Learn at Home

Grade 4 - Science

Department of Education
Carmen Fariña, Chancellor

OFFICE OF CURRICULUM, INSTRUCTION
& PROFESSIONAL LEARNING

Unit Overview

This series of online activities packet of resources is designed for students and their parents who wish to support in-school learning with activities that can be done independently and/or with a partner at home. The packet includes ten activities that support the major scientific work of the 4th Grade with a particular focus on science content. These activities should each take 30-40 minutes (although some can be extended) and may be completed in any order.

How to use this guide

For each activity, you will find:

- A description and/or instructions for the activity
- Information about both content and practice that the activity supports
- One or more focus or discussion questions that will help deepen the learning of the activity

Day 1 Science

Activity: Magnetism

Task

Complete the online course on properties of magnets. Have you ever visited the Lighthouse of Alexandria? Meet Sarah and explore the lighthouse together.

At the end of the activity, you should understand:

- The properties of magnets
- Magnets will attract objects made of metals – iron, nickel, and cobalt
- How magnetic poles work
- Opposite poles attract each other, and similar poles repel each other

Link: Click on https://en.e-learningforkids.org/science/lesson/alexandrian-lighthouse-properties-of-magnets/

Vocabulary

Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

☐ **Magnet** – an object that attracts iron or steal

☐ **Magnetic** - an object that is attracted to a magnet

☐ **Attract** – to pull together

☐ **Force** – a push or a pull

☐ **Pole** – a place on a magnet where magnetism is the strongest

☐ **Repel** – to push away

Click on Exercise 1 – Attraction

Click on Exercise 2 – Magnetic Poles

Click on Exercise 3 – Properties of magnets

Click on Exercise 4 – Review

Day 2 Science

Activity: Magnetic Sort – What can a magnet stick to?

Vocabulary

Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

- ☐ **Magnet** – an object that attracts iron or steal
- ☐ **Magnetic** - an object that is attracted to a magnet
- ☐ **Attract** – to pull together
- ☐ **Force** – a push or a pull
- ☐ **Pole** – a place on a magnet where magnetism is the strongest
- ☐ **Repel** – to push away

Tools and Materials

- Magnet (any shape or size)
- Steel paper clip
- Iron nail
- Rubber band
- Copper penny
- Brass fastener
- Plastic button
- Wooden pencil
- Wax crayon
- Piece of aluminum foil

Procedure

Examine the materials. Sort the items into two groups. In one group, place the objects you think will stick to a magnet. Place the objects you think will not stick to a magnet in a second group.

I predict a magnet will attract:	**Put a check here if your prediction was correct**
I predict a magnet will not stick to:	**Put a check if your prediction was correct**

During activity 2 we found that there are materials that act as electrical insulators that interrupt the flow of electricity. What did we use to determine whether the electrical current was interrupted?

_____

_____

_____

List the common materials that stick to a magnet._____

_____

Day 3 Science

Activity: Simple Circuits

Problem

- What materials are needed for light a bulb?

Materials

- 1 “D” Cell Battery
- Flash light bulb
- 20 cm piece of insulated copper wire with stripped ends

Vocabulary

Learn the new vocabulary words below. You will use these vocabulary words in today’s activity.

☐ **Electricity –** a form of energy that people produce from the active energy of wind and moving water and the stored energy in oil and coal.

☐ **Battery –** a battery stores electrical energy. Batteries come in many shapes and sizes.

☐ **Complete circuit –** the closed path electrons follow.

