

# Insulator Lesson Plan

**Teacher**

**Date**

**School**

**SLE # PS.7.6.4: Investigate the transfer of**

energy in real world situations: conduction, convection, radiation

## **Objectives:**

**Content:** I will investigate the transfer of energy in real world situations: conduction, convection, and radiation.

**Language:** I will be able to use the terms conduction, convection, radiation, insulator, and conductor while working on the activity.

**Assessment:** Students will be assessed based on their completed graphic organizer, graph, and if their design functions.

**Technology/Materials:** Plastic or Styrofoam cups, ice, thermometers, graph paper (for graphing) various materials to use as insulation (felt, newspaper, AC/Heater filters, cloth, t-shirts, colored construction paper, white paper, Styrofoam, foam, wool, etc)

**Vocabulary:** conduction, convection, radiation, insulator, conductor

**Bloom's:**  Remembering  Understanding  Applying  Analyzing  Evaluation  Creating

**Questions:** Tell me what an insulator does. Tell me what a conductor is. What are some different real-world uses of insulators and/or conductors? Create a list of materials that would work as insulators. Create a list of materials that would work as conductors. Describe how you could keep a cup of ice cold for an extended period of time.

**High Yield Strategies:**  Identifying similarities & Differences  Summarizing & Note Taking  Cooperative Learning

Reinforcing Effort & Providing Recognition  Setting Objectives & Providing Feedback  Generating & Testing Hypotheses

Cues, Questions & Advanced Organizers  Homework & Practice  Nonlinguistic Representations

## **Instructional Strategies:**

**Pre-Activity:** Fill a bucket or cooler with ice to use in the activity. Gather the various materials to be used in the activity. A suggestion would be to cut the materials into manageable pieces. You may choose to use other materials than what is listed.

**Engagement:** Activate prior knowledge by asking questions above. Create a class list of materials that would work as insulators and/or conductors. Show the class the different materials that they could use during the activity.

**Exploration:** Distribute Plastic or Styrofoam cups of ice to students. (You may choose to use either cup. Using the plastic cups allows for students to use the Styrofoam cups as a variable in the activity.) Tell them that their task is to use the materials provided or any materials in the room to help keep their cup of ice the coldest. The students will need to take temperature readings every 10-15 minutes (or any increment you choose) to graph later.

**Explanation:** While the students are working, walk around the room asking students probing questions such as "Tell me about your theory of using the materials you are using. Describe what you believe will happen to keep your cup cold. What are some factors that may be influencing your results? Predict your final temperature. How could this be applied to the real world?"

**Elaboration:** Allow students to try the experiment again using different materials to see if they will work better.

**Intervention Strategies:** Remodel as needed, walk throughout the room facilitating

**Accommodations & Modifications (IEPs)** See individual IEPs. Group as needed, shorten assignment, allow for pictorial representation instead of writing assignment.

**Evaluation:** Students should finish collecting data and graph their results. The students could also draw a sketch of their cup with the materials that they used as insulators. Allow students to share their results and graphs with the class. Have students share out any ideas of how to improve their designs.

**Closure:** Have the students write or discuss the following questions:

- Which materials kept the ice the coldest?
- Which materials did not keep the ice cold?
- Describe the method you used to develop your insulated cup.
- Create a list of real world applications of insulators or conductors.

**Homework:** Have students go home and create a list of insulators and conductors in their home.

Interdisciplinary Items Included: Math (graphing)