

The following instructional plan is part of a GaDOE collection of Unit Frameworks, Performance Tasks, examples of Student Work, and Teacher Commentary. Many more GaDOE approved instructional plans are available by using the Search Standards feature located on [GeorgiaStandards.Org](http://GeorgiaStandards.Org).

## Georgia Performance Standards Framework

### **Matter Unit:** **(7 weeks)**

#### **OVERVIEW:**

Investigate physical changes in matter including tearing, melting, dissolving, and others. Identify states of matter (solid, liquid, gas).

#### **STANDARDS ADDRESSED IN THIS UNIT**

##### **Focus Standard:**

**S2P1. Students will investigate the properties of matter and changes that occur in objects.**

- a. Identify the three common states of matter as solid, liquid, or gas.
- b. Investigate changes in objects by tearing, dissolving, melting, squeezing, etc.

#### **RELATED STANDARDS ADDRESSED IN THIS UNIT**

**S2CS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

- a. Identify the parts of things, such as toys or tools, and identify what things can do when put together that they could not do otherwise.
- b. Use a model—such as a toy or a picture—to describe a feature of the primary thing.
- c. Describe changes in the size, weight, color, or movement of things, and note which of their other qualities remain the same during a specific change.
- d. Compare very different sizes, weights, ages (baby/adult), and speeds (fast/slow) of both human made and natural things.

**S2CS5. Students will communicate scientific ideas and activities clearly.**

- a. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.
- b. Draw pictures (grade level appropriate) that correctly portray features of the thing being described.
- c. Use simple pictographs and bar graphs to communicate data.

## RELATED STANDARDS ADDRESSED IN THIS UNIT (continuation)

### **S2CS6. Students will be familiar with the character of scientific knowledge and how it is achieved. Students will recognize that:**

- a. When a science investigation is done the way it was done before, we expect to get a similar result.
- b. Science involves collecting data and testing hypotheses.
- c. Scientists often repeat experiments multiple times and subject their ideas to criticism by other scientists who may disagree with them and do further tests.
- d. All different kinds of people can be and are scientists.

## ENDURING UNDERSTANDINGS

- Everything is made of matter and can change.
- Things can be done to matter which may change their properties.
- Not all matter changes the same way.
- Changes occur and affect our surroundings.

## ESSENTIAL QUESTIONS:

- How can matter be changed?
- What are the properties of matter?
- How do we classify matter?
- How do we describe matter?
- How do changes affect matter?
- What are some of the ways matter can change?
- How can water be a solid, liquid, and a gas?

MISCONCEPTIONS		PROPER CONCEPTIONS	
<ul style="list-style-type: none"> <li>Matter does not change.</li> <li>Students may believe that water must be boiled in order to change from a liquid to a gas.</li> <li>Freezing only happens when it is cold.</li> </ul>		<ul style="list-style-type: none"> <li>All matter can change. Even a rock can be changed over time</li> <li>Water does change from a liquid to a gas when it reaches boiling temperature. It can also evaporate at room temperature or even when it is cold outside.</li> <li>Matter freezes (becomes a solid) at different temperatures. Glue and wax freeze at room temperature. Water freezes at 0° C.</li> </ul>	
CONCEPTS	KNOW AND DO	LANGUAGE	EVIDENCE
<ul style="list-style-type: none"> <li>Three States of Matter</li> <li>Three States of Matter</li> <li>Physical Changes in Matter</li> <li>Physical Changes in Matter</li> <li>Physical Changes in Matter</li> </ul>	<ul style="list-style-type: none"> <li>Identify, describe, and classify the three states of matter: solids, liquids, and gases according to their properties.</li> <li>All matter takes up space and has mass.</li> <li>All matter does not change in the same way.</li> <li>Identify how changes affect the properties of matter.</li> <li>Observe, predict, and describe the changes that were applied to matter.</li> </ul>	<ul style="list-style-type: none"> <li>Solid, liquid, gas, properties</li> <li>Matter, dissolving, melting, temperature, mixture</li> </ul>	<ul style="list-style-type: none"> <li>See Assessment Plan listed below.</li> </ul>

### Culminating Activity

**By the conclusion of this unit, students should be able to demonstrate the following competencies:**

#### GRASPS

**Goal:** Create a Superhero or heroine who is able to change matter using their superpowers.

**Role:** Comic strip writer

**Audience:** Students who read comic books.

**Scenario:** Superheroes have special powers. The students will use their knowledge of how matter can be changed to create a superhero or heroine with special powers such as freezing, squeezing, melting, tearing, dissolving, etc...

Use [Superhero planning](#) sheet.

**Product:** Students will create a comic strip showcasing the unique power of the superhero/heroine the students designed. Students will include details of how the superpower is used to change three different types of matter.

## TASKS

**The collection of the following tasks represents the level of depth, rigor and complexity expected of all students to demonstrate evidence of learning.**

**Task 1: Water Changes** – Students will experiment with water in two different states, solid and liquid.

**Description:**

Allow students to work in groups of two or three. Provide each group of students with a clear plastic cup containing pieces of ice. Guide groups through observations with the ice. Encourage students to record their observations in their [science journal](#). Teacher guiding questions: “What is in the cup? Describe the ice. What does it look like? Feel like? What is the ice made of? How is ice made?”

