Grade 2 Physical Science Unit (2.P.2)

Decision 1: What will students learn in this unit?

Standards Addressed:
1. Science: 2.P.2
2. Reading Informational Text: 2.RL.2.1
3. Math: 2.MD.2
5. Technology: 2.TT.1
6. Other

What do I want my students to KNOW, UNDERSTAND and be able to DO at the end of this unit?

<table>
<thead>
<tr>
<th>Know</th>
<th>Understand</th>
<th>Do</th>
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</thead>
<tbody>
<tr>
<td>2.P.2.1</td>
<td>2.P.2</td>
<td>2.P.2.1</td>
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<tr>
<td>• solids are materials that maintain their own shapes, while liquids tend to assume the shapes of their containers.</td>
<td>• properties of solids and liquids and the changes they undergo.</td>
<td>• Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.</td>
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<td>• examples of materials that can be classified as solid and materials that can be classified as liquid.</td>
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<td>• water can be a liquid or a solid and can go back and forth from one form to the other when heat is added or removed.</td>
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<td>• things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them.</td>
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<tr>
<td>2.P.2.2</td>
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<td>2.P.2.2</td>
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<tr>
<td>• know how to measure and compare the volume of a liquid poured into different containers.</td>
<td>• Compare the amount (volume and weight) of water in a container before and after freezing.</td>
<td>• Compare what happens to water left in an open container over time as to water left in a closed container.</td>
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<tr>
<td>• know how to measure and compare the weight of water poured into different containers.</td>
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<td>• know if water is turned into ice and then the ice is allowed to melt, the amount of water is the same as it was before freezing.</td>
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<tr>
<td>2.P.2.3</td>
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<td>2.P.2.3</td>
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<tr>
<td>• know how to measure and compare the volume of a liquid poured into different containers.</td>
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<tr>
<td>• know that a container of water left open will contain less water over time, while a closed container of water will not change.</td>
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Decision 2: Assessment

Plan for how students will indicate learning and understanding of the concepts in the unit. How will you assess learning?

Possibilities/options:
- Pre-assessment
- Short answer tests or quizzes
- Student logs, journals and informal writing
- Lab activities
- Formal writing assignments
- Informal or formal student Interviews, conferences, observations etc.

Anticipation guide (pre and post assessment), student experiment log
Informational Text Pre-Assessment: Give students an on-level text and sticky notes. Instruct them to ask questions on sticky notes while they read to help them better understand the text. Rubric to assess mastery of questioning objective.

Describe the performance, product, or project that will be the culminating activity for the unit.

The student’s assignment for the Culminating Activity includes:
- **Unit** essential question or “I Can” statement for the culminating activity.
- A thorough **description** of the activity including steps or task **analysis** in completing the culminating activity.
- A copy(ies) of the rubric(s) you will use to assess the culminating activity or any other aspects of the unit.
### Decision 2: Assessments – Rubric Reminders:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Scale</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
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<tr>
<td>Questioning</td>
<td>I asked one question relevant to my topic that helped me understand the text.</td>
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</tbody>
</table>

**Post Assessment, Anticipation Guide:**

- **Mastery** – 9/10 correct
- **Non-Master** – Less than 9/10 correct

**Informative Writing Rubric:**

- Use 2nd Grade County Writing Rubric
- Relate to content (States of Matter, Solids and Liquids)
**Decision 3: Student Learning Map**

**Key Learning Targets:**

- I can understand the properties of solids and liquids and the changes they undergo.

<table>
<thead>
<tr>
<th>Concept:</th>
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<tbody>
<tr>
<td>Examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.</td>
<td>Compare the amount (volume and weight) of water in a container before and after freezing.</td>
<td>Compare what happens to water left in an open container over time to water left in a closed container.</td>
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</table>

**Lesson EQ(s):**

- I can identify and provide examples of common objects and materials that are solids and liquids.
- I can give examples of matter that change from a solid to a liquid by heating and cooling.
- I can give examples of matter that change from a liquid to a solid by heating and cooling.
- I can measure the length of an object using different units.
- I can ask and answer such questions as **who**, **what**, **where**, **when**, **why**, and **how**.
- I can write an opinion piece that states my opinion and supports it with 3 reasons.
- I can write the sequence of events of a scientific investigation.
- I can explain a topic and use facts to support it.

