5

Science

Activity Sheets

(First Quarter)

Department of Education
June 2016

Suggested Activities for Grade 5 Science
1st Quarter: Matter

Week	Learning Competency	Activity/ies
1-3	**Properties:** The learners use the properties of materials whether they are useful or harmful **(S5MT-I-a-b-1)**	Activity 1: Observation Boxes Activity 2: States of Matter Activity 3: Measuring Matter Activity 4: Mystery Boxes Activity 5: Harmful or Useful
4-8	**Changes that Materials Undergo** The learners investigate changes that happen in materials under the following conditions: 1. Presence or lack of oxygen; and 2. Application of heat **(S5MT-Ic-d-2)**	Activity 7:Physical Changes in Water (Liquid) Activity 8: Physical Change in Solid Activity 9: Changes in State Activity 10: Identifying the conditions when chemical change occur Activity 11: Identifying the products if chemical change Activity 12: Observing the products of Chemical Change Activity 13: Chemical Properties of Some Materials Activity 14: Agents Causing Changes in Matter
9	Recognize the importance of recycle, reduce, reuse, recover and repair in waste management **(S5MT-I-e-g-3)**	Activity 15: No Segregation, No Collection Activity 16: How Much Waste? Activity 17: Sort, Recycle, Save!
10	Design a product out of local, recyclable solid and/or liquid materials in making useful products **(S5MT-Ic-d-4)**	Activity 18:

ACTIVITY 1: OBSERVATION BOXES

LESSON CONCEPT:

This activity recalls the different physical properties of matter. Matter has physical properties (e.g., color, relative size, shape, texture, composition, patterns, and odor) that can be observed, described, and used to identify matter.

TIME: 2 – 3 class periods

Materials:

Whole class
4 balloons (2 not inflated and 2 inflated with air)
2-3 water bottles with water
1 large empty water bottle (e.g., 5 gallon)

Observation Set #1
2 boxes (observation boxes)
2 balls of different sizes (relative size)
2 balls of the same color made of different materials (composition)
2 pieces of graph paper with different sized squares (patterns)
2 pieces of cloth (different textures)
2 air fresheners with different scents (smell)
2 paper clips of different colors (color)

Observation Set #2
2 boxes (observation boxes)
2 pens of different colors (color)
2 small erasers with slightly different shapes (shape)
2 red balls, rubber and styrofoam (size/composition)
2 jars made of different materials (composition)
2 pencils of different colors (color)
2 air fresheners with different scents (smell)
2 pieces of graph paper with different sized squares (patterns)

PROCEDURE:

1. To motivate the students, ask the students to imagine how the bottle under your desk looks like by letting them draw their idea. . The student whose drawing is closes to the real one will win a prize.
2. Place students into 6 groups and have each group pick one person to be the group observer.
3. The observers from the groups move to the other side of the room and look at what is in the observation box for 2 minutes and then report back to their group what they saw.
4. Call on a group member from group one and ask them to name one item in the box.

5. Hold up either the actual item or the similar item from the other observation box and ask students if that is it.
6. Explain what was important to notice (properties) about that particular object.
7. Continue through the other groups in the same fashion until you are finished with all 8 objects. Then go through each property again: **color, relative size, shape, texture, composition, patterns, odor.**
8. As students are sharing out, have them use three column notes to record findings.
9. Repeat the activity above with a second set of objects with new observers. Now students will be taking notes in three-column format modeled above. Students should be pay closer attention to the object's properties.
10. Go back to Procedure 1, ask the students to explain orally their illustrations of bottled water, then show and reveal the actual bottled water.

OBSERVATION BOX – WHAT DO YOU SEE!

OBJECT	DESCRIPTION	PHYSICAL PROPERTIES

Guide Questions:

1. When you observe objects/matter, what properties do you usually pay more attention to?
2. How do you make observations to describe the properties of matter more accurately?

Evaluation:

1. Display two objects (labeled A and B) that are almost the same (e.g., color, relative size, shape, texture, composition, patterns, odor). Use a document camera or trays on tables to display objects. Have students observe the objects and write detailed and accurate descriptions of objects A and B.
2. Descriptions have enough detail that a reader could tell the two objects apart. Use the following rubric to determine the extent to which students are able to use multiple properties to describe matter.

Rubric

3	Students use 3 or more properties to distinguish between the objects (e.g., color, relative size, shape, texture, composition, patterns, odor).
2	Students use 2 properties to distinguish between objects (e.g., color, relative size, shape, texture, composition, patterns, odor).
1	Students use 1 property to distinguish between objects (e.g., color, relative size, shape, texture, composition, patterns, odor).

ACTIVITY 2: STATES OF MATTER

LESSON CONCEPT:

Physical properties of matter can be observed on the macro and micro level. On the macro level solids keep their shape, liquids take the shape of their container, and gases expand to fill the container. On the micro level the spacing and movement of particles defines whether a substance is a ***solid, liquid*** or ***gas.***

TIME: 1 - 2 class periods

Materials:

Whole class
2 1-pound bags of split peas

Per Group (e.g., groups of 4, groups of 2)
Various objects in different states of matter (e.g., eraser, balloon filled with air, block, water with food coloring, juice)
Glass
Water
Ice
Glue

PROCEDURE:

1. Gather materials and make a model of the States of Matter Placemat.

States of Matter Placemat

Matter is _____

State of Matter	Definition	Example	Molecular Arrangement
solid			
liquid			
gas			

2. Distribute various objects, which are in different states of matter (e.g., eraser, balloon filled with air, block, water with food coloring, juice).
3. Have students sort the objects into three groups.
4. Have students discuss their reasons for sorting the objects the way they had agreed upon.
5. Introduce the vocabulary of solid, liquid and gas if students have not already used the vocabulary.
6. Have students use hand movements to model the movement of molecules in various states of matter. Have students: clasp their hands together to model the movement of molecules in a solid, slide their hands one over the other to model movement of molecules in a liquid, and move their hands over their heads to model movement of molecules in a gas.
7. Section off a part of the room and have students enter the space as molecules. At first model a gas by having very few students in the space. These students can move freely and quickly. Next, model a liquid by adding more students and have them move about, now more slowly but still fluidly. Finally, send in many more students, resulting in a very impacted space, which doesn't allow movement (a solid). One could also do this activity in reverse. Moving from very dense to less dense.
    - Introduce students to the States of Matter Placemat (See: States of Matter Placemat). Explain to students that the model demonstrates the way particles (molecules) are arranged in solids, liquids, and gases that give each state of matter its properties.
8. Once students have been shown the spatial distance between particles, ask students why the state of matter will affect its movement and characteristics. Encourage students to think about how easily it is to move when they are: 1.) crowded into a space or 2.) in an open space.
9. Distribute "placemat" on which split peas will be glued to illustrate the molecules of liquids, gases and solids.

Guide Questions:

1. What is solid? Liquid? Gas?
2. How are solids, liquids, and gases different form each other?

ACTIVITY 3: MEASURING MATTER

LESSON CONCEPT:

Physical properties of matter, such as, length, mass, and volume can be measured using a ruler, balance, and graduated cylinder.

