What is the World Made of? A modified unit on solids

Leah Lynch
Dr. Verplaetse
TSL 518
Introduction
1. **Title:** What is the World Made of?

2. **Grade:** 2nd

3. **Target Group:** Mainstream class with integrated ELL students.

4. **Source of Written Reading Materials:**

5. **Source of Lessons:** [http://newhavenscience.org/2currpage.htm](http://newhavenscience.org/2currpage.htm)

6. **Overarching Learning Goals:**
   
   i. I want my students to know properties of solids.
   
   ii. I want my students to know properties of liquids.
   
   iii. I want my students to know properties of gases.
   
   iv. I want my students to know that the structure of matter affects the usage of materials.
Lesson 1
<table>
<thead>
<tr>
<th>Lesson #1 Content Objectives:</th>
<th>Lesson #1 Language Objectives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students will identify and describe the properties of solids.(^1)</td>
<td>1-1. Students will understand the properties of solids, through listening to a short story read aloud in a whole group setting.</td>
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<td>1-2. In small groups students will hold a discussion in order to develop an understanding of the properties of solids.</td>
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<td>1-3. Whole group students will hold a discussion in order to demonstrate an understanding of the properties of solids.</td>
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<td>1-4. Individually, in small groups, with partners, or with the teacher students will write to define the properties of solids and use vocabulary in 2-3 sentences.</td>
</tr>
</tbody>
</table>

\(^1\) Taken from original lesson plan
<table>
<thead>
<tr>
<th>Domain/Topic:</th>
<th>5 Mainstream Advanced/Fluent ELLs</th>
<th>4 Expanding/Intermediate Fluency</th>
<th>3 Developing/Speech Emergent</th>
<th>2 Emerging Early Production</th>
<th>1 Starting/Preproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening/Speaking: Explain the properties of solids</td>
<td>In small groups, students will identify the properties of solids, give full examples, and lead a discussion about the topic.</td>
<td>In small groups, students will identify the properties of solids, give examples and fully participate in a discussion about the topic.</td>
<td>In small groups, students will use the word bank to identify the properties of solids and give examples about the topic.</td>
<td>With a partner, students will use the word bank in order to identify one property of solids and use it in a complete sentence.</td>
<td>With support from the teacher, students will point to a realia of a solid and point to a corresponding descriptive word on the word bank to describe it.</td>
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<tr>
<td>Writing: Define the properties of solids</td>
<td>Students will independently write a paragraph of 3 or more sentences defining the properties of solids.</td>
<td>In small groups, students will write a paragraph of 3 or more sentences defining the properties of solids.</td>
<td>In small groups, students will write 1-2 sentences defining the properties of solids.</td>
<td>With a partner, students will write a sentence defining the properties of solids by filling in the blanks with the support of a word bank.</td>
<td>With teacher support, students will circle an example of a solid and choose a word from the word bank to describe it.</td>
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<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Vocabulary</td>
<td>Grammar</td>
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<tr>
<td>Identify and Describe</td>
<td>The properties of solids</td>
<td>1. A solid is a ___object</td>
<td>1. Hard, soft, flat, square, circular/circle, wood/wooden, red, blue, yellow, orange, green, purple, brown, etc.</td>
<td>Adjectives</td>
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<td>2. A solid will...</td>
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<td>Present tense Verbs</td>
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<td>3. You/ I could/can ____ a solid</td>
<td>2. Hold its shape unless you change it completely.</td>
<td>Nouns</td>
<td></td>
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<td>4. An example of a solid could be a...</td>
<td>3. Push, pull, roll, squeeze, break, cut</td>
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|                          |                                  |                                                                            | 4. Desk, book, pencil, paper, crayon, marker, box, sandwich, board, eraser, lamp, bookcase, blocks, window, curtain, computer, floor, carpet, flag, container, light, cabinet, pants, shirt, dress, shoes, bottle, pot, chair, etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., etc., 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Lesson #1: What is the World Made of?

**CCSS.ELA-Literacy Standards: RI.2.1**  W.2.1, W.2.2, SL.2.1, SL.2.2, SL.2.6

**Goal:** Solids can be described by their properties.²

**Grade:** 2

**Length:** Approximately 60 minutes

**Materials:**
- Book: *What is the World Made Of?* by Kathleen Weidner Zoehfeld ³
- Chart paper
- Markers
- Science journals and/or attached worksheets
- Pencils
- Wooden block
- Clear, plastic Bottle
- Pipe cleaner
- Spoon
- Stuffed animal
- Worksheets (see attached)

**Procedure:**

**Day 1 (Properties of solids)**

**Words in bold are teacher talk**

**Building Background knowledge for ELL students:**

Call ELL students to back table before the start of the lesson. Review the following terms: hard, soft, push, squeeze, pull, roll, flatten, and cut. Teacher can translate into students’ native language using Google translate. Teacher will model the verb: push. Act out pushing something and say “push” in English. Have students mimic your pushing and repeat the English word for the action. Continue modeling and saying the coordinating English verb for the words: pull, squeeze, roll, flat, and cut. Have students copy your actions and words. The terms and coordinating illustrations will be posted and kept on the science word wall for future reference. (See appendix pages 9-10)

