

# Energy Transfer in Nature

Real World Energy  
Learner Worksheet Answer Key  
Grade Level: 9-12

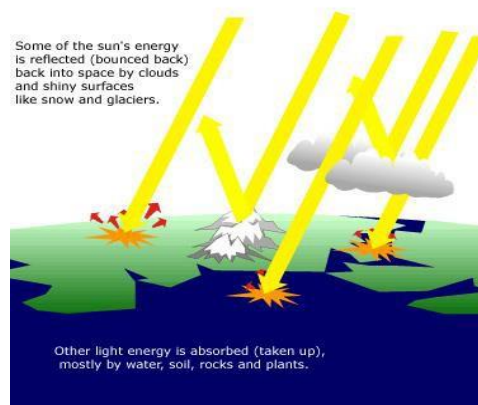


Name:

Read the energy transfer in nature backgrounder to answer the following questions.

## 1. Draw the Earth's energy budget. Label your diagram.

The amount of sun's energy that is absorbed (taken up), reflected (bounced back) and emitted (given off) by the Earth is called the earth's energy budget.



## 2. What is the role of greenhouse gases in the global energy budget?

The role of greenhouse gases in the global energy budget is to trap the heat in the atmosphere.

## 3. What is the role of ocean currents in the transfer of energy in nature?

Ocean currents transfer warm water from the equator towards the poles and cold water from the poles to the equator.

**4. Explain what a food chain is. Chart the transfer of energy in a food chain.**

A food chain is a chain of organisms (plants, animals) that eat and are eaten. Transfer of energy in a food chain.

**5. If the doors, vents, and windows of your classroom were sealed, what would happen to the concentration of carbon dioxide in the air?**

The carbon dioxide concentration would increase if the doors, vents, and windows of your classroom were sealed because the number of sources for CO<sub>2</sub> in the room far exceeds the sinks.

**6. If you knew the room would soon be sealed, with everyone inside, with no ventilation, and no escape, what could you do to prevent everyone from suffocating?**

If you knew the room would soon be sealed, with everyone inside, with no ventilation, and no escape, the room would have to be turned into a giant greenhouse, and filled with green plants to absorb CO<sub>2</sub> emitted by the people. The amount of carbon absorbed by the plants would have to equal the amount of carbon emitted by the animals.

**7. What do you think would happen if all naturally occurring greenhouse gases present in the atmosphere were suddenly removed?**

If all naturally occurring greenhouse gases present in the atmosphere were suddenly removed the Earth's global temperature would be a lot colder (33 degrees Celsius colder).

**8. Select one item from the list below. Evaluate the possible environmental, social and economic impacts that climate change may cause for the item you selected.**

- Land
- Atmosphere
- Water

Answers may vary.

Land: Learners should outline the following: plants unable to adapt to climate change, resulting in loss of plant species that also results in loss of habitat for animal species; more extreme weather, resulting in more drought, floods, severe storms; plants become more susceptible to disease; loss of landmass due to increased coastal flooding from melting ice caps.

Atmosphere: Learners should outline the following: loss of plants would continue to increase carbon dioxide levels in the atmosphere; changes in climate would affect ocean and air currents which would affect weather resulting in more extreme weather; changes in weather would affect plant and animal species both on land and in water.

Water: Learners should outline the following: global warming would melt more ice caps, increasing the amount of water in oceans, resulting in coastal flooding and changes in ocean temperature and currents; increase in temperature would affect plant and animal species in the oceans, especially plankton.

Learners should emphasize that all changes are predictions based on modelling. We know a lot about the interactions between Earth's energy budget and ocean and air currents, but we do not know everything so it is hard to predict the outcomes. The outcomes could be much more drastic than anticipated or completely different if an interaction is not fully understood.

**9. Recommend an action you can take to reduce climate change.**

Answers may vary. The main focus should be on reducing the release of carbon dioxide into the atmosphere so the actions should result in reduced consumption of fossil fuels (coal, oil and natural gas).

Transportation is one of the largest contributors of greenhouse gases as well as electricity (especially if the electricity is generated from a coal thermal power plant) and natural gas usage.