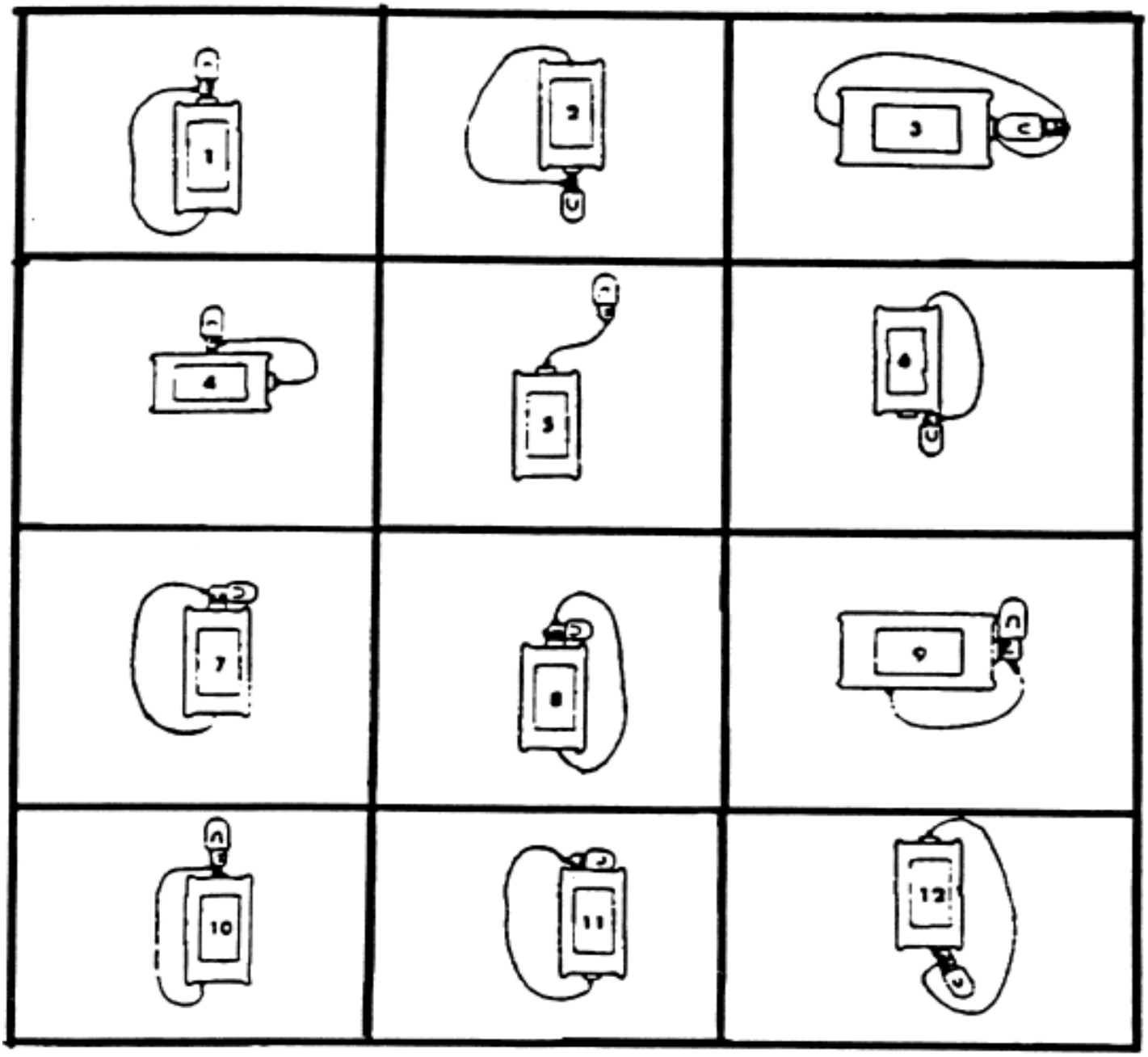
☐ **Current –** flow of electricity through a conductor.

☐ **Flash Light Bulb –** a glass envelope enclosing the light source of an electric lamp.

- Use a flash light bulb, a battery, and wires to light the bulb. When you succeed, draw a picture of the solution in the box below.

Turn-Ons

Look at the diagram below. If you predict the bulb will light, draw a circle around the set-up. Do not draw a circle if you predict the bulb will not light.



How well did you do? Were your predictions correct?

_____
_____
_____
_____

How were you able to get the bulb to light?

_____
_____
_____

What is the name given to the set-up that lights the bulb?

_____
_____
_____

Compare the different set-ups that light the bulb while others were unable._____
_____
_____

Write an explanation how this could be called a closed circuit. How can you make it an open circuit?

_____
_____
_____

Day 4 Science

Activity: Conductors & Insulators

Task

Complete the online course on conductors and insulators. Visit Vlad and learn about properties and conductors and insulators and which materials are used for it.

At the end of this lesson, the student should understand:

- Metals are conductors of electricity while most other materials are not.
- Why metals are used for cables and wires while plastics are used to cover wires, plugs, and switches.

Link: Click on https://en.e-learningforkids.org/science/lesson/arctic-ocean-conductors-insulators/

Vocabulary

Learn the new vocabulary words below. You will use these vocabulary words in today's activity.

☐ **Conductor** – a conductor is a material that current can pass through easily, like metals.