TIME: 2 class periods

MATERIALS:

Whole class

3 containers for liquid and colored water
- one container tall and narrow
- one container short and wide
- one container "just right"

3 weighing scales/ triple beam balances
Measuring wheel
Red, yellow, blue food coloring

Per Group (groups of 4)

tray
500 ml graduated cylinder
6 clear plastic cups
Large containers filled with red colored water, yellow colored water, and blue colored water for students to use
Disposable pipette or eye-dropper
Ruler/ Meter stick
Activity Sheet

Procedures:

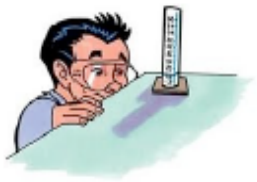
1. Day 1: Display the 3 containers of liquid of different shapes and sizes with 240 ml of colored water each. Each container actually has the same amount of liquid (i.e., 240 ml) but the three different shapes of container make it appear that some may contain more or less liquid.
2. Ask students which container has the most liquid. Discuss in lab groups and share out responses. Teacher will record student predictions.
3. Introduce a graduated cylinder. Explain to students how to accurately measure using a graduated cylinder: get at eye level to the liquid being measured within the graduated cylinder by placing it on level, flat surface of a table.
4. Distribute tray of materials to each lab group, including sheet of directions (See Measuring Volume). Emphasize the importance of accurately measuring and following directions. Students will follow procedures on the lab worksheet.
5. The final product should result in all 6 cups with the same amount of liquid (in milliliters) and arranged in a rainbow order (red, orange, yellow, green, blue, violet).

Have students measure each cup of liquid using a graduated cylinder. Have students record their measurements on their worksheet.

6. Ask students:
    a. What if I had given you spoons to measure the liquids in this activity? (It would be harder to measure)
    b. What if everyone had different sized spoons? (ESR: The colors might not be consistent among groups.)
    c. Why do scientists use standardized measurements and tools for measurement? Scientists use standardized measures to be accurate and consistent.
    d. What state of matter were we working with earlier in the lesson? (Liquid)
    e. What physical property were we measuring? (Volume)

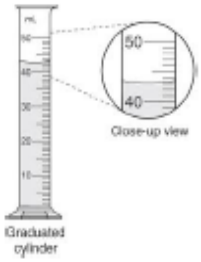
7. Day 2: Measuring Length: Give students various instruments with which to measure length, such as, rulers, meter stick, and measuring wheel. Clarify for students the difference between the metric system (International System of Units SI) and the United States Customary System of measurement. Direct students to measure using metric units, such as centimeters and milliliters on the ruler. (Suggestion: Tape over the inches side to discourage students from using those units of measure, and eliminate possibility of confusion.) Give students various objects to measure length: a textbook edge, a pencil, a pencil box, etc. Have students record objects and measurement in their science notebooks.
8. Demonstrate measurement for non-rectangular prism shape (example: marbles, rocks, golf balls, sets of old keys, little toys, bags of pennies) by using displacement. Measure out 200mL of water and note measurement. Add any object that will sink and note new measurement. Find the difference and record as volume of object. Have each group practice with a new amount of water and different objects. Have students record their observations and measurements in their science notebooks.

ACTIVITY SHEET



Measuring Volume
Focus: *Liquids*

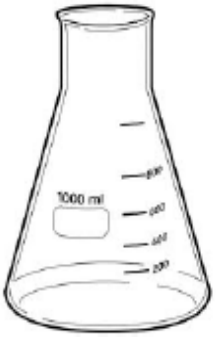
Follow the directions carefully.
You will be using a ***graduated cylinder*** to exactly measure the amounts of liquid you need.
We will measure in ***milliliters.***



☑ Check off each step after it's completed.

- ☐ 1. Label the six cups A, B, C, D, E, and F.
- ☐ 2. From the beaker of *red water*, measure 38 ml and pour into cup A.
- ☐ 3. From the beaker of *yellow water*, measure 36 ml and pour into cup C
- ☐ 4. From the beaker of *blue water*, measure 36 ml and pour into Cup E
- ☐ 5. From cup C, measure 8 ml and pour into cup D.
- ☐ 6. From cup E, measure 14 ml and add to cup D
- ☐ 7. From the beaker of *blue water*, measure 8 ml and pour it into cup F.
- ☐ 8. From the beaker of *red water*, measure 14 ml and pour into cup F.
- ☐ 9. From cup A, measure 16 ml of water and pour into cup B.
- ☐ 10. From cup C, measure 6 ml and add it to cup B.
- ☐ 11. Now, record your observations on the back of this sheet.

Other Tools for Measuring Liquids . . .



Students in Group: _____ Date:_____

Write your observations in the boxes below.

Cup	Color of Water
A	
B	
C	
D	
E	
F	

Now, go back and measure how much liquid is in each of the cups.
Write your measurements in the box below.

Cup	Amount of Water (milliliters = ml)
A	
B	
C	
D	
E	
F	

Optional: Draw a colorful diagram of the cups after completing all the previous steps.

ACTIVITY 4: MYSTERY BOXES

LESSON CONCEPT:

Matter has observable physical properties at both a macro and micro level. Everything is made of something smaller, including matter. Matter is made up of elements. The ways elements are put together make different types of matter. This serves as an introductory lesson on structure of matter.

TIME: 1 - 2 class periods

Materials:

Whole class
1 demonstration station with mystery box and sample materials (see below)
1 image of an atom
1 image of the sun

Per Group (groups of 2)
Cardboard box with cardboard or sponge shape (rectangle or triangle) taped inside and one marble (taped closed so that students are unable to see inside)
Cardboard box (empty and open)
Tape (masking tape)
One marble
Rectangle and triangle cardboard or sponge shapes
Pencil
Activity Sheet

Procedures:

1. Gather supplies (cut cardboard or sponge shapes).
2. Assemble mystery boxes by taping a rectangle or square shape made of sponge or cardboard inside each box (placement varies); also place a marble inside each box, and tape box closed.
3. Reproduce copies of Mystery Box Activity Sheet.
4. Display a picture of the atom and the sun.
5. Ask students, "How do scientists know what is inside an atom? How do scientist know what the inside of the sun looks like? How do scientists construct this model?"
6. Discuss how scientists are able to construct a model for something that cannot be seen with the human eye.
7. Distribute taped mystery boxes, empty mystery boxes, masking tape, marbles, cardboard or sponge shapes, and Mystery Box lab papers.
8. Allow students to observe their taped mystery boxes and construct a drawing of what they think is in the mystery box models.
9. Discuss/chart student findings. Discuss student methods. Have students describe how they inferred what was in their mystery box.

10. Distribute empty mystery boxes, masking tape, marbles, cardboard or sponge shapes. Have students create their own mystery box for another group to observe and infer what is inside the mystery box.
11. Have students compare and contrast their methods for constructing mystery boxes with a scientist's method for constructing a model of something that cannot be seen such as the Earth's layers or the Sun's layers.

