

# Energy is Everywhere

Kindergarten

Activity: 1

Time: 1 Class Period

## General Description

Students will take a walk around the school and use their skills of observation to identify different uses of energy. They will then be asked the following questions: energy? Where does the energy being used come from? After the walk the students will draw at least one thing that used energy. Then the students can create a class graph using the pictures by energy sources; batteries, electricity, solar, a bird flying.

## Objectives

Students will observe and identify sources of energy found in the world around them.  
Students will describe what energy is in their own words.

## Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and spaces sciences

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in crating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

M00 S2C1 PO2 Interpret a pictograph

M00 S2C1 PO3 Answer questions about a pictograph

M00 S2C1 PO4 Formulate questions based on data displayed in graphs, charts, and tables

M00 S2C1 PO5 Solve problems based on simple graphs, charts, and tables

## Teacher Background

It is important that the children be given the opportunity to predict what they might see using energy. A basic discussion of what energy is would provide a good introduction to the lesson.

## Materials

Paper for recording pictures

Crayons/markers

Large paper for class graph

## **Procedure/Exploration**

1. Ask children what they think energy is. Identify that children have energy, the sun has energy, the wind has energy, etc.
2. The students will take a walking field trip around the school and buildings. Question: What do you see that uses energy?
3. The students will draw at least one thing they saw that uses energy.
4. The class can graph the pictures by energy source (batteries, electricity, solar...).
5. Have the students develop a class definition of energy.

# Let's Save Energy

Kindergarten

Activity: 2

Time: 1 Class Period

## General Description

Even small children can become aware of the different ways to conserve energy. This lesson will provide the students with strategies and reminders of what they can do (close doors, turn off lights, take showers instead of baths, not standing with the refrigerator door open) to help conserve energy.

## Objectives

Students will identify simple ways they can help save energy.

## Arizona State Standards

SC00 S6C1 PO4 Identify ways some natural or man-made materials can be reused or recycled (e.g., efficient use of paper, recycle aluminum cans)

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in creating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

## Teacher Background

Conservation is the planned usage of a natural resource. Discuss recycling as a means of conserving energy. Children should be made aware that they have the power to conserve just as well as adults do.

## Materials

Paper

Crayons/markers/paint

Two-sided tape

## Procedure/Exploration

1. Introduce to children what it means to conserve electricity.
2. Identify objects in the classroom which use electricity.
3. Brainstorm objects students might find at home that use electricity; correct misconceptions.
4. The class will brainstorm what children can do around the house to conserve energy.
5. Students will design light covers and signs for doors, color them, cut them out and tape them to the switches or the doors.
6. Students will share their designs with the class.

# ***Mouse House Surprise***

**Grade K**

**Activity: 3**

**Time: 1 Class Period**

## **General Description**

Students and teacher will join together in a shared book experience. The teacher will read aloud from the big book, *Mouse House Surprise*. The students will join in on the repeated pattern. The class will then discuss what happens when the power goes off. They will discuss the following ideas: What goes off in your house? Is there another form of energy in your house besides electricity? (Batteries, gas, etc.)

## **Objectives**

Students will explore and illustrate the path that electricity takes from a power plant to the inside of their house or school.

## **Arizona State Standards**

SC00 S1C4 PO 1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S1C4 PO 2 Communicate with other groups to describe the results of an investigation

W00 S1C1 PO 1 Generate ideas through class discussion

W00 S1C1 PO 2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO 1 Participate in creating expository texts (e.g. Labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

## **Teacher Information**

The book, *Mouse House Surprise*, lends itself well to shared reading by its continuing pattern and show what could happen when power lines are knocked down during an electric storm. The children initially think everything is broken, but their parents explain what has happened and the power is restored.

## **Materials**

Objects powered by batteries

*Mouse House Surprise* Big book; call APS for a copy at 602-250-2291.

Drawing paper

Markers/crayons

## **Procedures/Exploration**

1. Read the story, *Mouse House Surprise*, aloud as a class.
2. Discuss the story using the following questions:
  - a. What happened at the Mouse House?
  - b. Could that happen at your house?

- c. Has it ever happened at your house?
  - d. What should you do if you lost all your electricity?
  - e. What are some things that use electricity in your house?
  - f. Where does the electricity come from?
3. Have the students draw a picture of how the electricity gets from the power plant to their home.
4. Allow the students to share their pictures, describing what they drew.

# Stuffed Sun

Grade K

Activity: 4

Time: 1 Class Period

## General Description

The class will discuss different sources of energy that come from the sun. Students will make a sun and draw on each of its rays an energy source that started with the sun.

## Objectives

Students will identify several ways that we use the sun's energy.