☐ **Insulator** – An insulator is a material that current cannot pass through easily, like plastic

Click on Exercise 1: Let's go fishing!

Click on Exercise 2: Make electric equipment

Click on Exercise 3: Stay Safe!

Click on Exercise 4: Recap

Day 5 Science

Activity: Testing Conductors & Insulators

Problem

- Which materials are able to carry electric current?

Tools and Materials

- 1 battery in holder
- 1 breadboard
- 1 light bulb
- 2 wires with washer's bag-o-stuff
- wires with clips
- push pins
- Steel paper clip
- iron nail
- rubber band
- copper penny
- brass fastener
- plastic button
- wood pencil
- wax crayon
- piece of aluminum foil

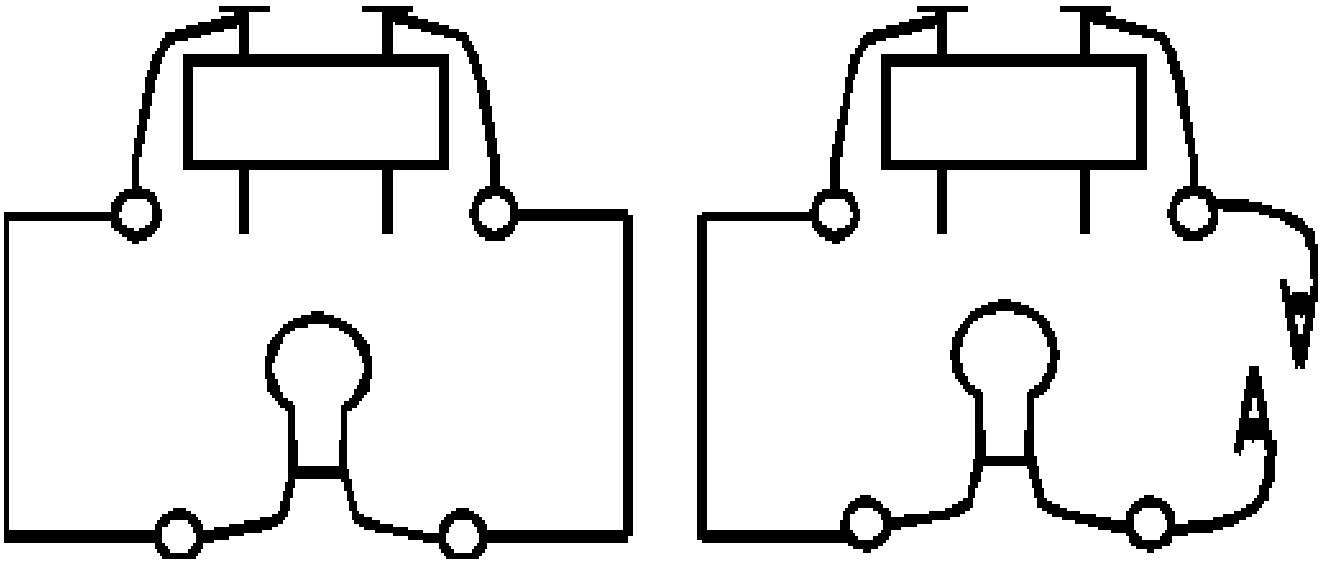
Vocabulary

☐ **Conductor** – a conductor is a material that current can pass through easily, like metals.

☐ **Insulator** – An insulator is a material that current cannot pass through easily, like plastic

Procedure

1. Build the simple circuit shown in the schematic below. If you do it correctly, the bulb will light.
2. Replace one of the wires with the 2 wires with clips as shown below.



3. Complete the circuit by clipping each of the materials in the bag-o-stuff between the clips.
4. Follow the diagram above. Predict which objects will conduct electricity. Then place the object between the tips of the wires and record which objects lit up the light bulb. Hint: If the object is a conductor, electricity can easily flow through it so the light bulb will light. If the object is an insulator, electricity cannot easily flow through it, so the light will not light.

List the materials in the following chart and check the appropriate column. How will you be able to tell which are conductors and which are insulators?

_____
_____
_____
_____

Name of Object	Material of Object	Prediction: Conductor	Insulator	Actual: Conductor	Insulator

How would you summarize what sort of materials are insulators and which are conductors?

_____
_____
_____

What did this investigation tell you about conductors?