Activity Sheet

Name: _____

Mystery Box Lab Paper

1. How do scientists know about the Sun's/Earth's layers?

_____

_____

2. Sketch what you think is inside the black box.

Idea #1	**Idea #2**

3. Test your ideas. Do you think your model is a match with the Mystery Box?

_____

_____

4. How would you alter your model? _____

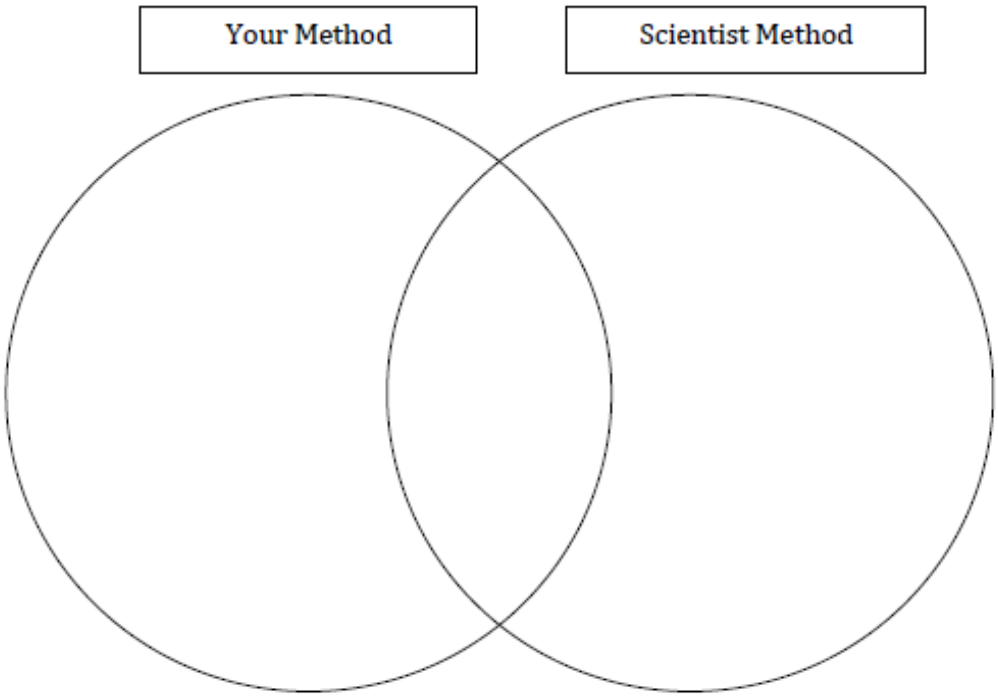
_____

_____

_____

Post Lab Question:

9. Compare and contrast your methods for constructing your mystery box with a scientist's method for constructing a model of something that cannot be seen such as the Earth's layers or the Sun's layers.



Describe how your method compares with a scientist's method.

_____

_____

_____

_____

ACTIVITY 5: HARMFUL OR USEFUL?

LESSON CONCEPT:

Different household materials, reagents and chemicals have their specific physical and chemical properties. These properties of the material will determine whether they are useful or harmful. When one is combined with one another, they may cause damage and harmful effects to people or surroundings.

TIME: 2 - 3 class periods

Materials:

For the teacher:

•Overheads: "Hazardous Household Substances", "Hazardous Substance Characteristics", and "Hazardous Substance Toxicity Chart"

• Examples of hazardous household products such as polishes, cleaners, pesticides, etc). Be sure that the containers are empty, with the lids taped shut.

For each student:

• Handout: "Inventory of Potentially Hazardous Household Products"

• Handout: "Common Safer Substitutes for Hazardous Household Products"

Procedures:

Day One

1. List the Discussion/Test Questions on the board. Have students brainstorm answers to these questions.

Discussion/Test Questions

A. Name two potentially hazardous products that can be found in each of the following areas in your home:

1. bathroom (toilet bowl cleanser, certain household cleansers, drain cleaner)
2. kitchen (oven cleaner, window cleaner, furniture polish)
3. garage/ basement (pesticides, flea powders, paint, paint thinner, motor oil)

B. Name four characteristics that identify a material as hazardous. Can a product have more than one hazard?

2. Show the overhead "Hazardous Household Substances". Discuss: What qualities make something hazardous? (harmful to human or animal health; harmful to the environment)

What is waste? (something not needed anymore, or an unwanted byproduct from the manufacture or use of an item)

3. Show the overheads "Hazardous Substance Characteristics" and "Hazardous Substance Toxicity Chart". Ask: What makes some substance more dangerous than others? (the amount required to cause harm). Have students give examples of household products that have hazardous characteristics.
4. Divide the class into five groups. Give each group the *Inventory of Potentially Hazardous Household Products* and the *Inventory of Potentially Hazardous Household Products*. Have the groups look over the inventory and discuss which products they think they might have at home and where they might be kept.
5. Tell students they will use the Inventory to find out what hazardous products they might have in their homes and how these products are labeled to warn the consumer. This can be given as an overnight or longer assignment. Stress that these products are potentially hazardous and that caution should be taken while doing this inventory. Tell the students to ask their parents for assistance.
6. Have the groups to use the their inventories to prepare a report for class presentation. Divide the products among the groups. Each report should cover:
   • the hazardous characteristics
   • the type of product (automotive, household)
   • the proper method of disposal (recycle, use up, etc)
   • a safer substitute

Day Two

1. Discuss some or all of the following questions after the students have completed and turned in their surveys. A tally sheet can be prepared that combines the results.
   a. Which items are found most frequently?
   b. Where were most of the products found? What are the best places to store potentially hazardous products? Did you find any products stored unsafely?
   c. What was the most common warning on the labels? Did similar products have similar warnings?
   d. Which products had directions for safe disposal? Did any of the products mention the health effects that the product could have?
   e. Were any products found that did not have adequate warnings, or that were unlabeled?

HANDOUT (For Students)

Inventory of Potentially Hazardous Household Products

This activity is an inventory. You are going to hunt around your house, basement, and garage to find out which of these products you have at home. Ask your parents to assist you in this activity.

Caution: Do not disturb these products. Some of them might be harmful. Wash your hands carefully after you handle any container. (Not all household products are hazardous.)

1. Check off the items you find in the "√" column. Add others that you find that are not on the list.
2. Write down the quantities that you find. Write down how many containers and the size of containers (12 oz, 1 pint, etc)
3. Write down where you find the product (under the sink, in a kitchen cupboard, on a shelf in the garage, etc.) List both the room and the exact location. Read the labels of the products. Write down any warnings (hazards and characteristics) that are on the labels.

PRODUCT	✓	Qunatity	Location	Warning Labels	Hazard Charateristics	Alternative
Oven Cleaner						
Drain Cleaner						
Toilet Cleaner						
Disinfectants						
Rug or Upholstery Cleaners						
Floor or Furniture Polish						
Bleach (or cleaners with bleach)						
Photographic Chemicals						
Silver Polish						
Pool Chemicals						
Mothballs						
Powder or Abrasive						
Cleaners						
Ammonia (or cleaners with ammonia)						
Spot Removers						
Rust Paint						
Thinners and Turpentine						
Furniture Strippers						
Stain or Finish						
Used Oil						
Brake Fluid						
Transmission Fluid						
Batteries						

Gasoline						
Rat & Mouse Poison						
Roach & Ant Killer						
House Plant Insecticides						

HANDOUT (For Teacher)

Hazardous Substance Characteristics

Toxic A substance that is potentially harmful to human health, can cause cancer or birth defects, and can contaminate, harm or kill fish or wildlife. Examples: lead, mercury, pesticides	
	**Reactive** An unstable substance that reacts strongly (including exploding) if exposed to heat, shock, air or water. Examples: bleach, and ammonia when mixed together, munitions
Corrosive A highly acidic or basic substance that corrodes storage containers or damages human tissue if touched. Examples: battery acid, bathroom cleaners, pool chemicals	
	**Ignitable** A substance that can exploded, catch on fire, or emit toxic fumes or gases into the environment. Examples: fuels, some cleaning fluids, some furniture polishes

HANDOUT (For Teacher)

