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Activities and Experiments

Properties of and Changes in Matter

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Answer Key is after the Materials List.

At Glance

Learning Expectations				Materials That Transmit, Reflect or Absorb Light and Sound	Properties of and Changes in Matter	Properties of Air and Characteristics of Flight
Understanding Concepts						
• Share prior knowledge.				•	•	•
• Demonstrate understanding that certain materials can transmit, reflect or absorb light and sound.				•		
• Classify materials as transparent, translucent or opaque.				•		
• Investigate the formation of shadows and predict their size, shape, and location.				•		
• Investigate how different properties of materials affect their sound.				•		
• Identify a variety of materials through which sound can travel.				•		
• Identify the states of matter and give examples of each.					•	
• Identify and describe the characteristics of each of the states of matter.					•	
• Identify “physical change” and “chemical change.”					•	
• Identify changes as reversible and non-reversible.					•	
• Demonstrate an understanding of the properties of air.						•
• Investigate the principles of flight and the effect of the properties of air on materials used in flying devices.						•
• Identify characteristics and adaptations that allow birds to fly and living things to be carried by the wind.						•
Skills of Inquiry, Design and Communication						
• Demonstrate an awareness of the scientific method.				•	•	•
• Understand the importance of observing safety practices.					•	•
• Observe with their senses.				•	•	•
• Work co-operatively with others.				•	•	•
• Listen, record, and compare others’ observations.				•	•	•
• Make predictions.				•	•	•
• Record observations, findings, and measurements using drawings and written descriptions.				•	•	•
• Design experiments to test ideas.				•	•	•
• Communicate the procedure and results of investigations using drawings and written descriptions				•	•	•
Relating Science and Technology to the Outside World						
• Identify technological innovations, how they are used and controlled.				•	•	•
• Create new inventions based on scientific concepts.				•	•	•

Teacher Assessment Rubric

Student's Name: _____

Date: _____

Criteria	Level 1	Level 2	Level 3	Level 4
Understanding Concepts				
Demonstrated understanding of the basic concepts of matter and materials	Limited understanding	Some understanding	General understanding	Thorough understanding
Demonstrated misconceptions	Significant misconceptions	Minor misconceptions	No significant misconceptions	No misconceptions
Quality of explanations given	Shows limited understanding of concepts	Gives only partial explanations	Usually gives complete or almost complete explanations	Always gives complete and accurate explanations
Inquiry, Design, and Communication Skills				
Ability to question, predict, carry out a procedure, observe, and conclude as it relates to the scientific method	Limited ability	Some ability	Good ability	Consistent ability
Use of the correct vocabulary relating to matter and materials and clarity and precision of communication	Limited communication	Some communication	Good communication	Consistent, effective communication
Awareness and use of safety procedures in the classroom	Limited awareness	Some awareness	Good awareness	Consistent awareness
Relating Science and Technology to Each Other and to the Outside World				
Demonstrated understanding of the connection between science and technology of matter and materials in familiar contexts	Limited understanding	Some understanding	Good understanding	Good understanding in both familiar and unfamiliar contexts
Demonstrated understanding of the connections between science and technology of matter and materials and the world	Limited understanding	Some understanding	Good understanding	Good understanding of connections and their implications

Student Self-Assessment Rubric

Name: _____

Date: _____

Put a check mark ✓ in the box that best describes you:

Expectations	Always	Frequently	Sometimes	Seldom
✓ I was focused and stayed on task.				
✓ I followed the directions.				
✓ I worked safely.				
✓ I finished on time.				
✓ My answers show thought, planning, and good effort.				
✓ I checked my work for correct spelling, grammar, and clarity.				
✓ I reported the results of my experiments.				
✓ I discussed the results of my experiments.				
✓ I understand the basic ideas about matter and materials.				
✓ I connected the material to my own life and to the real world.				
✓ I know what I do well.				
✓ I know what I need to improve.				

I liked _____

I learned _____

I want to learn more about _____



Introduction

Teacher Notes

The activities in this book have two intentions:

- To teach concepts related to matter and materials.
- To provide students with the opportunity to apply necessary skills needed for the mastery of science and technology curricula.

Throughout the experiments, the scientific method is used. The scientific method is an investigative process which follows five steps to discover if the evidence supports a hypothesis:

1. **Consider a question to investigate.**

It is important to choose a question that is clear and that the students are capable of answering.

2. **Predict what you think will happen.**

A hypothesis is an educated guess about the answer to the question being investigated. For example: “I believe matter will change when heated.” A group discussion is ideal at this point.

3. **Create a plan or procedure to investigate the hypothesis.**

The plan will include a list of materials, and a list of steps to follow. It forms the “experiment.”

4. **Record all the observations of the investigation.**

Results can be recorded in written, table (chart) or picture form.

5. **Draw a conclusion.**

Do the results support the hypothesis? Encourage the students to share their conclusions with their classmates.

The experiments and activities in this book fall under three categories:

- **Materials that Transmit, Reflect or Absorb Light and Sound**
- **Properties of and Changes in Matter**
- **Properties of Air and Characteristics of Flight**

In each section you will find:

- **Teacher Notes:** ideas and suggestions for conducting experiments and completing activities.
- **Materials List:** items needed to carry out experiments and activities
- **Pre-assessment Quiz:** a quick overview of what students already know about the topic.
- **Activities and Experiments:** simply laid out instructions and worksheets.
- **What Have You Learned?:** A quick review of concepts covered and a check for student understanding.



