

Miners want to explore ocean's deep floor for precious rocks and minerals



Coral reefs grow in the waters of Tatawa Besar, Komodo, Indonesia, April 30, 2015. Rising demand for copper, cobalt, gold and rare-earth elements vital in manufacturing smartphones and other high-tech products is causing a prospecting rush to the dark seafloor thousands of feet beneath the waves. Photo: AP/Dita Alangkara, File

KINGSTON, Jamaica — The deep oceans cover more than half the globe. The freezing water contains valuable treasures in the form of rocks and minerals. They have never been touched by humans.

However, this might all be about to change. Experts believe we are entering a period of deep seabed mining. Machines will be going under water to dig out some of the precious rocks and minerals.

Scientists will use robots to collect minerals from the sea floor. Copper, cobalt and gold are all valuable minerals. They are used to make smartphones and other high-tech products. The undersea materials are needed because there are no longer enough of them on land.

Some People Say Oceans Should Be Protected

A group called the International Seabed Authority, or ISA, is in charge of the underwater world. It has been giving governments and companies permission to explore under the oceans. This has worried conservationists, or people who care about taking care of the environment. They believe the ocean's natural state must be protected. They also say not enough is known about the risks of pulling minerals from their natural settings.

Michael Lodge works at ISA. He says there has been a lot more undersea exploration in the last five years.

ISA is in charge of seabeds, or ocean floors, outside of the waters that surround a country. So far, it has given out 27 permits for undersea exploration, mostly since 2011. The permits are good for 15 years. They allow governments or companies to explore in the Pacific, Atlantic and Indian Oceans.

Robots Would Dive Deep To Collect Minerals

Governments and companies have been moving quickly to join the exploration. Some experts believe deep-sea mining could start within the next five years. That means robots would be sent under water to collect the crushed minerals. The minerals would then be sent up through pipes and onto ships.

Last month, a group of scientists asked ISA to stop giving out new mining permits. The group said it wants to protect some underwater areas first.

Matthew Gianni works at the Deep Sea Conservation Coalition. He said that before any mining is allowed, experts need to really understand how it will affect the environment.

So far, most of ISA's permits have been given for a large area of the Pacific Ocean near Mexico and the United States. The area is known to be rich in copper, cobalt and manganese. As part of a plan to help the environment, miners are not allowed to touch some of the areas.

Scientists also want to explore the Western Pacific, Atlantic and Indian Oceans. ISA thinks one of those areas could provide up to one-fourth of the world's cobalt, which is a metal.

Scientist Warns Work Should Go Slowly

"The concentrations of minerals that you find in the seabed are very much richer than what's left on land," ISA's Lodge said. "So demand is only going to increase."

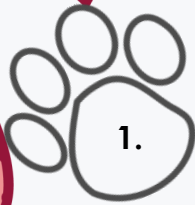
Douglas McCauley is a scientist at the University of California in Santa Barbara. He thinks the world is nearing a revolution in undersea exploration, and he is worried about its effect.

"(It looks) uncomfortably similar to what we did to land in the 1700s and 1800s," McCauley said. He added that when people began to mine and build on land, more and more types of animals died out.

Still, there are certain things people can do to approach seabed mining intelligently. First, he said, miners should learn what plants and animals are down there before we mine. Second, ISA should go slowly on mining permits and study the effects of mining as it is happening. Third, ISA should set up systems of protected areas before, not after, mining starts.

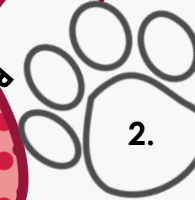
"You can't really blame people in the 1700s for the damage they did to the environment," McCauley said. "But we certainly are to blame if we don't do seabed mining properly."

Read It!



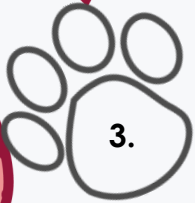
1. Why are undersea materials such as copper, cobalt and gold needed?

Read It!



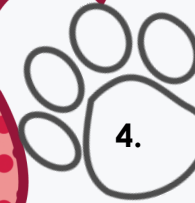
2. How would the minerals be mined from the bottom of the ocean?

Read It!

