a good source of income if done right. To care for livestock properly, it is best to consult with experts who already know the ropes and also to plan for the farm so that foreseen problems and safety concerns may be addressed. A well-managed farm will be good for business.

LESSON OUTPUT

Imagine that you will be setting up and managing a farm for your family. Create a slide presentation which contains details for you to convince your family that you have a great, feasible, and profitable idea. The presentation should have no more than 10 slides. Your score will be determined by the following rubrics.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student presented a comprehensive plan for a family livestock farm in ten slides. Explanations were given on the chosen animal/s as well as location, feeds and equipment needed to make it happen	The student presented a good plan for a family livestock farm in ten slides. Listed were the chosen animal/s, location, feeds and equipment needed to make it happen with some details included.	The student presented a list of the chosen animal/s, location, feeds and equipment (in ten slides) to make it happen with little details included.	The student presented a list of the chosen animal/s, location, feeds and equipment (in ten slides) to make it happen with no details included.	The student presented an incomplete list of the chosen animal/s, location, feeds and equipment (in ten slides) needed to make it happen with no details included.	
2. Creativity	The student created a convincing presentation using creative visuals, text, and audio to drive their point.	The student created an engaging presentation using template visuals, text, and audio to drive their point.	The student created an understandable presentation using standard visuals and text to drive their point.	The student created a presentation using plain visuals and text to drive their point.	The student created a presentation using only text to drive their point.	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed a day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed a day after the given deadline.	The project was completed two days or more after the given deadline.	
TOTAL						

EXERCISES

Exercise 1

Multiple Choice: Choose the letter of the best answer.

1. The Philippine wild boar is also known as this.
   a. nosy pig
   b. native pig
   c. naïve pig
   d. nutty pig

2. These cannot be pets.
   a. livestock
   b. parrots
   c. dogs
   d. cats

3. Not livestock.
   a. goat
   b. cattle
   c. dog
   d. pig

4. Livestock are often raised for _____.
   a. food
   b. war
   c. work
   d. wood

5. These are often raised in fish cages in lakes.
   a. turtles
   b. tilapia
   c. tapioca
   d. tawilis
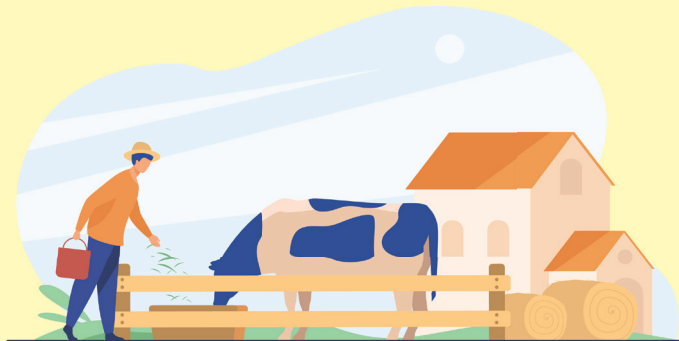
Exercise 2
Fill in the Blanks.

1. The _____ produces meat which has less fat.

2. The _____ serves as the venue for selling livestock.

3. The _____ is a type of fish which originated in the Nile river in Africa.

4. Fish may be farmed in cages, tanks, or _____.

5. _____ from a livestock farm should be addressed so that the wellbeing of the community is not affected.

techFactors**Inc**
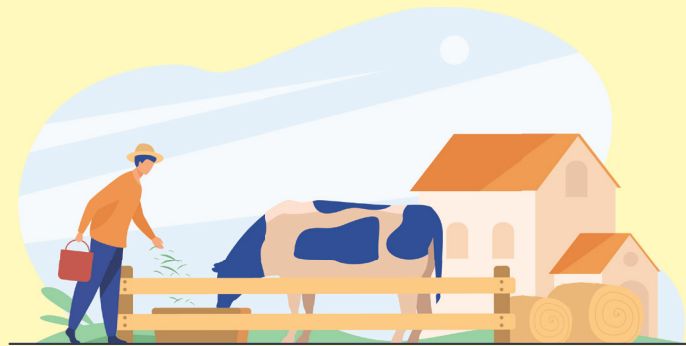
LifeTek-TLE

Home Economics

Allocation of Budget

1

Food Preservation

2

Basic Sewing

3

TRIVIA
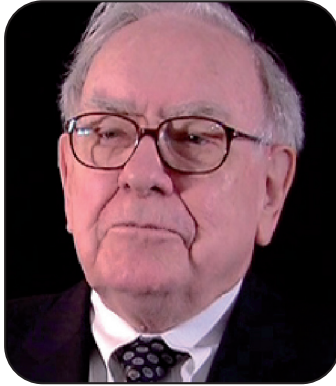
Warren Edward Buffett, is an American investor, business tycoon and philanthropist. He is the chairman and CEO of the Berkshire Hathaway business conglomerate, and is known as one of the richest men in the world.

Despite his immense wealth, he chooses to live on only 1 % of his earnings, and still lives in the same house he bought in the late 1950s.

LEARNING OUTCOMES

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

1. Define what budgeting is.
2. Identify different sources of income.
3. Demonstrate budget allocation.

ENGAGE

Rebus:

Directions: Solve the 4-pics-1 word puzzle presented here.

EXPLORE

What do you know about a family budget?

Directions: Identify the different elements of a family budget and sources of family income. Choose and write only the letter of your answer.

A. Bonus	F. Pension
B. Budget	G. Profit
C. Clothing	H. Salary
D. Food	I. Shelter
E. Income	J. Utilities

_____ 1. This term refers to the sum of money that an individual or business receives in exchange for the goods and services provided.

_____ 2. This term refers to useful features in the home which require a monthly allotment of cash, like electricity, water, telephone and Internet connection.

_____ 3. This term refers to any large or small enclosed place made to secure people from different weather conditions.

_____ 4. This refers to the amount of money added seasonally to a salary as a reward for good service or which is given in recognition for a specified number of years of service to the company.

_____ 5. This term refers to a summary or plan an individual, family or company prepares, which identifies or itemizes expenses for a certain period of time.

_____ 6. This term refers to any health-giving substance that both people and animals eat and drink to support life and growth.

_____ 7. This refers to the money earned from producing something or from operating a business, after all expenses are settled.

_____ 8. This term refers to any garment worn to protect the family from hot or cold weather conditions.

_____ 9. This refers to the fixed sum of money received at fixed intervals, such as weekly, twice a month, or monthly, for doing a particular job as an employee.

_____ 10. This refers to a fixed amount of retirement money paid out to an employee when he/she departs from working at a company or organization.

Look for some examples of a monthly family budget.

Questions:

What are the three basic needs of your family?
What are the things to consider when budgeting?

EXPLAIN

What you need to know:

What is a budget?

A **budget** is the summary or plans which an individual, family, or company prepares, which identifies or itemizes expenses for a certain period.

What is budgeting?

Budgeting is the process of balancing income with expenses to avoid overspending and debt.

What is debt?

Debt is the amount of money an individual or one party borrowed from another, which is to be paid back at a specific time.

Components of a Family Budget

1. **Food** is any health-giving substance that both people and animals eat and drink to support life and growth.

2. **Shelter** is a large or small enclosed place made to secure people from different weather conditions.

3. **Education** may be formal or informal. It is the process of giving and receiving instruction, which is usually provided to the younger members of a family.

4. **Health care** consists of medical care, such as dental care, which is provided to an individual or to a community to ensure good health.

5. **Clothing** is any garment worn to protect the body from hot or cold weather conditions.

6. **Household operational costs** refer to the monthly costs allotted for rent, taxes, repairs and collection services.

7. **Utilities** refers to useful features in the home which require a monthly allotment of cash, such as electricity, gas, water, telephone, cable and internet connection.

8. **Recreation** refers to those activities done for enjoyment when not working.

9. **Savings** refers to the amount of money an individual, family, or company saves, either in the bank or as an investment for future use.

Allocation of Family Budget

It is very important to manage the family's resources properly to avoid overspending or to create unwanted debt which cannot be paid off in the future. This is why we need to properly allocate funds in the family's budget for a certain period of time. The following are the things to consider to properly allocate funds in the family budget.

1. Every family must consider the *sum of shared income* that its members, who are earning money, receive, be it weekly, twice a month or monthly.

2. The family budget will be influenced by the *size* of the family – the number of members in the family – and the *composition of the family*, such as the number of young members and those who are older, as well as any member of the family who have special needs.

3. The *values and standards of living* of the specific family is also a factor to consider. The budgets of low income earning families are limited to spending on such needs as food and education, while high income earning families can spend more on their needs and wants.

4. Every member of the family must understand and cooperate on how the family's income is budgeted. Everyone must thus discuss their goals and priorities and differentiate on what they need and want to avoid overspending.

5. Every child in the family, from an early age, should be taught and trained on how to spend their allowance according to their needs.

6. Every member of the family must help with minimizing the use and purchase of water, electricity and other items, to keep the family within budget.

What are the steps in making a budget?

1. Decide on the amount of money to be spent for a specific time (weekly, twice a month, monthly).

2. Make a list or summary specifying the items you need to spend on and indicate the amount to be spent.

3. Check the figures and items to find out if you are spending the right amount where it is needed.

4. Add the figures to get the total amount of your expenses.

5. Finally, compare the expenses with your income or allowance to see if you are overspending or not. If you have more expenses than income, then you are overspending. If your expenses are the same as your income, then you are just on budget. If your expenses are less than your income, then you are saving.

What is income?

Income is the sum of money that an individual or business receives in exchange for any goods and services provided.

What is Family Income?

Family Income is the total sum of money earned, weekly, twice a month, or monthly, by every working member of the family.

Where does family income come from?

There are different ways members of a family can earn money to be spent on their different needs and wants. *Listed here are some of the different sources of family income.*

1. Salary or Wage refers to a fixed sum of money received at fixed intervals, such as weekly, twice a month, or monthly, for doing a particular job as an employee.

2. Commission is the percentage or fee received by a sales representative or an agent for the service he/she has rendered.
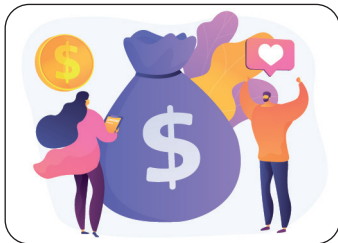
3. A bonus is the amount of money added seasonally to a salary as a reward for good service, or in recognition for the number of years a worker served in a company.
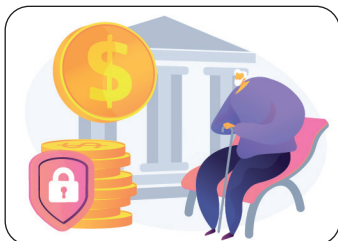
4. Pension is a fixed amount of retirement money paid to an employee when he/she departs from work life.
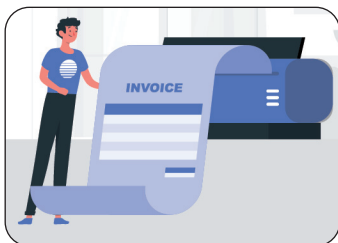
5. Service fees are the amount of money earned from different services rendered for others, such as doing the laundry, doing repairs and the like.
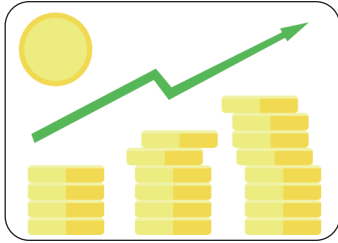
6. Profit is money earned from producing something or from operating a business after all expenses are settled and paid up.

7. Dividends are the profit earned by a company which are paid to its shareholders or stockholders. These are issued in different ways, such as cash or stocks.
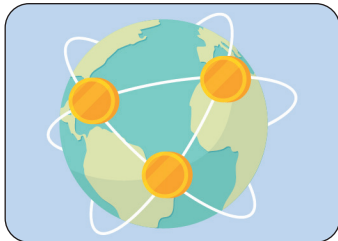
8. Remittances or cash gifts are sums of money transferred by someone working overseas through banks or remittance centers for their family back home.

Hard-earned money must be spent wisely so that families don't suffer from financial shortages and incur debt in the future. Listed here are some *tips on how to spend your family income wisely*.

1. List down all expenses made by every member of the family.

2. From the listed expenses, identify which are necessary and which are not necessary, then avoid unnecessary expenses.

3. Before purchasing something with a high cost (expensive), discuss the possible purchase with the adult members of the family and decide if it is needed.

4. When going to the grocery store or supermarket, be sure to have a list of items or materials to be bought, then stick to buying only those items on the list. Also, buy the things that are needed every day in bulk to lessen transportation costs.

5. When buying fruits and vegetables, buy those that are in season, for these are cheaper compared to those which are out of season. Also, know substitute ingredients for some more costly ones to lessen the amount to be spent, while also ensuring that healthy and quality food is served to the family.

6. Be familiar with the stores near your community that offer quality goods at low prices.

7. Every member of the family must learn to value savings over products. Choose items that offer good quality at a low price or cost.

8. Lastly, every family must make sure to save an amount of money in the bank, or place an investment which the family will benefit in the future.

In Business

If you want to own or start a business, budgeting and generating income must be carefully observed. A good budget will help the business earn high income if a good low-cost marketing strategy is carefully chosen. Here are some *tips for budgeting your business finances*.

1. **Be mindful**. You must be aware of what is happening in your business, it is important to understand the needs of your business as well as the income and expenses your business regularly generates.

2. **Be realistic**. You must set a business goal that you can achieve, which will happen in real life. Select a low-cost marketing strategy whenever possible.

3. **Be conservative**. You must anticipate possible losses in the future, and make sure you manage your income as well as not overspend on your expenses.

4. **Be detailed**. You must closely monitor the progress of your business. You must check and track your income and expenses on your chart of accounts.
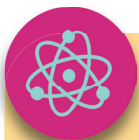
SUMMARY

- Budgeting is the process of balancing income with expenses to avoid overspending and debt.
- It is very important to budget a family's income to prevent future financial shortages or incurring future debts.
- Every family member must help with budgeting the family's income by identifying their needs versus wants, and by saving money for future use.

EXERCISES

Exercise 1

How much have you learned?

Multiple Choice:

Directions: Read each statement carefully. Choose the letter of the correct answer.

1. This term refers to any health-giving substance that both people and animals eat and drink to support life and growth.

   a. Clothing
   b. Food
   c. Health care
   d. Shelter

2. This term refers to useful features in the home which require a monthly allotment of cash, such as electricity, water, telephone and internet connection.

   a. Clothing
   b. Education
   c. Recreation
   d. Utilities

3. This may be formal or informal. It is the process of giving and receiving instruction, which is usually provided to the younger members of a family.

   a. Education
   b. Food
   c. Shelter
   d. Utilities

4. This refers to the fixed sum of money received at fixed intervals, such as weekly, twice a month, or monthly, for doing a particular job as an employee.

   a. Bonus
   b. Commission
   c. Remittance
   d. Salary

5. This refers to the amount of money added seasonally to salary as a reward for good service or in recognition of the years of service given to a company.

   a. Bonus
   b. Income
   c. Pension
   d. Profit

Exercise 2
True or False:
Directions: Write T is the statement is true, and F if it is false.