Properties of and Changes in Matter

Teacher Notes

Using their present and prior knowledge base, students will begin to examine and explore the forms of matter and materials that they encounter daily, their sources and their use in our society. Through a variety of experiments and activities, students will have the opportunity to learn the following:

PROPERTIES:

- Definition of Matter
- States of Matter
- Common Properties
- Buoyancy and Density
- Compare and Contrast Properties of States of Matter
- Categorize States of Matter

CHANGES:

- How Temperature Affects Matter
- Changes in Matter
- Physical and Chemical Changes
- Reversible and Non-reversible Changes
- Measuring Matter

Design and Construct a “Cooler” and Present Results.

WHAT HAVE YOU LEARNED?:

An activity to assess student understanding of the properties of matter and the terms used in relation to this topic.



Materials List for Experiments and Activities

Teacher Notes

Suggestions:

- Review the scientific method.
- Try any experiments in advance before students attempt them.
- Collect all materials required before beginning an activity or experiment.
- Plan for modification for individual student needs.
- Discuss and practice safety rules and procedures.
- Student can perform experiments individually, in pairs or in teams.

Experiment or Activity	Page #	For each child/pair or team, you will need
Common Properties of Matter Activity #3	54	• a green apple and a lime • ping pong ball • show box • beach ball • thick hardcover library book (reference books work fine)
Buoyancy Experiment #1	55 - 56	• a plastic bowl or dishpan filled $\frac{3}{4}$ with water • a marble • a lemon • a coin (penny, nickel) • a cork • a pencil • big paper clip
Density Experiment #2	57	• a glass jar (mason jar or canning jar is fine) • $\frac{1}{2}$ cup (125 ml) of water • $\frac{1}{2}$ cup (125 ml) cooking oil • $\frac{1}{2}$ cup (125 ml) corn syrup (or honey)
Properties of and Changes in Matter How Temperature Affects Matter Experiment #1	60	• 2 clear glass containers (beakers, drinking glasses) • 2 ice cubes • very cold water • very hot water • digital timer • partner
Keeping It Cool! Activity #10	66 - 67	• This activity includes a list of suggested materials for students to make their choices (p. 66)

What Do You Know about Properties of and Changes in Matter? (Page 51)

Pre-assessment Quiz

A.

Statement	TRUE	FALSE
1. Once matter has changed its form, it cannot change back.		*
2. Some forms of matter can be in all three states: solid, liquid, gas	*	
3. Temperature affects how matter appears or changes.	*	
4. Everything, including air, is made of matter.	*	
5. Matter can be totally destroyed by fire.		*
6. An example of a physical change is a change in color.	*	
7. A good insulator will only keep something warm/hot.		*
8. Usually, we cannot detect gases in our environment.	*	

B. Answers will vary

What is Matter? Activity #1: (Page 52)

1.

✓	my winter coat	✓	trees in the park
X	music from the car radio	X	friendship
✓	a glass of milk	✓	roast turkey dinner
✓	a chocolate bar	✓	oranges and bananas
X	a story read by my teacher	X	a whisper
✓	my science notebook	✓	mud pies

2. Answers will vary

States of Matter Activity #2: (Page 53)

1. **Picture:** spaghetti sauce (**liquid**) and steam (**gas**), spaghetti (**solid**) and steam (**gas**), ice cubes (**solid**) and bottle of water (**liquid**), hot chocolate and marshmallows (**solid**), cookies, (**solid**)

2. Answers will vary.

Common Properties of the States of Matter Activity #3: (Page 54)

1.

Property	Apple	Lime	Ping Pong Ball	Shoe Box	Beach Ball	Hardcover Library Book
color	green	green	white	various	various	various
hardness	hard	hard	hard	medium	soft	hard
shape	round	oblong	round	rectangle	round	rectangle

2. a) color: apple, lime b) shape: ping pong ball and beach ball; book and shoe box

3. a) smallest ping pong ball b) lime c) apple d) shoebox e) library book f) biggest beach ball

4. Answers may vary a) lightest ping pong ball b) shoe box c) beach ball d) lime e) apple

5. heaviest library book

Buoyancy Experiment # 1: (Pages 55–56)

Predict: 1 & 2 Answers will vary

Observe:

1. Order of weight: a) lightest: cork b) paper clip c) pencil d) coin e) marble f) heaviest lemon

2.

Object	Observation: sink? float?	Prediction: Correct?	Object	Observation: sink? float?	Prediction: Correct?
marble	sink	Answers will vary.	cork	float	Answers will vary.
lemon	float	Answers will vary.	pencil	float	Answers will vary.
coin	sink	Answers will vary.	big paper clip	sink	Answers will vary.

Conclude:

1. Answers will vary

If an object is **more dense** than the liquid, it will **sink**. If an object is **less dense** than the liquid, it will **float**.

Density Experiment #2: (Page 57)

Predict: Answers will vary.

Observe:

What I saw: (Check student diagram)	Arrange the liquids in order from the one at the top to the one at the bottom. oil, water, corn syrup
--	--

Conclude:

The liquid at the bottom of the jar is the corn syrup. It is the most dense of the three liquids.

The liquid at the top of the jar is oil. It is the least dense of the three liquids.

The one with the greatest density goes to the bottom (sinks) and the one with the least density goes to the top (floats).

