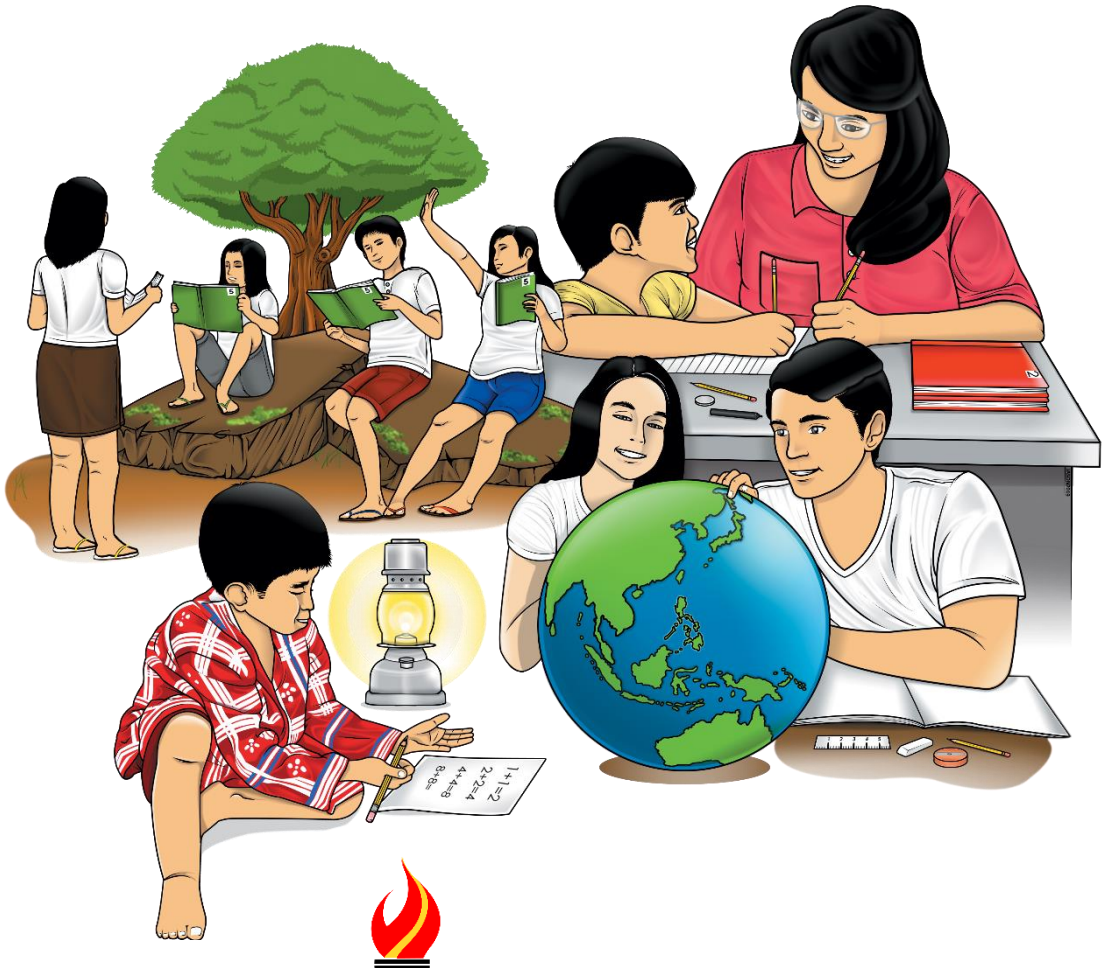
Senior High School

DepED
DEPARTMENT OF EDUCATION

Physical Science

Quarter 1 – Module 7:
Earth's Natural Gem



ALTERNATIVE DELIVERY MODE
ADM

Science – Grade 11/12
Alternative Delivery Mode
Quarter 1 – Module 7: Earth's Natural Gem
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Senior High School

Physical Science

Quarter 1 – Module 7:
Earth's Natural Gem

Introductory Message

For the facilitator:

Welcome to Physical Science Grade 11/12 Alternative Delivery Mode (ADM) Module on Biological macromolecule structure and its function!