Next, pour the ice into containers of different sizes and shapes. “How does the ice look now? Is it the same or different? Has the shape of the ice changed? Why do you think that is?” Have students record their observations in their science journal. Encourage students to illustrate their observations in their science journal.

Have students predict what will happen if we leave the ice out on the desk/table? Why? How do you know? How long might this take? Have students record their predictions in their journal.

Place ice in clear cups on desks. Allow ice to naturally change state. While the change is occurring you may wish to read a read aloud such as *Amazing Water* by Melvin Berger, or *I am Water* by Jean Marzollo, or other water related titles from your media center. Stop and make observations on the progress of the ice every 3-5 minutes.

When the ice has completely melted, allow students to draw “before and after” pictures of it in their journal. Ask guiding questions for the students to discuss in their groups. “What happened to the ice? Why? What’s in the cup? How is it like the ice? How is it different from the ice? Describe the water. What does it look like? Feel like?” Encourage students to record their observations in their journals.

Pour the water into containers of different sizes and shapes. Ask the same questions as before. Allow students to complete a [Venn diagram](#) to compare and contrast ice and water when poured into containers of different shapes and sizes. “Can you think of something else that will take the shape of the container?” Record a list of student generated responses on the board, chart, or in their journals.

Ask students, “Is there any what that we could change this water back into ice? How long might this take?” Solicit student responses. Return the water to the freezer. If possible, allow student to check the water at regular intervals.

**Task 1: Water Changes** – Students will experiment with water in two different states, solid and liquid. (continuation)

**Discussion, Suggestions for use:**

Have students answer the questions below in their journal, using words and/or pictures. Allow students to explain their answers verbally.

1. How can we make water change from water to ice?
2. How can we make water change from ice to water?
3. Give two examples of where you would see water changing back and forth from one state to another?
4. Do you think the water would ever stop changing states? Why or why not?

**Task 2: Marvelous Matter** – Students will be able learn that everything around us is matter; and matter exists in three states.

**Materials:**

What is Matter? by Melvin Berger A BIG BOOK (or other similar title), computer, LCD Projector, United Streaming video: Properties of Matter Part 1, 3 Hula Hoops, Ziplock Baggies (Attach 3 to each Museum Homework Sheet), several items that are gases (These items go in the hula hoops.), several items that are liquids (These items go in the hula hoops.), several items that are solids (These items go in the hula hoops.), Matter Property Cards, and Museum Letter.

**Description:**

Begin this lesson by having 3 hula hoops set out on the floor with solid items in one hoop, liquids or illustration of liquids in the 2<sup>nd</sup> hoop, and gases or illustrations of gases in the 3<sup>rd</sup> hoop. Have several examples of solids, liquids or gases in a group outside of the 3 hoops. (These items will be sorted by the children into the correct hoop at the end of the lesson.) Have the children pair share what they think these hoops are for.

Children sit in a circle around the 3 hoops and the extra group of items. The teacher posts the [Matter Property Cards](#) so all children can see them. She challenges students to read each card aloud with her. The children will be listening during the read aloud big book What Is Matter? and the United Streaming video *Properties of Matter Part 1* available on [www.UnitedStreaming.com](http://www.UnitedStreaming.com). (Your media specialist should have a code for login to this site. It is a free resource to all Georgia schools.)

Read a book on matter. A good book is the big book What Is Matter? As it is read, pause whenever a connection can be made to one of the Matter Property Cards, e.g. when the book discusses solids, pause to have students place the card that says “Solids” with the correct hoop of solid objects.

**Task 2: Marvelous Matter** – Students will be able learn that everything around us is matter; and matter exists in three states. (Continuation)

**Description (continuation):**

View the United Streaming video *Properties of Matter Part 2* available on [www.UnitedStreaming.com](http://www.UnitedStreaming.com). (Your media specialist should have a code for login to this site.) As it is shown, pause whenever a connection can be made to one of the Matter Property Cards (e.g. when the video discusses properties of liquids –such as takes the shape of its container, pause and have a student place the card that says “takes the shape of its container” with the correct hoop of liquid objects. )

After literature connection and video are shared, all Matter Property Cards should be correctly placed inside or near the correct hoop. (Note to teacher- some cards are repeated multiple times since they go with multiple states of matter, e.g. “takes up space” is a property of solids, liquids and gases so there are 3 cards that say this.)

Teach the class the following poem to help them begin to learn about the 3 common states of matter and their properties. (The tune is to Mary Had A Little Lamb.)

Matter always takes up space, takes up space, takes up space.  
Matter always takes up space, it is found everywhere.  
Solids have their own shape, their own shape, their own shape.  
Solids have their own shape that can't change on its own.  
Liquids flow and change their shape, change their shape, change their shape.  
Liquids flow and change their shape to fit their con-tain-er.  
Gases can expand or shrink, expand or shrink, expand or shrink.  
Gases can expand or shrink to fill up any space.  
Matter is all around us, all around us, all around us.  
Matter is all around us, solid, liquid and gas.

**Home Extension:**

For Homework send home the [Museum Letter](#) - students are to find an example in their home of a solid, liquid and gas. They will bring this to school the next day in 3 Ziploc bags. (Instructions are below) The collection of bags will be used the next day to create a “Matter Museum”. Their baggies can be displayed on a bulletin board under the correct heading “Solids”, “Liquids”, or “Gases” and can be referred to throughout the unit. Also, be sure to add the Matter Property Cards to the correct section of your “Matter Museum”.