Hazardous Household Substances

Item	Why Hazardous	Disposal
Auto Battery	Corrosive, Toxic	Recycle
Drain Cleaner	Corrosive, Toxic	Give to someone to use up or flush small amounts down the drain.*
Empty Aerosol Can	Flammable, Toxic	Place in trash for landfill.
House Cleaners with Ammonia	Corrosive, Toxic, Irritant	Give to someone to use up or flush down the drain.
Oil Base Paint	Flammable, Toxic	Give to someone to use up or Hazardous Waste Collection.
Oven Cleaner	Corrosive, Toxic	Give to someone to use up or Hazardous Waste Collection.
Rat Poison	Toxic	Hazardous Waste Collection.
Roach and Ant Killer	Toxic	Hazardous Waste Collection.
Transmission Fluid	Flammable, Toxic	Recycle
Used Motor Oil	Flammable, Toxic	Recycle

Hazardous Substance Toxicity Chart

Warning Word	Toxicity*	Examples
CAUTION	**Moderately Toxic** Lethal Dose: An ounce to a pint.	Ammonia, Most Paints Floor Polishes
WARNING	**Very toxic** Lethal Dose: a teaspoon to a tablespoon	Antifreeze, Bleach, Some fertilizers, Many pesticides
DANGER	**Extremely Toxic** Lethal Dose: a taste to a teaspoon	Rat Poison, Mercury batteries, Some pesticides and weed killers, Paint thinner, Drain opener, Some oven cleaners

HANDOUT (For Students)

Common Safer Substitite for Hazardous Household Products

Product	Substitute
Ant Control	Pour a line of cream of tartar (a spice found in grocery stores) at the place where they enter the house. The ant will not cross over it. Sprinkle red chili pepper, paprika and/or dried peppermint where ants are entering the house.
Air Freshener	Leave an opened box o f baking soda in the room. Add cloves and cinnamon to boiling water and then simmer. Use fresh flowers and herbs.
Insecticides	Stripping old fruit from the vines and trees will keep insects from laying their eggs in the old fruit, decreasing the number o f baby insects in the garden. Use products like Dipel © for tomato hookworm. Dipel © causes disease only in specific pests and is harmless to humans and pets.
Fertilizer	Compost leaves, grass clippings, and other organic waste. Spread around the base of plants, or mix with soil when planting.
Cleanser (Porcelain Cleaners)	Dip damp cloth in baking soda and rub over stains. You can also make a paste with water and baking soda and apply it to stained surfaces. Allow to set before rubbing clean and rinsing.
Copper Cleaner	Pour vinegar and salt over copper and rub with a damp cloth.
Drain Opener	Prevent clogging by using a drain strainer. Use a plunger or mechanical snake. Pour ½ cup (125 ml) baking soda into the drain followed by 2 cups (500 ml) of boiling water. Flush drain weekly with boiling water for prevention.
Flea & Tick Repellent	Feed pets brewer's yeast, vitamin B and garlic tablets. Herbs such as fennel, rue, and rosemary repel flies. Place eucalyptus seeds and leaves around the area where the animal sleeps.
Furniture Polish	Use small amount of mayonnaise and soft cloth. Mix 3 parts of olive oil and one part vinegar and use soft cloth. Mix one part lemon juice with 2 parts olive oil or vegetable oil and use soft cloth.
General Cleaner	Mix 3 tablespoons ((45 ml) baking soda with one quart (950 ml) warm water.
Insect Repellent	Blend 6 cloves crushed garlic, one onion (minced), one tablespoon (15 ml) dried hot pepper and one teaspoon (5ml) soap in one gallon (4 l) of water. Let set one to 2 days. Strain and spray.
Japanese Beetles	Pheromone taps are available which attract the beetles into a container for disposal in your household trash.
Laundry Detergent	Select a non-phosphate detergent, use baking powder or soap in place of detergent. Make a paste of baking soda and water for dirty spots.
Linoleum Floor Cleaner/Wax	Mop with one cup (250 ml) white vinegar, with 2 gallons (7.6 l) of water to remove dull, greasy film. Polish with club soda. Adding sour milk or skim milk to rinse water will shine the floor without

	polishing.
Mosquito Repellent	Drink brewer's yeast or take in tablet form on a daily basis during summer months. (NOTE: some people are allergic to it, so make sure you are not allergic to brewer's yeast before taking it by swirling it around and spitting it out. If you get any reactions, do not take brewer's yeast.)
Mothballs	Place cedar chips around clothes. Dried lavender can be made into sachets and placed in drawers or closets.
Oven Cleaner	Sprinkle salt on spills when they are warm, and scrub. Mix 3 tablespoons (45 ml) baking soda with one quart (950 ml) warm water. Use non-stick or Teflon © oven liners (reusable trays) to catch spills. Rub gently with steel wool.
Cockroaches	Set out a dish of equal parts baking soda and powdered sugar. Set out a dish of equal parts oatmeal flour and plaster of paris. Rub some grease or petroleum jelly on the inside of a jar that contains a banana. Set a tongue depressor or emery board near the jar to serve as a ramp. The cockroaches will be trapped inside the jar. Place bay leaves around cracks in the room.
Snail & Slug Killer	Fill a shallow pan with stale beer and place in the infested area. Overturn clay pots and the snails will seek shelter in them from the heat. The snails can then be collected. Lay boards between rows of planted vegetables. The snails often attach themselves to the boards and can be collected.
Upholstery Cleaner	Clean stains immediately with club soda. Club soda will also remove spots on rugs.
Window cleaner	Mix ½ cup (125 ml) white vinegar with one gallon (3.8 l) warm water. Use newspapers to dry the glass. Use lemon juice and dry with a soft cloth.
Wood Floor Wax/Cleaner	Mix equal parts cooking oil and vinegar. Apply a thin coat and rub in well. Painted wooden floors can be washed with one teaspoon (5 ml) baking soda and one gallon (3.8 ml) hot water. Rinse with clean water.

Activity 6: Physical Changes in Water (Liquid)

Learning Objectives:
By the end of this activity, the pupils should be able to:

1. Describe what physical change is;
2. Enumerate and define the different processes that allow changes in certain materials; and
3. Observe changes in physical properties of materials

Time: 2-3 class periods

Materials:
Ice cubes, empty can, alcohol lamp, tripod, wire gauze, match, piece of transparent plastic container, pair of tongs

Procedure:

1. Pour water into an empty ice cube tray. Describe the physical properties of the water in the tray.
   _____
2. Put the tray into the freezer overnight.
3. Remove the tray the next morning. Describe what was formed.
   _____
4. Describe the physical properties of water at very low temperature.
   Color:_____ odor:_____ shape: _____texture:_____
5. Put the ice cubes in a drinking glass. Expose the glass to sunlight for five minutes. Observe and describe the physocal properties of the ice cubes.
   a. What happened to the ice cubes placed in water?
      _____
   b. Compare the peroperties of the ice cubes with the properties of water.
      _____
   c. Are the melted ice cubes still water in composition?
      _____
   d. How do you know?
      _____
6. Put the melted ice cubes (water) into a can. Put the can over a heat source, such as an alcohol lamp.
   a. Describe the physical properties of water.
   b. What has happened as you continuoulsy heated the water?
7. Remove the can from source of heat. Place a piece of transparent plastic container on top of the can's opening.

a. What could be seen on the underside of the transparent plastic container?
b. How did they form?

_____

c. Where did they come from?

_____

d. What kind of change occurred when water was heated?

_____

e. When did water vapor condense into water droplets?

_____

Note to Teacher:

In this activity, you observed how water changed from one state to another. The water changed its state when it absorbed or released heat. Absorption or release of heat causes matter to change.