This module was collaboratively designed, developed, and reviewed to assist the teachers/facilitators in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners in guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st - century skills while taking into consideration their needs.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator, orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their learning. Furthermore, please encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Physical Science 11/12 Alternative Delivery Mode (ADM) Module on Earth's Natural Gem!

Our hands are the most represented parts of the human body. It is often used to depict skill, action, and purpose. With our hands, we create, accomplish, and learn. Hence, you are capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be able to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 ***What I Need to Know***	This part will give you an idea of the skills or competencies you are expected to learn in the Module.
 ***What I Know***	This part includes an activity that will check what you already know about the lesson. If you get all the correct answers (100%), you may decide to skip this module.
 ***What's In***	This drill or review to help you link the current lesson with the previous one.
 ***What's New***	This section provides a brief discussion of the lesson. It aims to help you discover and understand new concepts and skills.
 ***What is It***	This part includes questions or blank sentences/paragraphs to be filled in to process what you learned from the lesson.
 ***What's More***	This part comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 ***What I Have Learned***	This part includes questions or blank sentences/paragraphs to be filled in to process what you learned from the lesson.

 ***What I Can Do***	This section provides an activity that will help you transfer your new knowledge or skills into real-life situations.
 ***Assessment***	This part is a task that aims to evaluate your level of mastery in achieving the learning competency.
 ***Additional Activities***	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.
 ***Answer Key***	This part contains answers to all activities in the module.

At the end of this module, you will also find:

References	This part is a list of all sources used in development of this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the module and in checking your answers.
5. Finish the task at hand before proceeding to the next activity.
6. Return this module to your teacher/facilitator once done.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain a deep understanding of the relevant competencies. You can do it!

What I Need to Know

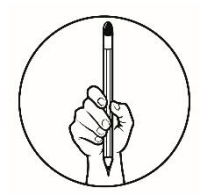
This module was designed and written with you in mind. It aims to help you master the principles governing the structures and functions of biological macromolecules. The language used recognizes the diverse vocabulary level of students. The lessons follow the standard sequence of the course.

This module consists of one lesson:

- Describe how energy is harnessed from different sources:
  (a) fossil fuel
  (b) biogas
  (c) geothermal
  (d) hydrothermal
  (e) batteries
  (f) solar cells
  (g) biomass

