

# Toying Around with a System

## Description

In this activity, students identify and describe the parts of a toy and determine whether it forms a system.

## Time Frame

1 lesson (45 minutes)

## Correlation to Texas Essential Knowledge and Skills

During this activity, students will be exposed to the following Texas Essential Knowledge and Skills:

**Note:** Some TEKS statements below end with a ; or *and* and nothing thereafter—this indicates that further TEKS statements follow but are not included here.

**(2.6) Science concepts.** The student knows that systems have parts and are composed of organisms and objects. The student is expected to:

- (A) manipulate, predict, and identify parts that, when separated from the whole, may result in the part or the whole not working, such as flashlights without batteries and plants without leaves;
- (B) manipulate, predict, and identify parts that, when put together, can do things they cannot do by themselves, such as a guitar and guitar strings;

**Note:** The TEKS listed here are the main content TEKS for this activity; however, this activity may also cover additional content and process skills included in other TEKS.

## Materials

Crayons or markers (1 package per student)  
Scissors (1 per student)  
Hole punch (6 per class)  
Cardboard, 6 cm x 6 cm square (1 per student and 1 for the teacher)  
String (1 meter per student and 1 meter for the teacher)  
Circular template, 6 cm in diameter (1 per student and 1 for the teacher)  
Systems poster (1 per class)

## Background Information for the Teacher

The natural world is made up of large and complex systems. These systems are made of individual parts that work together to form a whole. Students, like scientists, learn to understand complex systems by investigating simple systems. Students can analyze simple toys, plants, and themselves to see how the parts of these systems function. The explanation of these simple systems enables students

to understand the more complex systems in their everyday world, such as the school, the playground, and the community.

### Advance Preparation

1. Cut a 6-centimeter by 6-centimeter cardboard square for each student and one for the teacher.
2. Cut a 1-meter length of string for each student and one for the teacher.
3. Prepare a circular template 6 centimeters in diameter for each student and one for the teacher.
4. Make a whirligig to use as a model. Follow the directions in the Procedures section below. A good example of how the finished whirligig should look is available at [www.stratfordhall.org/whirligig.html](http://www.stratfordhall.org/whirligig.html).
5. Prepare a systems poster by writing the following questions on one side:
  - Can a toy be a system?
  - What are its parts?
  - What is the function of each part?
  - Can a part of this system be removed that does not change how the system functions?
  - Can a part of this system be removed that changes how the system functions?

### Procedures

1. Give each student a piece of cardboard, a circular template, and a string. Have students use the circular template to trace the circle on the cardboard. Students should then cut out their circles and decorate them using markers or crayons. Tell students to punch two holes, at least 2.5 centimeters apart, near the center of the circle. Students should thread the string through the holes and knot the two ends together.
2. Tell a student that this was once used as a toy by many children and was called a “whirligig.” Show students how to work the toy:
  - Place one finger in each end of the loops of the string.
  - Pull the string tight and turn hands to wind the string.
  - Alternately tighten and loosen the string to make it whirl.
3. Show students the systems poster. Discuss the questions on the poster:
  - Can a toy be a system?
  - What are its parts?
  - What is the function of each part?
  - Can a part of this system be removed that does not change how the system functions?

Can a part of this system be removed that changes how the system functions?

4. Display a different toy or apparatus, such as a stapler, pencil sharpener, printer, or computer. Ask the students the systems questions about the new items.
5. Have students record ideas or make drawings about what parts make up a system of their choice. They should indicate the function of the parts and consider what would happen if a part were removed.