Activity 7: Physical Change in Solid

Learning Objectives:
By the end of this activity, the pupils should be able to:

1. Describe what physical change is;
2. Enumerate and define the different processe that allow changes in certain materials; and
3. Observe changes in physical properties of materials

Time: 1 class period

Materials:
Pair of scissors, a small stone, bond paper, hammer, rubberband, wooden stick, copper wire, stove and cloth to wrap the stone

Procedure:

1. Record the properties of the given objects in the table below before and after procedure 2-5 are done.
2. Cut the bond paper into small strips.
3. Stretch the rubber band to a considerable length.
4. Wind the copper wire around the wooden stick.
5. Pound the stone using the hammer. (Caution: Wrap the stone in cloth before pounding)
6. Complete the table to describe the changes in the materials.

Table 1. Physical Properties of Some Materials

Material	**Properties**		**Is the new material the same as the original?**	
	Before	**After**	**Yes**	**No**
Bond Paper	Cutting with scissors			
	Size	Size		
	Shape	Shape		
	Color	Color		
	Odor	Odor		
	Texture	texture		
Rubber Band	Size	Size		
	Shape	Shape		
	Color	Color		
	Odor	Odor		
	Texture	texture		
Copper wire	Size	Size		
	Shape	Shape		

	Color	Color		
	Odor	Odor		
	Texture	texture		
Stone	Size	Size		
	Shape	Shape		
	Color	Color		
	Odor	Odor		
	Texture	texture		

Note to Teacher:

In this activity, you observed how physical properties of solids change. The changes in physical properties of solids vary. As observed, the sizes, and the shapes of the objects changed.

The composition of the bond paper, rubber band, copper wire, and stone remained the same. Only their sizes and shapes changed.

The rubber band changed in size and in shape when it was stretched. Once the force exerted upon it was released, the rubber band returned t its original size and shape. This is true for most elastic materials.

In the same manner, the copper wire that had been wound around a wooden stick has changed it shape.

When matter undergoes physical change, only its physical properties are altered. No new material, which is entirely different from the original material, is produced.

Activity 8: Physical Changes

Learning Objectives:

By the end of this lesson, the pupils should be able to:

1. Infer that materials undergo changes
2. Describe the changes that matter undergoes under different conditions

Time: 1 class period

Materials:

Beaker, alcohol lamp, wire gauze, tripod, match, 100 millitres of water, ice, spoon, dry cloth, small piece of lard or butter, scissors and colored paper

Procure:

1. Let the pupils recite or tell the common properties of matter. (*color, size, shape, texture, smell and taste*)
2. Tell the pupils that matter undergoes changes. You will explore the changes that matter undergoes by doing this experiment.
3. Group Activity:
   a) Let the children form a group of five members. Find out what properties are affected when matter undergoes a physical change.
   b) Let the children set up the beaker, alcohol lamp, wire gauze, and tripod as shown in the figure.

c. Ask them to make predictions of what might happen before proceeding with the rest of the activities. Write the predictions in the chart (*Attachment #1*)

d. Let them heat 100 ml of water in the beaker. (*Give precautionary measure as the children do this because hot or boiling water can burn the skin*.) Observe the water when it starts to boil. While waiting for the water to boil, let a member of the group place the spoon on the ice. Then wipe it dry. Make sure the spoon is kept dry. When boiling has occurred, let the pupils place the cold spoon above the steam.

Ask them what have they observed. Let them record their observations in the chart. *(Attachment #1)*

e. Ask the pupils to put a small slice of lard or butter in the spoon. Place the spoon near the flame. (Caution: Hold the spoon with a piece of cloth or a pot holder. Record observations.

f. Place the spoon with the butter or lard over the ice. Find out what happens to the butter. Record observations.

g. Cut the colored paper into three different shapes. Compare the three pieces of paper.

4. Discuss the result of the activity. Ask the pupils if new substances have been formed. Let formulate the meaning of physical change based on their observations and conclusion.

Attachment # 1

PROBLEMS

1. What physical changes does matter undergo?
2. What properties are affected when matter undergo physical change?

Setup	*Predictions*	*Observations*
1. Cold, dry spoon over steam		
2. Butter or lard near flame		
3. Butter or lard over ice		
4. Paper		

CONCLUSION:

_____

_____

_____

_____

_____

Note to Teachers:

A change in the size, shape, or phase of matter is called a physical change. If you break a piece of glass, the shape of the glass changes. However, the fragments of the glass contain the same particles and have the same properties as the original glass. Physical changes do not change the particles that make up matter. In a chemical change, a new substance that has nwe and different properties is formed. Some evidences of a chemical change are the production of heat and light, appearance of bubbles, and the formation of a precipitate or solid within a solution.

There are many chemical changes that occur around you. Rust forms when oxygen in the air combines with iron. Acid rain forms when sulfur dioxide in the air combines with water. Acid rain corrodes roof and destroys statues. On the positive side, new ans useful substances are produced through chemical changes.

Changes in matter may be useful but changes may also be harmful. Burning is useful chemical change. However, burning may lead to the production of too much carbon dioxide. Carbon dioxide causes heat to be trapped in the atmosphere. This phenomenon is called greenhouse effect. Many scientists believe that greenhouse effect leads to global warming.

Activity 9: Changes in State

Learning Objectives:

By the end of this activity,the pupils should be able to:

1. Predict if new materials will be formed given a specific process.
2. Cite the conditions or factors that bring about changes in materials
3. Infer that materials undergo changes

Time: 2-3 class periods

Materials:

Pictures of candles burning, butter melting, refrigerator, diagram showing change in state involving release and absorption of heat

Procedure:

A. Melting

1. Ask the pupils to predict what will happen to ice when removed from the freezer and left on table for some time. Le them recall the activity on physical change. Ask the pupils what happened to the butter when placed over the flame? Let them explain the change that occurs when a solid turns into liquid. Ask the pupils what causes ice and butter to melt. Emphasize to pupils that ice and butter melt when heated. Tell the pupils that different solid melt at different temperatures. Cite examples. Ask the pupils to compare the melting point of ice, candle and metals. Emphasize that for metals to melt, they need to absorb more amount of heat than candles. For candles to melt, they need more amount of heat than ice and butter.

B. Freezing

2. Present a picture of cooling in the refrigerator *(Figure 2.2*). Let the pupils infer how water is frozen in a freezer and how food is cooled in a refrigerator. Ask the pupils to explain what happens during the cooling process. Emphasize that cooling is the removal of heat.

C. Evaporation

3. Ask the pupils to state what happens to water when it continues to absorb heat. Emphasize that liquid water changes to vapor or gas when it absorbs heat. Let the pupils recall that bubbles appeared when water was heated to boil. Ask the pupils what the steam indicated. Emphasize that steam indicated the escape of vapor from the heated liquid.

D. Sublimation

4. If dry ice is available, show a sample to the class. Ask the pupils if they have seen a dry ice. Ask them what is dry ice made up. What is obviously seen when dry ice is exposed

to air? Show them a mothball. Ask if their parents are using mothball at home. Let them share their experience with the mothball. Let them differentiate sublimation from melting. Ask which process requires heat? Which process is accompanied by release of heat?

E. Condensation

5. Ask the pupils what formed on the cold dry side of the spoon when it was placed over the steam. Let them explain where the droplets of water come from. Ask the pupils if these processes require heat. Explain that condensation is a process that is accompanied by release of heat.

IV. Generalization:

1. Make the pupils summarize the change in the state of matter when heat is absorbed or lost. Present Figure 2. 4. Ask them to cite examples of how changes in the state of matter help people.