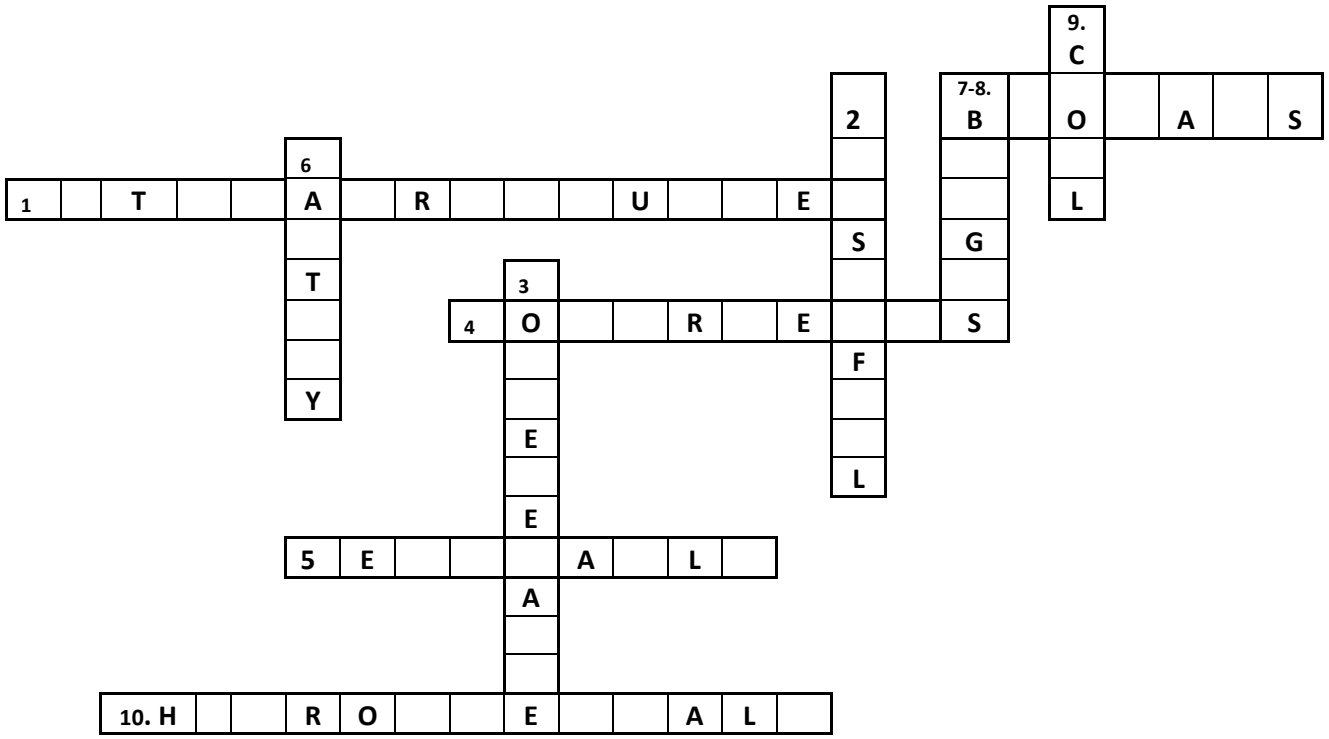
By the end of this module, you can:

1. describe the different sources of energy;
2. give a summary of how energy produces from a different source;
3. differentiate renewable and non-renewable sources of energy; and
4. outline the pros and cons of the different sources of energy.



What I Know

Directions: Complete the crossword by filling in a word that fits the given clues below.



1. The materials or substances that exist naturally without any action of humankind.
2. It is the world's dominant energy source formed from organic material over millions of years.
3. The resources that take place longer than a person's lifespan.
4. It is commonly used by industries and homes which convert radiant energy into electricity.
5. The resources that can be replaced in a short period.
6. A natural resource that can be found inside our home and can be used by cars, flashlights and other materials.
7. It is from the anaerobic decomposition of organic materials brought about by certain varieties of bacteria.
8. Any organic materials that burn directly to provide heat and energy is called _____.
9. An example of combustible material formed from decayed plants and converted into another formed that can be used in cooking.
10. The process of obtaining heat or energy from a large body of water is known as _____ energy.

Lesson 1 How Energy is Harnessed from Different Sources

The energy we use to power everything we do from our home to school and workplace comes from a variety of different sources. These sources break into renewable and non-renewable energy sources.

What's In

A **renewable energy source** is any natural resources that replaces at the same rate on which the resource is used. A **non-renewable energy source** is any natural source that forms at a rate that is much lower than the rate that it is consumed.

1. **Fossil fuels** are combustible materials that took millions of years to form underneath the earth. It is a general term for buried combustible geologic deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years.

2. **Biogas** is produced by the anaerobic decomposition of organic materials brought about by certain varieties of bacteria. It burns to generate heat and used in combustion engines to produce electricity.

3. **Geothermal energy** is the heat obtained from underneath the earth and carried to the surface as steam. Work is being done on geothermal systems that pump hot water into underground hotspots and then use the resulting steam to generate electricity.

4. **Hydrothermal energy** is the process of obtaining heat or energy from a large body of water. Water in dams or from waterfalls are the most common sources of hydrothermal energy.

5. **Batteries** are voltaic cells that undergo electrochemical processes to produce electrical energy. It includes dry cells, lead and storage batteries and fuel cells.