² Taken from original lesson plan
³ Taken from original lesson plan

Lynch
Step 1. Call students to the carpet, whole group have them bring their pencils and set them down in front of them. Display the solids realia. Ask students to sit and think to themselves for a minute about what they know, if anything, and what they would like to know about each of the objects. Teacher models think aloud: “I know that the block feels hard. What can I do with it? I can throw it, I could stand on it, and I could play with it. I want to know what it is made of.” Teacher will write guiding questions and include illustrations on the board such as: What can I do with/to it? How does it feel/smell/sound/look? What color is it? What shape is it? How big is it? (Appendix pp. 9-10, 20)

Step 2. Teacher will explain “We are going to complete a KWL chart. I want you to work with your partner and tell him or her what you do know (point to your head) and then ask a question about the solids (point to your chin and make a confused face). You can use the questions on the board to help you. I want you to look at one another in the eyes (point to your eyes) while you are speaking and speak clearly (point to your mouth).” (See appendix p 19) Teacher distributes solids to groups. Students are to then observe, turn, talk, and brainstorm with their neighbors about what they know and would like to learn about the objects. Walk around and listen in on students’ conversations and refer them back to the guiding questions/illustrations (appendix pp. 9-10, 20) Students may use L1 and/or L2.

Step 3. Redirect students back to whole group and have them share out what they know and want to know about the objects. Chart their responses on class-wide KWL chart. (Appendix p19) At this point in the lesson, record all responses whether correct or incorrect.

Step 4. Explain to the students that all things in the world are made up of matter. Display a vocabulary poster showing Matter: what things are made of. (Appendix p 11) Read the definition and have the students repeat. Explain that solids are made of a type of matter and that they have special properties: A property describes a thing. A property makes a thing what it is. A property makes a thing special. Appendix (p 11) You will read the definition to the students and then have the students repeat the definition with you.

Step 5. Tell students that today we are reading to find out the properties of solids. Refer back to the vocabulary poster and previously written learning objective. (Appendix p11)

Step 6. On chart paper, write the word “solid” in the center of a web. (Appendix 18) Call group back together. Display the book What is the World Made Of? Have student observe the front cover. Ask them to, “Make a prediction, what do you think this book is going to be mostly about?” Pause for a few seconds while referencing the illustrations on the cover. Briefly display the inner illustrations in the book and ask students, “What
do you think you are going to learn from listening to this book?” Pause and reference the illustrations in the book. Read pages 1-7. Pause after page 7. Re-read the line “Everything on earth is made of matter.” Ask the students, “What is made of matter?” Pause, reference the illustrations on the pages. Their responses could be: all things, everything, walls, blocks, dolls, socks, etc.

Step 7. Re-read pages 8 and 9. Check for understanding. Ask, “What are some properties of solids?” Pause, reference the illustrations on the pages. Students’ responses could include: hard, soft, hold their shape unless you do something to change them, have weight. Chart correct responses on the solids word web poster. Add illustrations to illustrate and explain the words. Ask “What can you do to solids?” Pause, reference the illustrations on the pages. Student responses should include: push, pull, squeeze, roll flat, cut, etc. Chart correct responses on solids word web poster. (Appendix p 18) Add illustrations to the poster in order to demonstrate and explain the words. Continue reading the book pausing and checking for understanding as necessary.

Step 8. Ask the students to turn and talk to 2-3 partners about what they learned about solids. Walk around and listen as students converse. If students are having difficulty generating examples of the properties of solids, refer them back to vocabulary definitions and word web posters. (Appendix p 11, 18) Guide them in their conversations with prompts such as “I like your thinking! What makes you think that?” “Can you explain why you think that is a solid?” “Is Play-Doh a solid or a liquid? Is it because Play-Doh holds its shape on the table or because it spills over the side of the desk when you put it down?”

Step 9. Ask students to share out what they discussed with their small groups. Chart in their responses in the “L” section of the KWL poster. (Appendix p19) Make sure to guide students’ responses to include solids: have their own shape, are visible, take up space and have weight unless energy changes them. Hang up posters on science bulletin board for future reference.

Step 10. Ask students to “Turn once more to your partner and you will take turns “teaching” each other what a solid is” (point to an example either on poster or realia) and what are some of their properties are (point to solids web poster). You could look at some of the answers we have on our posters to help you. I should hear everyone taking turns talking (point to your mouth), listening to their partner (pull on your ear) and see everyone looking at the speaker (point to your eyes).” Explain to the students that “Now you will have the opportunity to show what they know about solids through writing. Everyone’s worksheet may not look the same so you are to work on the one that I give you.” Dismiss students back to their seats, pass out worksheets and explain to them that “Everyone’s directions are to include an example of a solid and its properties.” (Appendix pp. 13-17 as needed)
Appendix for Lesson #1
Pages 9-10: Illustrations for Building Background Knowledge
Page 11: Matter and Properties Poster
Page 12: Rubric for Assessment
Pages 13-17: Modified Worksheets
Page 18-20: Graphic Organizers
Page 21: Illustrations for Essential Vocabulary
Pages 29-30: Narrative Reflection
QUESTIONS I CAN ASK ABOUT SOLIDS

What can I do with/to it?

How does it feel?

How does it Smell?

How does it Sound?

How does it look?

What color is it?
What shape is it?

Triangle  Square
Circle  Rectangle

How big is it?

How much does it weigh?

heavy
Learning Objective: Today we will identify and describe the properties of solids.

Matter: what things are made of.