**Task 2: Marvelous Matter** – Students will be able learn that everything around us is matter; and matter exists in three states. (Continuation)

**Discussion / Assessment Options:**

Bring in extra items for students to group (items that were not in a hoop). Students write solid, liquid or gas on their board to tell the teacher where that item belongs. The teacher observes correct/incorrect responses. Teacher asks a student to share with a partner why that item belongs in the category they identified. Teacher listens to individual reasoning to see if students are able to identify properties of the state of matter correctly. Call on individuals to share why the item belongs in the solid, liquid or gas hoop and then place it in its correct hoop. Continue with remaining items.

Ask students “Where can matter be found?” Answer- Everywhere- challenge them to try and find something in your room that would NOT be a solid, liquid or gas. After a minute or two ask for volunteers to share what they found. Lead them to discover that almost everything in our classroom (and world) is matter. If it takes up space and has mass it is matter. Now challenge them to list one example of each state of matter solid, liquid and gas in their journals or on notebook paper. Collect their examples and check for accuracy.

Allow students to record their observations in their science journals. A copy of the poem above could be copied for the students to paste into their journal.

### Task 3: Temperature Changes Matter

**Materials:** Temperature Can Change Matter graphic organizer, web access, United Streaming access

**Description:**

Refer to the “Matter Museum” that the children created in an earlier task. Ask the children if there is any solid that could be changed to a liquid in their museum display. How could these change? Many times it occurs because heat has been added. Refer to ice + heat = water. Are there any liquids that can turn to a gas? Students may not know this yet. You can leave this question unanswered and challenge them to see if they can find an example of a liquid turning into a gas in the video clip called “*What Are The Three States Of Matter?*” available at [http://ksnn.larc.nasa.gov/k2/videos/s\\_statesMatter\\_H.html](http://ksnn.larc.nasa.gov/k2/videos/s_statesMatter_H.html). After showing the video, ask again if there is a liquid in the “Matter Museum” that can change into a gas? How? Ask students to share ways that temperature affected solids, liquids and gases in the video clip they have just seen.

Challenge them to listen for 2 other ways temperature can change matter from one state to another as you read Rookie Reader: Solids, Liquids and Gases and show the United Streaming video *Properties of Matter Part 2* available on [www.UnitedStreaming.com](http://www.UnitedStreaming.com). (Your media specialist should have a code for login to this site.) The video clip is 17 minutes long. The 1<sup>st</sup> 13.5 minutes review the states of matter. The last 3.5 minutes discuss how temperature can change matter. You might choose to only show the last portion of the video. To do this select the tab to the right that says “video segments” and choose the segments you want to show. Students record two examples of how temperature can change matter change on the [Temperature Can Change Matter](#) graphic organizer.

**Assessment:** Temperature Can Change Matter graphic organizer and discussion questions following streaming videos (sample questions are listed in the lesson above.)

Have students illustrate and record two examples of how temperature can change using their science journal.

**Home Extension:** Students are challenged to find one item at home that temperature can cause to change from one state of matter to another. See [Matter Can Change With Temperature](#).

#### Task 4: Solids, Liquids, & Gases are different!

**Materials:**

Web access, masking tape

**Description:**

Pair share last night's homework on how temperature can change matter from one state to another.

Visit [http://www.bbc.co.uk/schools/ks2bitesize/science/activities/solids\\_liquids.shtml](http://www.bbc.co.uk/schools/ks2bitesize/science/activities/solids_liquids.shtml). Discuss melting and solidifying of matter. This site is an interactive site that allows students to perform experiments online.

Discuss how solids liquids and gases are different- allow students to identify properties of each state by referring to the cards displayed on your "Matter Museum" created in the Magnificent Matter 1 lesson. Tell the children that today they will learn another way solids, liquids and gases are different. Tape off a square on the floor that is large enough to hold all your students in a standing position, but not provide enough space for them to move around. Call on all students to squeeze as close together inside the tape square as they can without hurting one another. Explain to them that they are each pretending to be the "parts" (atoms) in a solid. Solids are made of pieces (atoms) that are closely packed together. They do not have room to move much at all. That is why solids maintain a shape. The teacher tries to walk through the solid. Is it possible? No.

Now sit half the students down outside the square. Explain that the remaining students are pretending to be the "parts" (atoms) in a liquid. Ask them if they can move around inside the tape square now. Can they travel around each other? Yes, and so can the parts (atoms) inside liquids. They are not as tightly packed as the pieces (atoms) of solids, so they can move and change shape. Make a curved shape out of tape on the floor. Have the "liquid parts/pieces" pour themselves into this new shape. Can they fit? Yes. Did they change shape to fit this new container? Yes. The teacher tries to walk through the liquid. Is it possible? Yes. Just like swimming, we can move through liquids.

The teacher now has all but 3 of the students sit down outside the square. The remaining 3 students are pretending to be "parts" (atoms) in a gas. Can they move freely? Yes. Can the teacher move through them? Yes. In fact she can move through them without even touching them. That is why we generally don't see gases- their particles are very far apart.

