



Lighting a Snow Globe

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Target Grade: 3rd grade

Time Required: 60 minutes

Standards:

1-PS4-3: Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

Lesson Objectives:

Students will:

- Design his/her own snow globe to test how a beam light will travel through it.
- Compare how the light travels through different materials
- Compare how the light travels through peer's snow globes vs. his/her own.

Central Focus:

In this lesson students will learn about how light travels through the air. They will examine different objects and record what the beam of light does as it hits the object such as a mirror, cookie paper, and snow globe filled with water.

Background Information:

Some materials allow light to pass through them, others allow only some light through, and others block all the light and create a dark shadow on any surface beyond them (i.e., on the other side from the light source), where the light cannot reach. Mirrors and prisms can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.)

*Note, this lesson uses a hand held laser. Have a discussion with students about safety measures to take and monitor students carefully.

Materials

- Mason Jar
- Laser light
- Flash light
- Glue



- Tape
- Sparkles
- Water
- Baby oil
- Sparkle
 - Dust
 - Large
 - Small
- Sequins

Instruction

Introduction

Step 1. The teacher will start the lesson off by having the students watch a [Bill Nye video](#) on the light waves and how they travel.

Step 2. The class and the teacher will discuss the main points about what objects light can travel through and objects that it can't pass. The teacher will write a T-chart on an anchor chart and record the class ideas.

Step 3. Explain to the class that today they will be experimenting with different objects and a laser to see how the light reacts when it hits the surface.

Guided Practice:

Step 4. Pass out sticky notes to the class and instruct them to label the words Foil, mirror, clear glass plate, cookie sheet. Hold up one object at a time and tell them to predict if the light what the light will do when it hits the object. After giving them time to predict demonstrate what the light does as it hits the object. Have the students record the actual action on their sticky notes.

Step 5. Instruct to the students that they are going to get a mason jar and construct a model to experiment how the light passes through their snow globe. They get to choose what to fill in their mason jar and then record and draw how the light passes through it. They will then compare and experiment with 3 other peer's snow globes to see how different materials affect the light pattern.

Activity:

Step 6. Students will have access to all the materials lined up on the back table. They will record their plan on their data sheet before building their model. When their snow globe is finished they will get the laser from the teacher and shine it aimed at their snow globe. They will draw what the light does when it hits their snow globe on their data sheet.



Step 7. When the students finish their experiment, they will rotate around the room and choose 3 peers who have different objects filled in their snow globe. They will shine the laser and a flash light through them and record what happens on their data sheet.

Closure:

Step 8. Ticket out the door. Have students write one thing light can travel through. One thing that makes light bend, and one think light cannot pass through.

Differentiation

Students get to choose what materials will make up their snow globe, thus differentiating their results. They will get to walk around and test their peers snow globes to get different perspectives on different materials.

Assessment

Formative:

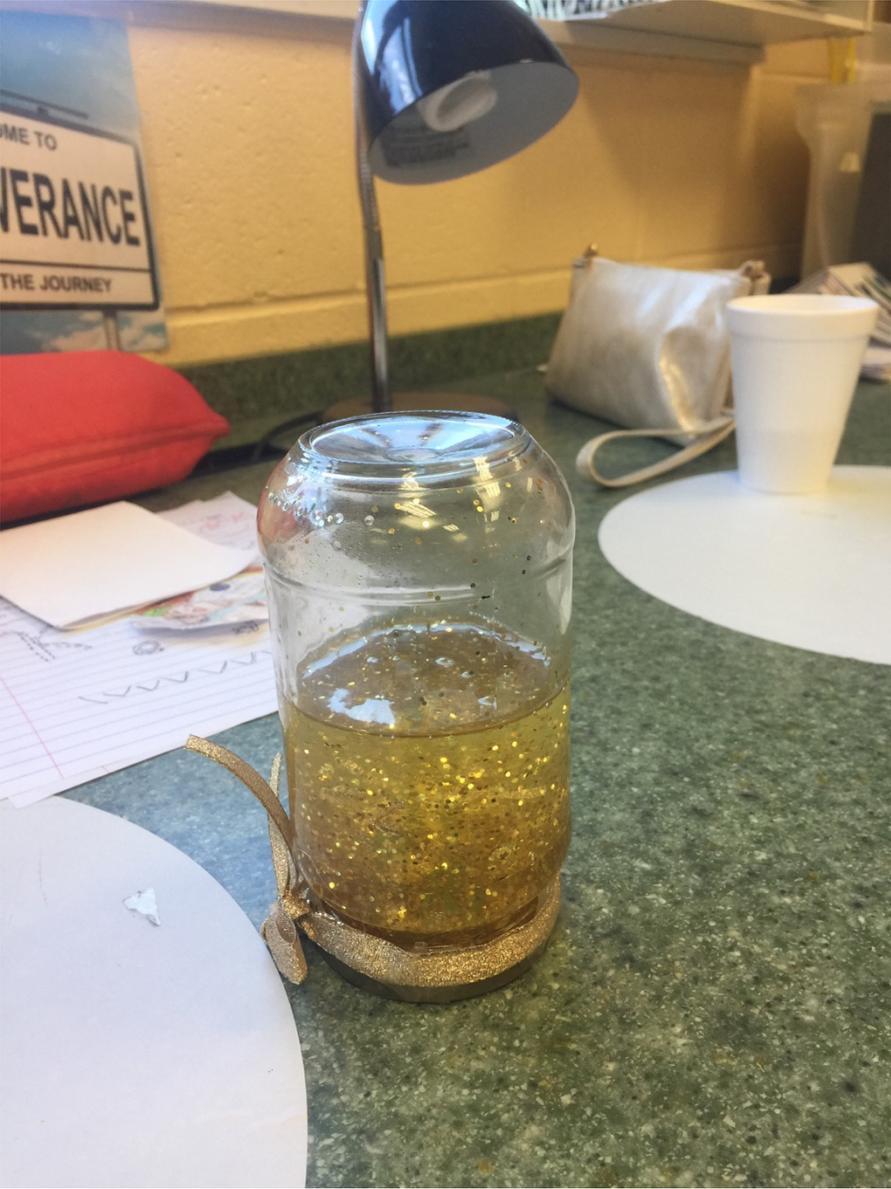
The ticket out the door will serve as an assessment to see if the students have met the overall objectives.

