Albedo = Reflection

What happens when there is a large volcanic eruption

(2) The average length for the Earth's day

Effects of eruptions on weather patterns: How did they change your day?

Look at the diagram and discuss what type of surface has high albedo and which

The set of materials are on the next page.

- Concrete
- Asphalt
- Rocks
- Ice
- Grass

What is the low albedo?

How much is reflected?

Albedo = Reflection
Estimate Albedo

RECALL:

- the **albedo** of an object tells us how much sunlight the object reflects
- albedo is reported as a number from 0 to 1 (or as a percentage, from 0% to 100%)
- 0 means no sunlight that hit the object is reflected
- 1 means all the sunlight that hit the object is reflected

DIRECTIONS:

- In the box below, draw at least four things you observe
- Estimate the albedo of your four chosen things (they should be different – please do not estimate the albedo of four different rooftops)
- Use of color is encouraged
- You will have 20 minutes to complete your estimations – good luck and have fun!
Directions: Working with your partner, read through the story and fill in the correct words to complete your story about Earth’s Energy Budget. You may use your notes to help you.

When you’re finished, draw a model representing the energy input from the sun on the earth. Feel free to add any details and labels in order to help me understand you’re thinking.

Earth’s Energy Budget: Part 1

The input part of the earth’s _________ budget comes from _________. It provides _________ to the earth. It comes in _______ wavelengths called _________ light. Once the sunlight enters the earth system it can be _________ or _________. Reflected means _________ and absorbed means _________. A surface’s reflection is known as its _________ and is measured on a scale of 0 — ___. White has a _______ reflectivity; black has a _______ reflectivity. When something has a high albedo that means that it _________ a lot of light. When something has a low albedo that means that it _________ a lot of light.

How I see it.....
What do we have to do with climate change?

It may seem hard to believe that people can actually change the Earth's climate. But scientists think that the things people do that send greenhouse gases into the air are making our planet warmer. Once, all climate changes occurred naturally. However, during the Industrial Revolution, we began altering our climate and environment through agricultural and industrial practices.

The Industrial Revolution was a time when people began using machines to make life easier. It started more than 200 years ago and changed the way humans live. Before the Industrial Revolution, human activity released very few gases into the atmosphere, but now through population growth, fossil fuel burning, and deforestation, we are affecting the mixture of gases in the atmosphere.

Since the Industrial Revolution, the need for energy to run machines has steadily increased. Some energy, like the energy you need to do your homework, comes from the food you eat. But other energy, like the energy that makes cars run and much of the energy used to light and heat our homes, comes from fuels like coal and oil – fossil fuels. Burning these fuels releases greenhouse gases.

To perform many of these functions, you need to use electricity. Electricity comes from power plants. Most power plants use coal and oil to make electricity. Burning coal and oil produces greenhouse gases. Other things we do send greenhouse gases into the air too. The trash that we send to landfills produces a greenhouse gas called methane. Methane is also produced by the animals we raise for dairy and meat products. Whenever we drive or ride in a car, we are adding greenhouse gases to the atmosphere. And, when factories make the things that we buy and use everyday, they too are sending gases into the atmosphere.

When Do YOU Send Greenhouse Gases into the Air?

Whenever you...
- Watch TV
- Play a video game
- Use the air conditioner
- Listen to an iPod
- Turn on a light
- Use a hair dryer
- Ride in a car
- Microwave a meal

...you are helping send greenhouse gas into the air.

How could we change our habits to reduce the amount of greenhouse gases we send into the atmosphere?
Carbon Dioxide and the Greenhouse Effect

The greenhouse effect is important. Without the greenhouse effect, the Earth would not be warm enough for humans to live. But if the greenhouse effect becomes stronger, it could make the Earth warmer than usual. Even a little extra warming may cause problems for humans, plants, and animals.

Carbon dioxide is currently responsible for over 60% of the enhanced greenhouse effect. This gas occurs naturally in the atmosphere, but burning coal, oil, and natural gas releases the carbon stored in these fossil fuels at a faster rate. In addition, deforestation, or cutting down trees to make more space for farms and homes, changes the amount of carbon dioxide in the atmosphere. Trees, like all living organisms, are made mostly of carbon; when forests are burned to clear land, the carbon in the trees is released as carbon dioxide.

Carbon dioxide produced by human activity enters the natural carbon cycle. Many billions of tons of carbon are exchanged naturally each year between the atmosphere, the oceans, and land plants. This exchange is known as the carbon cycle. The exchanges in this natural system are well balanced; carbon dioxide levels appear to have varied little for 10,000 years before 1800. In the last 200 years, however, levels of carbon dioxide in the atmosphere have increased more.

Adapted from *Climate Change Information Kit* and *Climate Change 101: Science and Impacts*.
Action Notes #4

The level of ________________ in the atmosphere have increased, causing the earth’s temperature to rise.

One GHG in particular, ________________ has steadily increased over the past century largely due to ________________ activity.

Mitigation means:
   a) to make less or reduce
   b) to increase
   c) to keep the same

Mitigation Strategies:

What are four areas where we can reduce emission?

1) 
   one way to do this is to:

2) 
   one way to do this is to:

3) 
   one way to do this is to:

4) 
   one way to do this is to:
What is a greenhouse?

How does a greenhouse work?

What is the greenhouse effect?

What are the main greenhouse gases in the atmosphere?

How do greenhouse gases contribute to global warming?

What do higher temperatures around the globe cause?

What would happen if there were no greenhouse gases?
A building made out of glass that keeps very warm inside allowing plants to grow, even if it’s cold outside.

The glass walls allow the sun's rays in but prevent the heat from getting out.

The Earth's surface and atmosphere stay warm when gases in the air trap heat from the sun.

* water vapor
* carbon dioxide (CO2)
* methane
* nitrous oxide

They raise the average global temperature
Climate Change

The whole planet would be much colder