Visit the interactive web site: [http://www.harcourtschool.com/activity/states\\_of\\_matter/index.html](http://www.harcourtschool.com/activity/states_of_matter/index.html). This site models the same concept of the parts / pieces (atoms) within solids, liquids and gases.

#### **Task 4: Solids, Liquids, & Gases are different! (continuation)**

##### **Teacher Note:**

**Students at this age group do not need to learn the term atom. The purpose of investigating the atomic properties of solid, liquids, and gases is to help students visualize differences between each state that are not visible using their eyes. We are building their body of knowledge to include the idea that matter is made up of pieces or parts. These pieces or parts react differently in various states.**

##### **Assessment:**

Oral discussion questions are embedded into each stage of this lesson. Students may respond to their choice of one or two of the discussion questions in their science journal.

#### **Task 5: Science Myth-Blasters**

##### **Materials:**

Construction paper; scissors; TORN PAPER TEMPLATE is from: <http://www.kidzone.ws/magic/walkthrough-t.htm>; balloon; baking soda; 12 oz. empty soda bottles; vinegar; pencil; ice cubes; cup; piece of string; packets of salt (from fast food restaurant)

##### **Description:**

Teacher has safety gear and science lab materials (such as a goggles, beaker, and magnifying glass) set on the table. Tell the class that today they are going to be Science Myth-blasters. They will solve mysteries and learn the real reason behind a variety of phenomena. All of this will be happening as they learn more about how matter can change.

Set up the following experiments around the room. As students complete the experiments they also complete the [Science Myth-Blasters](#) organizer. At each experiment, position a parent volunteer, an older student, or a student in your class who needs to be challenged. This volunteer becomes the “Myth-Blaster” who models the experiment 1<sup>st</sup> and then assists the group as they complete the experiment and fill in their Myth-Blasters page.

### Task 5: Science Myth-Blasters (Continuation)

#### 1. Torn Paper Mystery:

The Myth-Blaster (volunteer) holds up a piece of construction paper and tells the “audience” (the students) that he/she can cut a hole in the paper and then can mysteriously step through it. Myth-Blaster asks- Do you believe it possible to change this solid matter by cutting a hole in it and then be able to step through the hole without tearing the paper? Yes it is- observe... Myth-Blaster cuts the paper as shown on the Kids Zone website. Visit the following website address: <http://www.kidzone.ws/Mystery/walkthrough-t.htm> to acquire the paper cutting template. By cutting on the lines, there will be one very large ring of paper that the Myth-Blaster can step through. Students fill in their Science Myth-Blasters page stating that the paper started as a solid, the change was cutting or tearing, and the result was still a solid but in a new shape. Students practice the trick with a partner before moving to the next experiment.

#### 2. Balloon Mystery-

The Myth-Blaster (volunteer) tells the audience (students) that he/she can mysteriously inflate a balloon without blowing into it. First the Myth-Blaster puts 2 tbsp. of vinegar into an empty 12 oz soda bottle. (If possible find a bottle that can't be seen through). Prior to the experiment, he/she puts 1 tbsp of baking soda into the balloon. The Myth-Blaster attaches the opening of the balloon onto the top of the bottle without letting any of the baking soda fall into the bottle yet. The Myth-Blaster holds the balloon and lifts it allowing the baking soda to fall into the bottle. A chemical reaction occurs between the vinegar (an acid) and the baking soda (a base) causing a gas to form (carbon dioxide) which expands to fill the balloon. The Myth-Blaster explains the mystery to the group. Students fill in their Science Myth-Blasters page stating that the baking soda started as a solid, the vinegar started out as a liquid. When the 2 combined, a chemical reaction occurred creating carbon dioxide- a gas which filled the balloon. Students recreate the solution to this mystery with a partner before moving to the next experiment.

#### 3. Mystery String-

Myth-Blaster sets out a glass of water with an ice cube floating in it and a piece of string. Have a volunteer try to lift the ice out of the glass without touching it. It will not work. When the volunteer gives up, take a string and wave it around in the air chanting Mystery words. As you are doing this, with the other hand secretly dump salt from a salt packet on top of the ice. Lay the string across the ice cube. Take about 1 minute recruiting the audience to help you say the Mystery chant-this allows the ice to melt slightly and refreeze around the string. Now, pull the string, and out comes the ice cube!

Students fill in their Science Myth-Blasters page stating that the ice started as a solid, the salt melted it, and then it refroze the result was a new shaped solid -ice frozen around the string. Students practice the trick with a partner before moving to the next experiment.

### Task 5: Science Myth-Blasters (Continuation)

**Assessment Options:** Teachers will observe students during Myth-Blaster performance task. Each student will solve the mysteries listed above. Teacher may wish to allow students to experiment with the materials for each task prior to showing the solutions. Have students articulate each step of the Myth-busting experience to a partner. Students should explain each step orally. Encourage students to record their responses in their science journal.

### Task 6: Marvelous Matter Café

**Materials:**

Cups; ice cream; straws; soda; One Sundae Glass

**Description:**

Teacher welcomes students to the Marvelous Matter Café. (Dressing as a waitress/waiter for emphasis would be a nice touch.) The waitress/waiter says that today they will all learn the secret recipe for the [Marvelous Matter Mixture](#). This mixture has all 3 states of matter represented and has several changes occurring in it as well. As waiters and waitresses in training, they must show that they understand the ingredients in the Marvelous Matter Mixture before making one. They must also pass their basic training test. Ask them (the students) if they are ready to start their training?