Summative:

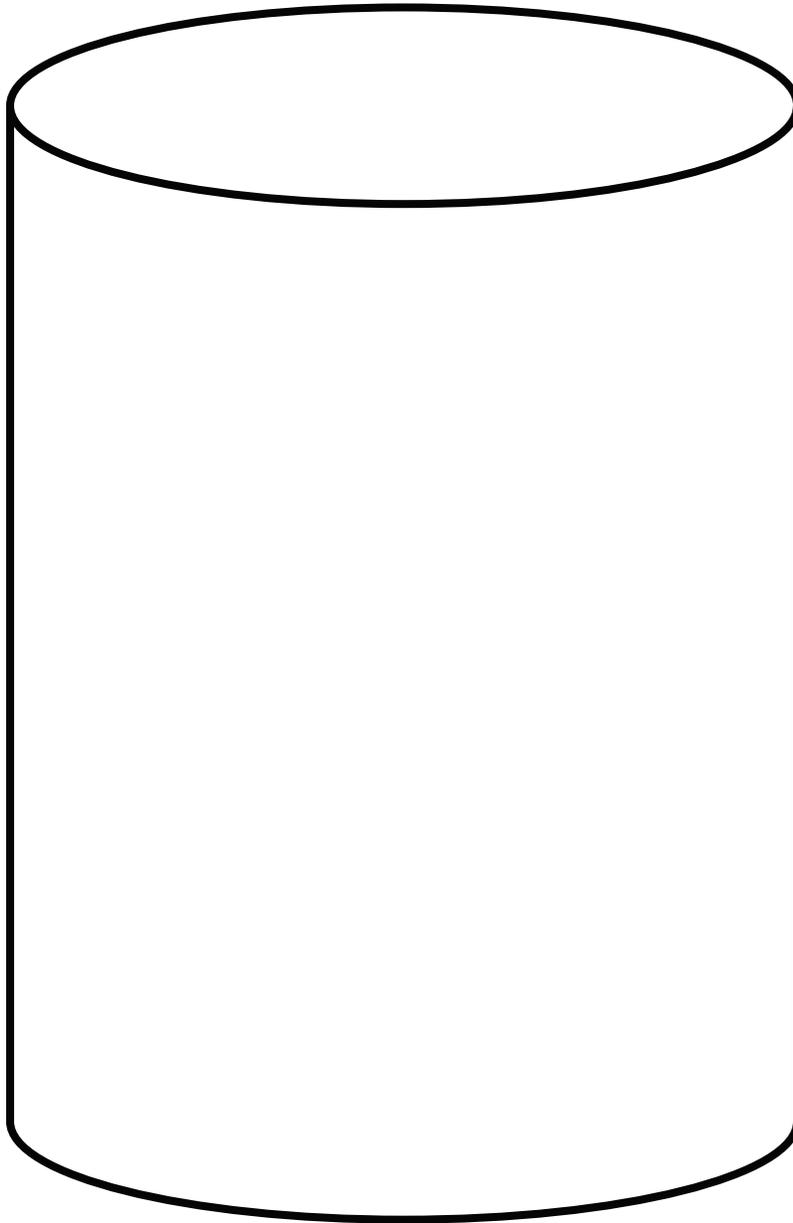
The data sheet can be collected as a class grade to ensure the students did their work and understand the way light travels.

5 Dimension 3: Disciplinary Core Ideas - Physical Sciences." National Research Council. 2012. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press. doi: 10.17226/13165.

Snow Globe example



Draw the colors and objects you have in your snow globe. Write the materials used on the side. Draw how the light goes through your snow globe and the material. Explain why.



Materials inside my snow globe:

Explain why you think the light traveled the way it did

Draw and list the materials in the snow globes from around the room. Draw how the light travels through the object. Explain why you think this is happening.