Properties of the Three States of Matter Activity #4: (page 58)

States of Matter	Examples in daily life	Shape: definite or not definite	Volume: definite or not definite
Solid	Answers will vary.	definite	definite
Liquid	Answers will vary.	not definite	not definite
Gas	Answers will vary.	not definite	not definite

What am I? Activity # 5: (Page 59)

Solids	Liquids	Gases
popcorn	milk	steam
toast	gasoline	fog
crackers	dew	mist
ice cream	water	car exhaust
hot dog	soda pop	helium
cake	chocolate syrup	oxygen
television	ketchup	carbon dioxide
bed	salad dressing	propane
pillows	honey	smoke
pencil	coffee	nitrogen

How Temperature Affects Matter Experiment #1: (Pages 60–61)

Predict: Answers will vary

Observe:

Draw and label a diagram to show the glass containers with ice cubes and water. (Check student diagram)	Which ice cube melted faster? The one with hot water How long did it take for the ice cube in Glass #1 to melt? .. Answers will vary. Glass #2 to melt? .. Answers will vary.
---	---

Conclude:

- The melting time is shorter for the ice cube in Glass #2 because the hot water raised the temperature of the ice.
- The ice cube started as a **solid** but turned into a **liquid**. When **heat** was applied, the ice cube **melted**.
If we put the melted water into a freezer, it would **freeze** and return to a **liquid**.
- The effect of temperature on the state of matter of the ice cube was that it hurried up the change of state.
- On a hot day, water puddles will **evaporate** and air will **condense** on the outside of a glass of ice water.

Changes in Matter Activity #6: (Page 62)

What Happened?	Change Caused by Heat? Cold?	Word to Describe Change	Tell Change of State
chocolate bar on window sill with sun shining on it	heat	melt	from solid to liquid
dripping wet swim suit hanging on clothesline drying, water vapor rising	heat	evaporate	from liquid to gas
open water on pond and frozen surface on pond	cold	freeze	from liquid to solid
person in shower, steam rising, water droplets forming on mirror	cold	condense	from gas to liquid
little boy's ice cream melting	heat	melt	from solid to liquid

Physical and Chemical Changes Activity #7: (Page 63)

Change	Is it Chemical? or Physical?
a plate is dropped and broken	physical
mom is adding cream and sugar to her coffee	chemical
ice cubes are melting in a glass	physical
a wheel on an old car is rusty	chemical

Reversible and Non-Reversible Change Activity#8: (Page 64)

Change	Reversible? Non-reversible?	Reason for my answer
little girl is blowing bubbles	non-reversible	Bubbles cannot be changed back to soapy liquid.
a piece of bread/toast is burned	non-reversible	Once burned something cannot be restored.
a piece of paper gets wet when water is spilled on it	reversible	Dry out the paper and it will be almost like the original.
a dish of ice cream melts in the sun	reversible	Put the dish in the freezer and it will return to a solid.
an egg is boiled	non-reversible	The egg was raw and now it is cooked.

Measuring Matter Activity #9: (Page 65)

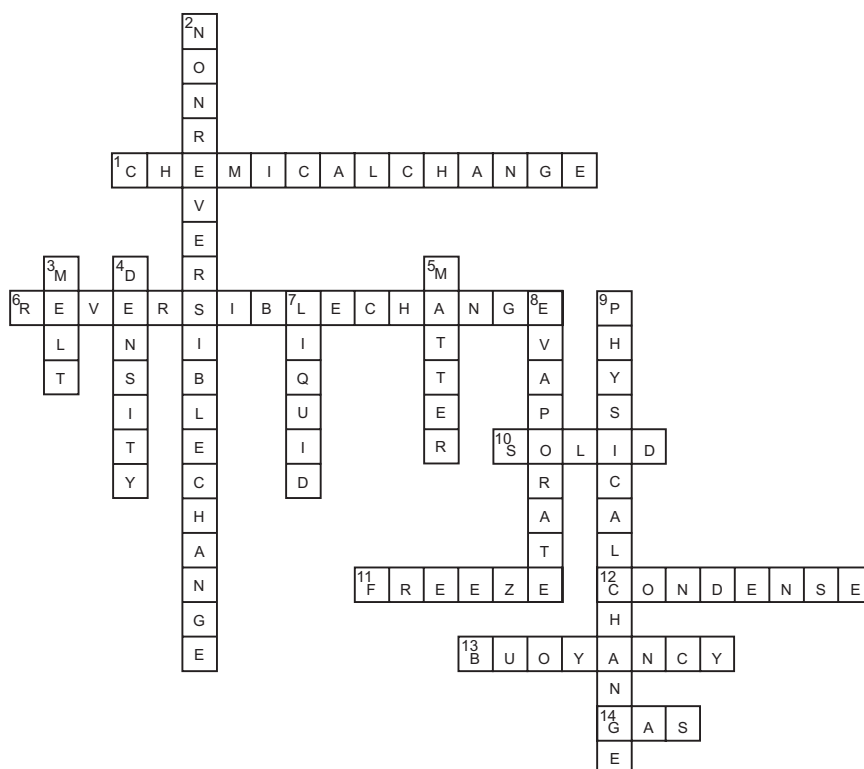
Form of Matter	Measuring cup	Measuring tape	Scales
The height of the teacher's desk		X	
The volume of a carton of chocolate milk	X		
The mass of your math textbook			X
The width of a window		X	
The volume of the classroom sink	X		
The mass of your lunch			X
The distance from your desk to the classroom door		X	

Keeping It Cool!! Activity #10: (Pages 66–67)

For this activity, it is important that the student complete the information sheet and that they have time to share their efforts with their classmates.

Teachers may wish to have the students predict which “coolers” will be the most effective and tell why. They may also graph the progress of the melting process to check on the accuracy of their predictions.