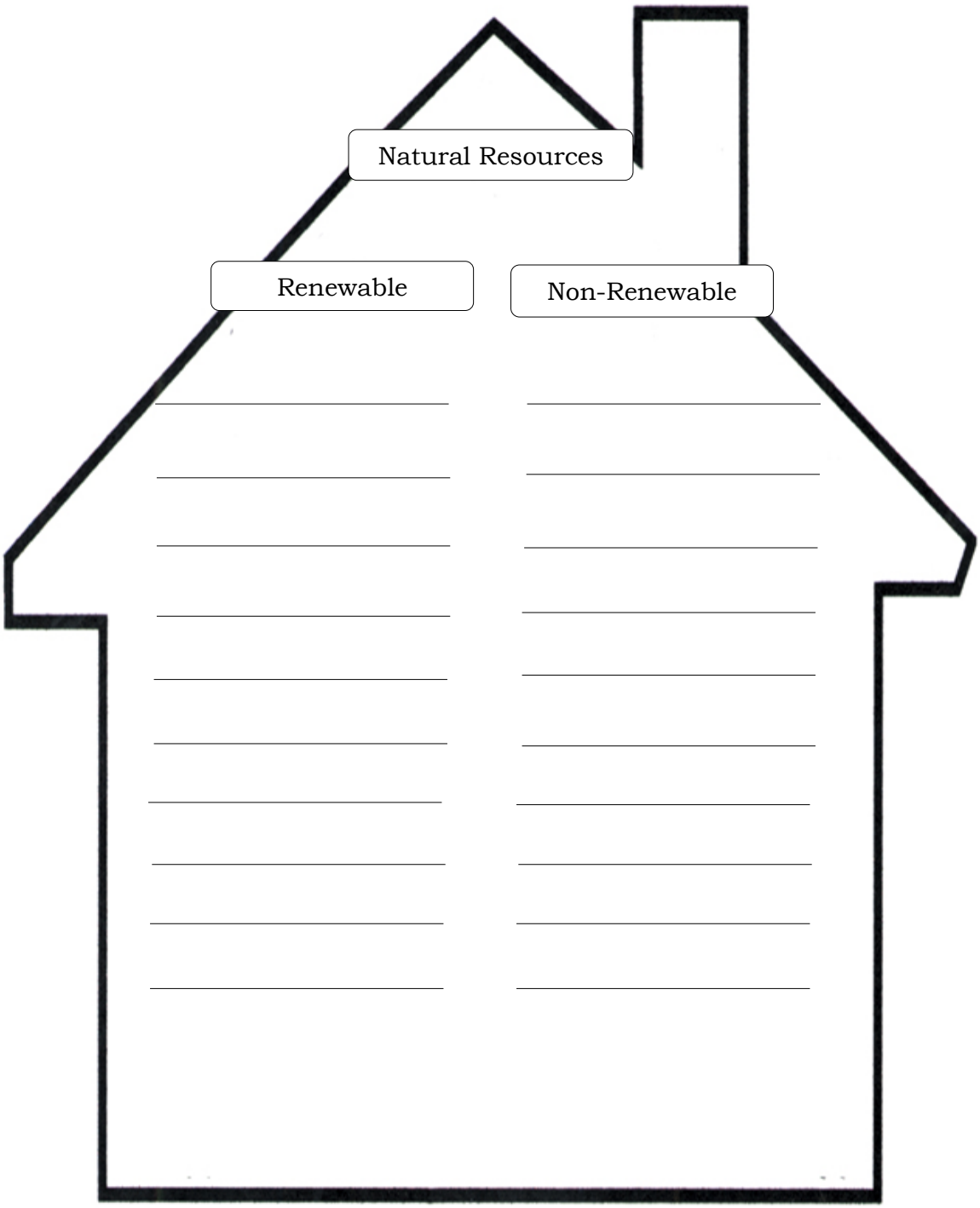
6. **Solar cells** are usually used for powering homes. These cells directly convert incoming radiant energy from the sun into usable form. Sunlight is directly converted to electrical energy.