_____
_____
_____

Students and their families may continue exploring the topic of fossil fuels and energy by conducting various online activities found here. http://www.fossil.energy.gov/education/energylessons/index.html

Day 6

Task: Force and Motion. Explore energy and matter interact through forces that result in changes in motion.

Materials Needed:

- Inclined Plane Task Card
- 1 heavy marble (or larger)
- 1 light marble (or smaller)
- 1 ruler (for inclined planes)
- blocks or books to raise the inclined plane to designated height
- 1 index card (3" X 5")
- 1 Distance Measurement Mat
- Inclined Plane: Data Sheet

Key Vocabulary:

- before
- decrease
- distance
- finish line
- height
- inches
- increase
- release point
- ruler
- trial

What to do: Inclined Plane Task Card

Step 1: Use your materials to create an inclined plane at least two inches in height. You can do this by raising one end of the ruler using blocks or books. The other end of the ruler lays flat on the table. 

Step 2: Measure the height of your inclined plane in inches. Record the height.

Step 3: Place the Distance Measurement Mat against the end of the ruler.
(note: mat not shown in image above)

Step 4: Fold an index card in half and place it against the bottom of the ruler. See image above.

Step 5: Release the marble from the **3 inch** mark and record the distance the index card/obstacle moves on the Distance Measuring Mat. Do this three times (trials) and record your results each time.

Step 6: Repeat Step 4, releasing the marble three times (trials) each for the 6 inch, and 12 inch mark.

Name: _____ Date: _____

Inclined Plane: Data Sheet

Directions: Complete the table below and then answer the questions based on your data.

Type of ball used: _____

Inclined Plane/Ramp Height	**Release Point**	**Index Card Obstacle** (Where did the index card end up?)		
		Trial 1	Trial 2	Trail 3
Height: _____ cm. (less steep)	5 centimeters			
	10 centimeters			
	15 centimeters			
Height: _____ cm. (more steep)	20 centimeters			
	25 centimeters			
	30 centimeters			

Choose one variable in your investigation. For example, test a different type of ball, create a different obstacle, change the incline height, etc. First make a prediction as to how far the obstacle will move on the Distance Measurement Mat. *What do you think will happen?* Then test your variable and record your data in your notebook. *What did you discover?*

Distance Measurement Mat
5 centimeters

10 centimeters
15 centimeters
20 centimeters
25 centimeters
30 centimeters
35 centimeters
40 centimeters
45 centimeters **Finish Line**

Journal Reflection Questions:

1. How did the height of the ruler and the release points of the marble affect the marble's speed and force? Discuss and explain.
2. How could you change the inclined plane to make the index card/obstacle move a greater distance? Discuss and explain.
3. What did you discover when you tested a variable during your extension activity? Discuss and explain.

Word	Student Definition	Illustration
Word bank: release point, height, ruler, distance, inches, before, after, finish line, trial, increase, decrease		

Name: _____ Date: _____

Checklist for Force and Motion Task

Completed	To Do
	I completed each part of the task.
	I completed each part of my data charts.

	I wrote an answer to each of the question prompts.
	I used ALL of the tools correctly and carefully.
	I read ALL of the directions on the task card.
	I used evidence and clear reasoning to support my claims.
	I was careful when placing the ball at the release point.

Day 7

Task: The Role of Plants and Animals in their Environments

Classify organisms as producers, consumers and decomposers; identify and illustrate the flow of energy in an ecosystem; create models of producers, consumers, and decomposers and describe their role in a food chain and food web; and identify the relationship between predator and prey.

At the end of the lesson, you will be able to:

- Classify organisms as producers, consumers and decomposers.
- Identify and illustrate the flow of energy in an ecosystem.
- Create models of producers, consumers, and decomposers and describe their role in a food chain and food web.
- Identify the relationship between predator and prey.

Materials:

- Food Chain/Web Organism Cards
- Organism Information Cards
- Student Food Chain Recording Sheets
- Food Web Instruction Card
- Food Chains and Webs Analysis
- large construction paper or poster
- colored pencils or crayons
- glue sticks
- Food Chains and Webs Summative Assessment Rubric
- science notebooks

Key Vocabulary:

- carnivore
- consumer
- decomposer
- ecosystem
- food chain
- food web
- herbivore
- omnivore
- predator
- prey
- producer

Use their prior knowledge to sort a set of *Food Chain/Web Organism Cards* into three groups: producers, consumers, and decomposers. Create three to five simple food chains and record in science notebooks.

