I LOVE Science Calendar and Activities
2013-2014

Volunteering
It is very important to build a relationship with your teacher
New volunteers should arrange to meet teacher before the first day of doing ILS in classroom.
Find out about the procedures at the school---where to sign in, where classrooms are located, where ILS materials are located.
Let Nancy Stanley know if you need additional materials.
Volunteers are not allowed to be alone with students. More extensive background is required.
Make sure you have completed Volunteer Forms and turned in to Nancy Stanley or your teacher.
Review ILS volunteer website http://ecsd-fl.schoolloop.com/LoveScience

Volunteer should check with classroom teacher about which activity to do each month.

Month	Activity	NGSSS	Alternate Activity
September	**Removing Pollution From Water**	Big Idea 8: Properties of Matter	
October	**Light**	Big Idea 10: Forms of Energy	
November	**Terminal Velocity**	Big Idea 13: Forces and Changes in Motion	
December or January	**Weathering and Erosion**	Big Idea 6: Earth Structures	
February	**Earth's Rotation**	Big Idea 5: Earth in Space and Time	
March	**Energy Flow**	Big Idea 17: Interdependence	Insect Hunt

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Removing Pollution from Water

SC.5.P.8.3 Demonstrate and explain that mixtures of solids can be separated based on observable properties of their parts such as particle size, shape, color, and magnetic attraction.

Materials

Coffee Filters
Cotton Balls
Paper Towels
Cups
Rubber Bands
Chalk
Food Coloring
Pitcher
Spoons

Procedure

1. Fill pitcher with water and add food coloring. (to show that the water was clear)
2. Pour enough colored water to fill one cup half full. *Discuss mixtures.*
3. Crush the chalk on a paper towel.
4. Add ½ spoonful of crushed chalk to the colored water.
5. Place a coffee filter (cotton, paper towel) over the top of the second cup and secure with a rubber band.
6. Slowly pour the colored water mixture on the filter.
7. Observe the contents of the coffee filter and the cup.

You can have groups try different filters (coffee filter, paper towel, cotton)

The original investigation suggested gravel, fine and coarse sand, and pebbles. Since the logistics of getting these to 35 schools was overwhelming, I am revising the investigation. If you would like to, you can do that as a demonstration for the student.

Light Activity

SC.5.P.10.1 Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.
SC.3.P.10.3 Demonstrate that light travels in a straight line until it strikes an object or travels from one medium to another.
SC.3.P.10.4 Demonstrate that light can be reflected, refracted, and absorbed.

Materials: Solid opaque object that will stand up (spool), flashlight, ruler.

Step 1: Measure the height of the wooden spool. Record the height here: _____ cm

Step 2: Place the spool 20 cm from the wall. Place the flashlight 10 cm from the spool, like in Picture 1.

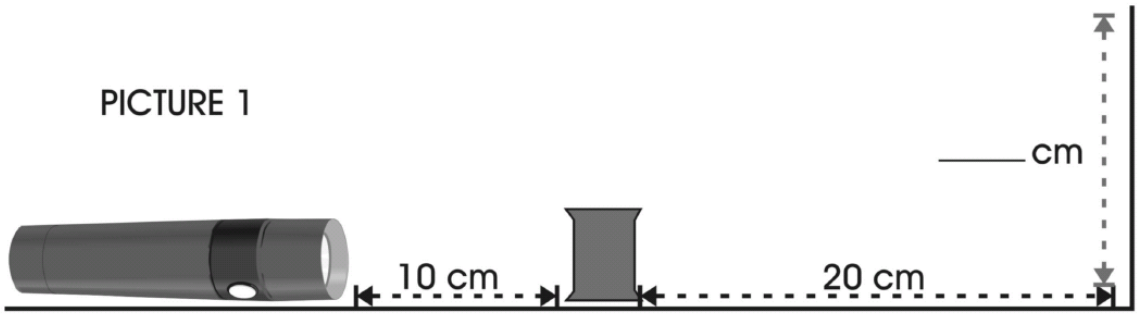
Step 3: Shine the flashlight on the spool and measure the height of the shadow it makes on the wall. Record the height of the shadow on the blank line in Picture 1.