What Have You Learned? (Page 68)



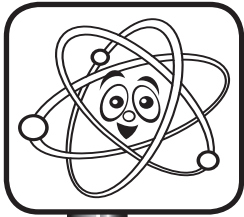


Name: _____

A. TRUE or FALSE?

1. Once matter has changed its form, it cannot change back.	True	False
2. Some forms of matter can be in all three states: solid, liquid, gas.	True	False
3. Temperature affects how matter appears or changes.	True	False
4. Everything, including air, is made of matter.	True	False
5. Matter can be totally destroyed by fire.	True	False
6. An example of a physical change is a change in color.	True	False
7. A good insulator will only keep something warm/hot.	True	False
8. Usually we cannot detect gases in our environment.	True	False

[illegible]



Name: _____

What is Matter?

Activity #1

Matter is the term we use to describe something that takes up **space** and has **weight**.

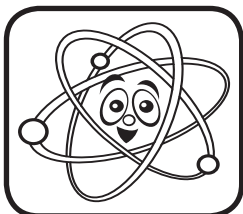
It includes living and non-living objects even us!

1. Put a check mark ✓ in front of each word that is a form of matter.
Put an X in front of each word that is not a form of matter.
* Read the definition again if you need help.

	my winter coat		trees in the park
	music from the car radio		friendship
	a glass of milk		roast turkey dinner
	a chocolate bar		oranges and bananas
	a story read by my teacher		a whisper
	my science notebook		mud pies

2. Write some things that you know are matter.
Think of ideas from your classroom and from your home.
Write your answers in the chart below.

Ideas From My Classroom	Ideas From My Home



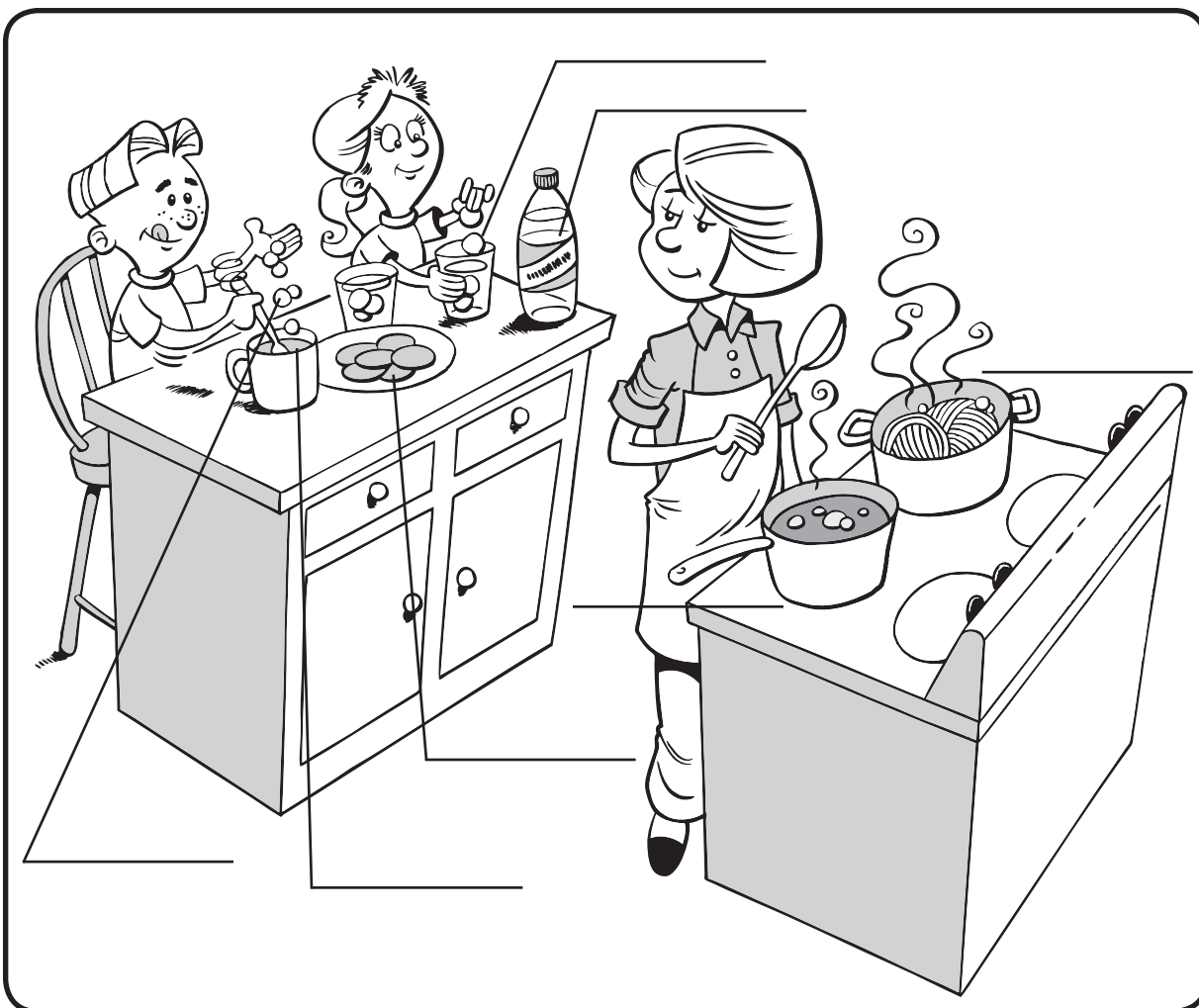
Name: _____

States of Matter

Activity #2

Everything in the world is made up of matter. There are many different kinds of matter, but we can sort all matter into three main groups: **solids**, **liquids** and **gases**.

1. Look at this picture. Then write **solid**, **liquid** or **gas** on the line beside the object.



Matter exists in one of three states: solid, liquid or gas.

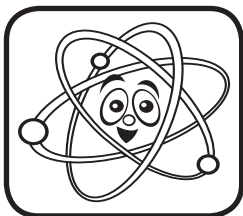
2. Water is the only matter that exists in all three states.