7. **Biomass** is any organic matter available on a renewable basis. The biomass of wood is burned directly to provide heat and energy

What's New

Activity 1

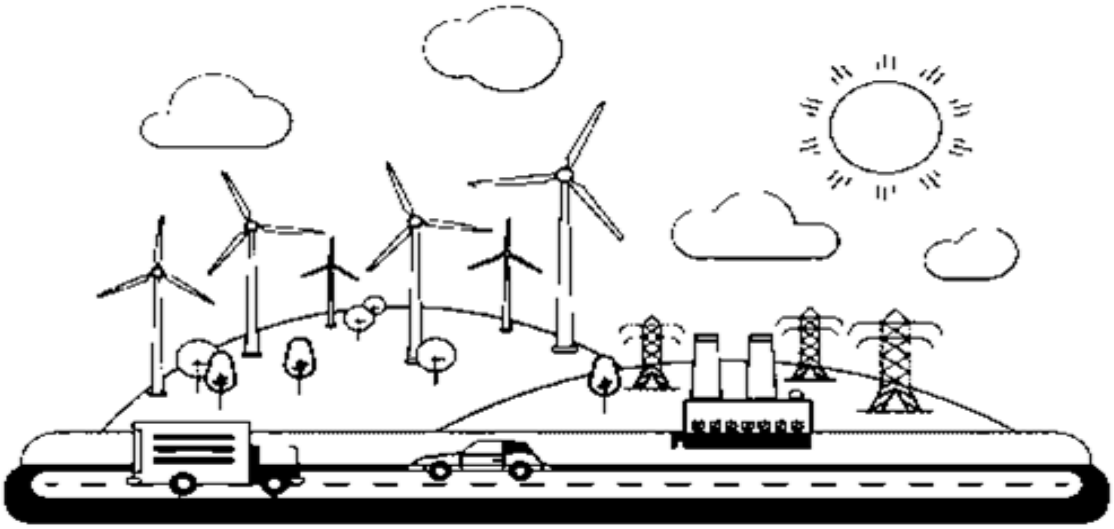
Directions: List down examples of renewable and non-renewable resources that can be found in your home.



What is It

Activity 2

Directions: Complete the table below. Choose your answer from the illustration.



Source:vecteezy.com

Natural Resources	Renewable/Non-Renewable	How will you conserve it?
1.		
2.		
3.		
4.		
5.		

What's More

Activity 3

Directions: Write down the pros and cons of the energy resource illustrated below.

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Coal

Advantages:

_____

_____

Disadvantages:

_____

_____

1.

Animal Manure

Advantages:

_____

_____

Disadvantages:

_____

_____

2.

Solar Panels

Advantages:

_____

_____

Disadvantages:

_____

_____

https://unsplash.com/photos/WvusC5M-TM8

What I Have Learned

1. Natural resources are materials or substances such as minerals, forests, water, and fertile land that are seen in nature and can be used for economic gain.

2. Renewable resources are materials that can be replaced within a person's lifespan.

3. Non-renewable resources are materials that will take longer than a person's lifespan to be replaced.

4. Biogas, geothermal energy, hydrothermal, solar cells, and biomass are considered as renewable resources, while fossil fuel and batteries are part of non-renewable resources.

5. Sources of energy are everywhere, however, we must conserve and preserve all-natural sources since our lives depend on food, water, clothing, houses, transportations, machines, and technology.

What I Can Do

Metro Manila after New Year's fireworks. Image by Patrick Roque via WikimediaCommons (CC BY-SA 4.0)October 31, 2019

The Sierra Madre mountain range looming over Metro Manila. Image by Johair Siscar Addang, Matrch 23, 2020

One of the most prominent problems in the Philippines is air pollution due to many sources contributing to it, such as private transportations, jeepneys, buses, and factories. As the situation worsens due to the pandemic, the government has decided to lockdown the areas with many cases of COVID19 recorded in the National Capital Region (NCR) that the movement of everyone is limited. If the pandemic has a good effect on our environment, what is it, and how is it manifested?