Teacher reviews [Matter Review](#) page first. (This sheet may be sent home in advance as so the children can review what they have learned about matter.) Students complete their training test- [Matter Test](#). Teacher reads test aloud to ensure that science knowledge, not reading ability is tested. Once this is completed, students are all passed on to the secret kitchen where they'll learn to make the Marvelous Matter Mixture. The teacher/waitress models how to make the mixture as students follow along and complete their top secret quiz. The teacher places a sundae glass on the table- the trainees are asked to correctly label its state of matter on their page. The teacher then places a scoop of ice cream into the sundae glass on the table- the trainees are asked to correctly label its state of matter on their page (emphasize that the ice cream did not change shape until the sides of the glass forced it to). The teacher adds soda to the sundae glass on the table- the trainees are asked to correctly label its state of matter on their page. The teacher places a straw into the sundae glass on the table- the trainees are asked to correctly label its state of matter on their page. The teacher points out the bubbles/foam that has appeared- the trainees are asked to correctly label its state of matter on their page. Then you ask a final question- When the ice cream was first added, it did not change shape, but later it melted into a liquid...Why? The trainees are asked to fill in the blank on the bottom of their sheet. As a reward for completing their training and passing the basic training test, the trainees will create their own Marvelous Matter Mixture to enjoy!!

**Task 6: Marvelous Matter Café (Continuation)**

**Assessment:**

Students will complete Marvelous Matter Mixture graphic organizer and Matter Test during this lesson.

**Balanced Assessment Plan For Organization**

Informal Observations	Selected Response	Constructed Response	Performance Assessment
<ul style="list-style-type: none"> <li>Groups work</li> <li>Sorting objects into hoops</li> <li>Oral discussion questions</li> <li>“Where can matter be found” oral assessment</li> <li>Video clip responses</li> <li>Peer discussions</li> <li>Pair Share</li> <li><a href="#">Matter Review</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Science Myth-Blasters</a></li> <li><a href="#">Matter Test</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Superhero planning</a></li> <li><a href="#">Venn diagram</a></li> <li><a href="#">Science Journal</a></li> <li><a href="#">Matter Property Cards</a></li> <li><a href="#">Temperature Can Change Matter</a></li> <li><a href="#">Matter Can Change With Temperature</a></li> <li><a href="#">Marvelous Matter Mixture</a></li> </ul>	<ul style="list-style-type: none"> <li>Changing water from ice to water and water to ice</li> <li>Comic strip of changing matter</li> <li>Matter <a href="#">Museum Letter</a></li> <li>Science Myth-Blasters task</li> </ul>

**Teacher Information and Resources**

**Children’s Literature Books**

The Snowy Day by Ezra Jack Keats

The Amazing Air Balloon by Jean Van Leeuwen. Illus by Marco Ventura Putnam. 2003

A Cool Drink of Water by Barbara Kerley, National Geographic .2002

A Drop Around the World by Barbara Shaw McKinney. Illus.by Michael S. Maydak Dawn. 1998

SPLASH! Constance Levy. Illus. by David Soman. Orchard.2002

Splish Splash by Joan Bransfield Graham. Illus. by Steve Scott. Houghton Mifflin.1994

This is Rain by Lola M. Schaefer. Illus. by Jane Wattenberg. Greenwillow. 2001

### Teacher Information and Resources (continuation)

#### Children's Literature Books: (continuation)

The Snowflake: The Water Cycle Story by Neil Waldman. Milbrook. 2003

Solids, Liquids, And Gases (Rookie Read-About Science) Ginger Garrett. 2005

Solids, Liquids and Gases (Starting with Science) Louise Osborne and Carol Gold. 1998

What Is Matter? Lisa Trumbauer. 1997 Book is available in big book format.

Solid, Liquid, or Gas? (Rookie Read-About Science) Fay Robinson. 1995

What is the World Made Of? All About Solids, Liquids and Gases (Let's-Read-And-Find-Out Science 2) Kathleen Weidner Zoehfeld,. 1998

#### Websites:

<http://www.unitedstreaming.com>

There are four separate videos available on matter:

- Properties of Matter Part 1
- Properties of Matter Part 2: Liquids, Solids and Gases
- Solids, Liquids, and Gases: A First Look
- Science Facts and Fun: Everything is Something

Good information on the differences between solids, liquids, and gases.

[http://www.harcourtschool.com/activity/states\\_of\\_matter/](http://www.harcourtschool.com/activity/states_of_matter/)

PowerPoint on matter.

<http://www.schools.pinellas.k12.fl.us/educators/tec/Davis2/matter.ppt/sld001.htm>

Webquest and experiments on Chemical & Physical Changes

<http://mypage.direct.ca/k/kasmith/gina/index.html>

Sample Lesson on Matter – Poor...but an example!