Give an example of water:

a) as a solid _____

b) as a liquid _____

c) as a gas _____



Common Properties of the States of Matter

Name: _____

Activity #3

The common properties of matter are:

buoyancy, density, color, hardness, shape, size, transparency, and weight.

In this activity, you will describe and compare **color, hardness, shape, size, and weight.**



- a green apple and a lime
- ping pong ball
- shoe box
- beach ball
- thick hardcover library book (reference books work fine)



1. Look at each object to get some ideas about their physical properties: color, hardness, shape, size and weight.
2. Complete the table by telling about the physical properties listed.

Property	Apple	Lime	Ping Pong Ball	Shoe Box	Beach Ball	Hardcover Library Book
color						
hardness						
shape						

3. Which objects are the same:

a) colour? _____

b) shape? _____

4. List these objects in order of **size** from **smallest** to **biggest**:

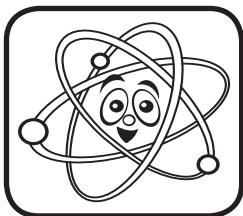
a) smallest _____ b) _____ c) _____

d) _____ e) _____ f) biggest _____

5. List these objects in order of **weight** from **lightest** to **heaviest**:

a) lightest _____ b) _____ c) _____

d) _____ e) _____ f) heaviest _____



Name: _____

Buoyancy

Experiment #1

Buoyancy is the upward force of a liquid that is pushing against a solid object. It will help determine whether an object will **float** or **sink**.

In this experiment, you will be investigating a number of objects to see how they are affected by buoyancy.



- a plastic bowl or dishpan filled $\frac{3}{4}$ with water
- a coin (penny, nickel)
- a marble
- a cork
- a lemon
- a lemon
- big paper clip



1. Test the weight of each of the objects by holding them one by one in your hand. Do you think that weight will affect whether an object will sink or float? Tell why.

2. Which of these objects will sink or float? Record your predictions on the chart.

Object	Prediction: sink? float?	Object	Prediction: sink? float?
marble		cork	
lemon		pencil	
coin		big paper clip	

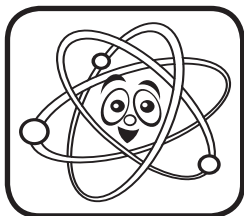


I think it will sink!



I think it will float!

1. Once again, test the weight of each of the objects by holding them one by one in your hand.
2. List the names of the objects, in order of **weight**, from **lightest** to **heaviest**. Write your answers as 1. under "Observe"
3. One by one, drop the objects into the water.
4. After each object is tested, record whether it sank or floated.
5. Record your answers on the chart.



Name: _____

Bouyancy

Experiment #1



1. Objects in order of **weight**:

a) lightest _____ b) _____ c) _____

d) _____ e) _____ f) heaviest _____

2. Complete the chart to record your observations about which objects sank or floated.

Tell whether your prediction was correct.

Object	Observation: sink? float?	Prediction: correct?	Object	Observation: sink? float?	Prediction: correct?
marble			cork		
lemon			pencil		
coin			big paper clip		



Did you predict that the heaviest objects would sink? _____

Why did you think that would happen? _____

Is that what *did* happen in your experiment? _____

Name one heavy object that you predicted would sink, but instead it floated. _____

Name one light object that you predicted would float, but instead it sank. _____

What might explain why this happened? _____

Whether an object sinks or floats depends upon more than just weight.

If we say that an object is **dense**, we mean that it is **heavy** for its **size**.

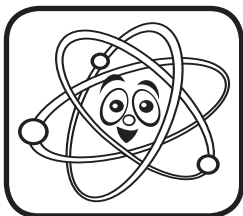
Compare the marble to the cork. The marble is smaller but heavier.

Dense materials usually sink.

Write **sink** or **float** on the lines.

If an object is **more dense** than the liquid, it will _____

If an object is **less dense** than the liquid, it will _____



Name: _____

Density

Experiment #2

We have learned that **density** is a factor in whether something will **sink** or **float**.

In this experiment, you will be investigating the density of three liquids.



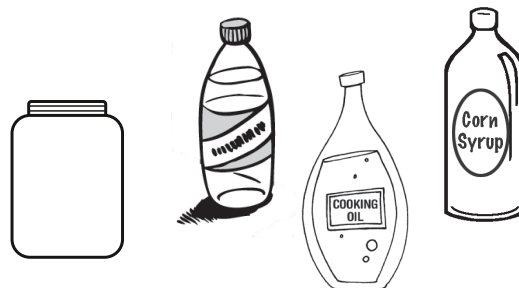
- a glass jar (mason jar is fine)
- $\frac{1}{2}$ cup (125 ml) cooking oil
- $\frac{1}{2}$ cup (125 ml) of water
- $\frac{1}{2}$ cup (125 ml) corn syrup (or honey)



What do you think will happen when these three liquids are mixed together?



1. Pour the water into the jar.
2. Pour the cooking oil into the jar.
3. Pour the corn syrup into the jar.
4. Wait for all three liquids to settle.
5. Draw and label a diagram to show your observations. Record your observations.



What I saw:

Arrange the liquids in order from the one at the top to the one at the bottom.

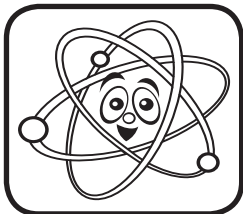


Which liquid is at the bottom of the jar? _____ What does this tell you? _____

Which liquid is at the top of the jar? _____ What does this tell you? _____

Complete the sentences using **greatest** or **least**.

The one with the _____ density goes to the bottom (sinks) and the one with the _____ density goes to the top (floats).



