

## Thinking About Systems

# Grade Level:

- 3
- 4
- 5
- 6

# Lesson Time:

45 minutes

### Objective:

Students will be able to understand how systems work by examining objects that work as a system.

### Preparation

Before going to the classroom, you will need to:

1. Contact the teacher to find out the length of the class period, as well as how many sets of materials you need to bring. Alert the teacher that this investigation is set up for groups of four.
2. Collect all the materials listed in the materials section and organize them into one Tool Bag for each group of four students
3. Collect any giveaways for the students, such as Earth system posters or bookmarks.
4. Run through the investigation yourself, just to see how long it takes. Adjust the timing to the class period, remembering that you will need time to introduce the investigation, clean up afterwards and re-set up for the next class (if you are working with more than one class).

### Materials:

Provide students, in groups of four, with the following:

- Poster paper
- Colored markers

For Instructional purposes:

- Overhead projector, transparencies and marker or chalkboard
- Objects with parts that work as a system (stapler, can opener, umbrella, nail clippers, tongs,

ballpoint pens, etc.)

- Flip chart or board and markers

### Purpose

A system is a group of related features or objects that are organized in some way. Different parts of a system interact with each other. This causes a system to function in some way as a whole. Every system has a driving force that makes it work. In any system, there can be a large number of parts and processes. Both are very important features of systems, and without either of them, nothing would happen. A system relies on all of its parts to function and will not function properly if some parts are removed. The way that Earth works is very complicated, but thinking of it as a system enables us to break it down into smaller pieces that are easier to explore and understand.

This investigation is designed to introduce the concept of a system and how that system's parts work together as a whole. This is an introduction to thinking of the Earth as a system.

### Safety

This investigation is considered generally safe to do with students. However, please review it for the specific setting, materials, students, and conventional safety precautions.

### Investigation Question

What is a system?

### What to do

1. **(2-5 minutes)** Ask your participants to name something that is a system. Record their ideas on the overhead or board. Ask them to explain why they think their suggestions are systems.
  2. **(2-5 minutes)** Divide the participants into groups of 3 or 4. Give each group an object, poster paper and markers.
  3. **(12-20 minutes)** Ask and allow each group to examine its object as a system. Here are some questions that they should answer (*you might want to write them on the overhead or board*):
    - What are its parts?
    - What is the energy that makes the system work?
    - What is the output of the system?
  4. **(5-10 minutes)** Ask groups to draw a diagram of their object on the poster paper and label its parts and what they do. They should explain what kind of energy makes the object work as a system and describe the output of the system.
  5. **(5-10 minutes)** When all the groups finish, ask them to hang their posters up in a gallery format. Each group can then present its poster or the participants can "tour" the gallery.
  6. **(2 minutes)** Thank students for their time and attention. You can leave giveaways behind for the classroom teacher to distribute.
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