<http://www.lessonplanspage.com/ScienceDistinguishSolidLiquidAndGas24.htm>

## Teacher Information and Resources (continuation)

### **Websites: (continuation)**

[http://www.bbc.co.uk/schools/scienceclips/ages/7\\_8/characteristics\\_materials.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials.shtml)

An interactive site on the properties or characteristics of matter

[http://www.bbc.co.uk/schools/scienceclips/ages/9\\_10/changing\\_state.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/9_10/changing_state.shtml)

A great interactive site on changes between states of matter

[http://www.bbc.co.uk/schools/scienceclips/ages/9\\_10/gases.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/9_10/gases.shtml)

Learn about gases and their properties – Sort items into solids, liquids and gases

<http://www.abpishools.org.uk/resources/solids-liquids-gases/index.asp>

Short video clips showing the states of matter, the changes in matter and the properties of matter

[http://www.chem4kids.com/files/matter\\_intro.html](http://www.chem4kids.com/files/matter_intro.html)

A great site on matter

[http://www.harcourtschool.com/activity/states\\_of\\_matter/index.html](http://www.harcourtschool.com/activity/states_of_matter/index.html)

Shows movements of molecules in different states of matter

[http://ksnn.larc.nasa.gov/k2/s\\_statesMatter\\_v.html](http://ksnn.larc.nasa.gov/k2/s_statesMatter_v.html)

Really cute online movie on the three states of matter

<http://www.schools.pinellas.k12.fl.us/educators/tec/Davis2/matter.ppt/sld001.htm>

PowerPoint on Matter

<http://www.hazelwood.k12.mo.us/~cdavis01/map2000/2nd.html>

Numbers 1-6 are really great interactive PowerPoints about matter.



# Comic Strip Planning

Main Character Name:

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Specific Ability(ies):

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Weakness:

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Ideas for the comic strip related to changing matter.

## Changes Journal Directions

### Steps for Journal Creation

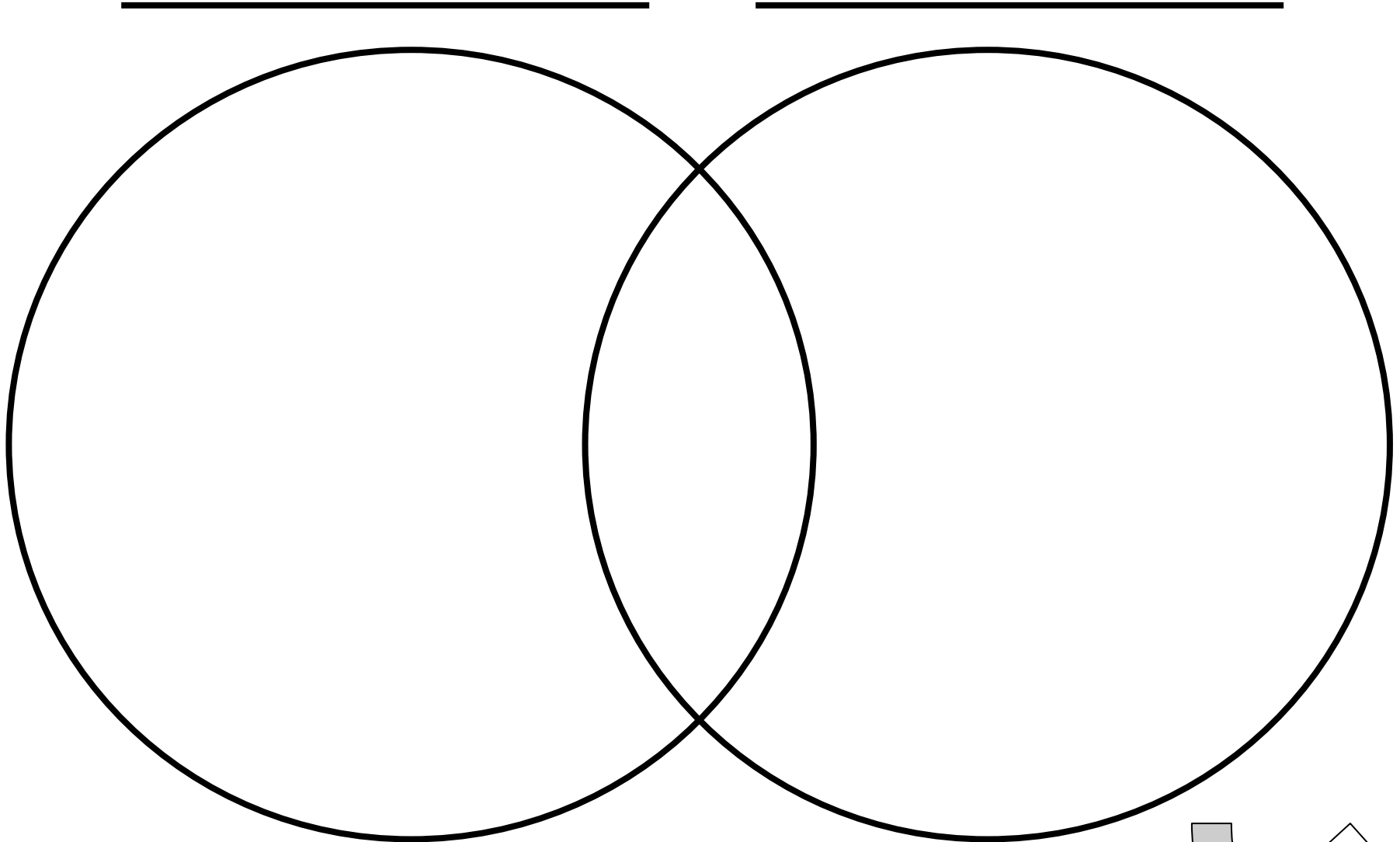
1. Create front and back copies the blank journal page included following these directions.
2. Provide each student with 8 blank pages and a single piece of construction paper or colored paper.
3. Fold each in half the “hamburger” way.
4. Staple along the spine to hold the pages and cover in place.
5. Provide each student with a blank table of contents card to glue/tape behind the front cover.
6. Have student write Changes Journal and their name on the cover.
7. Under the title have students write the unit EQ: How can matter change?