Properties: A property describes a thing. A property makes a thing what it is. A property makes a thing special.
Assessment:

- Science journals and/or worksheets

Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<tbody>
<tr>
<td>2</td>
<td>Student understands examples of solids and their properties.</td>
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</table>
| 1     | - Student understands examples of solids but not their properties.  
        - Student does not understand examples of solids, but understands their properties. |
| 0     | Student does not understand examples of solids or their properties. |
Name: ________________________________

(5) Directions: On your own, draw an example of a solid. Write 3 or more sentences including the definition of solids and give examples of their properties
(4) Directions: With your small group, draw an example of a solid. Write 3 or more sentences including the definition of solids and give examples of their properties.
(3) Directions: In your small group, draw an example of a solid. Write 1-2 sentences about the properties of solids.
(2) Directions: With your partner, draw an example of a solid. Use the word bank to fill in the blanks.

WORD BANK: hard block soft hold change chair pencil book window plant sandwich

A solid is a ______ object.

A solid will ______ its shape ______ unless you ______ it.

I drew a ______, it is a solid.
(1) Directions: With the teacher, circle one (or more) example of a solid. Choose a word from the word bank to describe one of the objects.

WORD BANK: hard soft hold change

- helium
- icicles
- orange juice
- airplane
- maple syrup
- carbon dioxide
- snowman
- gasoline
- air inside of a soccer ball
- air inside of a tire
- paint
- cheese

A solid can be
<table>
<thead>
<tr>
<th>What I Know</th>
<th>What I Want to know</th>
<th>What I Learned</th>
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Illustration Samples

Matter

Pull

Chair

Squeeze

Hard

Book

Soft

Carpet

Push
What Is the World Made Of?
All About Solids, Liquids, and Gases

by Kathleen Weidner Zoehfeld • illustrated by Paul Meisel

HarperCollins Publishers
Special thanks to Dr. Leonard Fine of Columbia University for his expert advice

The art in this book was created using a mixed-media technique that includes pen and ink, watercolor, acrylic colored pencil, and pastel on Arches hot press paper.

The Let’s Read-and-Find-Out Science book series was originated by Dr. Franklyn M. Branley, Astronomer Emeritus and former Chairman of the American Museum–Harvard Planetarium, and was formerly co-edited by him and Dr. Romo Garu, Professor Emeritus of Childhood Education, Teachers College, Columbia University. Text and illustrations for each of the books in the series are checked for accuracy by an expert in the relevant field. For more information about Let’s Read-and-Find-Out Science books, write to HarperCollins Children’s Books, 10 East 53rd Street, New York, NY 10022, or visit our web site at http://www.harperchildrens.com.


What Is the World Made Of?
All About Solids, Liquids, and Gases
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Illustrations copyright © 1998 by Paul Meisel

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What is the world made of? : all about solids, liquids, and gases / by Kathleen Weidner Zoehfeld ; illustrated by Paul Meisel.
   p.    cm. — (Let’s-read-and-find-out science. Stage 2)
   Summary: In simple text, presents the three states of matter: solid, liquid, and gas, and describes their attributes.
   1. Matter—Constiution—Juvenile literature. I. Meisel, Paul, ill. II. Title. III. Series.
   QC173.16.Z64 1998
   530.4—dc21
   97-30658
   CIP
   AC

Typography by Flynn Géron and Christine Cacana
1 2 3 4 5 6 7 8 9 10

First Edition
The air in the breeze that blows the leaves. Water flowing in the creek. Everything on earth is made of matter. Lucky for us, it’s easy to tell that not all matter is alike.
Some solids are hard and some are soft. But all solids hold their shape unless you do something to change them.

A wooden block is hard. You can push it and pull it and squeeze it—it will always stay squared. If your baby brother pounds it with his toy truck, it may chip or break. But then the broken pieces will hold their shapes.
Modeling clay is soft. You can roll it out flat, like a pancake, or squeeze it into a ball. You can cut it with a knife or scissors. But if you leave it alone, it will hold whatever shape it is in. It is a solid.
LETS-READ-AND-FIND-OUT ABOUT

Solids, Liquids, and Gases

Can you make an ice cube disappear?
Put it on a hot sidewalk. It melts into water and
then vanishes! The ice cube changes from solid to
liquid to gas. . . . Read on to find out more about
the three states of matter.

Other Stage 2 books you might enjoy:

Introduce basic science concepts to young children
and help satisfy their curiosity about how the world works.

Stage 1 books explain simple
science concepts for preschoolers
and kindergarteners.

Stage 2 books explore more
challenging concepts for children
in the primary grades.
Narrative for lesson #1

Building Background Knowledge:

Building background knowledge at the start of a lesson is key to comprehension. So, one of the first modifications that I made was adding a KWL chart. The “K” provides an opportunity for the students to retrieve relevant background knowledge. Providing adequate background knowledge for students “facilitates understanding of the lesson content and increases the likelihood of learning retention.”

I would encourage teachers to allow students to speak to each other in their native language, and if there was not another student who spoke the same language, the teacher could tell the student to think to themselves in their native language and then slowly try to translate into English, using the visuals, dictionaries, etc. If the students needed extended time to brainstorm, the teacher would have to be flexible.

