

Pass It On

Grades 2-3

Overview

As a whole group the students will observe energy being transferred from one thing to another. The students will explore energy by doing the Flick a Nickel Trick and building Mini-Movies and Spinners.

Objectives

- To help students understand that energy can be used in many ways.
- To help students understand that energy can't be destroyed. When something loses energy, it is either transferred to something else or changed into another kind of energy.

Materials

For the presenter:

- 7 nickels
- a sample of a Mini-movie & a Spinner (see pages 2 & 3)

For each pair of students:

- 7 checkers or nickels in a plastic sandwich bag

For each student:

- Two copies - 2" circles
- One - 3x5 recipe card
- 1 pencil
- crayons or markers
- 1 piece of string - 26 inches long
- 1 piece of sturdy cardboard - 3" x 3"
- scotch tape

Getting Ready

Activity 1

The whole group activity needs to be set up in an area where all the students are able to see. A large table that everyone could gather around would work well. Put seven nickels or checkers into each plastic sandwich bag. You will need one bag/checkers or nickels for each pair of students.

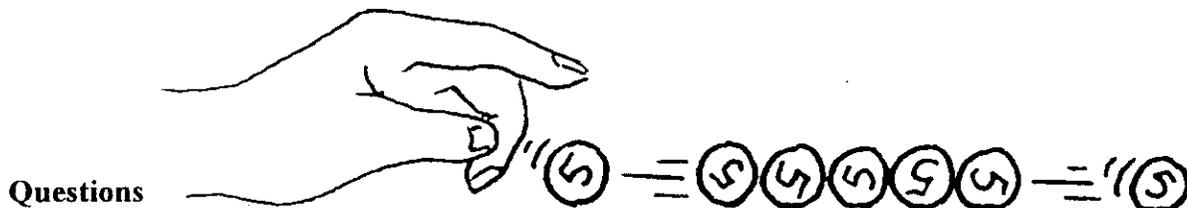
Activity 2

Draw 2 - 2 inch circles on a piece of paper. Run enough copies of the circles so each student has 1 copy of 2 circles. Put circles, cardboard, recipe cards, tape and string on a table that can be easily accessed by students. Make a sample of a Mini-Movie and a Spinner for demonstration.

Procedures

Activity 1: Flick the Nickel Trick

This activity is to be used as an introduction to energy. Use the trick and questions to get the kids thinking and spark their interest in energy. Begin by telling the students that today you are going to show them a trick called *Flick the Nickel*. As they watch you do it, ask them if they can figure out what caused the nickels to move. Line up six nickels on a table with a smooth surface. It is important that they are in a straight row and touching. Take the seventh nickel and put it about 2 nickel lengths away from the row of nickels. With your thumb and second finger, flick the seventh nickel at the row of nickels. When it hits the row it should cause the end nickel to move while the others remain in a row. Do this activity a couple more times, asking students to be the flickers. (Checkers are easier to use than nickels)



“What caused the seventh nickel to move? (*you flicked it with you finger*) Where did it get the *energy* to move? (*from you*) How did the first nickel move? (*When the first nickel hit the row of nickels they each passed on the energy to the last nickel and made it move.*) Do nickels have energy? (*no*) Then how can they move?” (*you passed your energy to them*) As soon as a student uses the word *energy*, write it on the chalkboard where you can refer back to it. Introduce the word to the students, if they don’t bring it up.

Have students return to their desks. Give each pair of students a bag with seven checkers or nickels to try the experiment for themselves. As you move around the classroom ask the student what they have observed. “Can you try flicking two nickels at once? Does it change what happens to the first nickel? Where are your nickels getting their energy?”

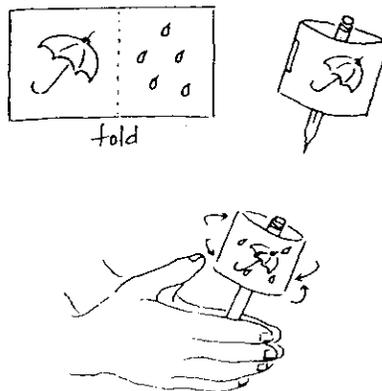
Before starting Activity 2, collect the bags of nickels or checkers.