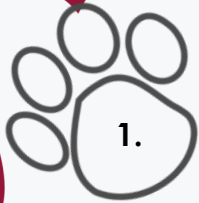


3. According to the article, what is the definition of a *conservationist*?

Read It!



4. When more and more people mined on land in the 1700s/1800s animals die out. What do you think could happen as a result of mining undersea?

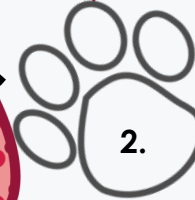


Watch It!

Go to the following Brainpop Video:

<http://tinyurl.com/gqng9q>

1. Click Play on the video.
2. Answer questions from Cards #2-8 on your lab sheet.



Watch It!

Why are trees considered natural resources?

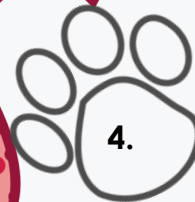
- A. They provide valuable shade that no other resource can provide
- B. Humans can use them to produce paper, lumber, fuel and other products.
- C. They are an important source of firewood for campfires.
- D. They grow back after they are cut down



Watch It!

Which of these is a true statement about natural resources?

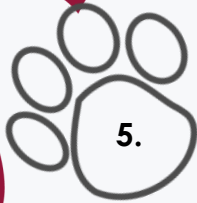
- A. Someday, humans will run out of fossil fuels.
- B. Using wind energy will make us feel better about ourselves.
- C. As soon as they're available, everyone should drive solar-powered cars.
- D. Fuel cells are the most important technology we've ever developed.



Watch It!

Why isn't glass a natural resource?

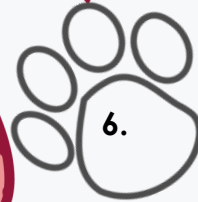
- A. It isn't used by humans
- B. It's nonrenewable
- C. It isn't found in nature
- D. It has a limited number of uses



Watch It!

Why is wind energy considered a renewable natural resource?

- A. It can be found in a variety of places.
- B. It is completely non-polluting.
- C. The wind can blow incredibly fast.
- D. It is unlikely that we will run out of wind.



Watch It!

How does recycling conserve natural resources?

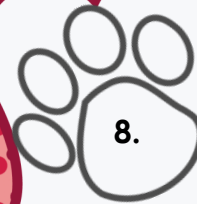
- A. It allows us to re-use products instead of manufacturing new ones.
- B. It prevents garbage from being burned.
- C. It saves on the amount of fuel used by garbage trucks.
- D. It saves the amount of plastic used to make garbage bags.



Watch It!

Which of the following is the most sensible way to conserve natural resources?

- A. Stop using electricity entirely.
- B. Bike or walk to school instead of riding in a gasoline-powered car.
- C. Never use any products made from trees.
- D. Never ride in a car.



Watch It!

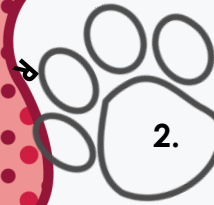
Which of the following is a key difference between renewable and nonrenewable resources?

- A. All non-renewable resources pollute the environment; renewable resources don't
- B. Non-renewable resources exist in unlimited quantities; renewable resources don't
- C. Non-renewable resources exist in limited quantities; renewable resources don't



Explore It!

1. Go to the following site:
<http://tinyurl.com/h72p5bx>



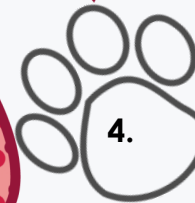
Explore It!

2. Click on Northwest Recycle City. Choose the house. List at least 3 things that should NOT be thrown away with the regular garbage.



Explore It!

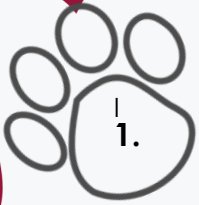
3. Click on the Auto Wreckers and explore. What are some ways cars are recycled?



Explore It!

4. Go to Southwest recycle city. Find the school. Click inside the classroom and define reduce, reuse and recycle (in your own words-paraphrase)

Assess It!



1.

If on an iPad, go to the **Socrative**

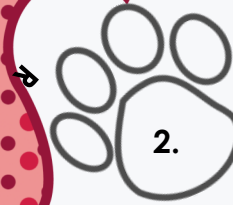
Student APP, or go to www.socrative.com.

Input the Room Name: **MsDudek** then put your last name, first name to begin taking the quiz.