_____ 1. Donna is training her children to save their money for future use by using coin banks.

_____ 2. Aling Marta goes to the market every Sunday. She buys everything she wants, even those that are not included in her shopping list.

_____ 3. Aling Lita buys cheaper, but quality, ingredients to replace expensive ones.

_____ 4. Rita makes a survey on which store near their community offers everyday goods at lower prices.

_____ 5. Mang Ambo is a Public Health employee. He receives his salary every 15th and 30th of the month.

LESSON OUTPUT

Individually, **create a budget for a day's meal plan of your family using Excel**. The deadline for submission will be given to you by your teacher. The budget will include costs of the various ingredients (vegetables, rice, etc.). You will be rated according to the rubrics presented.

Rubrics for Budget Plan

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	A budgeted meal plan for one day was completed. All costs were broken down by meal and by ingredient.	A budgeted meal plan for one day was completed. Costs were broken down by ingredient.	A budgeted meal plan for one day was completed. The cost consisted of the total estimated cost, with no breakdown per meal or per ingredient.	A budgeted meal plan for one day was submitted but it seems not complete.	The budgeted meal plan was only for one meal or there was a failure to submit.	
2. Creativity	The student displayed a great deal of creative initiative when detailing the ingredients and specific costs involved.	The student displayed creativity in detailing the meals and general costs involved.	The student displayed a fair amount of creativity and initiative in presenting the costs of meals.	The student displayed some initiative in creativity presenting the meals and how much they cost.	The student displayed a lack of initiative when detailing the meals and costs involved.	
3. Promptness	The activity was completed and submitted two or more days ahead of the given deadline.	The was activity was completed and submitted one day ahead of the given deadline.	The activity was completed and submitted on the given deadline.	The activity was completed and submitted one to two days after the given deadline.	The activity was completed and submitted three days or more after the given deadline.	
TOTAL						

TRIVIA

Did you know that the banana ketchup was invented by a Batangueño food scientist named, Maria Y. Orosa? Born on November 29, 1893, she is known as the creator of food preservation techniques which had practical use in The Philippines during World War 2, creating instant powdered food such as one made of soya, which fed prisoners including starving Filipinos during the war. Her research led to the development of preservation techniques for popular Filipino dishes, including adobo.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define food preservation.
2. Identify different ways of preserving food.
3. Demonstrate various ways of preserving food.
4. Learn to conduct a survey for market trends and demands in preserved/ processed foods.

ENGAGE

CRACK-A-WORD

Directions: Use the given code to guess the word.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

Clue: it is the process of preventing food from spoilage or decaying.

16	18	5	19	5	18	22	1	20	9	15	14

EXPLORE

Choose the letter of what is being described in each statement from the given word pool.

A. Salt	F. Mixing spoon
B. Pressure cooker	G. Canning
C. Drying	H. Electronic food processor
D. Whisk	I. Sterilization
E. Freezing	J. Chopping board

_____ 1. It is an electronic device used in food preparation which grinds or slices fruits, vegetables and meat.

_____ 2. This is used to smoothly blend ingredients.

_____ 3. It is used to stir, mix or blend ingredients.

_____ 4. It is used as a platform to cut fruits, vegetables and meat.

_____ 5. It is used to tenderize meat cuts and reduces the cooking time of food while retaining its nutrients.

_____ 6. This is the main ingredient used in food preservation and is also used as a taste enhancer.

_____ 7. It is an old form of food preservation that can be done under the heat of the sun or by using artificial heat.

_____ 8. This method involves cooking and sealing food in an airtight, sterilized container.

_____ 9. This is the method of storing food at low temperatures to delay spoilage.

_____ 10. This is the method of food preservation that requires high temperature and heating of food for a long time period to delay spoilage.

EXPLAIN

Different Methods of Food preservation

Salting is the most common and oldest method of food preservation due to the availability of salt. Salt is the main ingredient used to preserve food because most fungi and bacteria cannot survive in a very salty environment. It is also used as a taste enhancer.

Drying is the oldest form of food preservation. This may be done under the heat of the sun or by using artificial heat from an oven. Smoking can also be done to remove moisture from food to delay its spoiling. Fish, meat, fruits and vegetables can be dried, but these need to be fresh and cleaned before drying. Daing and tinapa are examples of dried foods.

Canning involves cooking and sealing food in an airtight container that has been sterilized to ensure that no remaining bacteria is present in the container itself. This has made canned goods last longer than food which has been preserved by any other method. This method was invented by Nicolas Appert and was supported in further studies by Louis Pasteur.

Freezing is the method of storing food at low temperatures to delay spoiling. When using this method, you must make sure that food are clean and free from physical damage.
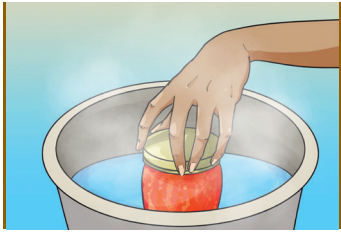
Sterilization is a food preservation method which requires food to be heated at a high temperature for a long period of time.

Pickling is a method of food preservation which uses an acid solution, such as vinegar, or a salty solution called brine.

Benefits of Food Preservation

1. It delays food spoiling.
2. It keeps food nutrients mostly intact.
3. It enables food to be saved for future consumption.
4. It helps provide a steady supply of seasonal food throughout the year.
5. It can be a source of family income.

Tools and equipment needed for food preservation

Image	Name of kitchen tools & equipment	Use or Function
	Kitchen knife	A cutting tool used to slice fruits, vegetables, or meat.
	Kitchen shears	A cutting tool used to open plastic containers.
	Measuring spoons and cups	Used to measure out solid and liquid ingredients.
	Strainer	Used to drain water from fruits, vegetables and meat when these are washed.
	Whisk	Used to smoothly blend ingredients.
	Ladle	Used to cook and lift liquids such as soups from pots.

	Mixing spoon	Used to stir, mix or blend ingredients.
	Chopping board	Used as a platform to cut fruit, vegetables and meat. (Use a separate chopping board for each type of food.)
	Pots and pans	These come in different sizes and are used as containers for the food that is being cooked.
	Containers	Can be made of glass or plastic and have covers. These hold the preserved food when this is kept in storage.
	Weighing scale	Used to measure the weight of ingredients or food before and after preservation.
	Electric food processor	An electronic device used to grind or easily slice fruits, vegetables and meat.
	Pressure cooker	Used to tenderize meat and cut the cooking time while still enabling the food to retain its nutrients.

Things to remember when purchasing ingredients for food preservation.

1. Select and buy fruits and vegetables that are in season, as these will be fresh and will be much cheaper.
2. Buy as many ingredients at once to save time, energy and money.
3. When buying meat, choose those which are fresh and have no foul odor.
4. Buy meat with an even layering of fat and which has a firm and fine texture.
5. Buy fish with red gills, clear eyes and which have no foul odor.
6. Buy fish whose flesh is firm and elastic.
7. When buying canned or packed ingredients, always check the expiration date.

Guidelines to observe when processing food.

1. Observe proper hygiene when preparing food to keep the food from being contaminated.
2. Make sure that all utensils to be used are clean and properly washed.
3. Food containers for preserved food must be sterilized and have covers.
4. Follow the recipe and correct measurements for the ingredients used.
5. Preserve food properly so it will last long.

In Business

The food business is in high demand because people need to eat. If you know how to preserve food, you can use your knowledge and skill in food processing to earn an income as well as provide food for your family, by preserving food and then selling these to others.

Market trends and demands in food processing and food preservation

It is important to research market trends and the demand for preserved or processed food before entering the food processing business.

Like any other product, the demand for the type of food you are selling is driven by changing trends and customer choices. Oftentimes, this can change the way food is processed and preserved.

Some of the things to consider in your research are:

1. **Changing consumer habits** – More people are now into eating healthy, natural and organic food. At the same time, there is also a growing need for convenience food (ready-to-eat meals). People are more concerned about their health and well-being, and this influences their decisions to buy food that can improve on these.

2. **Trends in food processing** – People are becoming more careful of what they eat because they know more about the dangers of eating too much processed food, which may have many preservatives. This led food manufacturers to explore new food processing and preservation systems that come from natural methods, and move away from methods which are thought to be harmful to the nutrients found in the food.

3. **Quality and safety standards** – The food industry has always been under tight safety and quality standards, but the health restrictions caused by the worldwide pandemic made companies consider making them tighter. Before entering the food business, the business owner must study the current safety trends in food handling to make sure that everyone from their customers, to their staff, and even themselves are kept safe from disease.
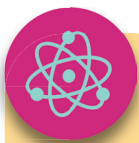
SUMMARY

Food preservation is the method of processing food so that its spoiling is delayed. There are different ways of food preservation, such as salting, drying, freezing, canning, sterilization and pickling. Observing proper hygiene prevents the food from being contaminated. Following the correct procedures of food preservation leads to well-preserved food.

EXERCISES

Multiple Choice:

Choose the letter of the correct answer.

1. What is the method of storing food at low temperatures to delay spoiling?

   a. Canning   b. Drying   c. Freezing   d. Salting

2. What is the method of food preservation which involves cooking and sealing food in an airtight container that has been sterilized to ensure that no remaining bacteria is present?

   a. Canning   b. Drying   c. Pickling   d. Sterilization

3. What is the method of food preservation used to delay spoiling, one example of which is smoking?

   a. Canning   b. Drying   c. Freezing   d. Salting

4. What is the method of food preservation where either an acid solution or brine is used?

   a. Canning   b. Drying   c. Freezing   d. Pickling

5. What is the oldest method of food preservation?

   a. Canning   b. Drying   c. Freezing   d. Salting

Exercise 2

Identification

Directions: Choose the letter of what is being described in each statement from the given word pool.

A. Delayed food spoiling	D. Vinegar
B. Proper hygiene	E. Salt
C. Fruits and vegetables	F. Expiration date

_____ 1. This is one of the main ingredients used to preserve food. It also serves as a food enhancer and adds taste.

_____ 2. This should be observed when food processing to avoid food contamination.

_____ 3. This is the main benefit of food preservation.

_____ 4. These ingredients should be brought while still in season.

_____ 5. This should be carefully checked when buying packed or canned goods.

LESSON OUTPUT

The learners are individually tasked to **make a slideshow on different ways of preserving food**. The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The slideshow contains all the different ways of preserving food. The slideshow also includes some additional information which wasn't presented in the lesson.	The slideshow contains all the different methods of preserving food.	The slideshow contains 4 – 5 methods of preserving food.	The slideshow contains 2 – 3 methods of preserving food.	The slideshow contains only one method of preserving food.	
2. Creativity	The approach of the student is unique and also fulfills the requirements of the project. The student displays all elements of appealing multimedia design. - text - graphics - sound - transition - animation	The project's requirements are met, and the student took some elements from several existing sources, such as that from other people or the Internet, and built on these. The student displays 4 elements of appealing multimedia design. - text - graphics - sound - transition - animation	The project's requirements are met, and the student took some elements from one existing source, such as a person or from the Internet, and built on these. The student displays 3 elements of appealing multimedia design. - text - graphics - sound - transition - animation	Some of the project's requirements aren't met. The student displays 2 elements of appealing multimedia design. - text - graphics - sound - transition - animation	The project's requirements are not met, and the student directly copied (plagiarized) their project from another source, such as from a person or from the Internet. The student displays 0–1 elements of appealing multimedia design. - text - graphics - sound - transition - animation	
3. Promptness	The project was completed well ahead of the given deadline.	The project was completed just before the given deadline.	The project was completed by the given deadline.	The project was completed just after the given deadline.	The project was completed well after the given deadline.	
TOTAL						

TRIVIA

Did you know that traditional Filipino sewing has come a long way from using natural textiles woven in a loom? These textiles come from the fibers of plants such as abaca and pineapple. These days, natural fibers are still used to make the terno and barong tagalog. In local history, the most famous sewing effort was done by Marcela Marino de Agoncillo, Lorenza Agoncillo, and Delfina Herbosa de Natividad and involved the first flag of the Philippines, first revealed in 1898 and depicted in Fernando Amorsolo's painting, The Making of the Philippine Flag.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define sewing.
2. Identify various sewing tools and equipment.
3. Discuss safety precautions in sewing.
4. Apply different kinds of hand stitches.
5. Learn to sew creative and marketable household linens.
6. Identify supplies/materials and tools needed for the project.
7. Learn to assess and market finished house hold linens in varied/creative ways.
8. Draft a pattern for household linens.

ENGAGE

Picture Puzzle

Directions: Guess the set of pictures presented here. Use the given clues to guess the word or group of words.
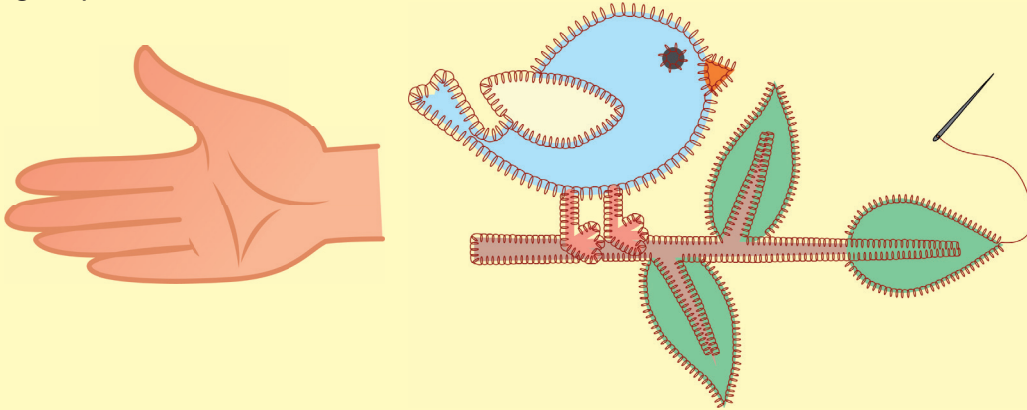
h			d		s			t	c			s

EXPLORE

Choose the letter of the correct answer from the given word pool.

A. Thimble

B. Lockstitch sewing machine

C. Thread clippers

D. Pins

E. Embroidery sewing machine

F. Over edging sewing machine

G. French curve

H. Tailor's chalk

I. Needle threader

J. Tracing wheel

_____ 1. It is used to help thread a needle.

_____ 2. It may or may not have a head and is used to hold fabric together.

_____ 3. A tool used to draw the curves of neck and arm holes on a pattern.

_____ 4. It is used together with a carbon paper to transfer marks from the draft pattern to the fabric.

_____ 5. It is a small pair of scissors that is used to remove excess thread and trim the edges of frayed fabric.

_____ 6. A bell-shaped like object that is worn over the index finger or thumb to keep the finger from being pricked.

_____ 7. It is used to put temporary marks on the fabric.

_____ 8. It is also known as a "domestic sewing machine." It may be electric or operated by foot.

_____ 9. It is a machine used to finish the edges of a garment.

_____ 10. It is a machine used to create fancy designs on fabric.

RESEARCH

Ask the learners to research different kinds of hand stitches.