Watch the video *Fabulous Food Chains: Crash Course Kids #7.1* and review the following science vocabulary words: *producer, consumer, decomposer, food chain.*

Why do we eat?

Gather the *Organism Information Cards*. Use the cards to generate your own definitions of herbivore, omnivore, and carnivore in their notebooks.

Many organisms eat the same thing. F*ood chain* only shows one flow of energy within an ecosystem, while a *food web* shows how food chains within an ecosystem are interconnected. Food webs better represent the interactions among organisms.

Watch the Video: *Study Jams: Food Webs*

Sunflower Seeds	Chipmunk
Sun	Red Tail Hawk

Decomposer

Vocabulary Cards 1

Carnivore – an animal that only eats other animals (red tailed hawk)

Consumer – an organism that gets energy from food

Decomposer – an organism that gets energy from dead/decaying organisms

Energy – the fuel needed for living organisms to live and thrive

Food chain – model of energy flow between living organisms

Food web – model of multiple energy flows (food chains) between living organisms

Vocabulary Cards 2

Herbivore – an animal that only eats plants
(example: grasshopper)

Omnivore – an animal that eats both plants and other animals (example: chipmunk)

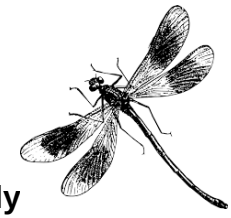
Organism – any living thing (plants, fungi, animals)

Predator – an animal that hunts other animals

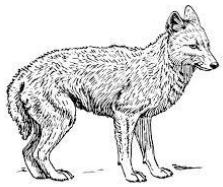
Prey – an animal that is hunted by other animals

Producer – an organism that makes its own food (only green plants)