Language and Content Vocabulary development:

The modified version of the lesson has more of an emphasis on vocabulary words that are essential to the content of the lesson. Research shows that “less is more” and to teach fewer words, but more in depth. The students are to listen to the written and displayed vocabulary definition and then repeat it out loud. Later on in the lesson the students would also have the opportunity to write to include their comprehension of the vocabulary. In the modified lesson there are picture cues linked to the meaning of the vocabulary words. The modified lesson encourages students to include the new vocabulary in their discourse. Teachers need to know that even the simplest answers from students helps them build and reinforce knowledge within a safe environment for language development.

Graphic Organizers:

I kept the word web in the modified version because graphic depiction of the text helps students (and teachers!) organize their thoughts in a meaningful way and improves their performance.

Use of Realia and Drawing:

Realia brings life to the text. It not only makes the lesson more interesting, but makes an impression on the students. No matter what the proficiency level of the text, the realia helps students attach meaning to words and encourages them refer back to it on their own. I wanted the students to show their understanding through written text, so I added the opportunity for them to draw/circle a picture of a solid. Drawing enhances the students’ learning and acts as an alternate form of expression for students who are struggling with English.

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4 (Echevarria and Graves)
5 (Echevarria and Graves)
6 (Echevarria and Graves)
Cooperative Groups:

In the modified version, I also built in more time in for cooperative groups. The students were encouraged to discuss their own thoughts and reactions to the topic of solids. Small groups and/or pairs allows for a safe place for students who are struggling with the language and content material to develop the necessary skills in reading, writing and speaking. Interaction allows students to co-construct knowledge and provides them with the practice needed to develop their academic language (among many things).

Teacher and Student Discourse:

In the modified version, I wanted to encourage teachers to think out loud and ask pertinent, guiding, open-ended questions. I made sure to emphasize key words, repeat important words and phrases, and give the lesson instructions one action at a time, in sequence. I also made sure that the questions teachers should ask will be comprehensive and scaffolded to better meet the needs of students at all proficiency levels.
Lesson 2
<table>
<thead>
<tr>
<th>Lesson #2 Content Objectives:</th>
<th>Lesson #2 Language Objectives:</th>
</tr>
</thead>
</table>
| 1. Students will understand that some solids have different properties.\(^1\) | 1-1. Students will observe and produce vocabulary to describe solids in small groups.  
1-2. Students will discuss similarities and differences between the solids using vocabulary in small groups.  
1-3. Students will write to describe solids in small groups. |

\(^1\) Taken from original lesson plan
<table>
<thead>
<tr>
<th>Domain/Topic:</th>
<th>5 Mainstream Advanced/Fluent ELLs</th>
<th>4 Expanding/Intermediate Fluency</th>
<th>3 Developing /Speech Emergent</th>
<th>2 Emerging Early Production</th>
<th>1 Starting/Preproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Listening/Speaking:</strong> Give examples of the properties of solids</td>
<td>In small groups, students will identify 8-10 properties of solids, give full examples proving properties that compare and contrast the two solids.</td>
<td>In small groups, students will identify 5-7 properties of solids. Students will compare and contrast the solids orally.</td>
<td>In small groups, students will use the word bank to identify 3-4 properties for each of the two solids.</td>
<td>In small groups, students will use the word bank in order to identify 2-3 properties of solids.</td>
<td>With support from the teacher, students will point to a realia of a solid and point to a corresponding descriptive word on the word bank to describe it.</td>
</tr>
<tr>
<td><strong>Writing:</strong> Comparing and contrasting the properties of solids</td>
<td>Independently, students will write to identify 8-10 similarities and differences between the 2 solids. Independently they will also write a 2-3 complete sentences explaining their solids’ similarities and differences and title the diagram.</td>
<td>Independently students will write to identify 5-7 similarities and differences between the 2 solids. They will also write a complete sentence explaining their solids’ similarities and differences and title the diagram.</td>
<td>In small groups students will use the word bank to identify 3-4 similarities and differences between the 2 solids and title the diagram.</td>
<td>In small groups students will choose 2-3 words from the word bank to describe their solids and title the diagram.</td>
<td>With support from the teacher, students will point to what is the same between the two solids and point to what is different.</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Vocabulary</td>
<td>Grammar</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>Compare and</td>
<td>The properties of solids</td>
<td>1. _____ is similar/compar/contrast to______...</td>
<td>1. large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay</td>
<td>Nouns, Adjectives</td>
<td></td>
</tr>
<tr>
<td>contrast</td>
<td></td>
<td>2. Because one is______ They both are_______</td>
<td>2. Hard, soft, flat, square, circular/circle, wood/wooden, red, blue, yellow, orange, green, purple, brown, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson #2: Comparing and Contrasting 2 Solids

CSS.ELA-Literacy Standards: RI.2.1 W.2.1, W.2.2, SL.2.1, SL.2.2, SL.2.6

Goal: Students will understand that some solids have different properties.²

Grade: 2

Length: Approximately 45 minutes

Materials:

- Examples of solids such as: large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay, etc. Enough for two per small group.
- Chart paper
- Markers
- Pencils
- Venn Diagram worksheet

Procedure:

Day 2 (Comparing and contrasting solids)

Words in bold are teacher talk

Building Background knowledge for ELL students:

Call ELL students to back table before the start of the lesson. Review the following yesterday’s vocabulary terms: hard, soft, push, squeeze, pull, roll, flatten, and cut. The teacher can reference the terms and coordinating illustrations that are posted on the science word wall. The teacher will introduce today’s vocabulary: Today we are going to compare (find out what is the same), contrast (find out what is different), and observe (look carefully). The teacher will use picture clues and realia (see appendix p 16-17). The teacher can translate the words into students’ native language using Google translate. If there is time, students may play the vocabulary memory match game (See appendix p15-17) or assign for homework the night before the lesson. Students may also play online learning games such as: http://www.eslgamesplus.com/memory-games/ for homework.