Questions:

1. What is the most used hand stitch?
2. What hand stiches have you tried?

EXPLAIN

Definition of terms

Clothier – a man who sews but is not a tailor.
Hem – the edge of a piece of cloth which is folded and then sewn, to prevent fraying.
Seamstress – a woman whose occupation is sewing.
Sewing – the activity of attaching fabrics together using needle and thread.
Tailor – a person who makes clothes to fit specific individuals.
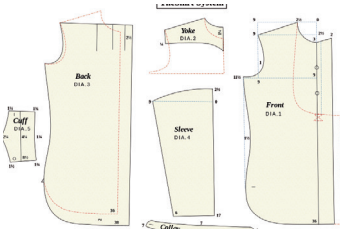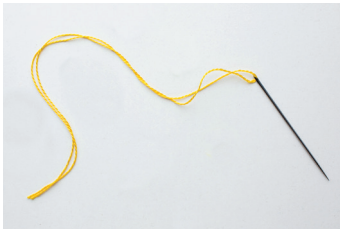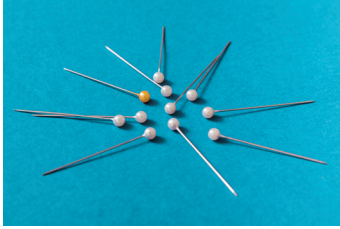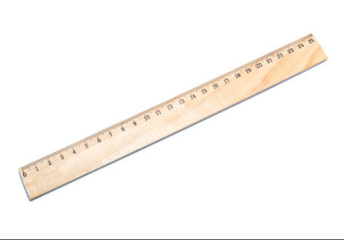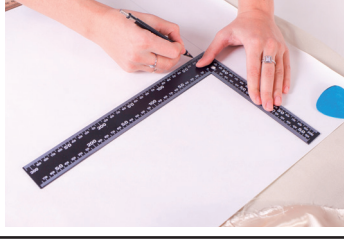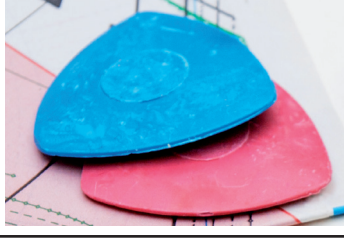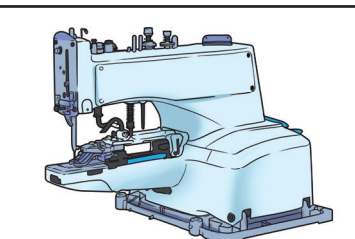
Sewing Tools and Equipment
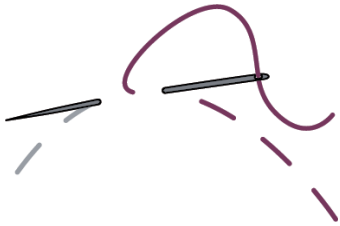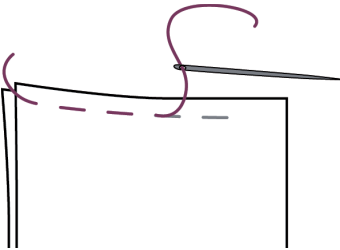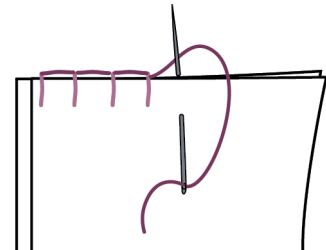
Image	Name of Sewing tools & equipment	Use or Function
	Fabric	This is also commonly referred to as textile. Used to make such items as clothing, beddings and curtains.
	Thread	A strand of fibers, such as cotton or nylon. These are available in different colors, and is used with a sewing needle to attach fabric pieces together.
	Pattern	This is the template which outlines how pieces will be cut out of a length of fabric.
	Hand needle	This is a thin piece of steel, one end of which is pointed and the other end which as an eye where thread is inserted. It is used in hand sewing.
	Machine needle	This is like a hand needle, except that the eye is located in the pointed end. It is used in sewing machines.
	Needle threader	This is used to help thread needles.

	Pins	These are used to hold separate pieces of fabric together. There are two kinds of pins commonly available: the pins with heads, usually colorful, which are used as stoppers; and pins without heads.
	Pincushion	This is used to hold and store needles and pins.
	Thimble	A bell-shaped object that is worn over the index finger or thumb to keep the finger from being pricked. It is also used to push the needle when sewing is being done.
	Scissors	A two-bladed hand tool used to cut thread, cloth, plastic, and paper.
	Pinking shears	This is used to cut the frayed edges of fabric.
	Seam ripper	This is a hand-held tool that is used to remove seams, cut thread and open up buttonholes.
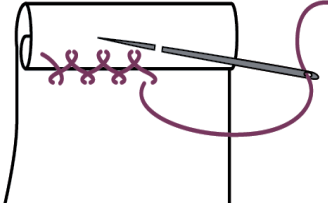
	Thread clippers	This is a small pair of scissors that is used to cut excess thread as well as the edges of frayed fabric.
	Tape measure	This is a ribbon-type tool used to take body measurements.
	Ruler	This is a stiff, straight-edged tool used to measure out short distances or lines.
	French curve	A tool with several curves. It is used to draw curves of neck and arm holes on a pattern.
	L-Square	This is a two-armed, right angled ruler used to scale up, or to scale down, patterns.
	Tailor's chalk	This is used to place temporary marks on fabric.
	Tracing wheel	This is used together with carbon paper to transfer marks from the pattern to the fabric.
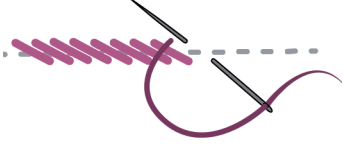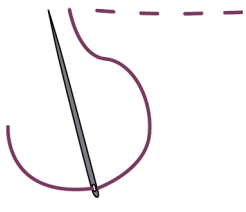
	Carbon paper	This is used to duplicate marks from the pattern to the fabric.
	Lockstitch sewing machine	This is also called the "domestic sewing machine." It can be operated electrically or by foot.
	High-speed sewing machine	This is also called the "straight stitching machine." It is commonly used by tailors.
	Over edging machine	This machine is used to finish the edges of a garment.
	Buttonholer machine	This machine makes button holes in garments.
	Button attachment machine	This electric machine attaches buttons to garments.
	Embroidery machine	This machine creates fancy designs on fabric.

Basic Hand Stitches

Image	Name of Stitches	Steps/Procedure
	Back Stitch	*This is a strong and dependable type of stitching.* 1. Make a small stitch. 2. Insert the threaded needle at the end of the first stitch, then bring the needle out after the exit point of the thread. 3. Repeat as often as needed to create layer of back stitches.
	Basting	*This stitch temporarily holds fabric together until permanent stitching can be done.* 1. Insert the threaded needle near the seam. 2. Create stitches around 6mm. to 12mm. long. 3. Once done, cut the thread, leaving a bit of it at the end. 4. Repeat as needed. 5. Once the permanent stitch is done, pull out the basting stitch thread.
	Blanket Stitch	*This is a decorative stitch that is used to hem the edges of thick fabric.* 1. Insert the threaded needle around 6 mm. from the edge of the fabric and anchor it by twice threading the needle through the thread already made. This anchors your stitching, so that it doesn't pull out easily. 2. Make a diagonal stitch to the right. 3. Loop the thread through the loose loops of thread at the edge, then make another diagonal stitch. Loop the thread through the loops of thread at the edge of the fabric. 4. Repeat step 3 as often as needed.

	Catch Stitch	*This stitch is used to hem and finish lined garments.* 1. Fold and hold the hem. Insert the threaded needle and anchor your stitching. 2. Run the thread diagonally across the hem, then insert the needle. 3. Insert the needle horizontally, bringing it out a very short distance for where the needle was inserted. (Note: the image shows the needle in this step going to the left.) 4. Pull out the thread and make another diagonal stitch. 5. Repeat stitching until the line of the garment is hemmed.
	Chain Stitch	*This is a traditional stitch that is used to hem jeans as well as to create detailed effect.* 1. Insert the threaded needle on the inner side of the fabric, then bring out the tip a short distance away. (Note: The inner side of the fabric is the side of the fabric that won't be visible to others.) DO NOT pull the needle all the way out. 2. Loop the thread around the point of the needle to form a loop. 3. Pull the needle out and tighten the thread to create the loop, which is the first part of the chain. 4. Repeat the process as often as needed to create the chain stitch.

	Outline Stitch	*This stitch is used to outline objects.* 1. Create a stitch. 2. On the inner side of the fabric, insert the needle somewhere between the ends of the previous stitch. Pull the needle out. 3. Make another small stitch by inserting the needle in from the outer side of the fabric, a short distance away from one end of the first stitch, and then inserting the needle in the same place as the end of the first stitch. 4. Repeat the process as often as needed.
	Running Stitch	This is a very popular, general purpose stitch. 1. Insert the threaded needle on the inner side of the fabric, then insert it a short distance away to create a stitch. 2. Repeat as often as needed.
	Whip Stitch	This stitch is used to close and hem pillows, cushions and jeans. It is a simpler variation of the blanket stitch. 1. Insert the threaded needle around the edge of the fabric and anchor it by twice threading the needle through the thread already made. 2. Make a diagonal stitch to the right. 3. Repeat step 2 as often as needed to close the edges of the fabric.

Safety Reminders to Follow When Sewing

1. Be careful when using sharp objects, such as scissors and sewing needles.
2. Do not let younger children play in your work area, to prevent accidents.
3. Measure and mark the fabric on the inner side before cutting it up.
4. Once you are done, clean your work area and dispose of your trash properly.
5. Keep sewing tools away from younger children.

Sewing Creative and Marketable Household Linens

Household linens are items made of cloth that are used in the home. Kinds of household linens include: bedroom linen (e.g., bedsheets, blankets, pillowcases, mattress covers); table linen (e.g., table cloths, table runners, table napkins); kitchen linen (e.g., hand towels, dish cloth, oven gloves, aprons); bathroom linen (e.g., bath towels, face towels); and curtains and draperies. Just like clothes, different kinds of fabric can be used to make household linens, such as cotton, silk, rayon, polyester, or any combination of these.

With the proper skills and the right tools for sewing, not only can you make your own household linens for personal use, but also market them so that they become a viable source of income for your family.

Sewing Household Linen: Pillowcase

For starters, you can make a simple pillowcase. It is a great project for beginners as it lets you practice foundational sewing skills like making a pattern, measuring, pinning, and basic sewing.

Drafting a Pattern

Before proceeding to the actual sewing, you will first need to draft a pattern for your pillowcase. **Pattern drafting** is the process of making a paper plan or template for the item you want to sew. The **pattern** serves as the basis for the design or shape and size of the sewing piece, and contains markings, measurements, and instructions on how the piece should be cut and sewn. The steps in pattern drafting are:

1. **Measuring**. Measurements are taken from a model or form. The larger or more elaborate a piece is, the more measurements are needed to create the pattern.

For the pillowcase, the form will be the pillow that you will cover. Hold and pull the top and bottom corners of the pillow tightly. Next, measure the pillow's length and width along the edge of the pillow.

2. **Pattern drawing**. Once you have the measurements, you can now create the basic pattern.

   On your pattern paper, draw a vertical line for the width measurement and a horizontal line for the length measurement of your pillowcase. Extend the lines to form a rectangle. Add 2 inches to the width for the seam allowances on the sides and 6 inches to the length for the top opening.

3. **Pattern creation**. You may now cut the pattern and assemble it onto the fabric.

How to Sew a Pillowcase

Here are the steps to sewing a simple pillowcase.

1. Prepare the materials you will need:
   - 1 yard of fabric
   - scissors
   - thread and needle
   - measuring tape
   - pins

2. Using the pattern you created, measure how much fabric you need. For a sleeping pillow of 20 inches by 30 inches, the size of fabric needed will be 44 inches by 36 inches. Measure and cut out the fabric.
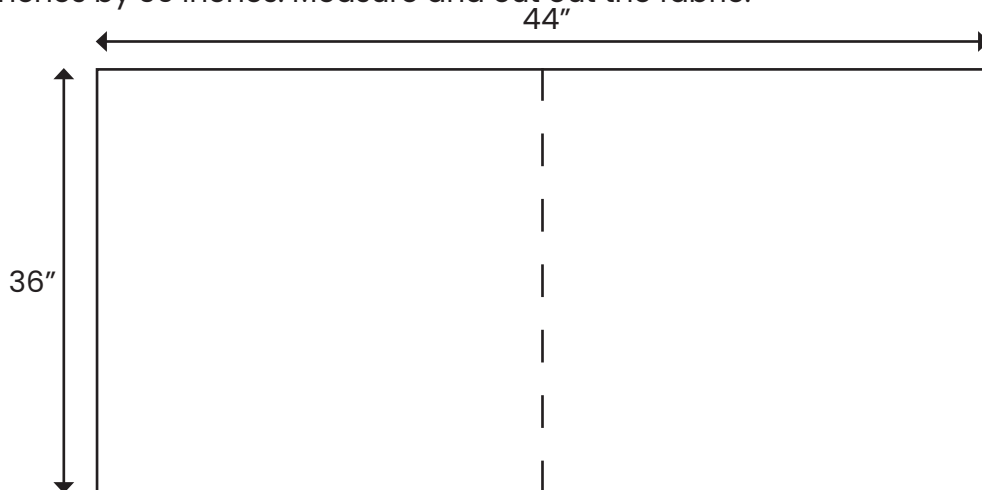
3. Create a seam around the fabric by folding the edges of the rectangle inward 1 inch. Hold securely with pins then sew the hem down using a straight stitch.

4. Fold the long side of the rectangle in half, with the inside of the fabric facing outwards. Match up the edges at the sides and along the bottom.

5. Sew the bottom and side edges of the fabric together. Leave the top part open.

6. Turn the pillowcase inside out. Fold the top edge of the pillowcase inward 3 inches and pin in place on the inside. Sew along the folds all the way around.

7. Put the pillow in and you're done!

You may view the following YouTube videos on how to sew a simple pillowcase:

"SEW A PILLOWCASE with 1 yard of fabric!" by MADE Everyday

https://www.youtube.com/watch?v=m3obNOWc4Kc

"How to make a handsewn pillowcase" by Crafting Patty

https://www.youtube.com/watch?v=KoBu3iQqrcc&t=124s

In Business

There are people who prefer to wear a customized clothing, the kind which exactly fits them. Sewing skills can allow you to create such clothing or any kind of clothing that others might want, thus giving you a way to earn income.