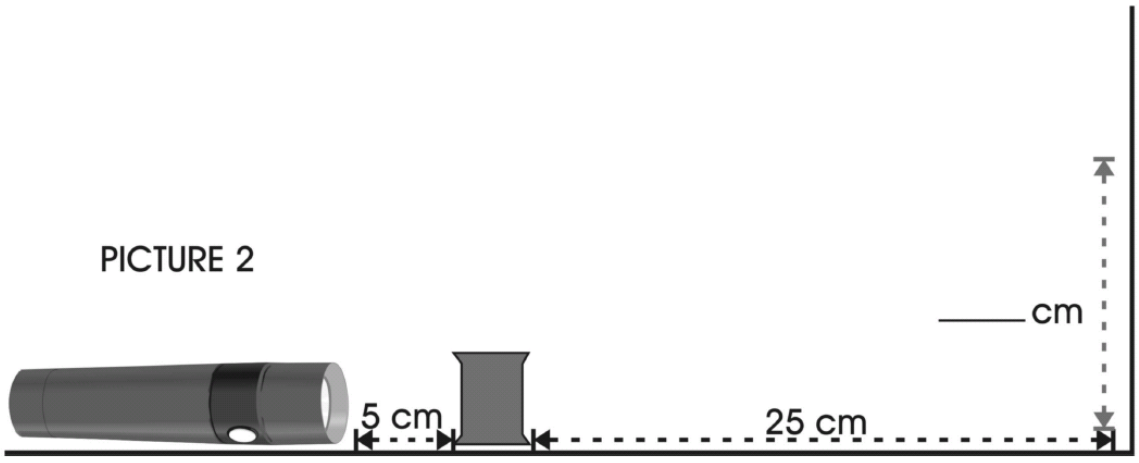
Step 4: Place the spool 25 cm from the wall. Place the flashlight 5 cm from the spool, like in Picture 2. Do you think the shadow will be larger or smaller? Circle your prediction:

larger smaller

Step 5: Shine the flashlight on the spool and measure the height of the shadow it makes on the wall. Record the height of the shadow on the blank line in Picture 2.

Step 6: Was your prediction right? Why do you think one shadow was bigger than the other?





Light Activity

Materials: flashlight, ruler, clear glass, hand lens.

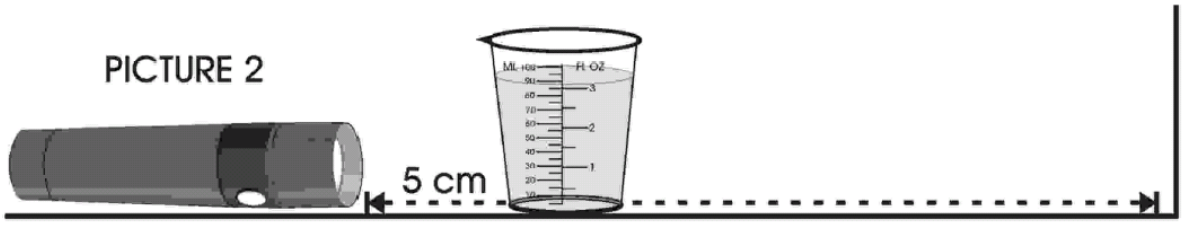
Step 1: Place the flashlight 25 cm from the wall as shown in Picture 1. Observe the light as it shines on the wall. Describe the light in the space below.

Step 2. Place a 100 ml beaker filled with water between the flashlight and the wall, about 5 cm from the flashlight, as shown in Picture 2. Observe the light as it shines through the water onto the wall. Does the light look different when it passes through the water? Describe the light in the space below.

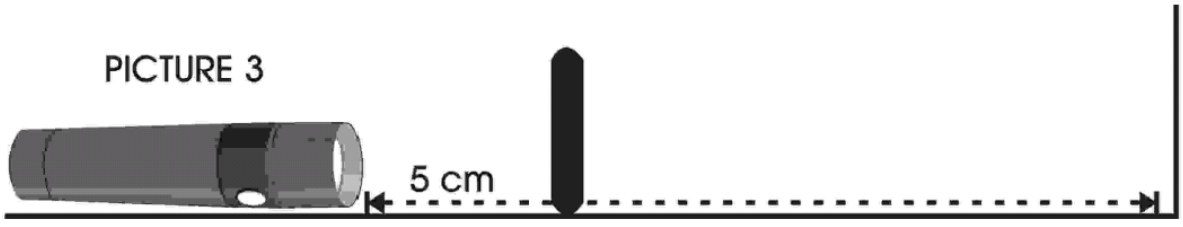
Step 3. Place the magnifying glass in the same place as the beaker, as shown in Picture 3. Observe the light as it shines through the lens onto the wall. Describe the light in the space below.