## Arizona State Standards

SC00 S4C3 PO2 Identify that plants and animals need the following to grow and survive:

- food
- water
- air
- space

***Explanation:** Plants and animals all get their energy ultimately from the sun. Helping students understand that plants receive their food from the sun and that animals get that same energy is a base concept in science.*

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S1C4 PO2 Communicate with other groups to describe the results of an investigation

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in creating expository texts (e.g. Labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

## Materials

Paper

Crayons/paint/markers

Staples and staplers

Butcher paper

Old newspaper

## Procedures/Exploration

1. Give each student a piece of butcher paper that measures 18X36-inch.
2. Have the students fold the paper in half and draw a large sun on one side.
3. On each ray of the sun, print some of the different ways we get energy from the sun. This will be information the students gained from class discussion
4. Staple across the top of the sun and down one side.
5. Stuff with old newspapers and staple the remaining side.

# Give Me Some Static

Kindergarten

Activity: 5

Time: 1 Class Period

## General Description

Students will conduct simple balloon experiments to demonstrate that static electricity can move objects without touching them.

## Objectives

Students will investigate the force of static electricity and how it can move objects.

## Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S5C3 PO2 Investigate how forces can make things move without another thing touching them (e.g. magnets, static electricity)

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in creating expository texts (e.g. Labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

## Teacher Background

Static electricity can act as a magnet. It can attract and/or repel objects. There is an invisible electric field around all matter. Most matter has a neutral charge but some matter has a negative or positive electric charge. These charges make up a field which we experience as static electricity. Static electricity has the ability to move objects depending on their positive or negative charge.

## Materials

Paper for recording pictures

Crayons/markers

Balloons

Paper to record observations

String

## Procedure/Exploration

1. Blow up the balloons. You may have to do this for the students.
2. The students will rub the balloon on a piece of cloth or a stuffed animal. Do not allow the students to rub the balloon in their hair for reasons of hygiene.
3. Hold the balloon near a stream of running water. Have the students draw what they see.

4. Cut some stiff paper into small strips or pieces.
5. The students will rub the balloon on a piece of cloth or a stuffed animal.
6. Hold the balloon about four inches away from the paper after rubbing it.
7. Record the results by drawing what they saw.
8. Tie two balloons each on opposite ends of a string.
9. The students will rub the balloon on a piece of cloth or a stuffed animal.
10. Hold the string in the middle and lift them up and record what happens in their science journals or on their papers.
11. Put the stiff paper between the balloons. Record the results.
12. Have the student draw a series of pictures that illustrate what the student has learned about static electricity.
13. Share with the class.



# Let's Investigate

## Magnets

Kindergarten

Activity: 6

Time: 1 Class Period

### General Description

Students will investigate what a magnet is and how it is used in everyday life.

### Objectives

Students will define magnet using their own terminology and investigate how magnets are used in their every day setting.

### Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S5C3 PO4 Identify familiar everyday uses of magnets (e.g. in toys, cabinet locks, decorations)

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in crating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

### Teacher Background

Students will use the inquiry process to discover what they believe magnets are and generate their own definition. It is important that students generate their own understanding of the world around them instead of trying to memorize definitions. Use of the science inquiry process comes naturally to young children. You will want to label what they are doing but they already know how to make observations and ask questions.

### Materials

Variety of magnets (can be purchased in a hardware store or scientific catalog)

Chart paper

Marker

Pencils for each student

Crayons for each student

Paper for each student

Variety of examples of how magnets are used in everyday life:

on cabinets doors

to hold up art work on the refrigerator

magnetic screwdriver

door bell

certain toys i.e. magna doodle, littlest pets, Barbie,

junk yards to pick up cars and move them (a photo or picture of that)

### **Procedure/Exploration**

1. Give each pair of students a magnet and let them wander the room and explore what it does and how it works.
2. After about 5 minutes call the children back together and ask them how they would tell someone on the telephone about the magnet. How would they define it?
3. Write their explanations on the chart paper and then discuss which ones they like best and develop a class definition.
4. Have the students brainstorm where they have seen magnets used in every day life
5. Share with the students some of the things that you have brought to the classroom that use magnets.
6. Walk around the room and see if there are any other examples
7. Have the students draw their favorite example of how to use a magnet.

# What Attracts?

Kindergarten

Activity: 7

Time: 1 Class Period

## General Description

The students will investigate what materials are magnetic and which are not.

## Objective

Students will classify a variety of objects as magnetic or non magnetic through investigation.

## Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses.

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences.

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words.

SC00 S5C3 PO4 Sort materials according to whether they are or are not attracted by a magnet.

W00 S1C1 PO1 Generate ideas through class discussion.

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion.

W00 S3C2 PO1 Participate in creating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing.

M00 S2C1 PO1 Formulate questions to collect data in contextual situations.

M00 S2C1 PO2 Interpret a pictograph

LS-R3 Share ideas, information, opinions and questions

## Teacher Background

Students will use the inquiry process to discover what materials are attracted to a magnet. This uses the inquiry process and you can make it as complex or simple as you feel your students are ready for.

## Materials

Variety of magnets (can be purchased in a hardware store or scientific catalog)

Activity Card K-7

Variety of objects the students can test to see if they are magnetic or not.