Activity 2: Mini-Movies & Spinners

Tell the students that they are going to have a chance to make two different types of toys, a Mini-Movie and a Spinner, that also use energy that is passed on. They are called *thaumatropes* (*THO-ma-tropes*). Write the word on the chalkboard. Explain that they were toys that were made during the 1800’s. They let you see an object that is out of sight. An old-fashioned thaumatrope is usually just a round piece of cardboard with pictures on both sides. When the card is spun, both pictures blend into one. Your eye holds onto the first image for a split second after it’s gone. By the time the second picture is in sight, you seem to see the first picture on the second picture. This is what happens when you go to the movies. Use your samples to demonstrate how the Mini-Movie and Spinner work. Before handing out any materials, show the students how to make their own Mini Movies & Spinners. using the directions below.

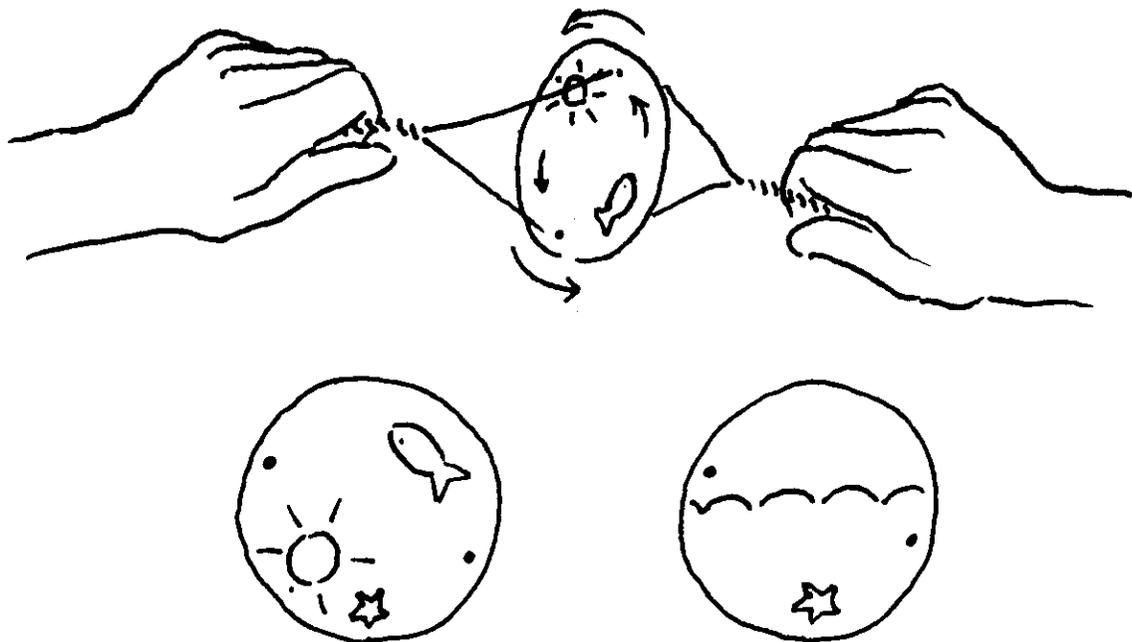
Mini Movies

1. Take a 3x5 index card and fold it in half.
2. Draw a different picture on each side. You will want to choose two simple things that go together. An example would be a lion & a cage or an umbrella & rain coming down.
3. Tape your pencil on the back side and in the center of one picture.
4. Now tape your card together on the side opposite the fold, so your pencil is inside the card. You have completed the thaumatrope!
5. Spin the thaumatrope by rolling the pencil between you hands.



Spinners

1. Cut out the two paper circles. Trace one circle on stiff cardboard and cut it out.
2. Think of two simple pictures that would make a colorful thaumatrope like you did on the Mini Movie. Draw one picture on the first paper circle and the other on the second paper circle. Make sure that the * (stars) are at the top of both pictures.
3. Glue the paper circles on opposite sides of the cardboard circle. Make sure that the dots and stars are opposite each other. Punch a hole where each dot is located. You may need to help the student with this so the circles don't rip.
4. Thread string through the holes. Tie the two ends of the string together.
5. Twirl the string with you fingers; once the string gets wound up, pull out on the string and the disk will spin. As this happens your movie will appear.



Hand out the materials to the students. As they are working, walk around the classroom and offer any help that is needed. Ask questions about their observations when they make their toys spin. “Where is it getting its energy from? What happens if you use more energy and move your hands faster? Do your toys have energy of their own or do they get it from somewhere else? Can you think of any other toys that may get their energy from somewhere other than people?” (*toys operated by batteries, wind-up cars, electric trains*)

Closure

Have each student hold up and demonstrate one of their finished toys. Ask the students: “Where does your Mini-Movie or Spinner get the energy to move? Can people pass their energy to an object and cause it to move?”

Clean Up

Each child is responsible for picking up their scraps and cleaning off their workspace.