Marketing Finished Household Linens

If you plan to start a business out of your finished household linens, you will need knowledge on the marketing and selling strategies that can help you become successful in your small business. Here are some important considerations when marketing your products:

1. **Packaging the products**. This involves the task of designing and producing the container or wrapping material of the product. It serves the following functions:

a. **Promotion.** Product packaging gives a first impression of the product. What's seen on the outside will often reflect what's on the inside, communicating the price and value of the product. Well-designed packaging can attract customers and encourage them to buy the product. It would be good to study your customers' wants and needs in terms of style and colors so that your packaging becomes appealing and compelling.

b. **Protection.** The packaging must keep the product safe from damage whether it is sitting on a shelf, kept in storage, or shipped from the source to the customer. Sturdy, reliable, and secure packaging that protects the product from dirt, stains, scratches, and other disfigurations is therefore essential in ensuring the safety and integrity of the product when it reaches the customer. Common packaging materials for household linens can be made out of paper, plastic, cardboard, and other environment-friendly materials.

c. **Identification.** Products need to be identified and differentiated from other products or brands and this is done through labelling. Labels on the packaging provide useful information about the product such as the product name, maker, features, materials used, instructions for use, etc. For household linens, include the type of fabric used, manufacturing date, and care instructions.

2. **Advertising the products.** Success in marketing your products is also dependent on how well you are able to spread the word and let others know about it. There are several choices available when it comes to advertising a product, but you will need to take into consideration your target audience and the most cost-effective way to reach out to as many of them as possible, as many times as possible. Here are some types of advertising you may use:

a. **Print media.** This uses physical printed media advertising to reach customers. Ads are printed as hardcopy in the form of flyers, brochures, posters, or may be published in newspapers and magazines.

b. **Product display.** Joining school fairs, bazaars, and exhibits can be a great way to promote and sell your products. It can provide opportunities to meet prospective customers and grow your customer base, as well as network with other business owners.

c. **Online marketing.** Selling products over the internet is the most modern and successful form of marketing today. Digital platforms used to communicate with customers are websites, social media, email, blogging, vlogging, and online ads.

3. **Record-keeping.** Keeping accurate, up-to-date, and reliable records of your income and expenses is an essential part of making sure that your business runs smoothly. Doing so will help keep your costs at a minimum without compromising the quality of your products. Thus, you need a systematic way of tracking your transactions and other details, whether online or on paper, or a combination of both. Here are some important records to include:

a. **Sales log.** This includes details of your sales for the day, week, or month, including the date, type of product, and the amount of each sale.

b. **Business expenses log.** This is a record of the expenses you incur in running the business, such as materials, supplies, electricity, rent, etc. The log should include the date, description, and amount of each expense.

c. **Accounts payable log.** This lists the money that you may owe other people. Record how much you owe, to whom, when payment is due, and the date you paid it.

d. **Accounts receivable log.** This is a list of the money that other people owe you for the products that you delivered. You must be able to track these customers, how much they owe, and when the payment is due. For each record, include the date, customer name, amount, date collected, and status.
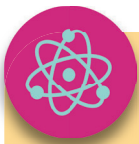
SUMMARY

There are different sewing tools and equipment used to sew garments. These tools and equipment make the job of creating well-fitted and quality garments easier.
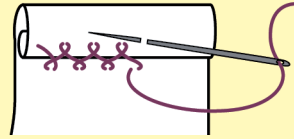
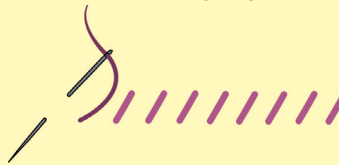# EXERCISES

Exercise 1

Multiple Choice:

Choose the letter corresponding to the correct answer.
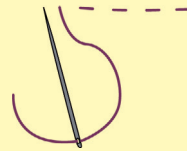
1. What is this type of stitch called?

    a. Back stitch
    b. Catch stitch
    c. Outline stitch
    d. Running stitch

2. What is this type of stitch called?
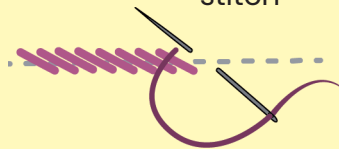
    a. Basting stitch
    b. Chain Stitch
    c. Running stitch
    d. Whip stitch

3. What is this type of stitch called?
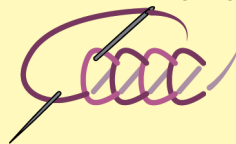
    a. Back stitch
    b. Outline stitch
    c. Running stitch
    d. Whip stitch

4. What is this type of stitch called?

    a. Blanket stitch
    b. Chain stitch
    c. Outline stitch
    d. Running stitch

5. What is this type of stitch called?

    a. Blanket stitch
    b. Chain stitch
    c. Running stitch
    d. Whip stitch

Exercise 2
Identification
Directions: Choose the letter of the correct answer from the given word pool.

A. Carbon paper	D. Sewing needle
B. Seam ripper	E. Tape measure
C. Scissors	F. Sewing

_____ 1. It is the activity of attaching fabrics together using needle and thread.

_____ 2. It is used to transfer or duplicate marks from the pattern to the fabric.

_____ 3. It is a ribbon type tool used to take body measurements.

_____ 4. It is a two-bladed hand tool used to cut thread, cloth, plastic and paper.

_____ 5. It is a handheld tool that is used to remove seams, cut thread, and open up buttonholes.

LESSON OUTPUT

The learners are individually tasked to **make a video on different kinds of hand stitches**.

The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The video shows at least 5 kinds of hand stitches.	The video shows 4 kinds of hand stitches.	The video shows 3 kinds of hand stitches.	The video shows 2 kinds of hand stitches.	The shows 1 kind of hand stitch.	
2. Creativity	The approach of the student is unique and hands on in showing different types of stitches, and the explanation on how each of these were made is engaging. The student did the stitches by themselves. The student displays all elements of appealing video presentation. - Clear focus - Good angle - Smooth transitions - Clear audio - Use of camera	The video showed different types of stitches, and the explanation on how these were made is engaging. The video shows someone else or other people doing the sewing. The student voiced the procedures. The student displays 4 elements of appealing video presentation. - Clear focus - Good angle - Smooth transitions - Clear audio - Use of camera	The video showed different types of stitches, and the explanation on how these were made is adequate. The footage came from such sources such as pictures from the Internet. The student labeled the procedures. The student displays 3 elements of appealing video presentation. - Clear focus - Good angle - Smooth transitions - Clear audio - Use of camera	The video showed different types of stitches, but the explanation on the procedures was lacking. The footage came from various sources. The student displays 2 elements of appealing video presentation. - Clear focus - Good angle - Smooth transitions - Clear audio - Use of camera	The video did not clearly identify the stitches presented, and the video was downloaded from the Internet. The student displays 0-1 elements of appealing video presentation. - Clear focus - Good angle - Smooth transitions - Clear audio - Use of camera	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed one day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed one day after the given deadline.	The project was completed two or more days after the given deadline.	
TOTAL						

LifeTek-TLE

Industrial Arts

Recycling

1

Repairing

2

Bamboo, Wood, and Metal Products

4

Waste Disposal

3

Electrical Gadgets

5

TRIVIA

Did you know that plastic waste materials are being turned into building materials in the Philippines? It is being done by engineer Winchester Lemen, owner of a recycling company in Davao City. He is repurposing plastic bottles, straws, grocery bags, and more as raw material for making furniture and construction products such as tiles, bricks, blocks, and boards. Lemen was inspired to make new products out of recycled plastic when he saw firsthand the tons of plastic waste that went into landfills every day. So, he experimented and successfully produced school tables and chairs which caught the attention of people. His future plans include building entire houses made of up to 90 percent recycled plastics. His recycling work is seen to partly address the plastic waste disposal problem in the country, which statistics pin at 60 billion sachets a year.

LEARNING OUTCOMES
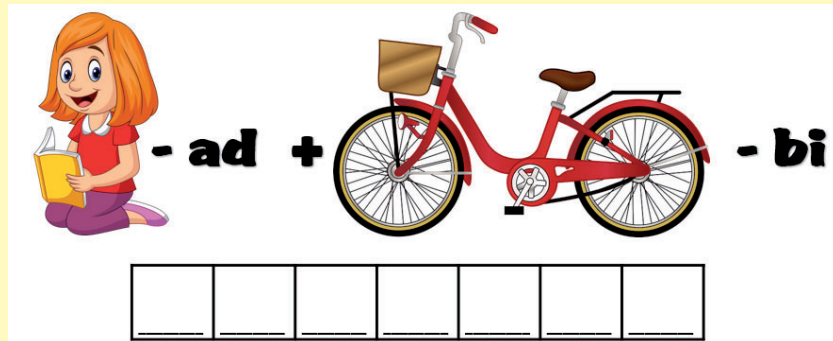
At the end of the lesson, you are expected to:

1. Define what recycling is.
2. Identify different ways of recycling.
3. Produce a recycled product.
4. Discuss the principles of "five S".

ENGAGE

Rebus

Directions: Solve the given puzzle by adding and subtracting letters to form the correct word. The word is about reusing waste items.

EXPLORE

Choose the letter of the correct answer from the given word pool.

A. CDs/DVDs	F. Seashells
B. Glass bottles/jars	G. Plastic bags
C. Rubber	H. Old clothes
D. Kitchen leftovers	I. Paper
E. Metal	I. Plastic bottles/containers

_____ 1. This can be used as notepad or as craft materials.

_____ 2. It can be used as a water or condiments container.

_____ 3. This can be reworked, sold in a garage sale, or donated.

_____ 4. It can be used as plant pots.

_____ 5. These are disks that can be used to record an save your data and projects.

_____ 6. It can be used as organic fertilizer.

_____ 7. It can be reused as grocery bags or trash bags.

_____ 8. When these materials are recycled, landfill space can be reduced.

_____ 9. Examples of these recyclable materials are tin cans and aluminum containers.

_____ 10. These can be used to create fashionable accessories.

RESEARCH

Ask the learners to research the recycling work of engineer Winchester Lemen and how he is able to recycle plastic materials.

Questions:

1. In your own home, what materials do you commonly recycle?

2. Why do we need to recycle?

EXPLAIN

What Is Recycling?

Recycling is the process of reusing materials which would otherwise be thrown away, either as is or by repurposing them to create something else.

Identifying Recyclables and the Benefits of Recycling

1. Recycling paper products, such as newspapers, magazines, cartons, boxes, can save trees because fewer trees need to be cut down to create paper.

2. Recycling plastic items, such as plastic caps, bottles, straws, rice and flour sacks, will save marine animals, since they choke on these.

3. Recycling metal items, such as tin cans, aluminum containers and metal scrap saves energy, since it takes less energy to recycle metal compared to making

a metal object from fresh metal ore. This also reduces the damage done to our environment.

4. Recycling wood, such as scrap wood, helps preserve our natural resources and our environment.

5. Recycling leather items, such as belts, bags, shoes, or slippers, reduces air, land and water pollution.

6. Recycling glass items, such as mirrors and clear glass, reduces air, land and water pollution.

7. Recycling rubber items, such as rubber tires and slippers reduces the spaces needed for landfills.

8. Recycling fabrics, such as cloth, lace and ribbons reduces the greenhouse gases that would be produced if new fabrics were made.

9. Recycling of plant parts, such as branches and twigs, leaves and coconut husks reduces pollution.

10. Recycling seashells, in addition to being used as fashionable accessories, reduces the space needed for landfills.

Different Ways of Recycling

1. Paper with unused surfaces can be used as scratch paper, for note taking and for making handicraft items.

2. Planting using plastic bottles and containers helps decorate your home and provide food for the family.

3. Composting kitchen leftovers creates organic fertilizer for your plants.

4. Plastic bags can be reused as grocery bags or trash bags.

5. Old clothes can be reworked, donated, sold in a garage sale and used as rags.

6. Glass bottles or jars can be used as water containers, condiment containers and flower holders.

7. Buy rechargeable batteries to reduce toxic waste in the environment. Non-rechargeable batteries, for example can have mercury, which is highly poisonous.

8. Check the Internet for where you can discard electronic gadgets you no longer use so these may be recycled, rather than left to produce toxic chemicals.

9. Buy rewritable storage devices such as flash drives for your digital files.

10. Buy cloth diapers instead of disposable ones.

The Principles of 5S

What is 5S?

The principles of 5S is a five-part method of improving a work environment by reducing waste and enhancing productivity. The goal of the 5S method is to clean up and organize a workplace starting from the physical elements, then move on to functional aspects that create a simplified work environment and a smooth, efficient flow of activities.

The 5S principles originated in Japan and the original S terms are in Japanese, so English translations may vary. The five steps are:

1. **Sorting (Seiri).** Remove unnecessary or unused items from your area to reduce clutter. This will allow space needed to organize important items in step 2.

2. **Straightening/Set in Order (Seiton).** Organize and identify storage for efficient use. This will allow you to easily find, use, and return items where they belong. There should be "a place for everything and everything in its place."

3. **Systematic Cleaning/Shine (Seiso).** Clean the work area thoroughly and regularly. After clearing up space and organizing items, you can now remove dirt and grime that has gathered underneath the clutter. Follow-up cleaning is necessary to keep the area clean.

4. **Standardizing (Seiketsu).** Make the practices part of the normal routine by specifying and assigning a person in charge of each part of the 5s method. This also means including 5S in work duties and checking to see if 5S is being done.

Common tools that can be used for this step are checklists, job cycle charts, and procedure labels and signs.

5. **Service/Sustaining (Shitsuke).** "Shitsuke" literally means "discipline," which implies making a habit of always doing things correctly without sliding back into the old ways. Without this step, any progress done with the other four steps will not last long. Tools for sustaining may include performance reviews, department tours, progress audits, and updated training.

In Business

Recycling can be an activity that can generate income and help in the world's problem with waste disposal. The plastic wastes that people generate can be used to make a number of new products that people can use. Being innovative in recycling can help you create a business that is useful to others as well as to the environment.
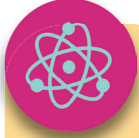
SUMMARY

Recycling is the act of creating new material or objects out of waste materials such as plastics which would otherwise be thrown away and end up in a landfill. It can be a source of income and at the same time serve as a solution to the problem of waste disposal. Recycling plays a vital role in the lessening of toxic waste and pollution in our environment.

LESSON OUTPUT

The learners are individually tasked to **make a short video on making a product recycled from trash**.

The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

EXERCISES

Multiple Choice.

Choose the letter of the correct answer.

1. Which can be used as condiment containers?

   a. Glass bottle
   b. Glass jars

   c. Both A & B
   d. None of the above

2. Which of the following paper materials cannot be recycled?

   a. Boxes
   b. Cartons

   c. Newspaper
   d. Tissue paper

3. These should be disposed of responsibly to lessen toxic waste.

   a. Batteries
   b. Electronic gadgets

   c. Both A & B
   d. None of the above

4. Under which of the following kinds of recyclable materials do tin cans and aluminum containers fall under?

   a. Glass
   b. Metal

   c. Paper
   d. Rubber

5. You can create fashionable accessories out of this naturally occurring recyclable material.

   a. Glass
   b. Plastic bags

   c. Seashells
   d. Rubber

Exercise 2

Identification.

Directions: Choose the letter of the answer to each question from the given word pool.