Properties of the Three States of Matter

Name: _____

Activity #4

Each state of matter has a property or characteristic that makes it **different** from the other states.

Read the following paragraphs, then complete the chart to compare the properties of each state.

Solids

Every solid has its own definite shape and volume. Think of some examples: a basketball, the family car, your school desk. You are able to change the shape of a solid, but only by using energy to do so. You can cut, bend, hit or burn a solid. Changing a solid takes effort. Some solids, like glass, break easily. Other solids, like stone and metals, are very hard.

Liquids

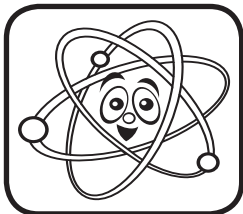
We see liquids everywhere in our daily lives. But liquids are all alike in some ways: they feel wet and they can be poured. A liquid can be hot or cold, thick or thin, gooey or runny. Liquids have volume but they have no shape of their own. They take on the shape of their container. Without a container, a liquid has no shape.

Gases

Air is a gas. Gases seem to just float around us. They spread out to fill whatever space there is. Gases have no definite volume and no definite shape. Usually, we cannot see, feel or smell gases. But we know they are there if you feel it on your face or when you see something blowing in the wind. One of the main gases is oxygen. All living things need oxygen to breathe. Humans and animals breathe in oxygen and plants breathe out oxygen.

Compare and contrast the three states of matter.

States of Matter	Examples in daily life	Shape: definite or not definite	Volume: definite or not definite
Solid			
Liquid			
Gas			



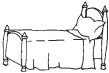
Name: _____

What am I?

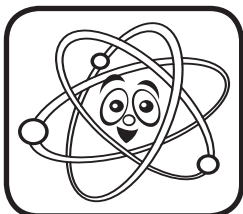
Activity #5

Classify the following examples of matter as solids, liquids and gases.

Write the words under the correct categories.

bed 	cake	carbon dioxide	car exhaust 	chocolate syrup
coffee	crackers	dew 	fog	gasoline 
helium	honey	hot dog	ice cream 	ketchup
milk 	mist	nitrogen	oxygen	pencil 
pillows	popcorn	propane 	salad dressing	smoke
soda pop	steam 	television	toast	water 

Solids	Liquids	Gases



Name: _____

How Temperature Affects Matter

Experiment #1

In this experiment, you will be the effect of temperature on the state of matter.



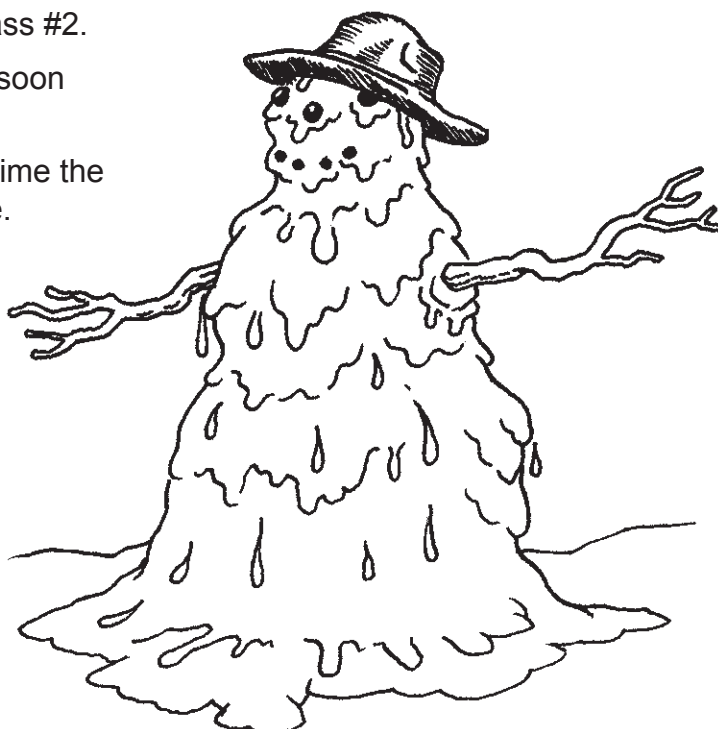
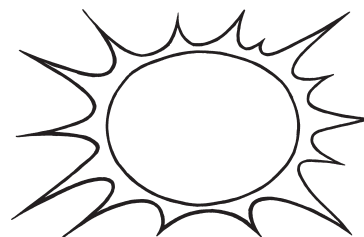
- 2 clear glass containers (beakers, drinking glasses)
- 2 ice cubes
- very cold water
- very hot water
- digital timer
- partner

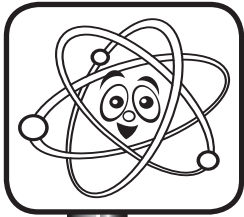


Ice will be placed in cold water and the hot water. Do you think ice will melt at different speeds? Tell why.



1. Place one ice cube in each glass container.
2. Pour very cold water in Glass #1 and very hot water in Glass #2.
3. Partner will start timer as soon as hot water is poured.
4. Observe what happens. Time the melting for each ice cube.
5. Record your results.





Name: _____

How Temperature Affects Matter

Experiment #1



Draw and label a diagram to show the glass containers with ice cubes and water.