Dragonfly

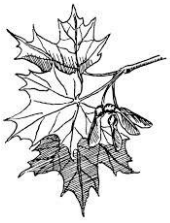


Coyote



Red Tailed Hawk

Leaves



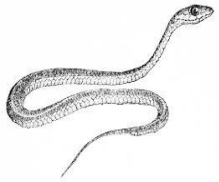
Fungi

Chipmunk

Berries

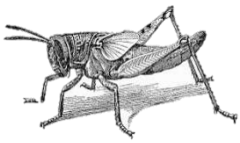
Eastern Bluebird

Garter Snake



Sunflower Seeds

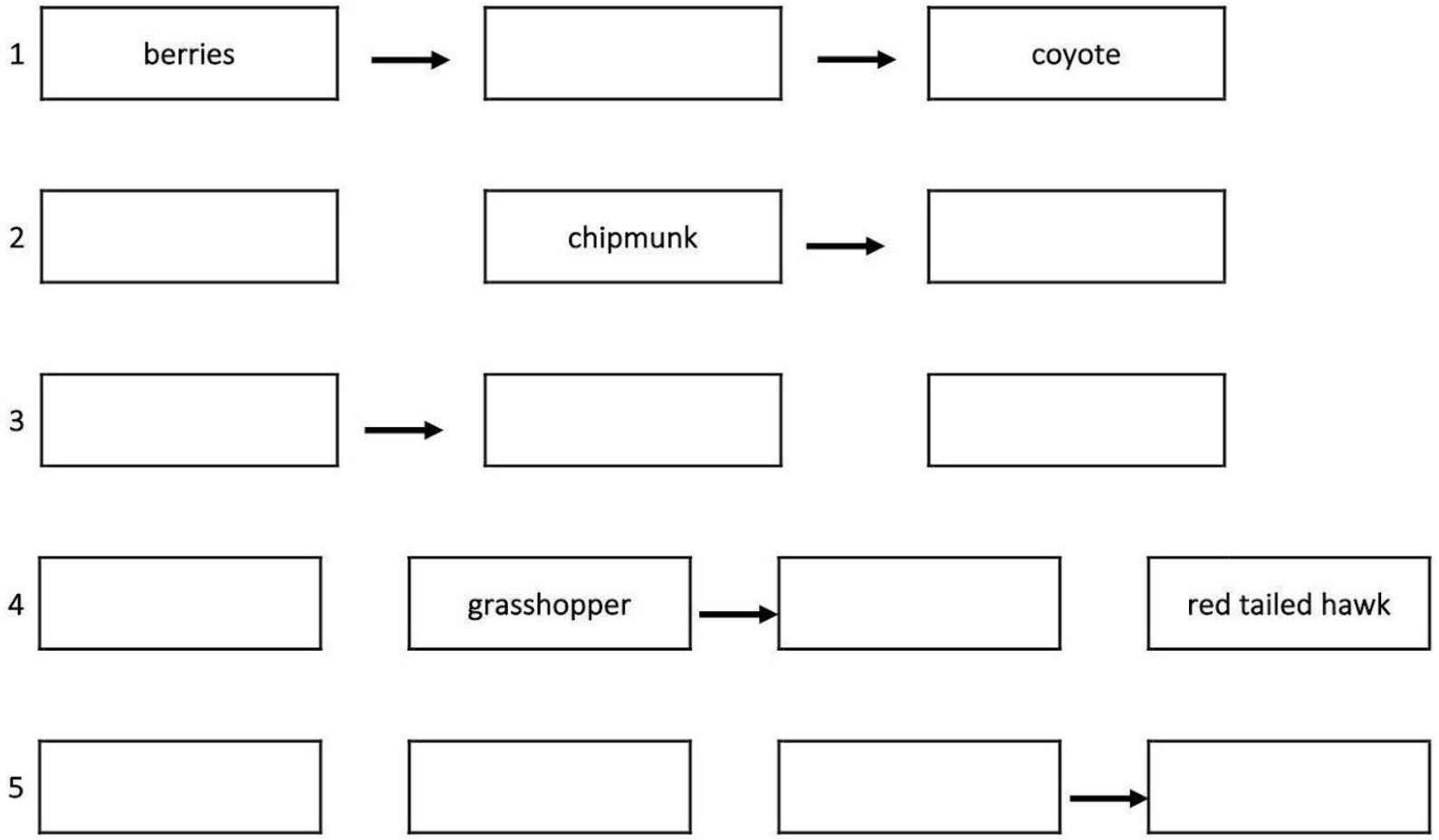
Grasshopper

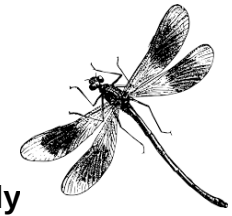


Raccoon

Name: _____ Date: _____ Class: _____

Food Chains



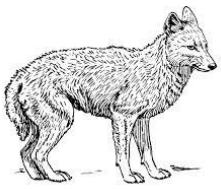


Dragonfly

Classifying Consumer:
Predators
Predator ☑ Prey ☑

What it eats: smaller insects

What eats it: chipmunk, Eastern bluebird, garter snake, raccoon

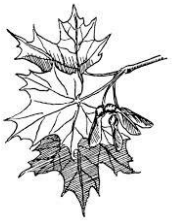


Coyote

Classifying Consumer:
Omnivore
Predator ☑ Prey ☑

What it eats: fruit, leaves, seeds, birds, rodents, snakes

What eats it: grizzlies, wolves

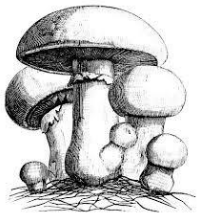


Leaves

Classifying Consumer:
Producer
Predator ☒ Prey ☒

What it eats: N/A

What eats it: chipmunk, coyote, grasshopper, raccoon

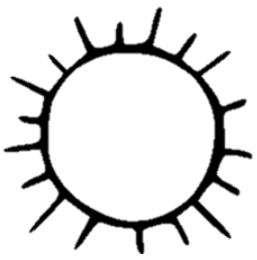


Fungi

Classifying Consumer:
Decomposer
Predator ☒ Prey ☒

What it eats: N/A

What eats it: chipmunk, grasshopper, raccoon



Sun
Source of energy for most living things/organisms on earth.

Red Tailed Hawk 

Classifying Consumer:
Carnivore
Predator ☑ Prey ☒

What it eats: birds, chipmunks, small birds, snakes

What eats it: N/A

Chipmunk 

Classifying Consumer:
Omnivore
Predator ☑ Prey ☑

What it eats: fungi, fruit, leaves, seeds, insects

What eats it: red tailed hawks, coyotes, snakes, raccoons

Berries 

Classifying Consumer:
Producer
Predator ☒ Prey ☒

What it eats: N/A

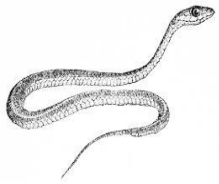
What eats it: chipmunk, coyote, Eastern bluebird, raccoon