A. Recycling	D. Pollution
B. CDs/DVDs	E. Compost
C. Plastic bottles/ containers	F. Plastic caps

_____ 1. What can you make with kitchen leftovers?

_____ 2. This is the process of reusing material which would otherwise be thrown away.

_____ 3. This can be lessened when we recycle.

_____ 4. Some kinds of these can be repeatedly used as storage devices.

_____ 5. These can be used as plant pots.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The video shows all of the following pieces of information in making a recycled product. - Preparation - Materials - Steps - Safety - Usefulness	The video shows 4 of the following pieces of information in making recycled product. - Preparation - Materials - Steps - Safety - Usefulness	The video shows 3 of the following pieces of information in making recycled product. - Preparation - Materials - Steps - Safety - Usefulness	The video shows 2 of the following pieces of information in making recycled product. - Preparation - Materials - Steps - Safety - Usefulness	The video shows only 1 of the following pieces of information about the recycled product. - Preparation - Materials - Steps - Safety - Usefulness	
2. Creativity	The approach of the student is unique. Most of the video was original. The video gave a good explanation of the procedure used to make the product, as well as what the product is about. The student created the recycled product by themselves. The student displays all elements of appealing video presentation. - Clear focus - Good angles - Smooth transitions - Clear audio - Use of camera	Most of the video was original, and was partially presented by sources the student tapped, such as a relative who recycles. The video gave a good explanation of the procedures used to make the product, as well as what the product is about. The student displays 4 elements of appealing video presentation. - Clear focus - Good angles - Smooth transitions - Clear audio - Use of camera	Some parts of the video came from such sources as the Internet, while the rest of the footage was original. The video gave a reasonably understandable explanation of the procedures used to make the product, as well as what the product is about. The student displays 3 elements of appealing video presentation. - Clear focus - Good angles - Smooth transitions - Clear audio - Use of camera	Most parts of the video came from such sources as the Internet, while the rest of the footage was original. The process wasn't clearly presented. The student displays 2 elements of appealing video presentation. - Clear focus - Good angles - Smooth transitions - Clear audio - Use of camera	All parts of the video footage came from such sources as the Internet. The student displays 0-1 elements of appealing video presentation. - Clear focus - Good angles - Smooth transitions - Clear audio - Use of camera	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed one day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed one day after the given deadline.	The project was completed two or more days after the given deadline.	
TOTAL						

TRIVIA

Did you know that many homes in poor neighborhoods in the Philippines, generally lack windows that let in adequate sunlight? This means that even during the day, families would switch on the light for them to be able to work in the dim interior. This incurs electricity expenses which they might not be able to afford. Fortunately, repairs could be done that would allow such houses to have more light during the day. It involves installing a soft drink bottle filled with a mixture of water and bleach in a hole made in the corrugated iron roof which goes through the ceiling. The bottle is held in place by a metal brace and sealant. Its purpose is to work like a lightbulb, but instead of electrical light, it disperses natural sunlight into the interior.

SOURCE: https://www.npr.org/2011/12/28/144385288/in-philippine-slums-capturing-light-in-a-bottle

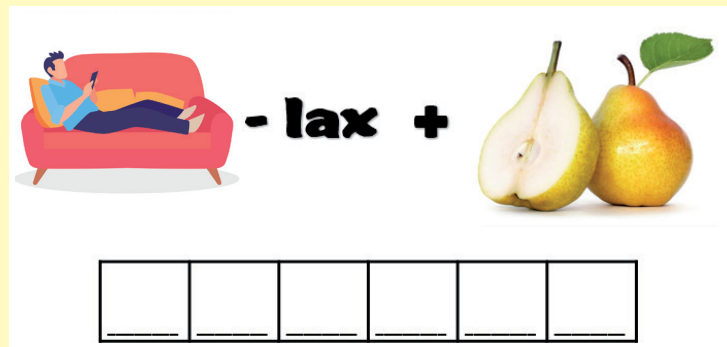## LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define what repairing is.
2. Identify various household repair methods.
3. Demonstrate how to repair a damaged household item.

ENGAGE

Rebus

Directions: Solve the given puzzle by adding and subtracting letters to form the correct word.

EXPLORE

Choose the letter of the correct answer from the given word pool.

A. Carpenter's plane	F. Nails
B. Pliers	G. Screwdriver
C. Chisel	H. Push-pull rule
D. Claw hammer	I. Electrical tape
E. Teflon tape	J. Wrench

_____ 1. These are slender, pointed pieces of metal that are used to fasten pieces of wood together.

_____ 2. This is a handheld tool used to tighten and loosen screws.

_____ 3. This is a sharp-edged handheld tool which is used together with a mallet or a hammer to rip off, carve or cut sections of wood.

_____ 4. This is an iron-soled tool used by carpenters to level and smooth rough wooden surfaces.

_____ 5. This is a handheld metal tool used to grip, fasten, tighten, loosen

and turn pipes, pipe fittings, nuts, and bolts

_____ 6. This is handheld tool with an insulated handle that is used to drive nails into, and extract these, from wood.

_____ 7. This is a white film tape used to seal pipe threads to prevent leaks.

_____ 8. This is a handheld tool used to hold objects firmly, as well as to loosen and tighten bolts.

_____ 9. This is a measuring tool that rolls up in its case when stored. It is used to measure straight distances.

_____ 10. This is a film tape, usually black, that is used to cover and insulate electrical wires.

RESEARCH

Ask the learners to research some common tools used to do household repairs. Ask them to research online about soda bottle solar light bulbs. What tools would be needed to install one in a house with a simple corrugated iron roof?

Questions:

1. What are some of the common repairs that you've seen done in your home?
2. Who repairs things at your home?

EXPLAIN
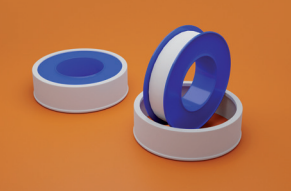
Definition of terms

Repairing – fixing something that is damaged.
Insulated – an item which is entirely or partially covered with plastic or rubber so that electricity and heat cannot pass through.

Common Tools and Equipment Needed for Household Repairs

Image	Name of Tool	Use/Function	Safety Measures to Be Observed
	Push-pull rule	This is a measuring tool that rolls up in its case when stored. It is used to measure straight distances.	Control the blade, and hook the tip on the edge of your working surface, to keep the ruler from whipping around.
	Claw hammer	This is a handheld tool with an insulated handle that is used to drive nails into, and extract these, from wood.	Keep out of reach of young children.
	Nails	These are slender, pointed pieces of metal that are used to fasten pieces of wood together.	Different nails are used for different purposes. Use the right nail for the job, and store these when not in use.
	Hand saw	This is a handheld, thin, toothed tool used to cut through wood.	Keep this tool sharp, clean, and dry. Keep out of reach of young children.
	Carpenter's plane	This is an iron-soled tool used by carpenters to level and smooth rough wooden surfaces.	Use a sharp planer and do not push down hard. Do not touch the blade to avoid cutting your fingers or hands.
	Chisel	This is a sharp-edged handheld tool which is used together with a mallet or a hammer to rip off, carve or cut portions of wood.	Use the right size of chisel for the job at hand. Keep out of reach of young children.

	Screwdriver	This is a handheld tool used to tighten and loosen screws.	Use the correct screwdriver for the job. Select and use an insulated screwdriver to get a good grip on the tool.
	Pliers	This is a handheld tool used to hold objects firmly, as well as to loosen and tighten bolts.	Use insulated pliers to get a good grip and to be safe from electrocution.
	Electrical tape	This is a film tape, usually black, that is used to cover and insulate electrical wires.	Store properly when not in use. Keep out of reach of young children.
	Wrench	This is a handheld metal tool used to grip, fasten, tighten, loosen and turn pipes, pipe fittings, nuts and bolts.	Select and use the correct wrench for the job at hand. Handle the wrench properly to keep it from sliding.
	Teflon tape	This is a white film tape used to seal pipe threads to prevent leaks.	Store properly when not in use. Keep out of reach of young children.
	Sandpaper	This is a piece of hard paper which has differing grain roughness. It is used to smooth down surfaces or remove unwanted material from a surface, such as hardened glue from a wooden chair.	Select and use the right roughness of sandpaper for the job at hand. Do not rub against skin. Keep out of reach of young children.
	Steel wool	A bundle of metal fibers used to smooth down surfaces or remove unwanted material from a surface.	Do not rub against skin. Keep out of reach of young children.

	Wood glue	A glue used to bond wood surfaces or wooden parts together.	Store properly when not in use. Keep out of reach of young children.
	Rags	Pieces of cloth which are usually used to clean things.	Store in a relatively open area, rather than in a container. Keep out of reach of young children.
	Plunger	This consists of a rubber cup on one end of a long handle. It is used to clear blocked pipes.	Store properly when not in use.

What are some common household repairs?

Common household repairs	Steps in repairing	Materials & Tools needed
Loose or broken chair.	1. Remove the broken part of the chair. 2. Remove the old adhesive from the joints using sandpaper. 3. Apply wood glue on the damaged section, then return the broken part. 4. Clean and remove excess wood glue with a rag.	Claw hammer Wood glue Sandpaper Rags

Burn marks on wooden furniture.	1. Gently clean the burnt area with steel wool. 2. Once the burn marks are removed, clean the whole piece of furniture.	Steel wool Rag
Leaky faucet.	1. Turn off your water supply. 2. Remove the faucet handle knob using a screwdriver. 3. Clean and remove any old Teflon tape still on the thread. 4. Apply Teflon tape on the thread, then screw the handle knob back on.	Wrench Teflon tape
Burned out light bulb or fluorescent lamp.	1. Turn the switch off. 2. Detach the light bulb or fluorescent lamp. 3. Replace the burned out light bulb or fluorescent lamp.	New light bulb or fluorescent lamp

Doorknob that is hard to turn or is loose.	**Doorknob that is hard to turn** 1. Apply a small amount of oil into the doorknob by applying it with the use of the key. 2. Place the key into the lock and turn it to check if it is now loose. **Loose doorknob** 1. Remove the doorknob handle. 2. Remove the doorknob base. 3. Tighten the screws. 4. Return the base and the doorknob handle.	Screwdriver
Doors hanging loosely.	1. Check the screws on the hinges. 2. Use a screwdriver to tighten the screws.	Screwdriver
Rusty window.	1. Prepare a cleaning solution. (1/2 cup ammonia, ¼ cup cornstarch, 1 cup vinegar) 2. Clean your window using the solution.	Cleaning solution Rag

Wall marks and scratches.	1. Use multi-purpose household cleaner. 2. Apply some multi-purpose cleaner on a rag and scrub the wall.	Multi-purpose cleaner Rag
Clogged toilet.	1. Use a plunger to unclog your toilet. Apply force into the pull, rather than into the push.	Plunger

In Business

Basic repairs can be learned from books or from the Internet, but some repairs need more skill than others. This is where repairmen come in, since a repairman knows more about repairing than the average person. For a repairman, making repairs can become a money-earning activity.
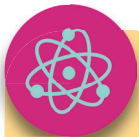
SUMMARY

Repairs are necessary on occasion in a household. Always remember to use the correct tools for the job to avoid accidents and to successfully fix what is damaged.

EXERCISES

Exercise 1
Multiple Choice.
Choose the letter of the correct answer.

1. Which of the following tools and materials are not needed to fix a broken chair?

   a. Claw hammer
   b. Chisel
   c. Wood glue
   d. Sand-paper

2. Which of the following tools is not needed to repair wooden furniture?

   a. Claw hammer
   b. Hand saw
   c. Nail
   d. Wrench

3. This is a measuring tool used for household repairs.

   a. French curve
   b. Push-pull rule
   c. Ruler
   d. Tape measure

4. An insulated tool keeps _____ from passing through.

   a. Electricity
   b. Heat
   c. Water
   d. Both A & B

5. This is a white film tape used to seal pipe threads to prevent leaks.

   a. Electrical tape
   b. Masking tape
   c. Scotch tape
   d. Teflon tape

Exercise 2
Identification.
Directions: Choose the letter of the answer from the given word pool.

A. Repairing	D. Plunger
B. Wrench	E. Hand saw
C. Screwdriver	F. Recycling

_____ 1. It is a handheld, thin, bladed tool that is used to cut pieces of wood.

_____ 2. It is a handheld tool used to tighten and loosen screws.

_____ 3. This refers to fixing something that is damaged.

_____ 4. It is a tool used to unclog a toilet.

_____ 5. It is a handheld metal tool that is used to grip, fasten, tighten, loosen and turn pipes, pipe fittings, nuts. and bolts.

LESSON OUTPUT

The learners are individually tasked to make a slideshow on doing one kind of household repair. The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student presented a complete process from start to finish. Explanations were given on what tools were used to do the repair. Insights were also given on what needed to be done (e.g., why Teflon tape is needed to help seal threads). An alternative outcome was shown, which shows what happens when the work isn't done properly.	The student presented a complete process from start to finish. Explanations were given on what tools were used to do the repair. Insights were also given on what needed to be done (e.g., why Teflon tape is needed to help seal threads).	The student presented a complete process from start to finish. The only explanations consisted of what tools were used to do the work.	The student presented a complete process from start to finish. No explanations or insights were provided.	The student did not present a complete process from start to finish.	
2. Creativity	The student's output made use of unconventional media and materials which made it pleasing to look at.	The student's output used common media used creatively but still made the content easy to understand.	The student's output was artistic but not clear in delivery.	The student's output was plain yet only a few things were easy to understand.	The student did not attempt to be creative in any way in delivering the content of the project.	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed a day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed a day after the given deadline.	The project was completed two days or more after the given deadline.	
TOTAL						

Waste Disposal

TRIVIA

Did you know that Republic Act 9003 of the Philippines requires at least 25 percent of all solid wastes from landfills and other waste disposal centers be recovered through the practice of reusing, recycling, composting, and similar projects? Solid waste management is a major concern in the country which has very limited land area for disposal of garbage. A time will come when there will be no land left to throw trash in. The only solution would be for people to reuse and recycle the waste material itself. This makes the saying, "Somebody's trash is someone else's treasure," even more relevant.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Define waste disposal.
2. Identify different ways of proper waste disposal.
3. Demonstrate proper waste disposal.

ENGAGE

Think about the saying, "Somebody's trash is someone else's treasure." How would you interpret it in relation to proper waste disposal?

Directions: Solve this substitution code cipher.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

Clue: *it is the process of storing, destroying, recycling or removing something that is considered trash.*

23	1	19	20	5

4	9	19	16	15	19	1	12

EXPLORE

Choose the letter of the word that best describes the statement from the given word pool.

A. Sorting	F. Recovery
B. Composting	G. Liquid waste
C. Prevention	H. Waste disposal
D. Solid waste	I. Reuse
E. Recycling	J. Hazardous waste

_____ 1. Creating new products out of old materials.

_____ 2. Using materials once again, for their original purpose.

_____ 3. it is the process of storing, destroying, recycling or removing something which is considered trash.

_____ 4. This refers to returning material back to its original form, so it can be used again.

_____ 5. This is about avoiding and controlling the amount of waste generated.

_____ 6. This is an aerobic method, or a method that needs air for the breaking down of organic wastes to create compost.

_____ 7. This refers to garbage such as glass, plastic, paper or metal.

_____ 8. This is the process of grouping trash according to type.

_____ 9. This kind of waste is toxic, flammable, medical or reactive.

_____ 10. This refers to waste such as oil or grease.

Ask the learners to do some research on waste hierarchy.