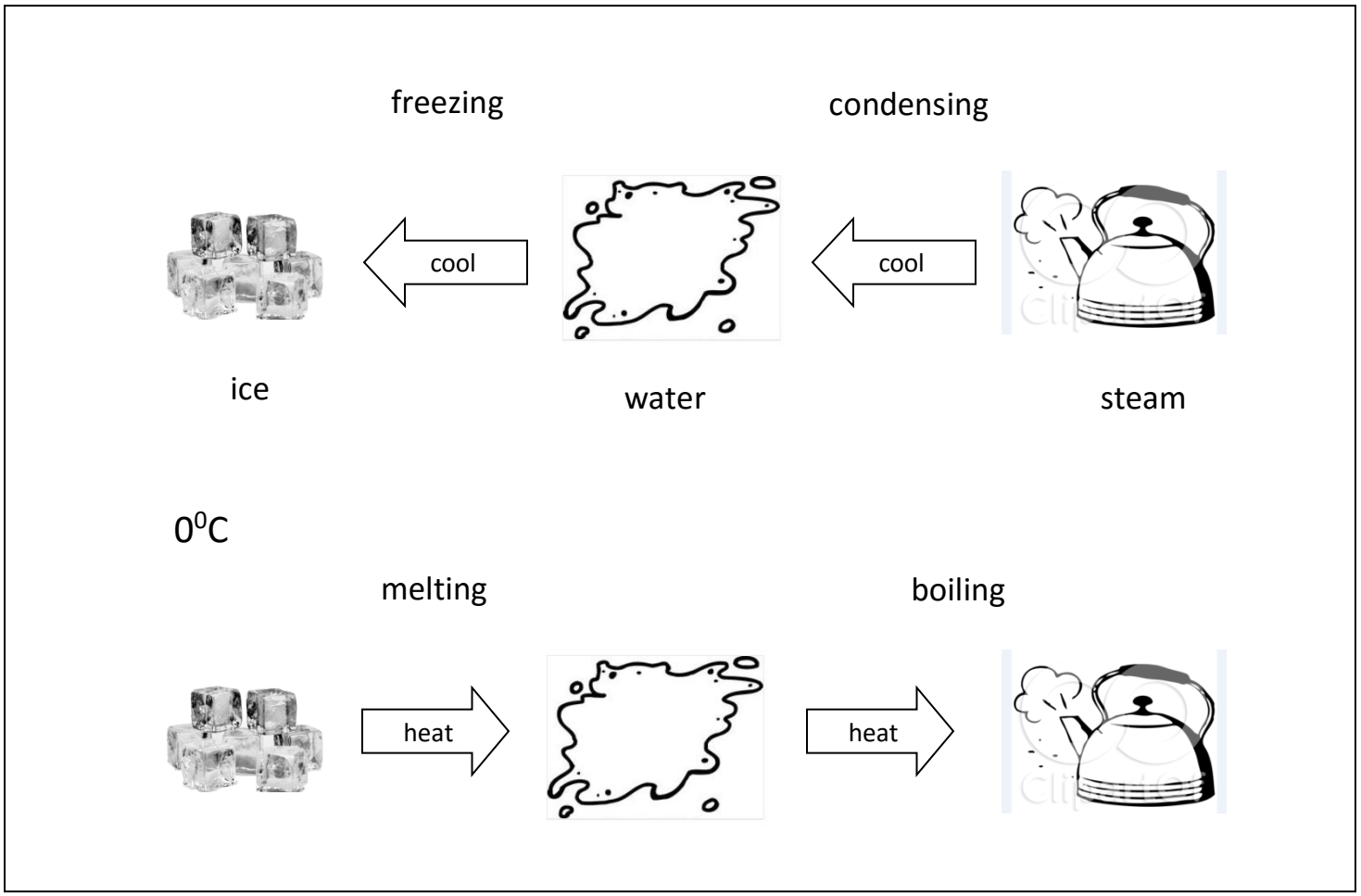


Figure 2.4 What happens when heat is removed or added?

Note to Teachers:

In a physical change, the composition of the product is still the same as that of the source. No new materials is formed.

Water is composed of two atoms of hydrogen and one atom of oxygen. That is why its formula is H_2O. Whether as solid. Liquid, or vapor, the composition of water remains the same. Thus **a change in state is a type of physical change.**

Solid to Liquid

Why should butter be kept in the refrigerator? If butter is left outside the refrigerator for some time, it will melt. What is melting?

Do you like ice cream? What happens to ice cream as you eat it? Ice cream changes from solid to liquid. *Melting* is the change from solid to liquid.

Not all solids melt easily like ice cream and butter. How would you melt a candle? The candle melts when heated. Metals like gold are melted at much higher temperatures.

Liquid to Gas (Evaporation)

When wet objects become dry, where does the liquid go? You may have seen drops of alcohol disappear from your skin. Where does the alcohol go?

What happens when water is heated? Water evaporates. Water does need to be heated by putting it under the flame. It may simply be exposed to sunlight. Water can be heated by the heat of the surroundings. When heated, liquid water changes to vapor or gas.

When water boils, you see bubbles of gases escaping from it. This is water in the form of *vapor* or *steam. Evaporation* is the change from liquid to vapor. Wet objects become dry because of evaporation.

Solid to Gas (Sublimation)

Have you seen a dry ice? Why is it called "*dry ice"?* Dry ice is not frozen water. It is solid carbon dioxide. It is paced in boxes containing ice cream and other frozen products top keep them from melting. Dry ice changes from solid to vapor or gas. *Sublimation* is the change from solid directly to gas without passing through the liquid state.

Dry ice and moth balls sublimate whe they absorb heat. Mothballs kept for some time became smaller in eventually disappear. How did you know the mothballs changed to gas? You could smell the peculiar odor of mothballs.

Liquid to Solid (Freezing)

Matter exists as solid, liquid or gas. Water is liquid at ordinary room temperature. What happens when you put water in the freezer/ Water in liquid state changes to solid in the freezer. *Freezing* or solidification is the change fro liquid to solid. Why does water become solid? In the freezer, water loses heat.

Food in the refrigerator is cooled by the removal of heat. Cold air from freezer moves down and absorbs heat. When heated, the air moves up to the freezer. A cooling coil absorbs the heat.

Gas to Liquid (Condensation)

When cold, dry spoon was laced over the steam coming from the beaker, droplets of water formed on the dry surface of the spoon. What changes took place? Where did the droplets of water come from? The water droplets came from the steam (water vapor that changed into liquid.)

The process whereby a gas changes to liquid is know as *condensation.* When water vapor comes in contact with a cool surface, it releases heat and the changes into liquid. Therefore, heat is involved in a change of state.

Activity 10: Identifying the Conditions When Chemical Change Occurs

Learning Objectives:
By the end of this activity,the pupils should be able to:

1. Observe that new material is formed when a chemical change occurs;
2. Observe that the product of chemical change cannot be brought back to its original form; and
3. Show examples of chemical change

Time: 2-3 class period

Materials:

Iron fillings, small wide-mouthed jar, water

Procedure:

1. Moisten the small wide-mouthed jar with water.
2. Sprinkle some iron fillings into the moistened jar.
3. Take note of the physical properties of the iron fillings.
4. Set aside the moistened jar for about 5 days.
5. After 5 day, take note of the physical properties of the iron fillings.
6. Describe the changes in the physical properties of the iron fillings, like its color.
7. Answer the following questions based on the experiment conducted:
    a. What kind of material is iron?
    b. Does iron undergo change when it is moist? What kind of change is it? Give reasons.
    c. What brings about the change?