Step 1. Call students to the carpet review the “properties of solids” poster from the previous day’s lesson. (See appendix p 11) Check for understanding. Ask, “What are some properties of solids?” Pause, point to the illustrations and words on the “solids” word web poster (see appendix p 18) as the students share their answers. Students’

²Taken from original lesson plan

Lynch
responses should include: hard, soft, hold their shape unless you do something to change them, and have weight. Ask “What can you do to solids?” Pause, reference to the words and illustrations as students share their answers. Student responses should include: push, pull, squeeze, roll flat, cut, etc. (See appendix p11) Who remembers some examples of solids? (Pause, wait for clarification) Students’ responses could include: chair, carpet, book, pencil, etc. Encourage students to point to objects in the classroom with you as they say them out loud.

Step 2. Teacher models think aloud: “I know that the block feels hard. I also know that the bolt feels hard. These two solids have the same property (point to vocabulary word poster appendix p 12) of being hard. Because these two solids have the same property, I am going to write “hard” in the center of the Venn diagram that has the bolt and the block. Hmmm but, when I observe the pipe cleaner, it is not hard. It is soft and flexible. The bolt (hold up item) is hard, but the pipe cleaner is different, it is soft. (Find the poster with the bolt and pipe cleaner Venn diagram and write the word “hard” in the circle under bolt, and “soft/ flexible” in the circle under the pipe cleaner see appendix pp. 19-20.) Today we will be comparing-telling what the same is, and contrasting-telling what is different about the properties of our different solids. I want you to think of as many as you can! We will be using a Venn diagram to show what we have found. Do you see how I labeled my Venn diagram? I want you to label yours also. Here is the list of items that everyone has. (Reference poster see appendix p 13-14) Do you see how I put the properties that are the same in the middle of the circles? (Pause, wait for clarification) And how the properties that are different go in the outer circles? (Pause wait for clarification) I want you to do that with your circles also. (See appendix pp. 19-20)

Step 3. When you are trying to see what is the same/comparing (reference vocabulary poster) and contrasting/seeing what’s different (reference vocabulary poster) your two solids think back to the questions you asked about your solids yesterday such as: What can I do with/to it? How does it feel/smell/sound/look? What color is it? What shape is it? How big is it? Teacher will write guiding questions and include illustrations on the board (for resources for step 3, see appendix pp. 9-10.)

Step 4. Ask students to get into small groups of 3-4. Pass out two solid objects to each group I want you to work with your partner and talk to him or her what is the same and different (reference vocabulary posters p 9-10, 11) about the solids. You can use the questions on the board to help you (point to questions on board). I want you to take turns looking at one another in the eyes (point to your eyes) while you are speaking and speak clearly (point to your mouth).” Teacher distributes solids and Venn diagram worksheets (appendix pp. 21-25) to groups. Students are to then label
Venn Diagrams, observe, turn, talk, and write on their worksheets with their neighbors about what is the same and different amongst the objects. Walk around and listen in on students’ conversations and refer them back to the guiding questions/illustrations (appendix pp. 9-10, 11) Students may use L1 and/or L2.

Step 5. Call small groups back together, whole group. Ask students to share out what they discussed with their small groups. Who would like to share what they found? (pause, wait for students’ responses.) While 2-3 groups are sharing, create a class Venn diagram (appendix 19-20) to show the many similarities and differences in the properties of solids. Review the meaning of solids by asking: What do all of these solids have that is the same? (Point to the definition poster appendix p12) Wait for students’ responses.
Appendix for Lesson #2

Page 8: Rubric for Assessment
Pages 9-10: Illustrations for building background knowledge
Page 11: Illustrations for Essential Vocabulary
Page 12: Vocabulary definition poster
Pages 13-14: List of solids
Pages 15-17: Vocabulary memory match
Page 18: Solids word web
Pages 19-20: Teacher model Venn
Pages 21-25: Modified Worksheets
Pages 26-27: Narrative Reflection
### Assessment:
- Science journals and/or worksheets

### Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Student understands examples of solids and their properties.</td>
</tr>
</tbody>
</table>
| 1     | - Student understands examples of solids but not their properties.  
        - Student does not understand examples of solids, but understands their properties. |
| 0     | Student does not understand examples of solids or their properties. |
QUESTION I CAN ASK ABOUT SOLIDS

What can I do with/to it?

How does it feel?

How does it Smell?

How does it Sound?

How does it look?

What color is it?
What shape is it?

Triangle
Square
Circle
Rectangle

How big is it?

big. little

How much does it weigh?

heavy
Illustration Samples

- Matter
- Chair
- Hard
- Soft

Push
Pull
Squeeze
Learning Objective: Today we will compare and contrast the properties of solids.

Properties: A property describes a thing. A property makes a thing what it is. A property makes a thing special.