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Venn Diagram: NAME: \_\_\_\_\_



# Matter Property Cards

This type of matter keeps its shape even when moved.

This matter can bend and move but do not change shape.

Matter that has the same shape, volume, and mass no matter where you put them.

This matter does not change by itself. A force must cause the change.

This matter  
takes up space.

This matter does  
not have a shape.

This matter  
takes the shape  
of whatever you  
put them in.

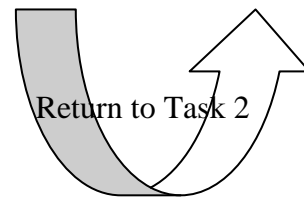
This type of  
matter has the  
same volume and  
mass no matter  
where you put  
them.

Matter that changes shape when moved from one container to another.

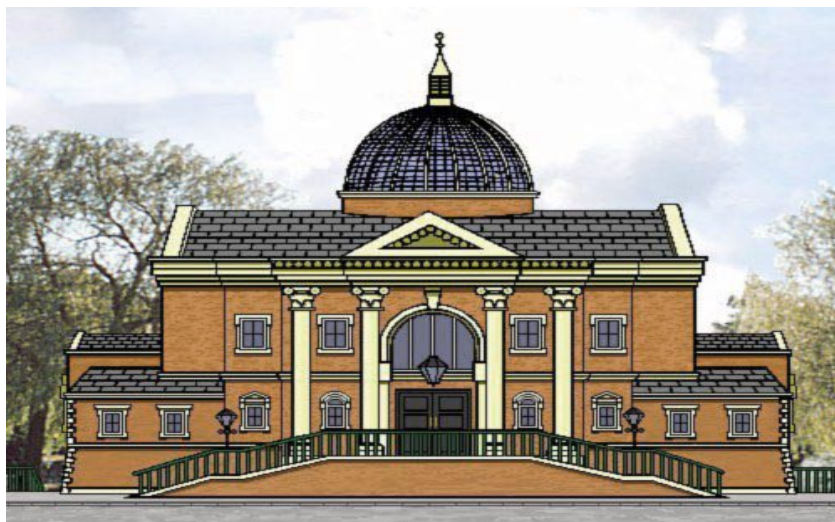
This type of matter flows when moved from one place to another.

Matter that keeps its shape even when moved.

A type of matter that can bend and move but do not change shape.



# MATTER MUSEUM



Dear Parents,

Wow! The class started learning about the three states of matter today and has decided to create a Matter Museum. There is only one problem . . . the museum needs items to go in its exhibits. So, your child's homework tonight is to find things that represent the three common states of matter.

Attached you will find three baggies.

Here's what your child needs to place in each baggie:

Bag 1: A Solid

Bag 2: A Liquid

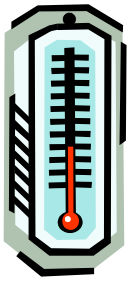
Bag 3: A Gas

At this point I am sure you are thinking "How does my child bring a solid, liquid or a gas to school?" Well there are a couple of ways he or she can do this. The first way is your child can cut a picture out of the item found on the internet, a newspaper or a magazine, or draw the object and place it in the baggie. The second is he or she may place a small plastic bottle that contains the matter in the baggie. Be careful with the liquids, and make sure there is no possibility of leakage. Just remember whatever is sent into the museum must be safe and will not be returned. The exhibit will be displayed for a long time so the children will be able to explore the items and make connections between and about the states of matter.

Thank you,  
The Museum Curators

Sketch and label matter changing from one state to another.	Sketch and label another example of matter changing from one state to another.

**NAME:** \_\_\_\_\_



Name \_\_\_\_\_

## Matter Can Change With Temperature

Look around your house (especially in the kitchen) for a solid, liquid or gas that you could change into a new state of matter by changing its temperature.

(Water, Ice and steam/water vapor are off-limits as answers since we did these in class)

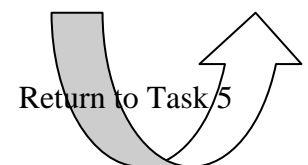
List and Draw your matter	Check ONE	List and Draw your NEW matter
<p>First you have</p> <p>_____.</p> <p>It is a:</p> <p><input type="checkbox"/> Solid   <input type="checkbox"/> Liquid   <input type="checkbox"/> Gas</p>	<p>If the temperature changes by</p> <p><input type="checkbox"/> getting VERY hot</p> <p><input type="checkbox"/> getting warmer</p> <p><input type="checkbox"/> getting colder</p> <p><input type="checkbox"/> getting VERY cold</p>	<p>Now the matter has changed into</p> <p>_____.</p> <p>It is a:</p> <p><input type="checkbox"/> Solid   <input type="checkbox"/> Liquid   <input type="checkbox"/> Gas</p>