PICTURE 1

PICTURE 2



PICTURE 3



First Light Activity (Teacher Guide)

MATERIALS NEEDED: Flashlight, ruler wooden spool or solid opaque object.

Objective: To use shadows to show that light travels in a straight line.

Set up a center with a table beside a blank wall, a flashlight, a ruler, and a wooden spool (or other solid opaque object.)

Explain that the closer the object is to the light source, the more light is blocked by the object and the larger the shadow is.
Emphasize the fact that the light travels in straight lines and cannot bend around an object.

Second Light Activity (2 parts)

MATERIALS NEEDED: Large glass bowl, water.

Objective: To show that light waves can bend (be refracted) when they pass through a substance with a different refractive index than air.

Fill a large glass bowl with tap water in a place where all of the students can see. Hold a pencil in the water so that the students can see how its image is distorted. Place one hand in the water so that students can see the distortion. Pour out the water and place one hand in the empty bowl so that the students can see the distortion.

Explain that the water and the glass bend the light waves because they are made of different material than the air.

MATERIALS NEEDED: Flashlight, magnifier, ruler, clear glass and water.

Set up a center with a table beside a blank wall, the flashlight, magnifier, a ruler, a 100 ml beaker, and water in a pitcher.

Explain the worksheet to the students.

Terminal Velocity

SC.5.P.13.1 Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects.

Materials

non-cling plastic wrap or plastic grocery bag
scissors (students or teacher should have)
string
tape
2 pennies
metric ruler
timer (optional)

Procedure

1. Use ruler and measure a piece of plastic wrap 15 cm x 15 cm. Cut out the square.
2. Cut four pieces of string 20 cm long and tape to the corners of the bag.
3. Bring the free ends of the four strings together and tape them to a penny.
4. Hold the parachute from the middle of the square and drop it from high over your head. DO NOT STAND ON TABLE or CHAIR.
5. Describe how it falls.
6. Make another parachute 30 cm x 30 cm and strings 35 cm long.
7. Release both parachutes at the same time.
8. Do multiple trials and have students record results.

You can use the timer and have students record time.

This is a good activity for the scientific method and variables. Discuss potential and kinetic energy. Be sure to have students form a hypothesis, discuss the variables in the experiment and make a conclusion.

Weathering and Erosion

SC.4.E.6.4 Describe the basic difference between physical weathering (breaking down of rock by wind, water, ice, temperature change, and plants) and erosion (movement of rock by gravity, wind, water, and ice).

Materials

Vinegar (acid)	goggles	sugar cubes (or sweet tart candy)
2 pieces of chalk	ziplock bag	pebbles
2 plastic cups		clear plastic container with lid

Discuss how the chalk will represent land or rocks and the vinegar will be the "weather" that will produce change to the land or rocks. Ask students how they think particle size affects changes to the Earth's surface. (Hypothesis)

Procedure

1. Fill cups ½ full with vinegar.
2. Give each group of students two pieces of chalk (break one piece in half). Have students place one piece of chalk in ziplock bag. Apply pressure to break the chalk into pieces. DO NOT CRUSH INTO POWDER
3. Give each group of students two cups with vinegar.
4. Have students put the piece of whole chalk into one cup of vinegar and all of the broken pieces of the other piece of chalk into the other cup.
5. Allow chalk to stay in the vinegar for 10 minutes.
6. During this time, discuss the variables (Vinegar and time-controlled variables, particle size- independent variable, dissolved-dependent variable) and weathering.
7. After, 10 minutes allow students to observe cups.
8. Discuss observations and make conclusion.

Discuss what would happen if you stirred (wind) or used heated vinegar (independent variables.) You can do this if time permits and teacher has a microwave to heat the vinegar.

Erosion Activity

Show students sugar cubes and pebbles. Put 10 sugar cubes and 10 pebbles into the container and put on lid. Shake the container and then pass the container around the room allowing students to shake during the 10 minutes. Discuss erosion with students.