Examples: penny bolt paper clip paper crayon pencil without metal band  
walk around the room to test what is magnetic or not

### Optional Materials:

Chart paper

Marker

## **Procedure/Exploration**

1. Give each pair of students a magnet and let them wander the room and explore what is magnetic or not.
2. They will record their observations on the Activity Card K-7 using drawings or words.
3. After an ample amount of time call the children back together and have them share what they discovered. You may choose to make a master chart.
4. At each table have a variety of objects that the students can test to determine if they are magnetic or not. Give the students time to test every object. As they make their observations they should be drawing/writing what is magnetic and what is not.
5. Have students share out loud what they found to be magnetic. If there are disagreements have them test those items again. Some parts of items might be magnetic and other parts not. For example a pencil has a small metal tip so that part is magnetic while the wooden part is not.
6. As a class generate a pictograph of what is magnetic vs. what is not magnetic.
7. Have the students talk about the pictograph and what it means to them.
8. Have the students share their ideas out loud.

# What Attracts?

Kindergarten

Activity: 7

Activity Card: K-7

## What do Magnets Attract?

Attracts to magnets	Does not attract to magnets

# Magnet Strength

Kindergarten

Activity: 8

Time: 1 Class Period

## General Description

Students will investigate whether or not the shape of a magnet affects the strength of the magnet.

## Objectives

Students will explore different shape magnets to determine if shape makes a difference in strength.

## Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S5C3 PO4 Sort materials according to whether they are or are not attracted by a magnet

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in creating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing

M00 S2C1 PO1 Formulate questions to collect data in contextual situations

M00 S2C1 PO2 Interpret a pictograph

LS R3 Share ideas, information, opinions and questions

## Teacher Background

Students will use the inquiry process to explore whether or not the shape of the magnet has an effect on the strength of the magnet.

## Materials

Variety of magnets (can be purchased in a hardware store or scientific catalog)

Activity Card K-8

Paper clips

## Optional Materials

Chart paper

Marker

## Procedure/Exploration

1. Give each pair of students a magnet and let them test how many paper clips their magnet can pick up. Have them draw the shape and write the number of paper clips on Activity Card K-8.
2. They will record their observations using drawings and numbers.

3. Give the students about two minutes with each shape magnet.
4. Provide paper to the students for them to create their own pictograph of their data. (This activity should not be done early in the year)
5. Have students explain their pictograph to the class.
6. Let the children explain which magnet was strongest and why they thought that to be true.

# Magnet Strength

Kindergarten

Activity: 8

Activity Card: K-8

Student's Name:

Date:

## Magnet Strength

Shape	Number of Paper Clips



# Magnetic Force

Kindergarten

Activity: 9

Time: 1 Class Period

## General Description

Students will investigate how things can move without being touched

## Objectives

Students will investigate how to make things move without being touched by another object.

## Arizona State Standards

SC00 S1C1 PO1 Observe common objects using multiple senses

SC00 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences

SC00 S1C4 PO1 Communicate observations with pictographs, pictures, models, and/or words

SC00 S5C3 PO2 Investigate how forces can make things move without another thing touching them. (e.g., magnets, static electricity, air flow)

W00 S1C1 PO1 Generate ideas through class discussion

W00 S1C1 PO2 Draw a picture about ideas generated through class discussion

W00 S3C2 PO1 Participate in creating expository texts (e.g. labels, lists, observations, journals, summaries) through drawing or writing

LS R3 Share ideas, information, opinions and questions

## Teacher Background

Students will use the inquiry process to explore how to move things without touching them with something else.

## Materials

Variety of magnets (can be purchased in a hardware store or scientific catalog)

Activity Card K-9

Shoe box

Plastic cup

Thin book

Paper clips

Baby food jar

Index card

Pencils

## Procedure/Exploration

1. Model for students how to test that a magnetic force can move objects without touching it.
  - a. Have a student help you by holding a piece of paper.
  - b. Place a paper clip on top of the paper.
  - c. Hold the magnet on the underside of the paper and show the students how you can still move the paper clip around without touching it.

2. Give each pair of students a magnet and let them explore the items in the materials list to determine whether or not the paper clip will move.
3. They will record their observations on the Activity Card K-9 circling “yes” or “no”.
4. Have the students answer the following questions.
  - a. Can a magnet move a paper clip through an index card?
  - b. Can a magnet move a paper clip through a thin book?
  - c. Can a magnet move a paper clip through the glass of a baby food jar?
  - d. Can a magnet move a paper clip through a plastic cup?
  - e. Can a magnet move a paper clip through a shoe box?
5. Let the children share what they discovered and why they think it worked.
  - a. Teacher Note: Magnets have magnet fields that fill the area directly next to the magnet.

# Magnetic Force

Kindergarten

Activity: 9

Activity Card: K-9

Student's Name:

Date:

## Magnet Strength

Thing	Move? Yes or No
Plastic Cup	Yes No
Baby Food Jar	Yes No
Thin Book	Yes No
Shoe box	Yes No
Index Card	Yes No