Compare: find out what is the same

Contrast: find out what is different

Observe: look carefully
List of Solids:

- Large spoon
- Small spoon
- Cork
- Pipe cleaner

Marble

Button

Die

Gem

Nut
Cap

Bobby pin

Small washer

Large washer

Large ball

Small ball

Wooden block

Paperclip

Clay
Vocabulary memory match game:

Teacher prep: print and cut out picture and word cards.

RULES: Put all of the cards face down on the table. Students are allowed to turn over 2 cards per turn. If they get a match, they may go again. Keep playing the game until there are no more cards left on the table. Whoever has the most matches at the end of the game is the winner.
Image Cards:
<table>
<thead>
<tr>
<th>Vocabulary definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All things in the world are made</strong></td>
</tr>
<tr>
<td><strong>Of matter.</strong></td>
</tr>
<tr>
<td><strong>A Chair is an example of a solid.</strong></td>
</tr>
<tr>
<td><strong>Solids can be hard.</strong></td>
</tr>
<tr>
<td><strong>Solids can be soft.</strong></td>
</tr>
<tr>
<td><strong>(Find out what is different)</strong></td>
</tr>
<tr>
<td><strong>Compare</strong></td>
</tr>
</tbody>
</table>

Lynch
Solids

1.

2.

3.

4.

5.

6.

7.

8.
<table>
<thead>
<tr>
<th>Bolt</th>
<th>Pipe Cleaner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard</td>
<td>Soft/Flexible</td>
</tr>
</tbody>
</table>
(5) Directions: In your small group, talk about 8-10 similarities and differences about your 2 solids. Then on your own, write the similarities and differences, title your diagram and on the back side of this paper, write 2-3 complete sentences explaining your solids’ similarities and differences.
(4) Directions: In your small group, talk about 5-7 similarities and differences about your 2 solids. Then on your own, write the similarities and differences, title your diagram, and on the back side of this paper, write a complete sentence explaining your solids’ similarities and differences.

<table>
<thead>
<tr>
<th>Similarity/Difference 1</th>
<th>Similarity/Difference 2</th>
<th>Similarity/Difference 3</th>
<th>Similarity/Difference 4</th>
<th>Similarity/Difference 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Similarity/Difference 6</th>
<th>Similarity/Difference 7</th>
<th>Similarity/Difference 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Name: ________________________________________________________________

WORD BANK:  hard  soft  large  small  circle  square  triangle  green  yellow
             red   blue  grey  black  white  heavy  light

3) Directions: In your small group, brainstorm and write 3-4 similarities and differences about your 2 solids. Title your diagram.

______________________________________________________________
(2) Directions: In your small group. Talk about your solids then choose 2-3 words from the word bank to describe your solids. Write the adjectives and title your diagram.
(1) Directions: With the teacher, point to what is the same between the two solids. Point to what is different.
Narrative for lesson #2

Providing Background Knowledge and Language and Content Vocabulary development:

I have learned that pre-teaching vocabulary is very important for ELL students. If we do not pre-teach the vocabulary that is essential to the lesson, we risk the students not being able to grasp the objectives of the lesson. For this lesson, I made sure to pull the ELL students aside to teach the key vocabulary for the lesson. The vocabulary will also be posted in the classroom for further reference. I also included a vocabulary memory match game, which can be modified for any key vocabulary concepts. The game could be played at school, pairing the differing language-levelled students, and/or the game could be send home for the students to practice before the lesson and as review. In the modified lesson, I made sure to emphasize teacher talk and modeling. Think out louds are perfect for engaging the students and getting them to think for themselves, so they know how to ask themselves more meaningful questions about the topics. I have also included lots of realia and pictures - whether teacher created or offline. The pictures and realia bring real-world meaning to the vocabulary and is more likely to create lasting memories of the meaning of the words.

Graphic Depiction of the text:

I modified the Venn Diagrams for the students’ different language levels. Of course the more language advanced students would be expected to challenge themselves with producing more writing such as including compete sentences and vocabulary terms. While the pre-production and emerging language students would receive much more support from the use of images, a word bank, and small group work with the teacher.

Cooperative Groups:

In the modified version, I also built in more time in for cooperative groups. The students were gradually released from the teacher. I wanted to teacher to model everything from how to think about the solids, how to write in the Venn diagram as well as how to work with their partners. I have learned that if you want the students’ group work to be successful and for them to stay on task, it is important to model how you expect students to interact with one another as well as how to handle the content. Once again, small groups and/or pairs is a safe place for students who are struggling with the language and content material to develop the necessary skills in reading, writing and speaking. Interaction also allows students to co-construct knowledge and provides them with the practice needed to develop their academic language (among many things).

Teacher and Student Discourse:

When I am teaching a lesson, I like to have a guide as of what to say, of course the words in bold that I have included are just suggestions and I would encourage teachers to use it as a guide and even add more on to what is provided. But when teaching any lesson I would make
sure to include think alouds and frequent the use of asking guiding, open-ended questions. I added wait time to check for understanding into the modified lesson, because I know that there are times I feel pressured to watch the clock, but if teachers do not make sure the students understand what they are working on, the lesson is a failure.
Lesson 3
<table>
<thead>
<tr>
<th>Lesson #3 Content Objectives:</th>
<th>Lesson #3 Language Objectives:</th>
</tr>
</thead>
</table>
| 1. Students will understand that some properties of solids are color and shape.¹ | 1-1. In small groups, students will sort solids based on properties.  
1-2. In small groups, students will observe the similarities and differences in the way they grouped the solids  
1-3. Individually students will write to describe the sorting of solids. |