Questions:

1. Who is the main waste contributor?
2. How do you dispose of your wastes at home?

EXPLAIN

The **waste hierarchy** aims to minimize the number of wastes generated by people.

Prevention	This is about avoiding and controlling the amount of waste generated.
Reuse	Waste materials are once again used for their original purpose or for another, similar purpose.
Recycle	Creating new products out of waste material.
Recovery	Returning waste material to its original form so it can be used again.
Disposal	Storing, destroying or removing waste.

Waste disposal is the process of storing, destroying, recycling or removing something which is considered trash.

Proper Ways of Waste Disposal to Help Protect the Environment

1. **Sorting** is the process of classifying trash according to what type of trash it is.

2. **Recycling** is the process of creating new products out of waste material.

3. **Reusing** is the act of using what would otherwise be material for either its original purpose, or for another use associated with its original purpose.

4. **Composting** is a method of decomposition that needs air (aerobic) for creating compost, which is a good fertilizer, from organic waste.

Different types of wastes

1. **Liquid waste** refers to liquid substances, such as oil or grease, that need to be disposed of. Some liquid wastes can be treated and reused, while others, for which no treatment is available, are thrown away.

2. **Solid waste** refers to garbage such as glass, plastic, paper, and metal. Some solid waste can be recycled, and those that cannot are thrown away.

3. **Organic waste** refers to kitchen leftovers and garden waste. Organic wastes decompose, so do not throw these anywhere. You can, instead, use a compost pit to make fertilizer.

4. **Electronic waste** refers to any kind of electrical or electronic equipment which is not functioning due to damage or old age.

5. **Hazardous waste** refers to any kind of toxic, flammable, medical or reactive waste. Reactive wastes are chemically unstable and can create toxic vapor or explosions. Batteries are an example of reactive waste.

The Philippines does not differ from other countries in how Filipinos generate tons of garbage daily. The "***Ecological Solid Waste Management Act of 2000*** or ***RA 9003***" was thus passed to mandate an efficient system of waste management, to avoid and reduce waste, to ensure environment friendly waste disposal methods, and to protect the health of both the public and the environment.

In Business

Junk shops recycle waste, as well as offer secondhand items at a cheaper price. Families which engage in this type of business can turn trash to cash.
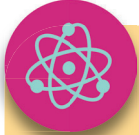
SUMMARY

Waste disposal is the process of storing, destroying, recycling or removing something which is considered trash. RA 9003 is a law that mandates a proper and efficient way of waste disposal to protect the health of both the public and the environment. It is best to sort garbage according to their proper types so that we can reuse and recycle materials, in order that waste that is finally disposed of is minimized.

LESSON OUTPUT

The learners are individually tasked to **make a video of themselves demonstrating proper disposal of waste**. The deadline for submission will be given to you by your teacher. You will be rated according to the rubrics presented.

EXERCISES

Exercise 1
Multiple Choice.
Choose the letter of the correct answer.

1. This refers to any kind of electrical or electronic equipment that is not functioning due to damage or old age.

    a. Electronic waste
    b. Hazardous waste
    c. Liquid waste
    d. Organic waste

2. This refers to garbage such as glass, plastic, paper, and metal. What is it?

    a. Hazardous waste
    b. Liquid waste
    c. Organic waste
    d. Solid waste

3. This refers to creating new products out of old materials.

    a. Reuse
    b. Recover
    c. Recycle
    d. Reduce

4. It is the act of using waste material again for its original purpose, or for a purpose similar to its original purpose.

    a. Reuse
    b. Recover
    c. Recycle
    d. Reduce

5. This is about avoiding and controlling the amount of waste generated.

    a. composting
    b. Disposal
    c. Prevention
    d. Segregation

Exercise 2

Identification.

Directions: Choose the letter of the answer from the given word pool.

A. Waste disposal	D. Recovery
B. RA 8749	E. RA 9003
C. Electrical Waste	F. Organic waste

_____ 1. The Ecological Solid Waste Management Act of 2000.

_____ 2. This refers to any kind of electronic equipment that is not functioning due to damage or old age.

_____ 3. This is the process of storing, destroying or removing waste.

_____ 4. It refers to wastes such as kitchen leftovers and garden wastes.

_____ 5. This refers to returning waste material to its original form, so it can be used again.

techFactorsInc

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/ Functionality	The student presented a comprehensive process from start to finish. Explanations were given on what were used to do the work. An alternative ending was shown, which shows what happens when waste disposal isn't done properly. The video shows all five different methods of waste disposal. The video shows all different ways of proper disposal. - segregation - recycling - reusing - composing - disposal	The student presented a complete process from start to finish. Explanations were given on what needed to be done. The video shows three or four different methods of waste disposal. - segregation - recycling - reusing - composing - disposal	The student presented an adequate process from start to finish. The video shows two different methods of waste disposal. -segregation - recycling - reusing - composing - disposal	The student presented a fairly useful process from start to finish. No explanatory comments or insights were provided. The video shows 1 method of waste disposal. - segregation - recycling - reusing - composing - disposal	The student did not present a clear process from start to finish.	
2. Creativity	The student's output made use of unconventional media and materials which made it pleasing to watch.	The student's output used common elements used creatively but still made the content easy to understand.	The student's output was clear in delivery and also fairly creative.	The student's output was sparingly creative and understandable.	The student did not attempt to be creative in any way in delivering the content.	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed one day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed one day after the given deadline.	The project was completed two days or more after the given deadline.	
TOTAL						

TRIVIA

Did you know that there used to be a thriving bamboo crafts industry in the Philippines? Before the introduction of plastics, Filipinos, such as this grandmother, Gloria Gillado, made bags and other containers made of bamboo. Gillado has been climbing mountains and chopping bamboo since she was a child. At 83, she was featured on a popular public-interest television program and is one of the last among those local artisans who have kept the bamboo crafts industry in the country alive. These days, bamboo crafts are also made for tourists, home decorating, and collectors.
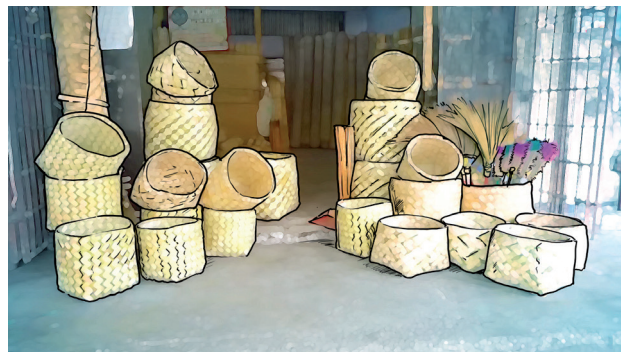
LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Know methods of enhancing/decorating a product made of bamboo, wood, or metal.

2. Demonstrate creativity and innovativeness in enhancing/decorating a product made of bamboo, wood, and metal products.

3. Conduct a simple survey using technology.

4. Discuss the effects of innovative finishing, materials, and creative accessories on the marketability of a product.

5. Refine and enhance a product made of bamboo, wood, or metal.

6. Prepare a project plan.

7. Market a product.

ENGAGE

1. Ask the students to think of a product that they would want to create (or maybe enhance/restore).

2. Ask them their choice of material if they had the option of making it from bamboo, wood, and metal.

3. Have a few students describe how they envision this product to be, what its use would be, and the aesthetics behind it considering the material it would be made from.

4. Let them watch these videos on the restoration on YouTube.

   5-Step Guide Antique Chair Restoration
   https://www.youtube.com/watch?v=rHyYXST3jMQ

   Cleaning Antique Furniture (Reviving a FILTHY Old Chair)
   https://www.youtube.com/watch?v=-d2A2yAAtiY

   How to restore an old chair with cheap tools (for beginner)
   https://www.youtube.com/watch?v=GyQNlggz2AY

EXPLORE

The students will explore around and look for an item that is made of bamboo, wood, or metal and to think about how it was made, including the tools used in its creation. It can be as simple as a pencil. Let them write their thoughts on the item.

RESEARCH

Once they have picked and mused about their chosen item in Explore, they will then do some research on the item to see if their thoughts about it are accurate. They can answer the following questions to help them in their research.

EXPLAIN

Definition of Terms

Industrial Arts – a technology education program that concerns the design and fabrication of objects.

Finishing – Includes improving on the decorative or aesthetic characteristics of an item, specifically relating to the quality of the surface.

3D Printer – An innovative printing system which uses extruded material, such as plastic, to recreate a digitally rendered object in three dimensions or as an actual item that can be held in the hand.

Laser Engraver – a device that uses a laser beam to burn markings on a surface such as that of wood to physically recreate a digitally rendered image.

Industrial arts, which is an education program that is about the design and fabrication of objects, typically involves graphic arts and engineering technology. Before an object such as a chair is made, it will have to be designed first and this would require the following activities.

1. Drawing
2. Defining details such as dimensions and other measurements
3. Establishment of the item's purpose (decorative or functional)
4. Determining the materials and tools needed
5. Fabrication or assembly

The creation of an object does not mean it has to be done by machines. Remember that in the olden days, the only things that people had on hand were their hands, which they effectively used to make things such as baskets and tools which were used to make other tools and more items.

Industrial Arts Tools

There are basic tools which may be used in creating or modifying an item such as a chair. The specific tools needed would depend on the material the item is made of, which could be wood, metal, or even bamboo. The following are some basic tools and materials which would be useful for a simple industrial arts project.

Pliers

Pencil	Calipers	Brush
Tape Measure	Hand Plane	Nails
Chisel	Putty Applicator/Filler	Varnish or Wood Stain
Speed Square	Spreader	Gloves
Crowbar	Itak or Bolo	Glue
Saw	Drill	Filler
Hammer	File	Paint
Sander	Dust Blower Ball	

Among the modern industrial arts machines are the 3D printer and the laser engraver. These can be expensive specialized tools and normally would not be used in the home setting.

The Workshop

Working on the creation or modification of an item requires a shop, or a workshop environment where all the tools and equipment are housed or made readily accessible. A workshop is where you can work in safety and with little interference to distract you from your work. The way your workshop is set up can also help in preventing accidents from happening as there will not be people around you doing other things who might get in the way of your tools.

Planning for Enhancement and Restoration

If you search a bit in your house, you will likely find an object that has been around but neglected for a long time. Usually, this item would look old and weathered, but with a little work, it can be restored and made to look like a new product again. But before you start working on an item, it is best to have a plan.

1. Once you have an item, imagine how you want it to look like.
2. Make a drawing of it from different angles and draw it in a way that it appears as it would once you have enhanced or restored it.
3. If you prefer, you can be innovative and take pictures of it and then save the images into your preferred computing device where you can digitally manipulate them to make the item appear as you had planned it.

The advantages of planning your changes in the manner described are that you...

1. get to be accurate on what you want the outcome to be,
2. will have a definite idea of the materials, accessories, and tools that you will need to do the job, and
3. will be accurate in the details of your enhancement or restoration.

Ways to Enhance or Restore an Item

The process of restoration would depend on the material that the item is made of. Let us say your item is made of bamboo (a construction material that's popular in Asia). Look at it and see how it may be enhanced or decorated. If it has foreign material introduced to it (such as wasp nests), you can remove these by poking on them with a stick. If the item looks like it needs a coat of varnish or wood stain, you can apply some of this finishing material where needed. If the item is the worse for wear with lots of scratches, you can sand it a bit first to smoothen out the surface imperfections before applying any finishing coat. If sanding and varnishing is insufficient, you can decorate it with painted pictures. While this technique is often done with old pottery, it can also be done on other items.

techFactorsInc

Proper Wood Finishing by Sanding

1. Know the result that you wish to achieve.

2. Prepare your sanders (different grains from coarse to fine or specifically #100 coarse to #180 fine grit sanding paper). The grain to use will depend on the state of the surface of the item. Coarse-grained sanders are often used to prep the surface for finer sanding, thus, fine grain sanders are usually used for finishing only. Note that sandpaper with a grit grade below 100 are hardly used for finishing wooden furniture.

3. Cover the work area floor with drop sheets to protect the floor. If you don't have these, old newspapers would do.

4. Sanding should always be done progressively from a coarse grit to a fine one. This is to make sure that the deep scratches are removed. The following illustrates the grit progression in sanding a surface.

100 Grit   120 Grit   180 Grit
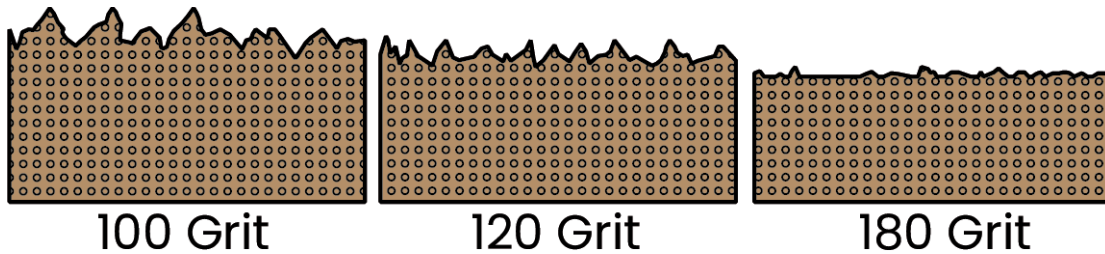
Effects of Innovative Finishing

There are traditional and old-fashioned ways for finishing or improving on the decorative or aesthetic characteristics of an item, specifically relating to the quality of the surface. These are by all means effective, but with the advancement of technology, there are now also innovative ways to finish a product and these would likely involve the use of power tools, new materials, and hardware such as laser engravers, which can burn designs onto the surface of wood and bamboo. Traditionally, manual sanding with sandpaper is enough, but the modern way to do it would be to use powder abrasives together with a rotary polishing tool.

Using new techniques will help to allow you to...

1. finish faster,
2. do a better job, and
3. achieve a more satisfactory result.

Project Planning

In planning for an industrial arts enhancement or restoration project, follow these steps.

1. Define your objectives for the project.
2. Take photos to manipulate or make sketches of your desired outcome for the project.
3. Make a list of the materials needed.

ITEM	QUANTITY	DESCRIPTION	PRICE

4. Prepare a list of the tools needed.

TOOL	QUANTITY	DESCRIPTION	PURPOSE

5. Define the procedure in steps.
6. Make a post enhancement assessment on the following. The rating for each one should be between 1 and 5 with one being the highest.

Wood Finishing Safety

1. Wear gloves.
2. Wear a protective visor.
3. Wear a face mask to avoid inhaling aerial particulates and fumes.

SKILL	USE OF ENHANCEMENT OR RESTORATION MATERIALS	PRODUCT QUALITY

In Business

Fixing, enhancing or restoring an old item, especially one made of wood, can be a good way to earn money. There are lots of wooden items that people own, such as old furniture that may require some restoration. Knowing how to renew them, could be something that people would gladly pay for. This is the reason why furniture shops thrive.
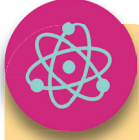
SUMMARY

Industrial arts, an educational program which concerns the creation of objects, typically involves graphic arts and engineering technology. Before an item is made or restored, there has to be a plan so the desired outcome for the item, which may be as simple as finishing its surface, has to be designed or drawn first before it is applied, fabricated or assembled in a workshop.

