

# Energy

## Its Forms, Changes, & Functions

### **Investigation #1** - Where Exactly Does Energy Go?

#### **Gather These Things:**

One ½ volt dry cell  
Five inch piece of electric wire  
Small wooden boards  
Assorted rubber bands — different thicknesses but same length  
One ½ volt light bulb  
Sandpaper  
Sturdy shoe

### **Investigation #2** - Stored or Active?

#### **Gather These Things:**

A few feet of pipe foam insulation (3/4-inch to 7/8-inch inside diameter, no thicker than 3/8 inches)  
Various sizes of objects to make hills (such as cans)  
Empty toilet paper or paper towel rolls  
Meter stick or measuring tape  
Scissors to cut insulation  
Marbles  
Tape  
Other creative supplies

### **Investigation #3** - Light: Reflected and Absorbed

#### **Gather These Things:**

Two small flat mirrors  
One large highly polished tablespoon  
Clothespins or other clamps  
Magnifying lens (convex lens)

#### **Investigation #4 - Light and Lenses**

##### **Gather These Things:**

Two convex lens (magnifying glasses)  
Candle  
Matches  
Glass of water  
Shallow (opaque) bowl of water  
Pencil  
Penny

#### **Investigation #5: - Waving the Red, Green, and Blue**

##### **Gather These Things:**

Projector or strong flashlight  
Prism or cut-glass object  
Metal slinky  
Red, green, and blue cellophane  
30 to 40 cm of string  
White poster or cardboard  
Red, green, and blue markers  
Clear tape  
Scissors

#### **Investigation #6 - Did You Hear That?**

##### **Gather These Things:**

Rubber band  
Tuning fork, if available  
Box with rubber bands from lesson #1  
Metal slinky

## **Investigation #7 - When Things Get Hot**

### **Gather These Things:**

Oven mitt  
Hot and cold water  
Two clear glasses  
Safety glasses  
Metal rod  
Modeling clay  
Matches  
Weather thermometer (Celsius)  
Timer or watch with second hand  
Food coloring  
Clear glass flask or bottle with narrow neck  
Tape  
Index card  
Clear drinking straw  
Pen or pencil  
Medicine dropper  
Red candle wax

## **Investigation #8 - Feeling the Heat**

### **Gather These Things:**

Two 12-oz Styrofoam cups  
One 8-oz Styrofoam cup  
Hottest tap water  
Cold water (refrigerated or iced)  
Long alcohol thermometer (not attached to backing)

## **Investigation #9 - Magnets Are Very Attractive**

### **Gather These Things:**

A tray filled with the following or similar items: a quarter, a penny, a steel washer, a brass bar, a feather, a plastic strip, a piece of aluminum foil, a strip of paper, a strip of wood, small flat glass mirror, and other items.

A horseshoe magnet or a bar magnet

Ruler

Stack of books

Tape

String

6-Volt battery

Insulated wire

Large iron nail

Steel or iron washers

## **Investigation #10 - Magnetism Is Pretty Special**

### **Gather These Things:**

Two bar magnets

Compass

Ruler

Thread

Steel pin

Tape

Match box (or other magnet holder)

Speaker magnet or other strong magnet

## **Investigation #11- How Do Magnets Become Magnets?**

### **Gather These Things:**

Iron filings  
Magnet  
Compass  
Small pieces of aluminum foil  
Large steel paper clip  
Plastic tube with lid  
Small steel paper clips

## **Investigation #12 - If It's Invisible, How Can You See It?**

### **Gather These Things:**

Two bar magnets  
Large piece of paper or cardboard  
Shaker of iron filings  
Compass  
Two thin pieces of wood about the thickness of the magnets  
Battery  
Long piece of insulated wire  
Large iron nail  
Covered thin box

## **Investigation #13 - Static Electricity?**

### **Gather These Things:**

Two plastic strips  
Wool cloth  
Paper  
Hard rubber comb  
Puffed rice cereal  
String  
Two balloons  
Wool cloth  
Narrow glass jar  
Nylon cloth (or plastic bag)

## **Investigation #14**

### **Gather These Things:**

Rubber balloon  
Wool cloth  
Scissors  
Cardboard square, 10 cm x 10 cm  
Silk cloth or other fabrics  
Medium size paper clip  
Clear glass container  
Tape  
Lightweight aluminum foil  
Assortment of rubber, plastic, and glass objects

## **Investigation #15 - Switching on a Series Circuit**

### **Gather These Things:**

(5) 15-cm. pieces of insulated wires for circuit (single strand, medium gauge)  
(2) 1.5 volt light bulbs with holders  
(2) 1.5 volt batteries with battery holders  
Knife switch

## **Investigation #16 - Is a Parallel Circuit Better Than a Series Circuit?**

### **Gather These Things:**

Series circuit from Activity #15  
More pieces of wire

## **Investigation #17 - The Dishwashing Liquid and Electric Current**

### **Gather These Things:**

Water bottle (dishwashing bottle with a nozzle will work)  
Water

## **Investigation #18 - Solar Energy Makes a Change**

### **Gather These Things:**

Calculator with solar batteries  
Two medium-size pizza boxes  
Aluminum foil  
Plastic wrap  
Black construction  
Paper  
Tape  
Thermometer  
Metric ruler  
Scissors

## **Investigation #19 - Wind or Water Energy**

### **Gather These Things:**

10-in. dowel -  $\frac{1}{4}$ – $\frac{5}{16}$  in.  
Pinwheel pattern (see appendix in Student Journal)  
Very thin screw  
Heavy thread  
Hair dryer  
Items to pick up  
Tape  
Nail  
Screw driver  
Large paper clamp  
Small paper clip  
Glossy, lightweight cardboard or poster board

## **Investigation #20 - Nuclear Energy**

**NO: Investigative Problems, Gather These Things**