¹ Taken from original lesson plan
<table>
<thead>
<tr>
<th>Domain/Topic:</th>
<th>5 Mainstream Advanced/Fluent ELLs</th>
<th>4 Expanding/Intermediate Fluency</th>
<th>3 Developing /Speech Emergent</th>
<th>2 Emerging Early Production</th>
<th>1 Starting/Preproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing: Explaining</td>
<td>Independently, students will write 2-3 complete sentences explaining how their partner sorted the solids with support as to why.</td>
<td>Independently, students will write 1-2 complete sentences explaining how their partner sorted the solids with support as to why.</td>
<td>Independently, students will use the word bank to write a complete sentence explaining how their partner sorted the solids with support as to why.</td>
<td>Independently, students will use the word bank to fill in the sentence as to how your partner sorted one group of the solids and why.</td>
<td>With small group support from the teacher, students will point to the solids that should be in the same group and then point to why.</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Vocabulary</td>
<td>Grammar</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>---------------</td>
<td>----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
</tbody>
</table>
| Classify | Sorting solids| My partner sorted the 1. _______ together. He/she did because they all had 2. _______ the same. | 1. large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay. 2. Weight, sounds, looks, feels/texture, color, shape | • Nouns  
• Adjectives |
**Lesson #3: Sorting Solids**

**CCSS.ELA-Literacy Standards: R1.2.1** W.2.1, W.2.2, SL.2.1, SL.2.2, SL.2.6

**Goal:** Students will understand that some properties of solids are color and shape.²

**Grade:** 2

**Length:** Approximately 50 min

**Materials:**
- One of every object per small group: large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay.
- Chart paper
- Markers
- Science journals
- Pencils

**Procedure:**

**Words in bold are teacher talk**

**Building Background knowledge for ELL students:**

Call ELL students to back table before the start of the lesson. Review the previous days’ vocabulary terms: compare, contrast, observe, hard, soft, push, squeeze, pull, roll, flatten, and cut. Use the vocabulary cards posted on word wall (appendix p 36-37) the teacher can reference the terms and coordinating illustrations that are posted on the science word wall. The teacher will introduce today’s vocabulary: Today we are going to first observe (look carefully) then we will compare (find out what is the same), contrast (find out what is different) and finally sort (put into groups based on what is the same) the solids. (See appendix p 12) The teacher will use picture clues and realia (see appendix p 9-11) to introduce the vocabulary pertinent to today’s lesson. The teacher can translate the words into students’ native language using Google translate. If there is time, students may play online learning games such as:

- [http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials_fs.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials_fs.shtml)
- [http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sorting_using_mate_fs.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sorting_using_mate_fs.shtml)

or assign for homework the night before the lesson to reinforce vocabulary or the night of to review.

² Taken from original lesson plan
Day 3 (Classifying solids based on properties mainly: color and shape)

Step 1. Call students to the carpet review the “properties of solids web” and “comparing and contrasting” student-generated list posters from previous days’ lessons (appendix p 18, 19-20) Ask, “What are some properties of solids?” Pause, point to the illustrations and words on the “solids” word web poster (see appendix p 18) as the students share their answers. Students’ responses should include: hard, soft, hold their shape unless you do something to change them, and have weight. Check for understanding by asking “If you understand what a property of a solid is give me a thumbs up (model thumbs-up) If you need more time to learn what a property is give me a thumbs down (model thumbs-down). If there are some students who still do not understand, pull them to the back table to work in a small group with you. Review the section of the lesson: “Building Background Knowledge for ELL students” with them.

Step 2. Introduce today’s objective: “Today we are going to first observe (look carefully) then we will compare (find out what is the same), contrast (find out what is different) and finally sort (put into groups based on what is the same) solids…” (Appendix p 12) Display a sample set of solids. Display solids name poster. Ask “are we only observing (reference vocabulary poster p 12) one type of solid today? Pause wait for feedback “No, we are observing many types of solids today. So do you think that there is only one way to sort (reference realia) these solids? Pause wait for feedback. No! There are many ways that we can sort these solids based on the properties that we have talked about. Let’s sort some together.” Hold up large metal spoon. “What is this?” (Reference solids poster appendix p 13-14) Stand next to the “questions I can ask about solids poster” (appendix p 9-10): “What color is it? Pause wait for feedback. How does it feel? (Pass it to a student and have them feel it and share what their thoughts are.) How does it smell? (Pass it to a student and have them smell it and share what their thoughts are) How does it sound? (Flick it and have students share what they heard) What shape is it? (Reference “questions I can ask myself about solids” poster’s shapes p 9-10 and have students share out their answers) How big is it? (Hold up smaller spoon for comparison, pause wait for student feedback) Chart properties of large spoon on multi-T-chart poster. (See appendix p15-17) Ok, so based on the properties that we have brainstormed together about this large spoon, which of the other items (point to realia) should we sort in the group with the large spoon? And WHY? (Shrug your shoulders) I’ll give you two minutes (hold up two fingers and tap wrist as if tapping wristwatch) to turn and talk to your neighbor about your thoughts. (Walk around and listen in to student’s conversations, use guiding questions as to “tell me why you think that?” “I like that idea, tell me what the properties are?” Find ELL student group and listen in on their conversation. Ask questions such as: which of the solids looks like the big spoon? Is a cork like a spoon? Is a ball like a spoon? While working with ELL
students, reference realia and solids list poster p 13-14. Let ELL students know ahead of time if you are going to call on them during whole group share out.)