Once you finish, you may sign out of the app.

Make sure to write down your answers on your sheet so you remember what you put!

Assess It!



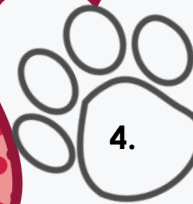
2.

Assess It!

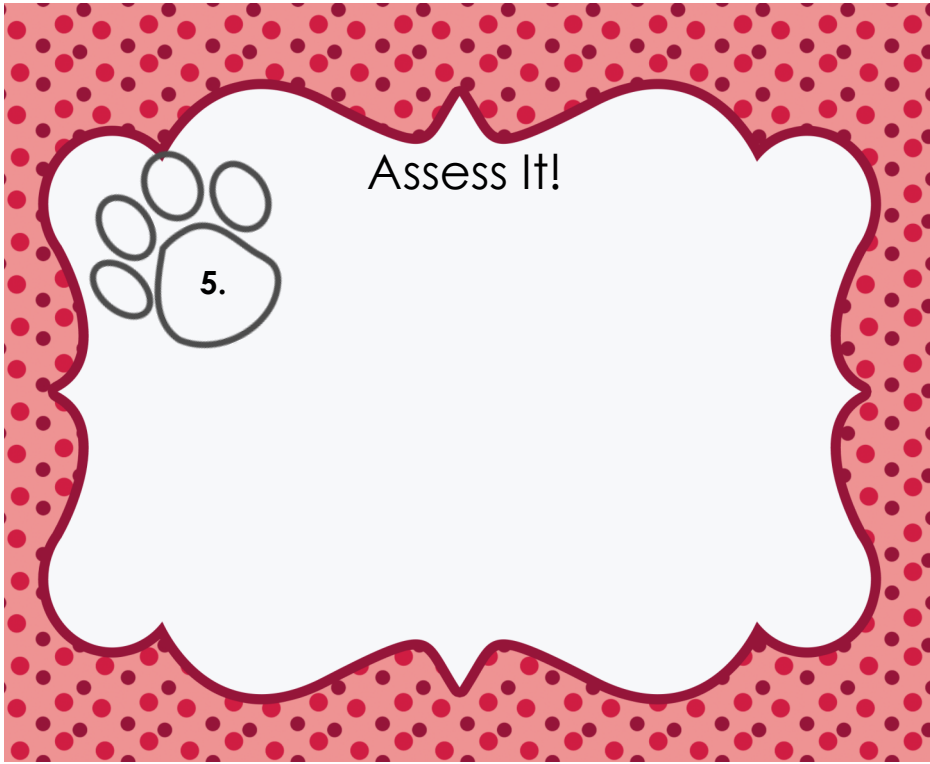


3.

Assess It!



4.





Research It!

Using the internet, research each of the following alternative energy sources: hydroelectric, solar, geothermal, nuclear, and biomass--- Write a brief description of each one on your lab sheet, and identify which are renewable and which are nonrenewable.

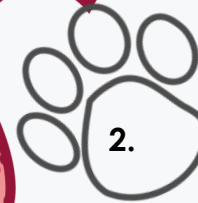
Illustrate It!

There are three main types of fossil fuels. Draw a picture or symbol for each one, and label whether it is a solid, a liquid or a gas.