Earth's Rotation

SC.4.E.5.4 Relate that the rotation of Earth (day and night) and apparent movements of the Sun, Moon and stars are connected.

Materials: tennis ball, push pins, map label, flashlight

Prepare ahead of time

1. Stick push pins in the tennis ball to represent the poles.
2. Cut out the map. Tape the map on the tennis ball.
3. Place a large sun cutout on a wall or use flashlight for sun.

Activity

1. Give each group a tennis ball. Tell students to grasp the pushpins and twirl the Earth.
2. Tell students that they are to try to figure out which way the Earth rotates in order for the sun to appear in the east first and to set in the west. Point out the letters representing the directions have been placed on the map.
3. After a period of investigation, hold a time of discussion that results in students concluding that the Earth rotates in a counterclockwise direction when viewed looking down on the North Pole.
4. Next draw the students' attention to the somewhat vertical lines that have been drawn on the map. Tell the students that these represent time zones. Each adjacent time zone represents one hour difference in time. Starting on the east coast and moving west, point out that the time decreases one hour with each area.
5. Make sure that students understand that time zones exist all over the world.

Earth's Rotation and Revolution

Materials: Earth blow-up globe, flashlight

1. One person should hold the flashlight to represent the sun. One person should hold the Earth globe. Mark a spot of the globe to indicate Florida.
2. Turn lights low. Turn on the flashlight and shine it on the Earth.
3. Person holding the Earth should rotate it on its axis.
4. Describe what you see.
5. While rotating the Earth, show how the Earth revolves around the sun (flashlight).
6. Describe what you see.

Energy Flow

SC.4.L.17.3 Trace the flow of energy from the Sun as it is transferred along the food chain through the producers to the consumers.

Materials

Pieces of Newspaper, Pictures of Sun, plants, mice, snakes, hawks

Procedure

Review with students the flow of energy through a food chain.

Activity

1. Divide students into groups with five members.
2. Give each student a card with a picture on it to place around his/her neck. Have students line up in order as they would appear in a food chain.
   (SUN → Plants → Mice → Snakes →Hawks)
3. The Sun will take an overwhelming armful of "energy" (pieces of newspaper) from the box.
4. At the command of "Go" the Sun (holding "energy" in arms) will race to the plant and transfer the "energy" into the plants arms. Some of the "energy" will fall to the ground.
5. The plants, in turn will race with the "energy" to the next consumer and transfer the "energy."
6. Each food chain member in turn receives the "energy" and transfers it to the next food chain member until the end of the food chain is reached.
7. Students should be encouraged to transfer the "energy" to the end of the food chain as quickly as possible.
8. At the end, students should remain in place with the "energy" in their arms. On the ground should be progressively smaller piles of energy and the person at the end of the food chain should have only a handful of energy.

Discuss how each part of food chain is dependent of the other.
Explain how the "energy" that fell on the floor is not lost or destroyed it is transferred into other forms (heat, light, waste.)

Review with students the flow of energy through a circuit.

Demonstration and/or Group

1. Connect battery, wires, light bulb to show a circuit.
2. Explain how energy flows from the battery through the wires to the bulb and back to the battery.
3. Disconnect the battery from the wire.
4. Discuss if there is a break in the circuit the energy does not flow and the light bulb will not light.



Insect Hunt

SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

Materials

colored paper (red, green, yellow, blue, black, white)
hole puncher
large green cloth
ziplock bag (for dots)
newspaper

Procedure

1. Use the hole puncher to make fifty pieces of each color of the paper, which will represent the insects.
2. Predict which color would be the easiest to find in the grass (green cloth.)
3. Predict which color would be the most difficult to find in the grass.
4. Lay the cloth on the floor and Scatter the "insects" all over the cloth.
5. Give the students 15 seconds to pick up insects—one at a time not a scoop.
6. Have students count the number of each color the group was able to catch.
7. Repeat activity two more times.
8. Record data on table.
9. Put all dots in plastic bag.
10. Repeat experiment using newspaper instead of the green cloth.

Have students explain why certain colors are easier to find than others and how this relates to an animal's ability to camouflage.

Insect Hunt Data Table

	Red Insects	Blue Insects	Green Insects	Yellow Insects	Black Insects	White Insects
Trial 1						
Trial 2						
Trial 3						
Average (mean)						