

# Investigation Five – The Little Orange Rooster

## Standard V

Students will understand that the sun is the main source of heat and light for things living on Earth. They will also understand that the motion of rubbing objects together may produce heat.

## Objective 2

Demonstrate that mechanical and electrical machines produce heat and sometimes light.

## Intended Learning Outcomes

1. Use science process and thinking skills
3. Understand science concepts and principles

## Standard V

## Objective 2

## Background Information

Heat energy can be produced by mechanical and electrical machines and can sometimes produce light. Mechanical machines are those which do not use electricity, such as machines that use fuel (cars, lawn mowers), human strength (bikes, skateboards), or flowing water (water turbine). Classroom examples of mechanical machines include using scissors, a stapler, or a pencil sharpener.

Electrical machines include those which use electrical power and would have a plug or use batteries. Classroom examples include an overhead projector, electric pencil sharpener, computer, heat lamp, TV, or VCR.

## Pre-Assessment/Invitation to Learn

Ask students for some examples of heat sources – things that produce heat. Write them on the board. If machines are not mentioned, talk about some machines that also give off heat, even if they are used for something else. Has anyone ever felt the back of a computer? Sometimes that is warm. Light bulbs can get so hot that you could burn yourself if you touched one while it was still on.

Today we are going to hear a story about a Little Orange Rooster. While listening to the story think about all the machines that he and his friends use, and think if those machines would get warm or not.

## Instructional Procedure

1. Read the story of the Little Orange Rooster.
2. Discuss with students the different machines that they used. Some of those machines were mechanical; they had motors that used gasoline. Some of the machines were electrical; they were plugged in or used batteries.
3. Help students classify which were mechanical and which were electrical.

## Materials

- Little Orange Rooster story
- 1 slice of bread per student
- Heat Source Worksheet
- Food coloring
- 4 containers
- 2 cups of milk
- Toaster
- 1 paintbrush per student

4. Hand out the Mechanical and Electrical worksheet and instruct students to draw 4 examples of each type of machine.
5. Sometimes machines that produce heat also produce light. Have students complete the worksheet by drawing some mechanical and electrical machines that produce light as well as heat.

## Curriculum Extensions

### *Science –*

- Students can be challenged to make a list of as many mechanical and electrical heat sources as they can find, with extra credit being given to all students who make a list of at least 25 machines. (*ILOs 2, 3*)
- Students may choose to classify machines as those which give off a lot of heat and those which give off a little heat. They may also classify machines that give off heat but no light and those which give off heat and light. (*ILO 1*)

### *Language Arts –*

- Listen and demonstrate understanding by responding to the step directions. (*Standard I, Objective 1*)

## Assessment Suggestions

1. Have students complete the writing activity in which they fill in the words to the story.
2. Have the students draw a picture of their favorite electrical or mechanical machine in the following way:
  - a. Teacher will pour  $\frac{1}{2}$  cup of milk into four small bowls.
  - b. Put two drops of food coloring in each bowl (one color per bowl).
  - c. Have students use a clean paintbrush and paint a picture of their favorite machine on one side of the bread. The picture should only be outlined, so the bread won't get soggy. Then they will paint an "M" for "mechanical", or an "E" for "electrical", to show what type of machine it is.
  - d. Toast the bread in a toaster.
  - e. Spread with butter and jam if desired.

## Resources

### *Books:*

- *Science Books of Energy* by Neil Ardley (Dawn Publications)
- *New Way Things Work* by David Macaulay (Houghton Mifflin)

### *Websites:*

- [www.energyquestion.ca.gov](http://www.energyquestion.ca.gov)

## **Homework and Family Connections**

Encourage students to show their family how to make Machine toast (see Assessment Suggestion #2). Each family member must draw a different type of machine, and label it as mechanical or electrical.

# Little Orange Rooster

## By Annette Van Wagenen

Once upon a time in a very sunny land, the Little Orange Rooster found a grain of wheat. He excitedly ran to his friends and asked, “Who will help me plant this wheat?”

“What happens when it is planted?” asked Misty Mouse.

“What good is a little thing like that?” questioned Puffy Pig.

“I love to dig in the dirt,” growled Doxie Dog.

So the Little Orange Rooster allowed Doxie Dog to dig a hole in the ground. Misty Mouse dropped in the grain seed. And Puffy Pig asked a lot of questions.

The Little Orange Rooster explained how the sun is the center of our solar system. Solar means “connected to the sun.” Our solar system is made up of the sun and everything circling around it. Without the sun’s energy, Earth would be completely dark and freezing cold. Living organisms use heat and light from the sun. Plants need sunlight to make their own food. Animals cannot make their own food. They must eat plants or other animals in order to live.

“Well, I want some food,” snapped Misty Mouse.

“It sounds like somebody’s going to have to work to get us some food,” said Puffy Pig.

“Let’s getting,” suggested Doxie Dog.

The wheat seed was planted. Each day the four animals came out to watch the plant thrive in the summer sun. When it was large enough to harvest, the Little Orange Rooster asked, “Who will help me harvest the wheat?”

“What does it mean to harvest?” questioned Misty Mouse.

“I don’t think that sounds very fun!” stated Puffy Pig.

“Can I dig it up?” asked Doxie Dog.

So the Little Orange Rooster tried to explain about machines. “After crops are planted, there are many types of machines that help a plant get from the ground to the table.” Machines can be mechanical, electrical, or non-electrical. Mechanical machines can use burning fuel, human strength, flowing water, or even horsepower to provide energy. Electrical machines need electricity and usually plug into an electrical outlet or use batteries. We are going to take this grown wheat plant to the mill where it will be crushed and ground into flour.

So the four animals went off to Millie’s Mill to watch the wonderful machinery turn the grain into flour. When they brought the flour to the Little Orange Rooster’s house, he asked, “Who would like to help me make bread?”

“How do you make bread?” wondered Misty Mouse.

“Is it fun to make bread?” asked Puffy Pig.

“Can I dig in the dough?” asked Doxie Dog.

“Well”, said the rooster, “we can all help. We’ll an eggbeater to beat one of my freshly laid eggs. Let’s open the new can of yeast with the electric can opener. Then we’ll mix in the bread machine the flour, salt, oil, sugar, and milk with the yeast and egg. We’ll bake it in the oven and use the electric knife to slice it when it is cool.”

It was a bit challenging to have four animals measuring and baking the bread, but when it was all done and out of the oven, it tasted wonderful.



Name: \_\_\_\_\_

## Energy From the Sun

### Word Box

sunlight  
center

energy  
things

freezing  
mechanical

food  
electrical





Little Orange Rooster explained how the sun is the \_\_\_\_\_ of our solar system. Without the sun's \_\_\_\_\_, Earth would be completely dark and \_\_\_\_\_ cold. Living \_\_\_\_\_ use heat and light from the sun. Plants need \_\_\_\_\_ to make their own food. Animals cannot make their own \_\_\_\_\_. They must eat other plants and animals to live.

After the Little Orange Rooster \_\_\_\_\_ the wheat, he took it to the flour mill where it was ground into flour. There they used a \_\_\_\_\_ machine, which used flowing water for energy, to crush the wheat. Then they went home and used an \_\_\_\_\_ Machine, which was plugged in, to make the bread.



Name: \_\_\_\_\_

### Heat Sources

<b>Mechanical</b> 	<b>Electrical</b> 

<b>Also Gives Off Light</b> 