Eastern Bluebird 

Classifying Consumer:
Omnivore
Predator ☑ Prey ☑

What it eats: fruit, seeds, insects

What eats it: red tailed hawks, coyotes, raccoons



Garter Snake

Classifying Consumer:
Carnivore
Predator ☑ Prey ☑

What it eats: insects, small rodents

What eats it: red-tailed hawks, coyotes, raccoons

Raccoon

Classifying Consumer:
Omnivore
Predator ☑ Prey ☑

What it eats: fungi, fruit, leaves, seeds, birds, insects, small rodents, snakes

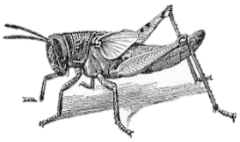
What eats it: coyotes

Sunflower Seeds

Classifying Consumer:
Producer
Predator ☒ Prey ☒

What it eats: N/A

What eats it: chipmunk, coyote, Eastern bluebird, raccoon



Grasshopper

Classifying Consumer:
Producer
Predator ☒ Prey ☑

What it eats: fungi, leaves

What eats it: chipmunk, Eastern bluebird, garter snake, raccoon

Day 9 Science

Activity: Reading for Understanding – “Electricity & Energy Circuits”

Directions

- Read the passage below and answer the questions that follow.

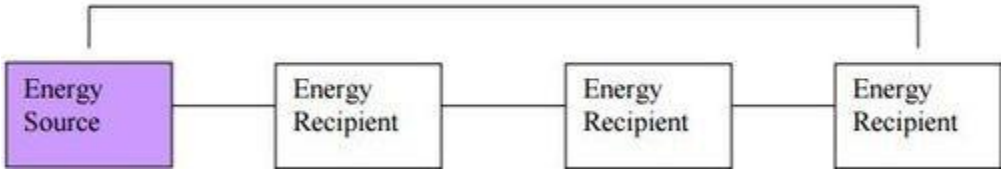
Electricity & Energy:nCircuits

by ReadWorks

An electric circuit is the complete path of an electric current. The simplest electric circuit is made up of two components, or parts. The first component is an energy source, such as a battery or generator. The second component is a wire or cable that carries energy from one end of the source. Then it connects back to the source at the other end.

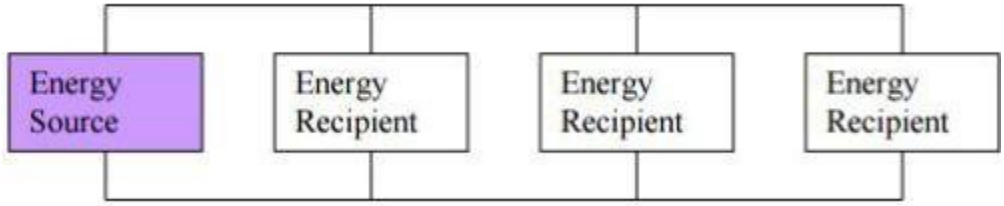
Usually a simple circuit has an energy recipient, such as a motor or lamp. An energy recipient is connected to the electric circuit by the wire or cable. There are two basic types of electric circuits: series circuits and parallel circuits.

Series Circuit



Series circuits are easy to understand if you think about certain strands of light bulbs linked to each other. One example is Christmas lights. With some Christmas lights, all of the lights don't work when one bulb goes out. Why does this happen? This is because in a series circuit the energy has to go through one energy recipient to get to the next. If a bulb blows out, the energy stops at that bulb. It never makes it to the next bulb.

Parallel Circuit



In a parallel circuit, energy is passed through the energy recipients and through a second connection. As long as there's an energy source, electricity will always be able to reach each recipient. If there is a problem with one recipient, the other recipients are not affected.

In practice, most electrical devices have combination circuits. Combination circuits do not use just one type of circuit. Instead, combination circuits utilize both series and parallel types. Devices that use combination circuits include computers and television sets. More complex circuits often have more electric components like switches and resistors, which limit the electric current flow.

Name:_____ **Date:** _____

1. According to this passage, what is the second component of a circuit?

A. electric current

B. energy source

C. energy recipient

D. wire or cable

2. What role do the two diagrams play in the passage?

A. They illustrate two types of circuits that are described in the text.

B. They contradict the information described in the text about series and parallel circuits.

C. They illustrate how series and parallel circuits combine to form a combination circuit.

D. They illustrate information about circuits not discussed in the text of passage.

3. What would happen if one light went out in a parallel circuit?

A. All of the lights would go out.

B. The circuit would become a simple circuit

C. All the lights except for that one would stay lit.

D. The energy source would stop working.

4. Read these sentences: "Combination circuits do not use just one type of circuit. Instead, combination circuits **utilize** both series and parallel types."