Assessment

Directions: Read each question carefully and encircle the correct answer.

1. Which of the following best describe renewable resources?
   A. Substances that can be regrown or replaced over a period of time.
   B. Resources that can be used quickly and cannot be replaced.
   C. Anything that can be found outdoor.
   D. Materials that can be recycled.

2. Which of the following natural resources are usually used by powering homes especially in remote areas?
   A. Biogas B. Biomass C. Fossil fuel D. Solar cells

3. Which of the following is not part of a fossil fuel?
   A. Coal B. Oil C. Petroleum D. Dry cell

4. Which is not true about natural resources?
   A. It is anything that can be classified as renewable and non-renewable.
   B. It is anything that come from nature and people can use it.
   C. It is any substance that can be recycled for further use.
   D. It is anything limited to factory usage.

5. Which of the following is an example of a non-renewable resource that can be found at home?
   A. Coal B. Furniture C. Rubber D. Wood

6. Any organic materials that are burned directly to provide heat and energy are called _____.
   A. Biogas B. Biomass C. Fossil fuel D. Solar cells

7. It refers to the process of obtaining heat or energy from a large body of water.
   A. Biomass B. Fossil fuel C. Geothermal D. Hydrothermal

8. It is a natural resource that can be found inside our home and can be used by cars, flashlights, and other materials.
   A. Battery B. Coal C. Electricity D. Gas

9. Which of the following is an example of combustible material formed from decayed plants and converted into another formed that can be used in cooking?
   A. Coal B. Fuel C. Gas D. Rubber

10. It is produced by the anaerobic decomposition of organic materials brought about by certain varieties of bacteria.
    A. Biogas B. Biomass C. Fossil fuel D. Solar cells

Additional Activities

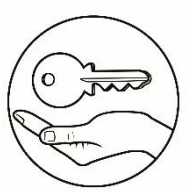
Directions: Answer the questions inside the thought balloon.

Why is the lesson important?

_____
_____
_____
_____
_____
_____

Where can I use the concepts that I learned?

_____
_____
_____
_____
_____
_____
_____



Answer Key

What I Know

1. Natural Resources
2. Fossil fuel
3. Non-renewable
4. Solar cells
5. Renewable
6. Battery
7. Biogas
8. Biomass
9. Coal
10. Hydrothermal

What's New

*Answers may vary

Renewable	Nob-Renewable
Wood	Cement
Solar cells	Bricks
Card board	Metals
Sunlight	Crude oil
Wind	Batteries

What is It

Natural Resources	Renewable or Non-Renewable	How to conserve
Sun	Renewable	- install solar panels
Trees	Renewable	- use paper wisely, plant trees
Fuel used by vehicles	Non-Renewable	- drive smoothly
Electricity	Non-Renewable	- unplug devices when not in use

What's More

*Answers may vary.

Natural Resources	Advantages	Disadvantages
1. Coal	• can be used in cooking	• quite dirty • uncontrollable temperature
2. Animal Manure	• improves soil fertility • improves the water and nutrient holding capacity of the soil	• Inconvenient to handle and store
3. Solar panels	• reduces electricity bills • low maintenance costs	• expensive to purchase • weather dependent

What I Can Do

*Possible answers

- ✓ Environmental pollution is reduced up to 30%
- ✓ The Earth recovered from degradation

Assessment

1. A
2. D
3. D
4. D
5. A
6. B
7. D
8. A
9. A
10. A

References

Books

1. Physical Science for Senior High School, author: Helen E. Caintic, Ph. D.

2. An Introduction to Physical Science, Rex Book Store Inc., 2016

Websites

https://www.solarschools.net/knowledge-bank/energy.convertion

https://www.solarschools.net/knowledge-bank/energy/sources

https://www.renewableresourcescoalition.org/alternative-energy-sources

https://www.yourhome.gov.au/energy/renewable-energy

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