**Lesson EQ(s):**

- I can measure the volume and mass of liquid using containers of different sizes and capacity to show the unchanged value.
- I can show how to turn water into ice by cooling, and back into water by heating, eventually into water vapor by heating.
- I can measure the mass and volume of a given amount of water, changed to ice, and again changed to water.

**Lesson EQ(s):**

- I can compare through observation and measurement water that is left in an open container change versus water kept in a closed container will retain its amount.

**Vocabulary:**

<table>
<thead>
<tr>
<th>Decision 3 - Student Learning Map</th>
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<tbody>
<tr>
<td>Solid</td>
<td>Volume</td>
<td>Evaporation</td>
</tr>
<tr>
<td>Liquid</td>
<td>Mass</td>
<td>Properties</td>
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<tr>
<td>Properties</td>
<td>Capacity</td>
<td></td>
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<tr>
<td>Physical changes</td>
<td>Water vapor</td>
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<tr>
<td>Measurement</td>
<td>Evaporation</td>
<td></td>
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<tr>
<td>Inches</td>
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<tr>
<td>Centimeters</td>
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<tr>
<td>Questions</td>
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</table>
Decision 4: Launch Activities

Hooks and Links

Develops student interest and links prior knowledge. Provides the Student Learning Map and the key vocabulary to students.

Guiding Questions:

1. How are you going to get students engaged?
2. How are you going to develop student interest and link their prior knowledge?
3. How are you going to start the Student Learning Map of the unit with students?
4. How are you going to preview key vocabulary with students?

- **Social Skills:** Ice cream—use to discuss that irreversible change with our words and use ice cream as a visual. As they say something mean to the ice cream as they are holding it, causing it to melt. When you say sorry and re-freeze it, it is still never the same as before. (engaging)
- Discussion about what the students think makes the ice cream change. (activating prior knowledge, preview vocabulary)
- Fill two identical containers with equal amounts of water. Put a lid on one container and leave the other open. Set them by the window. Students observe the water levels and record predictions. Observe water level two weeks later and record results. Discuss. (2.P.2.3)
- Introduce “I Cans” and vocabulary.
Decision 5: Acquisition Lesson One

Language Objective(s), where appropriate:

I can ask and answer questions before, during, and after I read.

Lesson Essential Question(s) or “I Can” Statement(s):

I can identify and provide examples of common objects and materials that are solids.
I can measure the length of an object using different units.

Activating Strategies: (Learners Mentally Active)

Read aloud “What is Matter?” Have students do the activity at the bottom of the article.

Activity:

Find three things made of wood in your classroom.
Name three things made of glass.
Find one other material in the classroom.
How are the things made of the same material different from each other?

Acceleration/Previewing: Put the word “Solid” in the middle!

Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)

Informational Text:

Nonfiction Text: Harcourt Science E5-E11
Students read text and record questions before, during, and after reading using question stems provided.
Discuss and share.

Science Investigations:

1. Explore foam and wood blocks in group (see “math” below).
2. Write “solid” on the board, explain it is a state of matter
3. Write “shape and size” on the board, discuss
4. Predict what will happen when you put the blocks…
5. Move the blocks and watch what happens
6. Add to chart
7. What are some more solids?

Math:

During science activity, students measure the length of blocks using two different units of measurement (inches and centimeters). Be sure to model this beforehand. Discuss strategies for measuring effectively.

Distributed Guided Practice/Summarizing Prompts:

Brainstorm a list of solids on their own, then play Give and Take (Give a good idea, take a good idea).

Summarizing Strategies: Learners Summarize and Answer Essential Questions

Frayer model: “Solid” in the middle, with definition, picture, non-example and example.