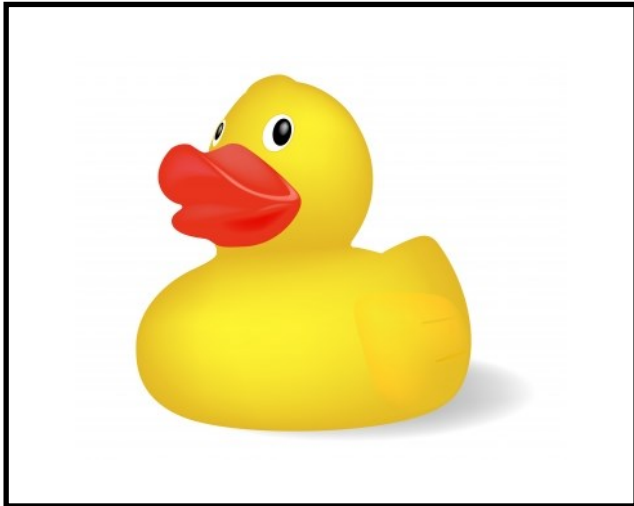
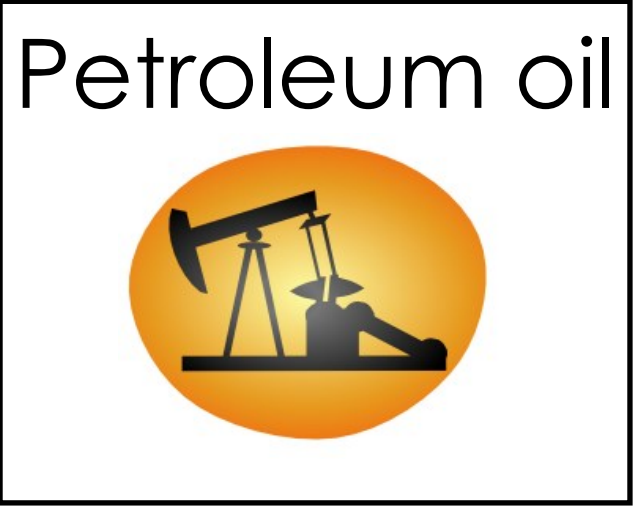
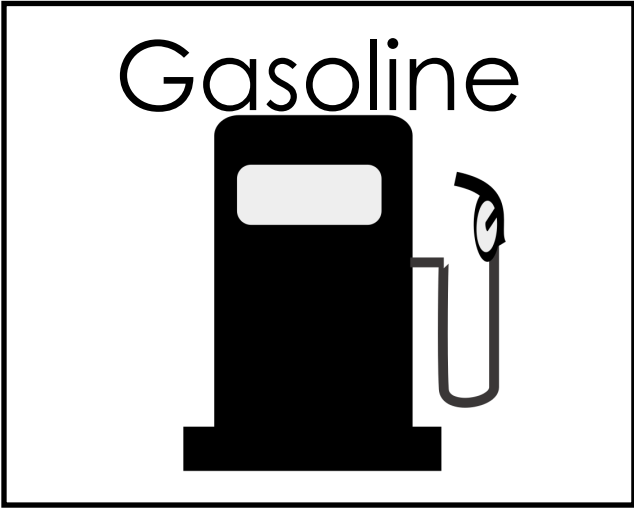
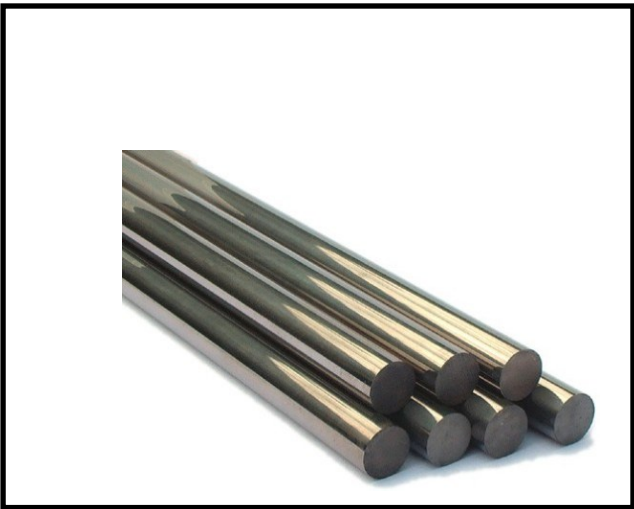
Write It!

Think about your day. Starting when you wake up in the morning, describe all of the natural resources you use from the time you wake up to the time you arrive at school.



Write It!

What is the main difference between a renewable and a nonrenewable resource?