Activity 11: Identifying the Products of the Chemical Change

Time: 1 class period

Materials:

The setup in the previous activity, small plate, dry iron fillings

Procedure:

1. Place the iron filings on a dry plate.
2. Compare the physical properties of the dry and wet iron fillings.
3. Take note of the differences in their physical properties, if any.

4. Enter your observations in table like this:

Physical Properties	
Dry Iron Fillings	**Wet Iron Fillings**

5. Answer the following in your Science notebook:
    a. Did the dry and wet iron fillings show the same physical and wet iron fillings.
    b. How do the wet iron fillings differ from the dry iron fillings?
    c. Did the wet iron fillings change? What brought about this change?
    d. What do you call this change? How does it differ from a physical change?
    e. Compare the original material and the product formed.
    f. Is the product formed a new material? Give your reasons.

Activity 12: Observing the Products of Chemical Change

Time: 1 class period

Procedure:

1. Place the setup under strong sunlight to dry the dry iron fillings for three days. After three days, observe the iron fillings. Write down your observations.
2. Continue to dry the iron fillings under the sun for another five days. Describe the iron fillings after the 5th day.
    a. Why do we have to place the setup under the sun?
    b. Does drying form a new material?
    c. Was there rusting when the setup was exposed to strong sunlight?
    d. Can the new material formed be changed into its original form again?
3. Answer these:
    a. Compare the original material and the product formed. Are they the same? different?
    b. Is the product formed a new material? Give your reasons.

Note to Teachers:

A chemical change differs from physical change. In a chemical change, new and different materials are formed. The new materials formed have properties different from the original materials.

Iron is one material that is very hard. Because of its hardness and strength, it is used to build cars, bicycles, and other machines.

Iron easily combines with oxygen and forms rust. Rust is soft and powdery.

Rusting is a chemical process when iron is exposed to the atmosphere. The moisture in the air speeds up the rusting process.

When a material undergoes a chemical change, the new material formed cannot be brought back to its original form. Chemical change is irreversible process.

Activity 13: Chemical Properties of Some Materials

Learning Objectives:
By the end of this activity,the pupils should be able to:

1. Define chemical change;
2. Differentiate chemical change from physical change ; and
3. Describe what happens when materials undergo chemical change

Time: 1 class period

Materials:

Piece of a paper, a bog clay pot or a metal container and matches

Procedure:

1. Describe the paper – its size, shape, color, odor sand texture
2. Burn the paper in a clay pot and describe how it changed. Use your eyes, nose and skin to gather the needed information to describe the changes.
3. Record the properties of ash.
4. Light a matchstick, place it on a metal cover, and desribe what happens.

Table 2. Chemical Properties of Some Materials

Material	**Property**		**Is the new material same in composition as the original?**	
	Before burning	After burning	Yes	No
Paper				
Size				
Shape				
Color				
Odor				
Texture				
Matchstick				
Size				
Shape				
Color				
Odor				
Texture				

5. Is the ash the same as the paper? Why do you say so?
6. Is the burned natchstik the same as the original ? Explain.
7. What kind of changes occurred? Explian.

8. What should you do to bring the ash to its original state (paper)? Explain your answer briefly.

Activity 13.2

Time: 1 class period

Materials:

Spoonful of sugar, metal bottle cap, alcohol burner, evaporated milk, vinegar, wide-mouthed bottle, toothpick, match and tongs

Procedure:

Ask the pupils to predict what will happen before you let them do the activity. Let them write their predictions on the chart provided (*See attachment*). After the experiment, let them compare their predictions with their observations.

A.

1. Put the sugar in the metal bottle cap. Be sure to remove any plastic or cork lining in the cap before using it.
2. Using tongs, hold the cap over the alcohol burner. Observe what happens to the sugar while it is being heated.
3. Stop heating the sugar when you see that a black substance has formed. Allow this balck substance to cool.
4. Using a toothpick, scrape a little of the black substance. Smell and taste it.

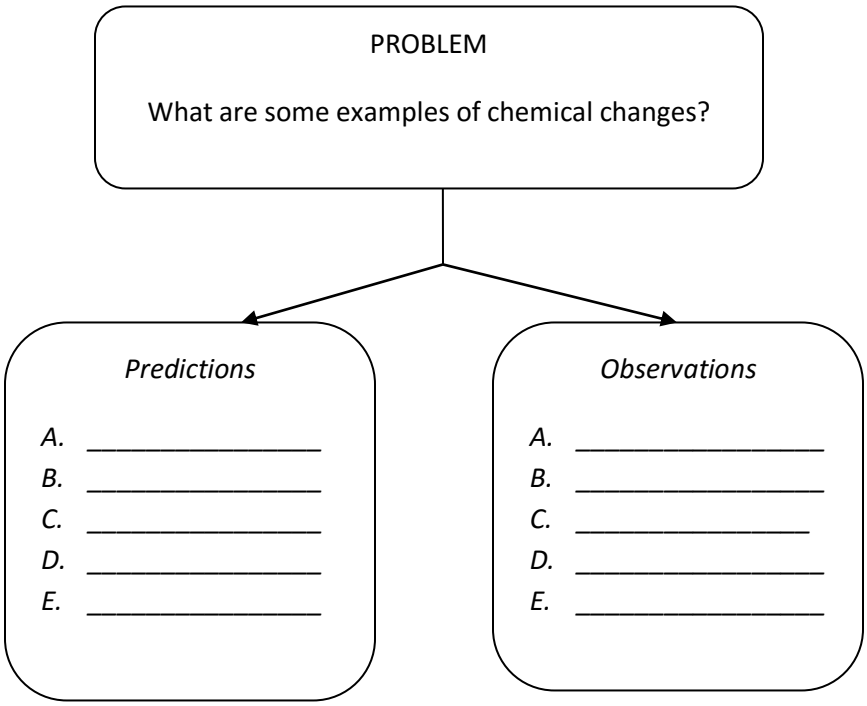
B.

5. Light a matchstick, place it inside a wide-mouthed bottle. Observe what comes out of the burning matchstick.

C.

6. Put 4 tablespoons of milk in a container. Smell and taste the milk. Add ½ tablespoon of vinegar to the milk. Smell and taste the mixture.

Attachment:



Note to Teacher:

You have learned that in a physical change, it is only the physical properties of matter, not its composition, that undergo change.

Matter can undergo another kind of change. Take for instance, a pile of garbage. Garbage undergoes change as it decays. There will be physical change in size, shape, color, odor, texture, and state. Moreover, the garbage will also form new materials with properties different from the original material. A foul odor is emitted by the decaying garbage. The odor is caused by the breakdown of the chemical composition of this pile of garbage. The kind of change that produces a new substance that is chemically different from that of the original is called chemical change.

In this activity, you observed two chemical change. In this kind of change, you saw the difference in the properties of the original materials (paper, matchstick and sugar) and the end product (ash). Water and carbon dioxide were also released during the chemical change. These two substances were released in gaseous form. As a result, the composition of the original material changed. The product (ash) can no longer return to its original form (paper, matchstick and sugar).

Activity 14: Agents Causing Changes in Matter

Learning Objectives:
By the end of this activity, the pupils should be able to:

1. Infer that changes in materials are brought about by different agents; and
2. Discuss that these agents may cause changes in an object's size, shape, and color, or composition

Time: 1-2 class periods

Materials:

Iodine solution (10% dilute), a piece of bread, ice cube, beaker, or can, medicine dropper, red food color, a piece of white cloth, fan, small cotton balls soaked in acetone, vinegar and baking soda

Procedure:

1. Put a drop of iodine solution on a piece of bread. Observe what happens.
2. Put the ice cube in a beaker or can and heat it. Observe what happens.
3. Put a drop of food color on a white cloth. Observe what happens.
4. Fan a small cotton ball soaked in acetone. Observe what happens to the cotton ball after a few minutes.
5. Add vinegar to the baking soda. Observe what happens.
6. Fill in Table 3 with your observations.