The word **utilize** means

A. to make use of

B. to burn out

C. to provide energy for

D. to create

5. The primary purpose of this passage is to describe

A. what combination circuits are

B. how Christmas lights work

C. the types of circuits found in computers

D. how different types of circuits work

6. How is energy passed in a parallel circuit?

7. What evidence from this passage could support the idea that a strand of lights might benefit from using a parallel circuit instead of a series circuit?

8. Choose the answer that best completes the sentence.

In a series circuit, energy is passed from one recipient to the next;_____, the flow of energy stops if one of the recipients has a problem.

A. previously
B. however
C. on the other hand
D. consequently

Day 10 Science

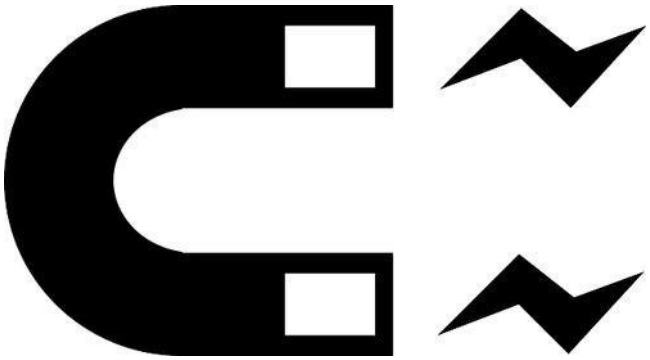
Activity: Reading for Understanding – “Magnetism – Types and Uses”

Directions

- Read the passage below and answer the questions that follow.

Magnetism - Magnets: Types and Uses

by ReadWorks



Magnets come in a wide variety with an equally wide variety of uses. The most common are bars or disks. Because they stick to certain metals, these magnets are used to fasten and latch things, like a cabinet door. Huge horseshoe magnets have a U shape. They are used to move iron and steel scrap. Tiny magnets on audiotape and videotape store sound and images.

Magnets are everywhere. They help to make life more convenient. They also help us to get around more quickly. For example, many electrical motors require electromagnets to run. The magnetic force that runs the motors is created when an electrical current flows through a coil of wire. Motors with electromagnets help run many household appliances. The same electromagnetic force is also used in the motors of cars, trains, and airplanes.

Magnets are so useful they're even being used to improve the health of some people. Huge magnets in a special machine can now give doctors detailed pictures within the body. The pictures help doctors find and treat problems inside the body, without having to make an incision.

People's reliance on magnets only continues to grow. In Japan, magnets are being used in some amazing new ways. For example, Japan now has a special train that runs on magnets. It literally levitates over the tracks. The magnetic force helps to provide a fast smooth ride. Hopefully, America will have a train like this very soon.

Name:_____**Date:** _____

1. Which sentence best describes the main idea of this passage?

A. Magnets come in a wide variety with many uses.

B. Magnets are everywhere.

C. Motors with electromagnets help run many household appliances.

D. Tiny magnets on audiotape and videotape store sound and images.

2. Which of the following is an opinion?

A. Huge horseshoe magnets have a U shape.

B. Hopefully, America will have a train like this very soon.

C. Many electrical motors require electromagnets to run.

D. Tiny magnets on audiotape and videotape store sound and images.

3. People_____use magnets in the home.

A. rarely

B. always

C. often

D. like to

4. According to the passage, you can tell that **convenient** means

A. easy

B. uncomfortable

C. difficult

D. solemn

5. The passage describes all of the following uses of magnets *except*

A. a latch for a cabinet door.

B. a motor for a household appliance.

C. a device to predict powerful storms.

D. a machine that shows pictures within the body.

6. How might you describe Japan's use of magnets?

7. According to the passage, how have magnets helped doctors?

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Many electrical motors require electromagnets to run_____the magnetic force that runs the motors is created when an electrical current flows through a coil of wire.

A. despite
B. against
C. across
D. since

9. Answer the following question based on the sentence below.

Magnets fasten and latch cabinet doors because they stick to certain metals. In the sentence, the word magnets best answers which question?

A. Who?
B. What?
C. Where?
D. Why?