Marble



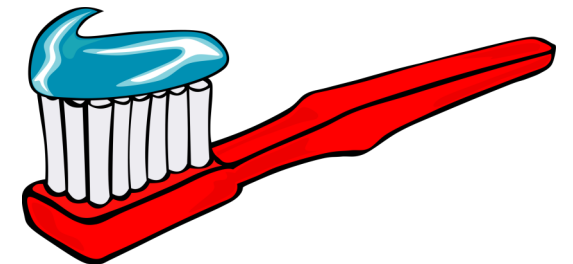
coal



limestone



© geology.com



Sugar cane



salt



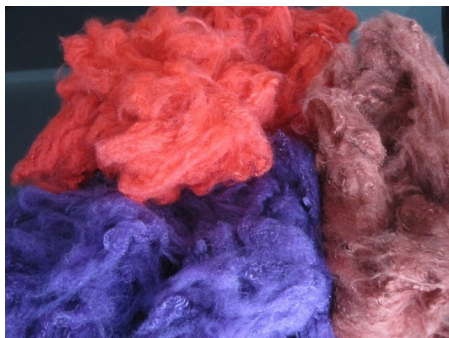
clay



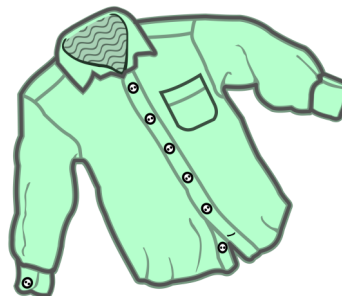
halite



polyester



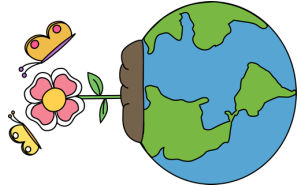
shirt



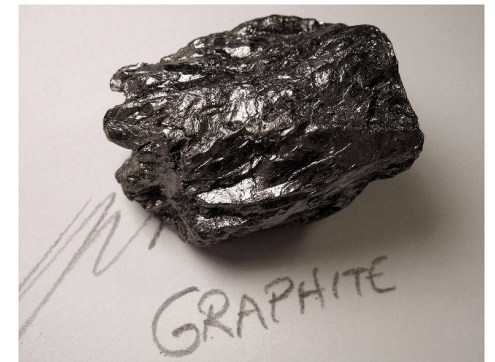
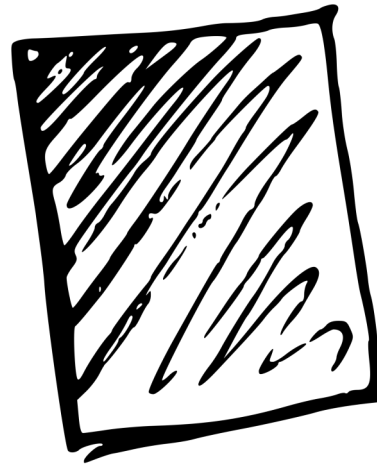
cotton



Natural Resources



Manmade Resources



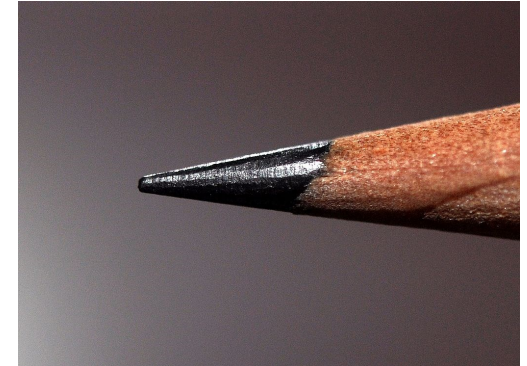
Renewable



leather



Nonrenewable



Name: _____ Class: _____ Date: _____

Input Stations

Explore It!

Task Card 2:



List of items you can't throw in the trash:

Task Card 3:

Ways cars are recycled :

Task Card 4:

Word	Definition
Reduce	
Reuse	
Recycle	

Read it!

1.

2.

3.

4.

Watch It!

View the Brainpop Video and answer questions on task cards 2-8.

_____ 2. _____ 4. _____ 6. _____ 8.
_____ 3. _____ 5. _____ 7.

Research It!

Task Card 1:

Type of Energy	Description	Renewable? (Y or N)?
Hydroelectric		
Solar		
Geothermal		
Nuclear		
Biomass		

Output Stations

Write It!

Task Card 1:

Task Card 2:

Output Stations Continued

Illustrate It!

Don't forget to label your diagram!

Assess It!

- | | |
|----------|----------|
| _____ 1. | _____ 5. |
| _____ 2. | _____ 6. |
| _____ 3. | _____ 7. |
| _____ 4. | _____ 8. |

Organize It!

Teacher Initials:

Reflection: How did you do? What did you find easy? What mistakes did you make?