LESSON OUTPUT

You are individually tasked to document the process of improving the quality of a wooden or bamboo item that is the worse for wear and finish and embellish it enough to make it look like you've made a new item. You are to **make a 5-slide presentation on the process**. Make use of text and images creatively to explain your idea. You will be rated according to the following rubrics.
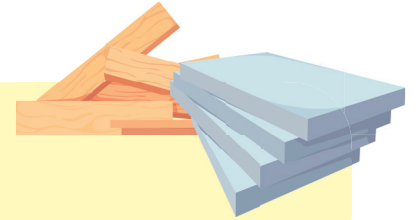
EXERCISES

Exercise 1
Fill in the blanks.

1. Industrial Arts concerns the design and _____ of objects.

2. A 3D printer recreates a digitally rendered object in _____.

3. A _____ uses a laser beam to draw on a surface like that of wood.

4. The design and fabrication of objects involves graphic arts and _____.

5. _____ is a common plant in Asia used to make baskets.

Exercise 2

Identification
Directions: What is being described?

_____ 1. This is where all the tools and equipment are housed or made readily accessible.

_____ 2. This is used for finishing wooden furniture except those with grit grades below 100.

_____ 3. These may be used with a rotary power tool.

_____ 4. What's used in the traditional way of sanding surfaces.

_____ 5. This should always be done progressively from a coarse grit to a fine one.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/Functionality	The student's presentation contained all that is needed to make a convincing argument about their idea for improving an item in five slides.	The student's presentation fairly explained their idea for improving an item in five slides.	The student reasonably presented their idea for improving an item in five slides with a fair amount of explanation.	The student presented their idea for improving an item in five slides without any usable explanation.	The student presented an idea for improving an item which did not make much sense or was convincing in the presentation.	
2. Creativity	The student's output was unique and made creatively use of text SHOULD BE creatively use text , images, and more.	The student's output was unique and made an attempt to creatively use of text SHOULD BE creatively use text and images to present the idea.	The student's output was based on an existing idea though supported by convincing text and images to present the idea.	The student's output was copied from someone else's idea although supported by fresh text and images.	The student did not attempt to create anything original and submitted work that was all copied.	
3. Promptness	The slideshow was completed more than 3 days ahead of the given deadline.	The slideshow was completed 3 days ahead of the given deadline.	The slideshow was completed by the given deadline.	The slideshow was completed within 3 days after the given deadline.	The slideshow was completed more than 3 days after the given deadline.	
TOTAL						

TRIVIA

Have you watched any of the Star Wars movies where the heroes and villains use a sword made of light, called the lightsaber? Did you know that there are sword toys based on these fictional devices which look like their movie counterparts? These are actually just modified flashlights powered by batteries with a long translucent tube that is lit up by a beam of light once the switch is on. Coplayers often make their own lightsabers from scratch, which is a fun and exciting activity as they get to learn the electrical basics and be creative in the process as well.

LEARNING OUTCOMES

At the end of the lesson, you are expected to:

1. Understand the concepts and skills needed to create a simple electrical device.
2. Construct or repair a simple electrical device.
3. Explain the general procedures that need to be followed when working on electrical devices.

ENGAGE

1. Ask the students about some electrical devices or gadgets that they've seen around them, such as in their home or in school.
2. Ask the students if they have repaired or worked on an electrical device before. If they have, ask what it was, what the student did to it, and why he or she worked on it.
3. Tell the students that, in this lesson, they will learn the basics of constructing a simple electrical device which resembles the lightsaber in Star Wars.

EXPLORE

1. Ask the students of they have taken apart a flashlight before to see how it worked.

2. Let them watch this video on YouTube how flashlights are made.
   https://www.youtube.com/watch?v=xPmPRx4sOCI

3. Let them watch this video on how a flashlight circuit works.
   https://www.youtube.com/watch?v=MpagOBVSewU

4. Let them watch this video on how to make a basic flashlight circuit.
   https://www.youtube.com/watch?v=oDUAvaXsK1g

5. Let them watch this video on how to make a flashlight lightsaber.
   https://www.youtube.com/watch?v=xdjX5Il3SnI

Choose the letter of the answer from the given word pool.

A. Electronic gadget	F. Direct current
B. Electrical appliance	G. Electrical component
C. Electrical circuit	H. Alternating current
D. Grounding	I. Electrical tape
E. Electronic symbol	J. Electrical device

_____ 1. This is a symbolic drawing which represents a particular electrical component.

_____ 2. This is an electrical machine, other than a light or a motor, which is designed to accomplish a particular task.

_____ 3. This kind of current is what is delivered through wall sockets.

_____ 4. This is a type of equipment which uses electronic technology.

_____ 5. This either uses electricity to perform some function, or produces electricity.

_____ 6. This is the kind of current delivered by batteries.

_____ 7. This is a kind of insulated tape which is wrapped around wires.

_____ 8. This refers to connecting an electrical device to the ground.

_____ 9. This is a part of any electrical circuit.

_____ 10. This is a closed path through which electricity flows.

Let the students, on their own, search for some common electrical devices. Have the students then relate these electrical devices to a particular application, e.g., light bulb (device) -> lighting a room (application).

Questions:

1. What sort of electrical devices did you come up with, in your research? How are these applied?

2. What sort of electrical devices do you see around your home? In school? In the places you go to?

3. Have you wondered how these electrical devices are made to work?

EXPLAIN

Definition of Terms

Alternating Current – a type of current presently used. It is most often delivered through wall sockets.

Direct Current – another type of current presently used. It is the kind of current delivered by batteries.

Electrical appliance – an electrical machine, other than a light or a motor, which is designed to accomplish a particular task. Examples of appliances are refrigerators and hair dryers.

Electrical circuit – a closed path through which electricity flows. Electrical components are usually included as part of an electrical circuit, so the circuit can do what it needs to do.

Electrical component – a part of any electrical circuit. Examples of electrical components are wires and fuses.

Electrical device – a device which either uses electricity to perform some function, or which produces electricity. A motor is an example of an electrical device.

Electronic gadget – equipment which uses electronic technology. Calculators and cell phones are examples of electronic gadgets.

Electronic symbol – a symbolic drawing which represents a particular electrical component.

Grounding – connecting an electrical device to the ground. This reduces the build-up of static electricity which could shock people or start fires.

If you asked your parents about TV in their day, they will tell you that, back then, TV signals were received by antennas, rather than sent through cable. But did you know that it was an engineer who worked for a TV company who was also an inventor of the Philippines' first digital terrestrial television (DTTV) antenna?

The traditional terrestrial television system was one which received analog signals, and when TV companies switched to digital systems, a different kind of antenna was needed. Dennis Carandag, who was then working as an engineer for ABS-CBN, invented a DTTV antenna which was compatible with the cathode-ray tube TV units that were among the prevalent electrical devices back then.

Granted, such an antenna is not compatible with today's flat screen digital TVs, but this is an example of Filipino ingenuity in the field of electrical engineering.

Take a look at your cell phone, electric fan or even a light switch. You've most likely taken it for granted, as using it is second nature to you. You most likely have not wondered about all the things that go into how such things work the way they do. For example, did you know that it as a Filipino Dennis Carandag, who invented a DTTV antenna which was used with old TV units?

Granted, such an antenna is not compatible with today's flat screen digital TVs, but this is an example of an electrical device invented by a Filipino.

In this lesson, you'll be taking a quick peek at what makes an electrical device work, specifically the basic flashlight, which you will be creating fantasy movie version of in this lesson.
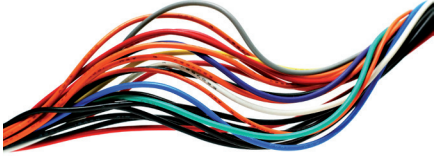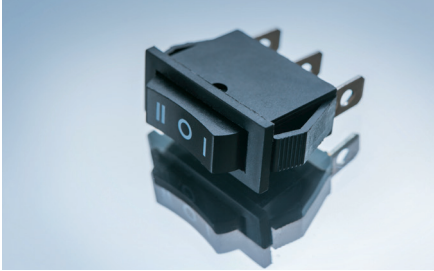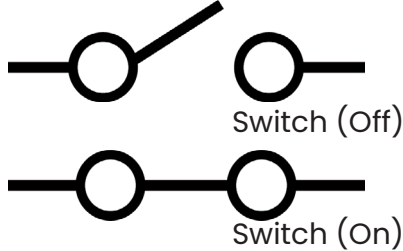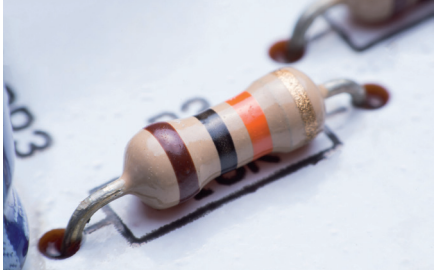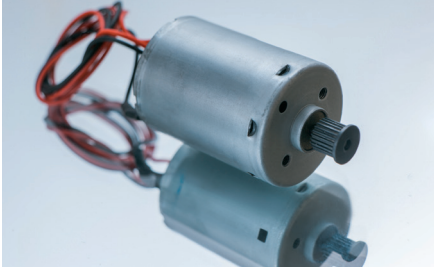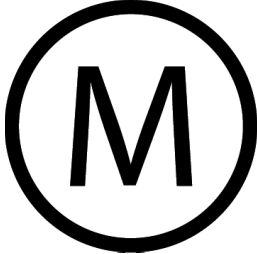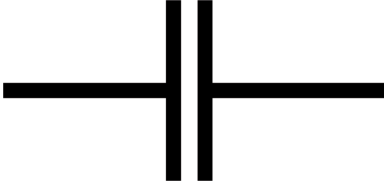
All things that run on electricity use electrical components. These are the things which, when put together, make such things as electrical devices and appliances, as well as electronic gadgets, possible. Making an electronic gadget is likely something which not all of you can do – can you put together a cell phone from scratch, for example? – but starting out by making simple electrical circuits is something that you can work on.
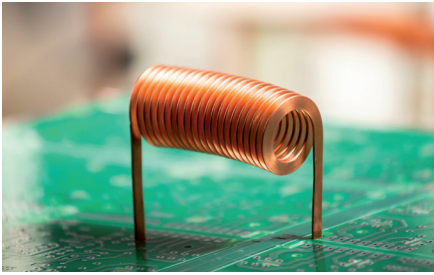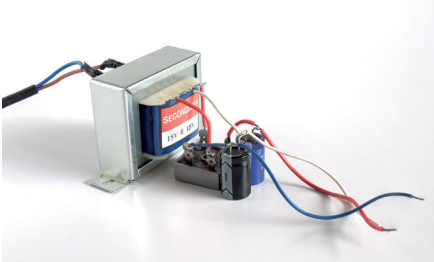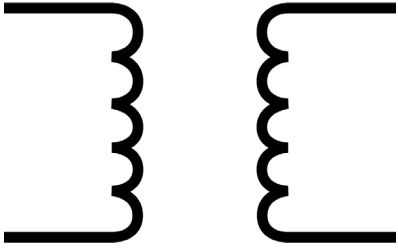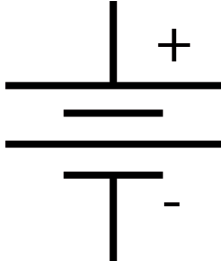
Basic Electrical Components
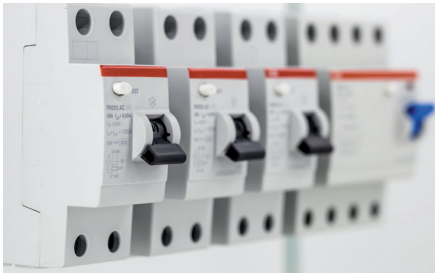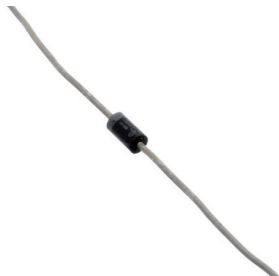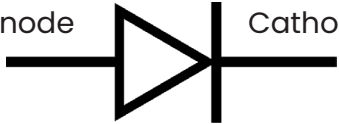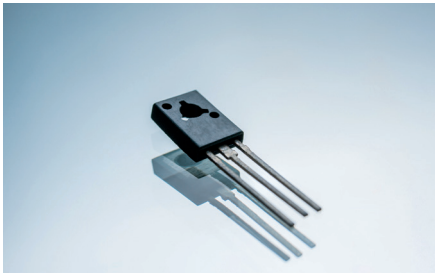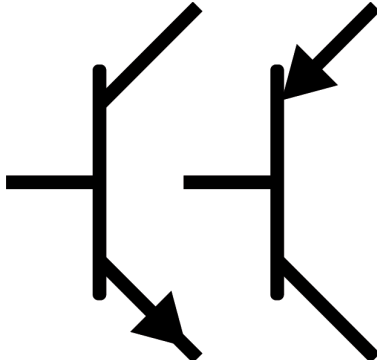
Electrical components are the building blocks for electrical circuits, and electrical circuits, are in turn, the building blocks for electronic devices, appliances and gadgets.

When making an electrical circuit, it is important to first draw it. Since it is very time consuming to draw a picture of, say, an actual resistor in an electrical circuit, electronic symbols are used. These are standard pictograms which are used to describe electrical circuits around the world.

The basic electrical components which are generally found in electrical circuits are:

Electrical Component	Example	Electrical Symbol
Wire – the most basic electrical component, as electricity runs through this.		
Switch – this electrical component is used to break the flow of current in a circuit.		Switch (Off) Switch (On)
Resistor – this restricts or regulates the current that flows in a circuit. Resistors can be fixed or variable. A volume control knob is an example of a variable resistor.		
Motor – this converts electrical energy into mechanical energy. An example is the motor of an electric fan.		
Capacitor – this stores electrical energy and can act as voltage regulators by limiting the maximum voltage used in the circuit.		

Inductor – this stores electrical energy as magnetic energy. This is often used to protect a circuit from a sudden surge of current.		
Transformer – these convert voltage, either by increasing it (step up) or by decreasing (step down) it.		
Battery – these convert chemical energy into electrical energy. Portable equipment, such as flashlights, use these.		
Fuse – these are used to protect the components of an electrical circuit from too much current. These are sacrificial devices, as they are designed to break or melt if too much current flows through them.		

Circuit breaker – this is essentially a switch which is a mechanical version of a fuse. When too much current flows through it, it switches open, preventing current from flowing.		
Diode – this is a semiconductor device which allows current to flow in only one direction. A light-emitting diode (LED) is a diode which gives off light.		Anode Cathode
Transistor – this regulates the flow of current or voltage, depending on the kind of transistor. It is also a switch for electronic signals. There are two kinds of transistors – NPN and PNP – the difference between which may be covered in a later lesson.		
Light bulb – this produces light from the electricity that flows through it.		