Lesson Resources

Harcourt Science E5-E11
What is Matter? Article for activator
Wooden and Foam Blocks
### Decision 5: Acquisition Lesson Two

**Language Objective(s), where appropriate:**

| I can ask and answer questions before, during, and after I read. |
| I can write an opinion piece that states my opinion and supports it with three reasons. |

**Lesson Essential Question(s) or “I Can” Statement(s):**

| I can identify and provide examples of common objects and materials that are liquids. |

**Activating Strategies: (Learners Mentally Active)**

| Have students record notes defining a liquid and how it is different from a solid. |

**Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)**

**Informational Text:**


**Solids and Liquid States of Matter Article**

**Harcourt Science E15-E17 (Easier Level Text)**

Students read text and record questions before, during, and after reading using question stems provided. Discuss and share.

**Science Investigation:**

1. Review solid
2. What’s in this cup? Solid? How do you know it’s a liquid?
3. Liquid is a state of matter with a definite volume, what is volume? Volume is a science word for size.
4. Measure in first cup, pour into other shaped containers. Watch as it changes shape. (compare to blocks not changing)
5. Pour into original container, the same amount! It didn’t change volume, but it does change shape.

**Distributed Guided Practice/Summarizing Prompts:**

Review Bill Nye video and add information they learned from the activity to their notes about liquids.

**Summarizing Strategies: Learners Summarize and Answer Essential Questions**

Frayer model: “Liquid” in the middle, with definition, picture, non-example and example.

Make Oobleck.

Opinion Writing: In your opinion, is Oobleck a solid or a liquid?

**Lesson Resources**

| Bill Nye School Tube Video |
| Solids and Liquid States of Matter Article |
| Harcourt Science E15-E17 (Easier Level Text) |
Decision 5: Acquisition Lesson Three

Language Objective(s), where appropriate:
I can ask and answer questions before, during, and after I read.
I can write the sequence of events of a scientific investigation.

Lesson Essential Question(s) or “I Can” Statement(s):
I can give examples of matter that change from a solid to a liquid by heating and cooling.
I can use technology tools and skills to help me practice and understand.

Activating Strategies: (Learners Mentally Active)

Technology:


Have students use website to explore changing liquids to solids. This should engage them in an activity where you can change the states of matter using heat.

Acceleration/Previewing: Rivet: Melting

Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)

Informational Text:
Harcourt Science E33-E36, E39-E41
Students read text and record questions before, during, and after reading using question stems provided. Discuss and share.

Science Investigation:
Delta activity 4 (Melting Ice) follow this lesson as the base
Put ice cube in a bag to melt rather than a cup. (Practice weighing their baggy before and after) Students can manipulate the bag to melt it faster—the hotter it is the faster it melts. Discuss melting rates and speeding up the process through heat. It explains why things melt faster on a hot day.
p. E38 in Harcourt Science—melt one with a lamp and one without a lamp—observe and journal.

Distributed Guided Practice/Summarizing Prompts:
Next investigation—develop a plan—Write step by step instructions for what you are going to do with your plan.

Summarizing Strategies: Learners Summarize and Answer Essential Questions

Narrative Writing:
Students write about the process of turning ice into water and discuss their observations and favorite parts of the experiment.

Lesson Resources
Harcourt Science E33-E36, E39-E41
Ice
Ziploc bags
Decision 5: Acquisition Lesson Four

Language Objective(s), where appropriate:

- I can ask and answer questions before, during, and after I read.
- I can explain a topic and use facts to support it.

Lesson Essential Question(s) or “I Can” Statement(s):

- I can give examples of matter that change from a liquid to solid by heating and cooling.
- I can use technology tools and skills to help me practice and understand.

Activating Strategies: (Learners Mentally Active)

<table>
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<tr>
<th>Technology:</th>
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Have students use website to explore changing liquids to solids. This should engage them in an activity where you can change the states of matter using heat.

Make bouncy balls (liquid to solid).

