



Somewhere Over the Rainbow

Science

The house began to spin, and then Dorothy found herself over the rainbow and in OZ meeting characters made of straw and tin, of fur, green in color, magical, coming to understand a brand new world.

National Standards > Science

NS.K-4.4 Earth and space science (Grades K-3)

- Properties of earth materials
- Objects in the sky
- Changes in earth and sky

NS.K-4.2 Physical Science (Grades K-3)

- Properties of objects and materials
- Position and motion of objects
- Light, heat, electricity, and magnetism

NS.K-4.1 Science as inquiry (Grades K-3)

- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Kentucky: Science Standards > Scientific Inquiry

2. Students shall develop their abilities to apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living studies, and vocational studies to what they will encounter throughout their lives.

Scientific Ways of Thinking and Working (2.1) Grades K-3

2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

- Ask simple scientific questions that can be investigated through observations combined with scientific information.
- Use simple equipment (e.g., magnifiers, magnets), tools (e.g., metric rulers, thermometers), skills (e.g., classifying, predicting), technology (e.g., electronic media, calculators, World Wide Web), and mathematics in scientific investigations.
- Use evidence (e.g., observations, data) from simple scientific investigations and scientific knowledge to develop reasonable explanations.
- Design and conduct simple scientific investigations.
- Communicate (e.g., draw, graph, write) designs, procedures, observations, and results of scientific investigations.

Note: In this lesson students will explore the following.

SC-E-1.1.2 Objects are made of one or more materials such as paper, wood, and metal. Objects can be described by the properties of the materials from which they are made. Those properties can be used to separate or classify

objects or materials. (Attributes of objects, their parts and physical materials.)

SC-E-2.3.2 Weather changes from day to day and over seasons. Weather can be described by observations and measurable quantities such as temperature, wind direction and speed, and precipitation. (Physical make-up of rainbows and tornadoes.)

Ohio: Science > Scientific Inquiry

- Develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information.
- Communicate findings to others.

Benchmark(s) Grades K-2

- B. Design and conduct a simple investigation to explore a question.
- C. Gather and communicate information from careful observations and simple investigation through a variety of methods.

Benchmark(s) Grade 3

- B. Organize and evaluate observations, measurements and other data to formulate inferences and conclusions.

Note: In this lesson students will explore the following.

Earth and Space Sciences > Benchmark(s) Grades K-2

- C. Observe, describe and measure changes in the weather, both long term and short term.

Physical Sciences

Benchmark(s) Grades K-2

- A. Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.
- B. Recognize that light, sound and objects move in different ways.

Benchmark(s) Grade 3

- C. Describe the forces that directly affect objects and their motion.

Objective

Students will:

- Understand the concept of physical attributes.
- Use age appropriate processes of scientific inquiry and observation to explore phenomena as presented the production of The Wizard of Oz.
 - Ask questions (What do you think? How do you know?)
 - Gather and analyze information
 - Observe and make discoveries
 - Evaluate and conclude findings

Assessment

Students will be able to:

- Recognize physical attributes of phenomena.
- Generate and ask questions about various phenomena.
- Make observations for/from scientific investigations and report findings.
- Work in small groups to complete an investigation.
- Create individual conclusions about group findings.

Sample Items to gauge student understanding:

1. What is a question? (*to ask or find out about something*)
2. Scientists experiment to find out answers to questions. True or False? (*true*)
3. Describe the steps you take to find out about, or explore something. (*answer will vary according to student.*)

Vocabulary

- Attributes (characteristics)
- Physical properties (make-up or traits)
- Observation
- Scientific inquiry

Materials

- Learning stations to be set up at the teacher's discretion for students to explore the following phenomena.
 - A variety of objects made of various materials and textures for observation of physical attributes.
 - Prisms, mirrors, water and flashlights to explore the attributes and phenomena of rainbows.
 - Supplies to create a tornado in a bottle or jar.

Tornado in a bottle

- 2 2-liter clear plastic pop bottles
- 1-inch metal washer
- Duct tape
- Tornado tube
- Water

Tornado in a Jar

- Small jar
- Clear liquid soap
- Vinegar
- Water

See suggested Web Site for directions:

Weather Wiz Kids: <http://www.weatherwizkids.com>, or

National Geographic: <http://www.nationalgeographic.com/ng/kids>

Activity 1

Whole to Part, Part to Whole

Teacher will:

1. Introduce/review the concept for the terms, "attribute" and "traits" through emphasis and example of highlighting personal attributes of the students—color of their eyes, hair, type of shoes, age, height, etc.
2. Facilitate class discussion to address attributes/traits of the characters in story/play The Wizard of Oz, in regards to both personality characteristics and physical characteristics.
3. Explain to students their opportunity to visit three learning stations to explore the physical attributes of such objects and phenomena as straw, tin, fur, rainbows and tornados. (*Students will explore and observe how these things look, feel, move, and their physical makeup.*)

Station suggestions:

- Hands-on observation of the physical properties of multiple objects to explore and record observations of texture, shape, etc.
- Hands-on experimentation and recorded observation of lights rays bending and separating for the creation of a rainbow.— red, orange, yellow, green, blue and violet.
- Hands-on experimentation and recorded observation of a simulated tornado.

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4. Have available at each station a means for students to record their observations—pencil and paper, markers, observation sheet, tape recorder, camera, etc.
5. Assign and divide students into small groups for station rotation.
6. Regroup students (whole class) upon their rotations to discuss observations and address the question of why objects are made of different things. Question prompt: Would it be better for all things to be made of the same thing, why or why not? Is there reason to think in a similar way about characters in a story or play? Would it be better for all characters to act or be the same?
7. Instruct students to write or draw to summarize what they saw and experienced.

Students will:

1. Discuss how the characters from The Wizard of Oz all have attributes.
2. Observe and explore classroom objects that are made of different physical attributes, as provided in learning stations.
3. Recognize and identify the general attributes of objects, including the physical makeup of a rainbow and a simulated tornado.
 - a. Rainbow—light and colors
 - b. Tornado—water, air, funnel, vortex (whirlpool)
4. Participate in discussion to address what and how things are made; and how multiple characters are created.
5. Write a summary statement, or create a visual to reflect on their learning experience.