Which ice cube melted faster? _____

How long did it take for the ice cube in

Glass #1 to melt? _____

Glass #2 to melt? _____



1. Why was the melting time shorter for the ice cube in Glass #2? _____

2. What change took place in the state of matter of the ice cube?
Complete the sentence.

solid

heat

melted

liquid

freeze

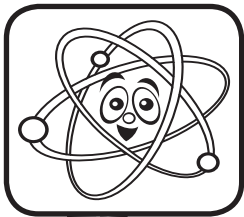
The ice cube started as a _____, but turned into a _____
When _____ was applied, the ice cube _____

If we put the melted water into a freezer, it would _____ and return to
a _____

3. What can you state about the effect of temperature on the state of matter of the ice cube?

4. Liquids and gases can be affected by changes in temperature as well.
Look up the meaning of **evaporate** and **condense** in the dictionary.
Then write the correct word in each of these sentences.

On a hot day, water puddles will _____ and air will _____
on the outside of a glass of ice water.



Name: _____

Changes in Matter

Activity #6

We have learned that temperature can change the state of matter.

Choose the word that describes the process of change.

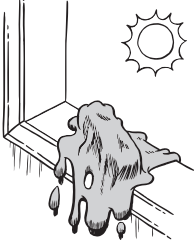
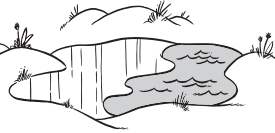
condense

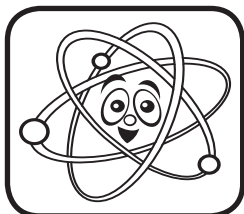
evaporate

freeze

melt

Tell if **heat** or **cold** was the cause of the change.

What Happened?	Change Caused by Heat? Cold?	Word to Describe Change	Tell Change of State
			from _____ to _____
			from _____ to _____
			from _____ to _____
			from _____ to _____
			from _____ to _____



Physical and Chemical Changes

Name: _____

Activity #7

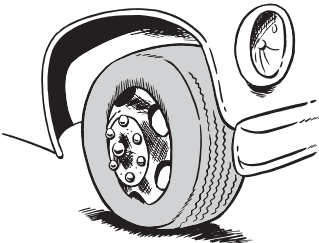
When matter changes, it can be a **physical** change or a **chemical** change.

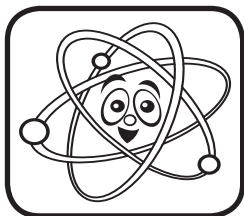
Physical change means a change in color, size, shape. When the state of matter changes there is also a physical change. Water, ice, and water vapor are all water.

Chemical change is a change in a substance that makes it different from its original matter.

Look at these examples of changes.

Tell whether the change is **physical** or **chemical**.

Change	Is it Chemical or Physical ?
	
	
	
	



Reversible and Non-Reversible Changes

Name: _____

Activity #8

There are other kinds of changes as well.
Two of these are **reversible changes** and **non-reversible changes**.

Examples:

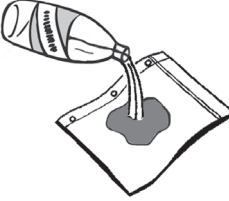
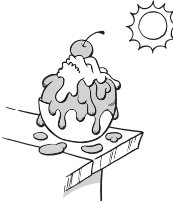
When an ice cube melts, it becomes water. But we can **reverse** that change by putting the water back into the freezer.

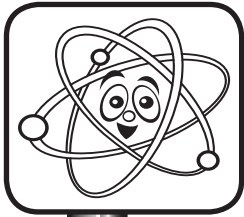
We put some wood on our campfire. As it burns, it turns to ashes. This is **non-reversible** as we cannot change the ashes back into wood.

Look at the examples below.

Decide if the changes are **reversible** or **non-reversible**.

Then tell your reasons for your choice.

Change	Reversible? Non-reversible?	Reason for my answer
		
		
		
		
		



Name: _____

Measuring Matter

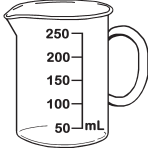
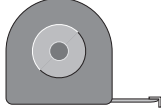
Activity #9

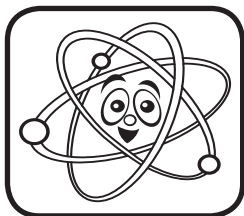
We use different ways to measure different forms of matter.

Read these examples.

Decide if you will use a measuring cup, a measuring tape or a set of scales to determine the measurement of each form.

Put a check mark ✓ under your choice.

Form of Matter	Measuring cup 	Measuring Tape 	Scales 
The height of the teacher's desk			
The volume of a carton of chocolate milk			
The mass of your math textbook			
The width of a window			
The volume of the classroom sink			
The mass of your lunch			
The distance from your desk to the classroom door			



Name: _____

Keeping It Cool!

Activity #10

In this activity, you will be designing a cooler and then testing it to see how well it works.

Your cooler will need these major parts:

- a container to hold all other materials
- an insulating material
- a container to hold the ice

Here are some suggestions of materials that you could use for each of these three parts.

Think about what you already know about how some materials help to keep the cold in, and the heat out.

Select materials that you think will keep the ice from melting as long as possible.

You may use materials other than those on the list.

Container to hold all other materials	Insulating materials	Container to hold the ice
• large tin can • plastic ice cream pail • shoebox • glass bowl • plastic bowl • wooden box • cardboard box • Styrofoam container	• shredded paper • Styrofoam packing • “bubble” wrap • wood chips • sawdust • newspaper • cloth • cotton batting	• plastic cup • tin can • glass jar or cup • Styrofoam cup • paper cup • thermos cup

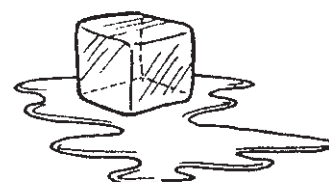
You need to complete the following tasks for this activity:

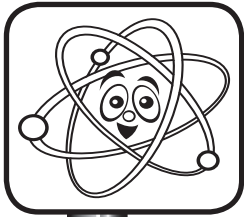
1. Design and construct your “cooler.”
2. Complete the information sheet for your project.
3. Bring your cooler and information sheet to class on _____

On that day, we will set up our coolers with their information sheets and will have a chance to look at our classmates’ ideas. We will check the progress of the ice’s melting in three days.