# SCIENCE MYTH-BLASTERS

Name \_\_\_\_\_

Mystery	What type of matter did you start with?	What happened to your matter?	What type of matter did you end with?	Did your matter change states or shape?
1. Torn Paper Mystery	<b>Paper:</b> <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Paper: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	<input type="checkbox"/> Changed States <input type="checkbox"/> Changed Shape <input type="checkbox"/> No Change Occurred
2. Balloon Mystery	Baking Soda: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas  Vinegar: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Carbon Dioxide: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	<input type="checkbox"/> Changed States <input type="checkbox"/> Changed Shape <input type="checkbox"/> No Change Occurred
3. Magic String Mystery	Ice Cube: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas  Salt: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Ice Cube: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	<input type="checkbox"/> Changed States <input type="checkbox"/> Changed Shape <input type="checkbox"/> No Change Occurred



Return to Task 5

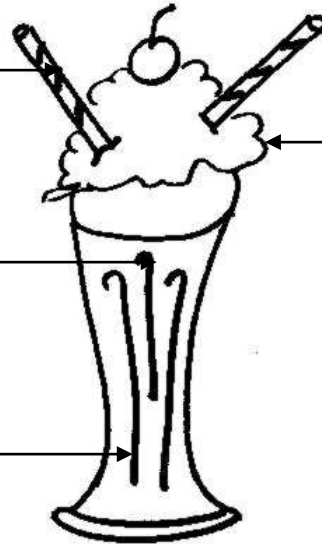
# The Marvelous Matter Mixture

Look where the arrows are pointing. Label each by writing if that item is a solid, a liquid or a gas.



The bubbles are a \_\_\_\_\_

The straw is a \_\_\_\_\_



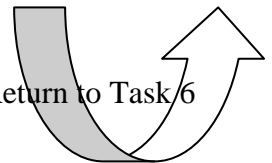
The ice cream is a \_\_\_\_\_

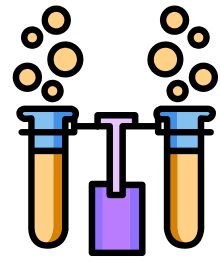
The soda is a \_\_\_\_\_

The glass is a \_\_\_\_\_

When the Marvelous Matter Mixture was made, a physical change happened. What caused the change? Fill in the missing word.

Freezing Cold Ice cream + \_\_\_\_\_ = A liquid





# Matter Review Sheet

- ❖ There are 3 states of matter solid, liquid and gas.
- ❖ Some of the ways we tell matter apart is by its color, shape, and size. These are called properties.
- ❖ Matter is everywhere!
- ❖ What State of Matter are These Things?

Object	State of Matter
Dog	Solid
Orange Juice	Liquid
Table	Solid
Helium in a Balloon	Gas
Milk	Liquid
Oxygen	Gas

- ❖ Some things can move between the three states of matter by freezing or heating them. One example is water (ice, water, steam).
- ❖ Solids:
  - Keep their shape even when moved.
  - They can bend and move, but do not change shape.
  - They have the same shape, volume, and mass (weight) no matter where you put them.
  - They do not change by themselves.

❖ Liquids:

- They do not have a shape at all.
- They will take the shape of whatever you put them in.
- They have the same volume (amount) and mass (weight) no matter where you put them.
- They change shape when moved from one container to another.

❖ Gases:

- They do not have a shape at all.
- They will take the shape of whatever you put them in.
- They can change their volume (amount, size).
- They can change shape.



Name: \_\_\_\_\_



# Matter Test

Circle the correct answer to each question.

1. There are \_\_\_\_\_ states of matter.  
a. 2                                      b. 3                                      c. 4
2. Matter is \_\_\_\_\_.  
a. in some places      b. only in water      c. everywhere
3. \_\_\_\_\_ help us tell matter apart.  
a. Properties              b. Addresses              c. Air
4. One property of matter is \_\_\_\_\_.  
a. cost                                      b. color                                      c. who it belongs to
5. Some things can move between states of matter. An example of this is \_\_\_\_\_.  
a. dogs                                      b. tables                                      c. water



Fill in the blanks.

6. The states of matter are \_\_\_\_\_,  
\_\_\_\_\_ and \_\_\_\_\_.
7. \_\_\_\_\_ do not have a shape and  
can change their volume or amount.
8. \_\_\_\_\_ keep their shape, volume  
and weight even when moved.
9. \_\_\_\_\_ have no shape and do not  
change their volume or weight.

Write in the type of matter each item is:  
a **solid**, a **liquid** or a **gas**.

10.

11.

12.

13.

14.

Circle True or False for each statement.

- |   |   |   |
|---|---|---|
| 15. Everything is matter.                               | T | F |
| 16. Some solids can bend and move.                      | T | F |
| 17. Size and shape are properties of matter.            | T | F |
| 18. Solids, liquids and ice are the 3 states of matter. | T | F |
| 19. All properties of matter are exactly the same.      | T | F |
| 20. Freezing or heating matter can change its state.    | T | F |

## EXTRA CREDIT

Object	State of Matter
Oxygen	
Chair	
Frog	
Water	
Milk	

In which state of matter are the molecules spread far apart?

\_\_\_\_\_

What caused the ice to change from a solid to a liquid?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Return to Task 6