Table 3. Observations

Substance	Agent of Change	Result	Change	
			Physical	Chemical
Piece of bread				
Ice cube				
Piece of white cloth				
Cotton ball soaked in acetone				
Vinegar and baking soda				

7. Find out other ways o how you can change the substances in the list. Write down the agents of change, the resulting substances, and the kinds of change you have observed in a table similar to Table 3.

Note to Teachers:

Different factors (or conditions) have brought about the changes that took place in this experiment.

Absorption or release of heat causes matter to undergo change. For instance, ice cube melt when they absorb heat. Some materials, like paper, burn when the absorb large amount of heat,enabling them to reach their kindling temperature. This time, a chemical change occurs. Kindling temperature is the lowest temperature at which a substance burst into flame.

Another way by which matter changes is when it releases heat. For example, water solidifies as it turns into ice. When a glass half-filled with vinegar was mixed with baking soda, bubbles formed. Feel the temperature of the glass. A chemical change has just occurred. During the chemical reaction, heat was released.

Light is another agent of change in matter. Note that colored or fabric fades when exposed to strong light. Chemicals like vitamins tablets are placed in dark-colored bottles to prevent any chemical change.

The application of force or pressure also causes change. This involves different mechanical means such as cutting, mixing, grinding, pounding, bending, strectching, squeezing, etc.

Eletricity can also chemically change a substance. It can break up a compound such as water into its components. When electricity passes through water, the current splits water into hydrogen and oxygen atoms.

Some substances also caused chemical reactions. For example, when plastic is dipped into hydrochloric acid (muriatic acid),it melts. It changes its composition, too. The same changes happen with food whe eaten. Ingested food mixes with the enzyme and gastric juices in the digestive organ. The browning of the flesh of a cut eggplant and the rusting od iron are chemical changes. These changes ae brought about by substances that chemically combine wit oxygen from the air.

Activity 15: No Segregation, No Collection

Learning Objectives:
By the end of this activity, the pupils should be able to:

1. classify different waste materials;
2. sort out materials at home as useful or harmful

Time: 1 class period

Materials:
Chart, paper and pencil

Procedure:

1. In line with the segregation scheme under the ecological waste management programs of barangays and cities, garbage or waste materials will not be collected by garbage collectors unless segragated or separated.
2. Using the chart below, classify these waste materials into biodegradeable, nonbiodegradable, hazardous and infectious.

Shell	dry leaves	leftover food
Tin can	cardboard	old newspaper
Atis seed	used syringe	bones of fish
Styrofoam	feather	expired medicines
Manure	plastic bottle	banana peelings
Sanitary napkins	broken glass	hospital waste

Biodegradable	Nonbiodegradable	Hazardous Waste	Infectious waste

3. Answer the following questions:
    a. What are waste materials?
    b. How are waste materials classified?
    c. What kind of materials are biodegradabale?
    d. What kind of materials are nonbiodegradable?
    e. How should you dispose biodegradable and non biodegradable materials?

Note to Teachers:

Biodegradable Wastes are materials that decompose or decay like fruit and vegetable peelings, dry leaves, left-over food, or paper. In time they become part of the soil. They decay as compost or organic fertilizer which is used to enrich the soil and utilized by plants.

Non Biodegradable Wastes are materials that do not decay easily like plastic, glass, or styrofoam. They may accumulate if not disposed properly. It takes a longer time for it to decompose. These materials, however, can be reused or recycled.

Hazardous Wastes are materials that contain toxic substances. Examoples of these are expired medicines, chemicals, use up batteries, nuclear wastes, etc. They are considered hazardous or dangerous to people's health and to the environment.

Infectious or Pathological Wastes are materials that may carry disease-causing micro organisms like hospital waste, syringes, gauzes and dead animals. One should handle these waste with extra care and segragated at once.

Activity 16: How Much Waste?

Learning Objectives:
By the end of this activity, the pupils should be able to:

1. classify different waste materials;
2. practice segragation techniques in managing solid wastes in school

Time: 1 class period

Materials:

Chart, paper and pencil

Procedure:

1. Make a chart like the sample given. Put the chart and a pencil next to the garbage can/bin.
2. All students in your class should record what they throw away. If paper is thrown away, then 1 is written in the paper row. If three plastic bottles are thrown away, then 3 is written in the plastic container row.
3. After gathering data for one day, total all the things that were thrown away.
4. Work in groups and answer this question:
   How can your class recycle and contribute to the recycling effort of your barangays to minimize waste?
   _____
   _____
   _____

What We Throw Away Today	
Paper, cardboard, and other paper materials	
Glass containers	
Plastic containers	
Plastic Bags or Wrappings	
Newspaper and Magazines	
Others	

Activity 17: SORT, RECYCLE, SAVE!

LESSON CONCEPT:

As discussed in the previous activities, various materials may be described through their physical and chemical properties and these properties tell on how people will properly use them. These properties will tell on how these materials can be reused, repaired or recycled to form another useful product or material.

TIME: 1 class periods

Materials:

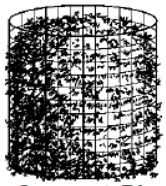
Coloring materials, paste/glue

Procedures:

Activity A

- Name and color the different waste item in the box.
- Cut them out and paste into their proper group or location in the next activity sheet.

ACTIVITY SHEET (For the Students)

GROUP	MATERIALS
 Plastic	
 Glass	
 Paper	
 Metal	
 Compost Bin	
 Thrift Store	

Activity 18: Organic Fertilizer Factory

Learning Objective:
By the end of this activity, the pupils should be able to:

1. Produce organic fertilizer through composting

TIME: 2-3 class periods

Materials:

Old plastic garbage bin with cover, knife, soil, grass cuttngs, fruit, and vegetable peelings, shovel or pitchfork, earthworms

Procedures:

1. Make holes all over the a garbage can and its cover. The holes allow air to circulate through the composter.
2. Start the first layer which can be made up of about 2.5 cm of grass cuttings and soil. The next layer can contain shredded kitchen waste. Third layer can be made up of decaying dry leaves. Then sprinkle some soil on top of the heap. Throw a few earthworms to help materials degrade.
3. Put the cover on thegarbage bin and place in a sunny out of the way place, a little away from a wall to let it get air from all sides.
4. Add more kitchen waste daily. Add some dry leaves or grass cuttings, every time you add kitchen waste.
5. Keep the organic matter damp but not wet. Mix the layers regularly with a pitchwork or shovel to get rid of odors.
6. When the garbage bin is ¾ full, stop adding organic matter and allow the composting process to wrok. The compost is ready when it's fairly dark and crumbly.

B. Let the pupils answer the following questions:

a. How does composting help in the proper disposal and in minimizing waste?
b. What waste materials do you throw in a composter?
c. What materials should not be thrown in a composter?
d. What gas fuel can de derived froma decomposing waste?

Note to Teachers:

Composting is one way we can get something good from biodegradable waste and help reduce also the garbage in landfills. Composting is a process of turning biodegradable materials into odorless organic fertilizer through the action of decomposers. Composts form when organic matter decays. The decay is brough about by decomposers like bacteria, fungi, earthworm and snails.

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