Acceleration/Previewing: Rivet: freezing

Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)

<table>
<thead>
<tr>
<th>Informational Text:</th>
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<td>Students read text and record questions before, during, and after reading using question stems provided. Discuss and share.</td>
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</table>

Science:

1. Review states of matter.
2. Show cups of water (one for each group).
3. How could I change this liquid into a solid? (Heads Together to brainstorm idea… most will say freeze!)
4. Groups label their cups by teams and note where the water level is on the cup.
5. Tell them you will put in freezer until tomorrow.
6. Wait until tomorrow!
7. Next day: Observe changes made in the matter liquid to a solid. How did it change? What made it change? (heat was taken away, put up equation: liquid – heat = solid).

Distributed Guided Practice/Summarizing Prompts: Brainstorm other ways/places to put liquid to make it change into solid.

Summarizing Strategies: Learners Summarize and Answer Essential Questions

<table>
<thead>
<tr>
<th>Informative Writing:</th>
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<tbody>
<tr>
<td>Explain the properties of solids and liquids and how they are different.</td>
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Lesson Resources

- Delta Science Readers p. 8
- Water
- Cups
Decision 6: Extending Thinking Activities

Include extending activities for several lessons in the essential units.

<table>
<thead>
<tr>
<th>Cause/Effect</th>
<th>Compare/Contrast</th>
<th>Deduction</th>
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</thead>
<tbody>
<tr>
<td>Justification</td>
<td>Induction</td>
<td>Analyzing Perspective</td>
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<tr>
<td>Error Analysis</td>
<td>Abstracting</td>
<td>Evaluation</td>
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<tr>
<td>Classifying</td>
<td>Constructing Support</td>
<td>Writing Prompt</td>
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</table>

Each acquisition lesson includes extending thinking activities.
Decision 7: Differentiating the Unit

What accommodations will you make in order to meet the varied interests, learning styles, and ability levels of all students?

<table>
<thead>
<tr>
<th>choice menus</th>
<th>compacting</th>
<th>grouping</th>
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</thead>
<tbody>
<tr>
<td>seating</td>
<td>visual, auditory, kinesthetic activities</td>
<td>scaffolding</td>
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<tr>
<td>real world meaning</td>
<td>interests</td>
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</table>

Use data from pre-assessments for grouping, scaffolding, and varying activities and interests.
Decision 8: Unit Calendar

Determine the most viable sequence for the experiences, activities, and lesson and create a timeline.

1. Pre-Assess questioning skill and science content before teaching.
2. Each lesson should take at least two days to teach. Teach acquisition lessons in order.
3. Post-Assess questioning skill and science content after teaching.
4. Re-teach based on data.
**Decision 9: Resources and Research**

Provide graphic organizers, links, book titles, websites, etc. that provide support for teaching this unit.

See attached.

Websites and texts can be found in plans. Any additional texts that are related to states of matter or solids/liquids and are on level for students may be used with questioning skill.

Student matter website (created by county teachers): [http://www.smore.com/0usv-matter?ref=my](http://www.smore.com/0usv-matter?ref=my)

Provide ideas about how to integrate Big 6 or Super 3 research framework.

**Plan:** Research melting/freezing points. How can you use this knowledge to turn a liquid to a solid and from a solid to a liquid?

**Do:** Create a Powerpoint/poster/Prezi presenting what you’ve learned about melting/freezing points and why they are important.

**Review:** View shared projects. Write a response.
**Unit Designers:**

**Date:** 1/22/13

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Amber Ballard</td>
<td>Dana</td>
</tr>
<tr>
<td>Amy Floyd</td>
<td>Clear Creek</td>
</tr>
<tr>
<td>Nicole Parris</td>
<td>Fletcher</td>
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<tr>
<td>Carol Broome</td>
<td>Glenn Marlow</td>
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<tr>
<td>Alecia Fletcher</td>
<td>Hillandale</td>
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<tr>
<td>Bettye Hixson</td>
<td>Etowah</td>
</tr>
<tr>
<td>Erin Stachura</td>
<td>Mills River</td>
</tr>
<tr>
<td>Michelle Mays</td>
<td>Edneyville</td>
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