Good Luck with your project!!

It will be fun to see which materials make the best insulators!





Name: _____

Keeping It Cool!

Activity #10

.....

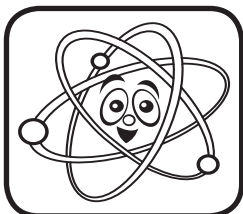
Name of my invention (cooler): _____

Materials I used to construct my cooler:

Materials I used	Reasons I chose this material

Draw a cross-section diagram of your cooler.

The length of time it took for the ice to melt in my cooler was _____



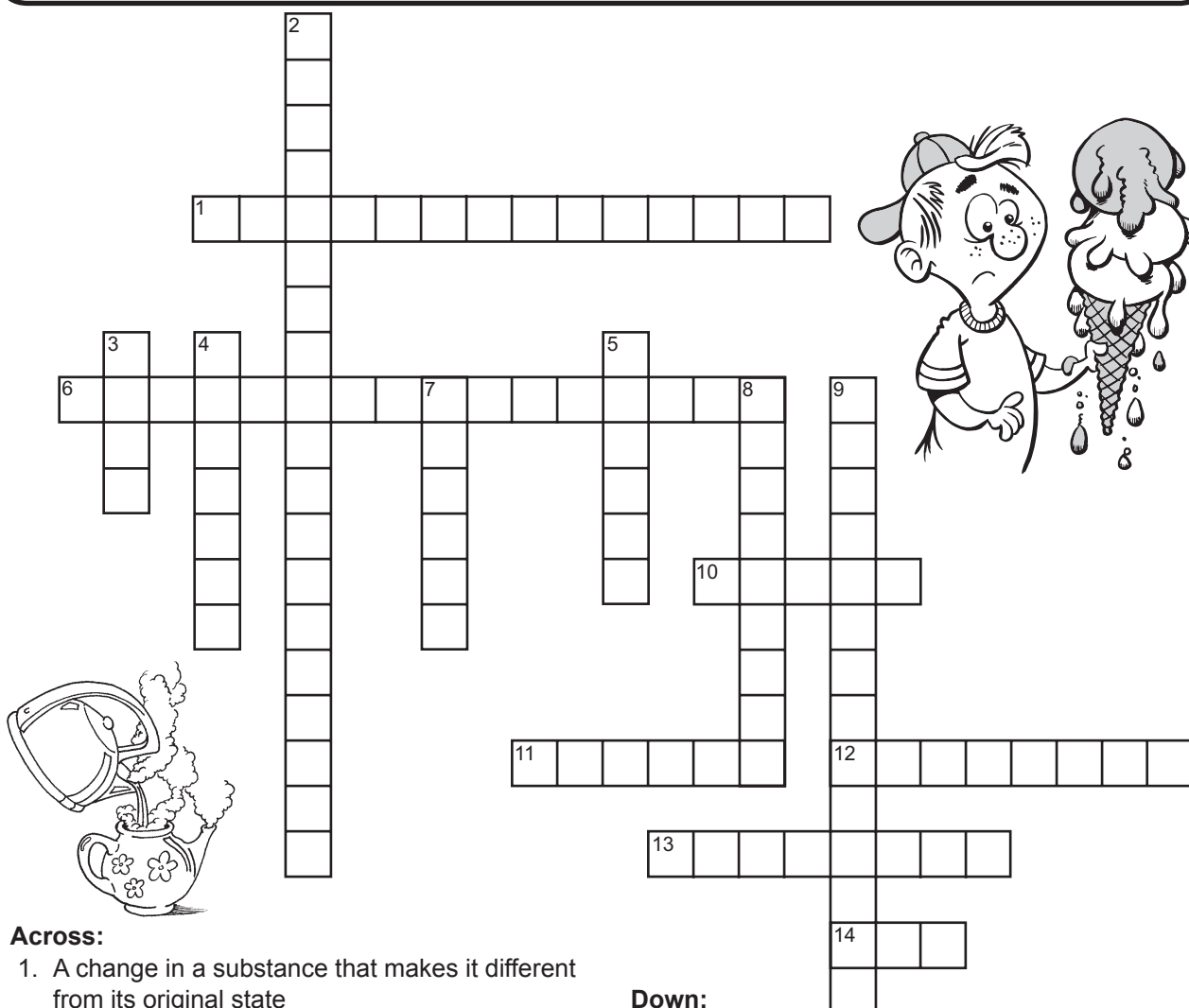
Name: _____

What Have You Learned?

We have learned a number of new ideas and terms about properties of and changes in matter.

Complete the crossword puzzle using the words in the Word Box.

buoyancy	chemical change	non-reversible change	density	liquid
freeze	gas	reversible change	matter	melt
condense	evaporate	physical change	solid	



Across:

1. A change in a substance that makes it different from its original state
6. When matter can be changed back to its original state
10. Matter with its own shape and weight
11. To change to a solid by applying deep cold
12. When a gas is cooled and becomes a liquid
13. Upward force of a liquid pushing against a solid object
14. Matter that is usually colorless, odorless, and invisible

Down:

2. When matter cannot be changed back to its original state
3. To change into a liquid by applying heat
4. Object's weight compared to its size.
5. Something that takes up space and has weight
7. Matter that can be poured
8. When a liquid is heated to the point of becoming a gas
9. A change in color, shape and size