An electrical circuit is a path through which electricity flows, and electrical components are placed in an electrical circuit to do certain things. An example of a simple electrical circuit can be seen in the following image.

With pictures   With symbols
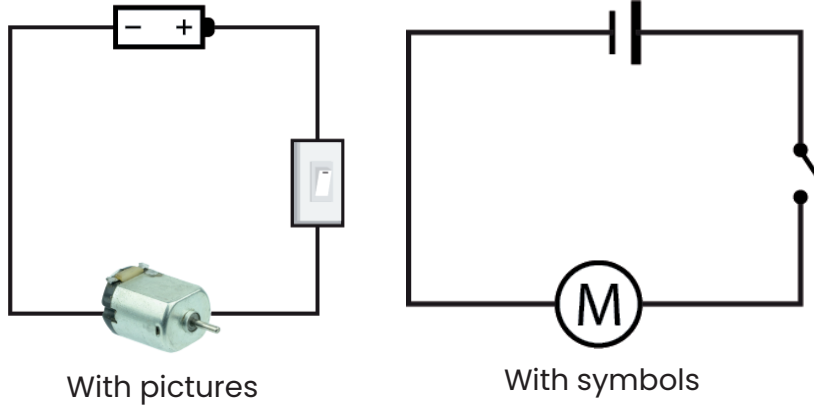
What follows is a modified diagram for a flashlight. Can you interpret it?
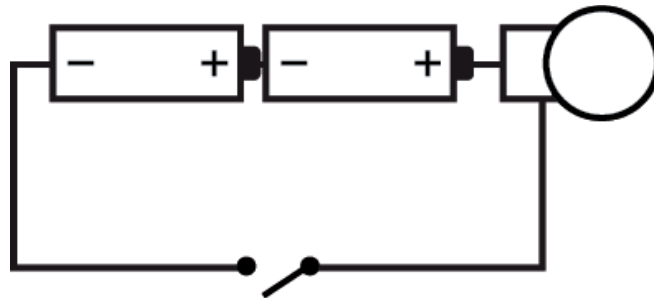
This circuit is a simple one, with a switch, battery, and a motor. From circuit schematic, can you tell if the circuit is on or off? (Hint: check the switch position.)

As you may have guessed, you can add as many electrical components to a circuit drawing as you want. If you build the real thing, though, make sure that there is enough power for everything to work, and that the circuit is safe to use.

Types of Current

Today's electrical and electronic devices run on two kinds of current: direct and alternating.

Alternating current, or **AC**, is the type of current which is used in power generation systems today, and is the type of current which comes out of wall sockets. It is so called because the electric current changes direction, back and forth, several times

a second. The standard frequency in the Philippines is 60 Hertz, which means that the electric current changes direction 60 times a second. The standard frequency in Europe and in some parts of Japan, by comparison, is 50 Hertz. Using equipment which has a different frequency and voltage from that of the available power supply—such as using an American microwave in Europe—could cause the device to get destroyed, which may even start a fire.

Direct current, or **DC**, is the type of current which is supplied by batteries. With DC, the current flows in only one direction in a circuit.

Alternating current is the present kind of current used publicly because the voltage stays the same for a far longer distance away from the power generator compared to direct current. 440 volts AC, for example, will remain at around 440 volts AC a kilometer away from the power generator, whereas it will have decayed to a level far less than a DC current would. Batteries use direct current, and these are used in circuits where the distances concerned are short, such as those in a flashlight, which can be held in a person's hand.

Tools Used to Work with Electrical Devices

As with any other type of work, tools are needed when working with electrical components. The most common types of tools used when working with electricity are those that follow.

Wire strippers – these are used to strip the insulation off wires, so the bare wire can be connected to a circuit. In the basic wire stripper, the sharp edges near the hinge are used to cut the insulation, while the nose end is used to twist or bend the wire so it will go where it needs to go.	

|	
Screwdrivers – these are used to turn screws in their slots, to tighten any connections. These come in different sizes, depending on how large the screw they'll be turning is. The main kinds of screws are regular (the tip is shaped like a chisel) and Philips (the tip looks something like a cross).	
Electrical tape – this is a special kind of tape which is insulated (it doesn't conduct electricity easily) and which is wrapped around wires or wire connections. Professional electricians use different colors of tape, as each color has a meaning, e.g., wires with red-colored tape indicate low voltage AC wires.	
Wire cutters – these are used to cut wires. Granted, the sharp-edged part of a wire stripper can be used for the same purpose, but wire cutters are better designed to cut through the harder metal that wires are made of, compared to soft insulation.	
Multimeter – this has two prongs, the ends of which are touched to two different points of a circuit to determine the resistance, voltage and any current across that section of circuit. Digital and analog versions are available, and all feature a selector which can change the multimeter's sensitivity, i.e. how low the current, voltage and resistance that can be detected is. This can also literally save your life, as it can detect if any current is running through the circuit you intend to work on.	
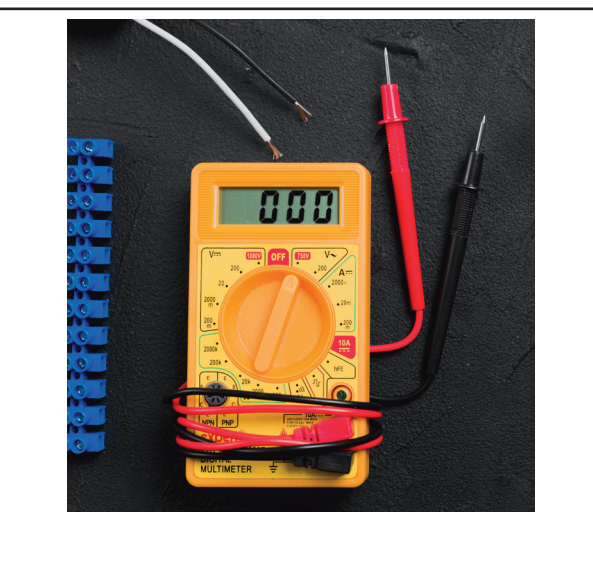
Since you'll be working with electricity, which carries with it the chance of getting shocked, the tools need to be insulated.

NOTE: It doesn't take much electricity to harm a person. The voltage which comes out of everyday electrical sockets—100 to 250 volts—can cause injuries and even kill people if there is enough exposure. Even 42 volts can kill a person; it all depends on the person's actual physical body makeup. Make sure you respect the hundreds of volts that could be running through any electrical circuit you work on.

Repairing Electrical Devices

Repairing an electrical device is, theoretically, easy, if you haves the electrical device that needs repair and another of the same kind of electrical device which is whole. By taking apart both electrical devices and comparing their components, you'll be able to see what's wrong. That said, since you likely don't have the kind of experience or training that technicians, or even your older siblings and relatives, have, your repairing electrical devices will be limited to such things as replacing or tightening wires and their connections.

Safety Procedures when Working with Electrical Devices

Because you'll be working with equipment that use electricity—which could be dangerous to work with—you need to follow the following procedures to work safely.

1. Make sure that the area you'll work in is dry. Water is a good conductor of electricity, and a strong electrical current could travel though the water which can harm or kill you.

2. Keep your work area clean. Dirt and grease can be ignited by an electrical spark.

3. Wear proper clothing and safety gear. This includes safety goggles and, if necessary, insulated gloves.

4. Remove all metal objects, such as jewelry, from your body.

5. Secure loose hair.

6. Make sure that the equipment you'll be working on has no power flowing through it. This means unplugging appliances from wall sockets and disconnecting batteries and other sources of power. Use a multimeter to make

sure no current is running through the equipment.

7. Make sure that the tools you are using are grounded. Power tools which need to be grounded use three-pronged plugs, with the third prong being the grounding wire.

8. Do not create a short circuit. This is basically a single wire whose ends are connected to a power source. The wire will overheat very quickly, could melt and set nearby flammable objects, such as paper or wood shavings, on fire. (Fun fact: an incandescent light bulb is essentially a safe version of a short-circuited wire. It takes a lot of heat to make the wire in an incandescent light bulb glow enough to give off light and doing so requires the wire to essentially be short-circuited.)

9. Make sure the circuit is grounded. Static electricity can build up in circuits, particularly the more complicated ones, and can shock or electrocute you.

10. Keep any power cords and extensions clean. Dirt can be ignited by electricity.

11. Inspect your tools to make sure they aren't cracked or have dirt or oil built up in these. Don't use equipment with damaged insulation, frayed wiring or broken plugs.

12. Store tools properly once you're done using these.

13. If possible, work with a buddy. He can help you out in case there's an accident.

14. If you're not sure how to use a tool, or how to work on or repair an electrical device or appliance, ask help from an adult who knows how.

Best Practices when Working with Electrical Circuits

1. Make sure all connections are tight. Loose connections could cause sparking, which could be a potential source of fire or electric shock.

2. Insulate all wires in a circuit, as much as possible, to minimize the chances of shock or of fire.

3. Ground the circuit or equipment you want to work on before you do so. This will send the excess electricity down into the earth, rather than into you.

4. When stripping a wire, don't apply so much pressure that the wire gets gouged. This will reduce the strength of the wire and will increase the chance of the wire getting cut when it is bent.

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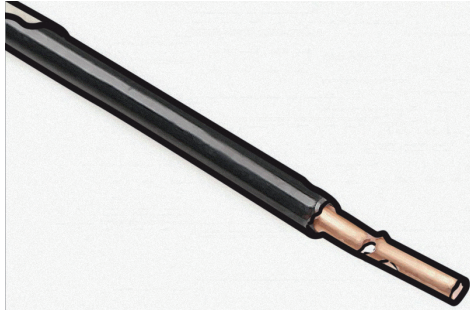
5. Minimize the amount of wire that comes out of a connection. Excess wire still has current running through it, and anything that touches that excess wire can still get electrocuted or burned.

6. Make sure that one wire isn't directly connected to another wire. This is called "crossing wires," and usually results in a short circuit, which can result in a fire.

Working on Electrical Devices

While electrical devices use electricity, working on these is essentially mechanical in nature. The same skills used in working with mechanical devices—such as screwing in hinges, bending wood and the like—are the basics of those used in working with electrical circuits; screws, for example, are worked the same way, be these used for a door hinge or to tie down a wire to a light socket.

In Business

The easiest way to make money out of working with electrical devices is to become an electrical repairman. There are a lot of electrical devices used in the world today, which means a lot of demand for electricians. Another way to turn your knowledge of electrical devices into money is to know how to repair an electrical device such as a cellphone which many people own these days.

SUMMARY

Electricity powers the electronic gadgets and electrical devices we use in everyday life. These, in turn, are made of electrical components which are linked together in an electrical circuit. To minimize the chances of accident. the basic components, basic tools safety procedures, and best practices for working on these electrical devices need to be followed.

LESSON OUTPUT

Create a lightsaber flashlight device, based on the following circuit schematic.
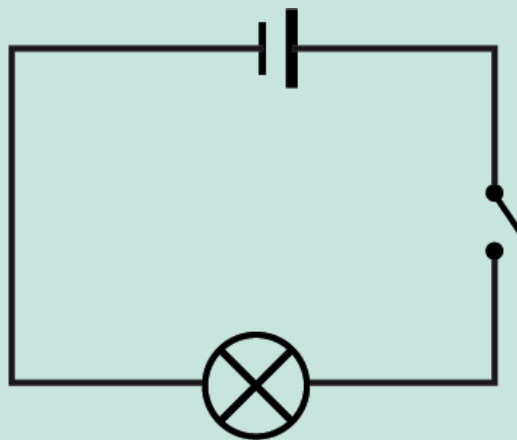
Note that the light beam of the lightsaber flashlight should be mostly directed in one direction, rather than going in all directions. Document on a short video how you made your lightsaber do this. Your score will be determined by the following rubrics.

EXERCISES

Exercise 1

Directions: Identify what is being asked for in the following statements.

_____ 1. This is used to break the flow of current in a circuit.

_____ 2. This restricts or regulates the current that flows through a circuit.

_____ 3. These are used to cut wires.

_____ 4. This is a sacrificial electrical component which protects the other components of an electrical circuit from too much current.

_____ 5. These come in two main kinds: regular and Philips.

_____ 6. This converts voltage, either by increasing or decreasing it.

_____ 7. This stores electrical energy and can also act as a voltage regulator.

_____ 8. This produces light from the electricity that flows through it.

_____ 9. This converts chemical energy into electrical energy.

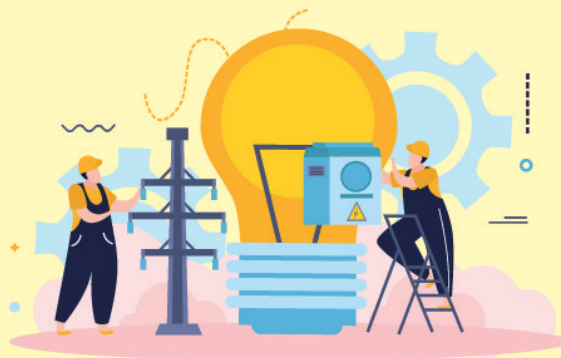_____ 10. This stores electrical energy as magnetic energy and protects a circuit from a sudden surge of current.

Exercise 2
Fill in the Blanks.
Directions: Supply the missing word in each of the entrepreneurial steps.

1. Connecting one wire directly to another wire is called _____.

2. Make sure a circuit is _____ before working on it.

3. Keep your _____ clean and dry.

4. Before working, remove all _____, such as jewelry, from your body.

5. Do not create a _____.

6. Don't use damaged _____.

7. Pick a _____ to work with, as much as possible.

8. As much as possible, _____ all wires in a circuit.

9. Make sure that all connections are _____.

10. Wear proper _____, such as insulated gloves.

Rubrics

CRITERIA	5	4	3	2	1	POINTS
1. Content/Functionality	The student presented a complete, working lightsaber flashlight. Explanations were given on what tools were used to do the work. Insights were also given on what needed to be done, e.g., why insulating tape is needed to cover wires. Explanations were given on what happens when the work isn't done properly.	The student presented a complete, working lightsaber flashlight. Explanations were given on what tools were used to do the work. Insights were also given on what needed to be done, e.g., why insulating tape is needed to cover wires.	The student presented a complete, working lightsaber flashlight. The only explanations consisted of what tools and materials were used.	The student presented a complete, working flashlight. No explanatory documentation provided.	The student did not present a complete or working flashlight. Nor did it resemble a lightsaber.	
2. Creativity	The student created a convincing working lightsaber flashlight which made use of unconventional materials or had some features which aren't found in flashlights that are commonly available.	The student created a working lightsaber flashlight which had some features which aren't found in flashlights that are commonly available.	The student created a working lightsaber flashlight.	The student created a lightsaber flashlight that did not work.	The student did not succeed in creating a lightsaber flashlight	
3. Promptness	The project was completed two or more days ahead of the given deadline.	The project was completed a day ahead of the given deadline.	The project was completed by the given deadline.	The project was completed a day after the given deadline.	The project was completed two days or more after the given deadline.	
TOTAL						