Step 3. Call group back together. Ask students, “Who will share with us what their group’s thoughts were? Which of these other solids would be sorted in the same group as the large spoon and why?” (Allow time for 2-3 groups to share out, clarify accordingly “tell me why you think that?” “I like that idea, tell me what the shared properties are?”)

Step 4. For our activity today. Everyone will get the chance to sort the solids, but we will do it one person at a time. If my partner is _____ he will sort all the solids for 5 minutes. Then when she/he is finished, I will try to guess by which property my partner sorted the solids. Then, it will be my turn to sort the solids, this time I will try to do it by a different property and my partner will try to guess by which property I sorted the solids. I will also have five (model 5 fingers and touch wrist as if tapping a wristwatch) minutes. If there is still time you can take another turn and try to sort them by yet another property. I will let you know when the time is up. Tell students that “Now it is your turn to work with small groups, pairs or with me to sort the solids based on their properties. When we are finished, we will write about how our partners and how we sorted the solids. Does anyone have any questions? Thumbs-up if you’re ready.” (Model thumbs up). Distribute the solid objects, one package to each group. While students are working pull small group to back table. Once they are set up and working, walk around to make sure other students are on task. Listen in and ask guiding questions (“tell me why you think that?” “I like that idea, tell me what the shared properties are? Why did you sort these solids together? What makes them the same?”)

Step 5. Call group back together. Who would like to share how their partner sorted the solids and why? (Allow for 2-3 groups of students to share out.) Ask “How did your partner sort the solids? Why do you think they did that?” Chart the objects and properties on multi-Chart (see appendix p 15-17)

Step 6. Dismiss students back to their seats. Have them complete the appropriate worksheets for their learning level appendix pp. 21-35. All students should be able to show what they learned about grouping solids according to their properties.
Appendix for Lesson #3

Page 8: Rubric for Assessment

Pages 9-10: Illustrations for building background knowledge

Page 11: Illustrations for Essential Vocabulary

Page 12: Vocabulary definition poster

Pages 13-14: List of solids

Pages 15-17: Class solids chart

Page 18: Solids word web

Pages 19-20: Whole class Venn diagram

Pages 21-35: Modified Worksheets

Pages 36-37: Vocabulary flashcards

Pages 38-39: Narrative Reflection
Assessment:

- Science journals and/or worksheets

Rubric

<table>
<thead>
<tr>
<th>2</th>
<th>Student understands examples of solids and their properties.</th>
</tr>
</thead>
</table>
| 1 | • Student understands examples of solids but not their properties.  
   • Student does not understand examples of solids, but understands their properties. |
| 0 | Student does not understand examples of solids or their properties. |
QUESTIONS I CAN ASK ABOUT SOLIDS

What can I do with/to it?

How does it feel?

How does it Smell?

How does it Sound?

How does it look?

What color is it?
What shape is it?
Triangle  Square
Circle     Rectangle

How big is it?
big. little

How much does it weigh?
heavy
Illustration Samples: things I can do to solids

- Matter
- Chair
- Hard
- Soft
- Push
- Pull
- Squeeze
- Same/Compare
- Contrast/Different
Learning Objective: Today we will sort solids based on their properties.

Properties: A property describes a thing. A property makes a thing what it is. A property makes a thing special.

Observe: look carefully

Compare: find out what is the same

Contrast: find out what is different

Sort: put into a group based on things that are the same
List of Solids:
Large spoon

Small spoon

Cork

Pipe cleaner

Marble

Button

Die

Gem

Nut
Cap

Bobby pin

Small washer

Large washer

Large ball

Small ball

Wooden block

Paperclip

Clay
## Properties of Solids Whole class poster

<table>
<thead>
<tr>
<th>Item</th>
<th>Size</th>
<th>Color</th>
<th>Texture (how it feels)</th>
<th>Weight</th>
<th>Sound</th>
<th>Use</th>
<th>Shape</th>
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Solids

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Bolt  Hard  Block
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<thead>
<tr>
<th>Bolt</th>
<th>Pipe Cleaner</th>
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<tbody>
<tr>
<td>Hard</td>
<td>Soft/Flexible</td>
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</table>
(5) Sort the objects according to their properties, then have your partners guess how you sorted them. Check off how you sorted the objects on this sheet, you do not need to use all of the groups.

<table>
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<th>Item</th>
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</table>
Name  ________________________________

(5) Directions: by yourself write 2-3 complete sentences explaining how your partner sorted the solids. Why do you think they did that?

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Lynch
Name __________________________________________________________

(4) Sort the objects according to their properties, then have your partners guess how you sorted them. Check off how you sorted the objects on this sheet, you do not need to use all of the groups.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
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<tr>
<td>clay</td>
<td><img src="image" alt="clay" /></td>
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<tr>
<td>wooden block</td>
<td><img src="image" alt="wooden block" /></td>
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<tr>
<td>small ball</td>
<td><img src="image" alt="small ball" /></td>
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<tr>
<td>large ball</td>
<td><img src="image" alt="large ball" /></td>
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<td></td>
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<tr>
<td>large washer</td>
<td><img src="image" alt="large washer" /></td>
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<tr>
<td>small washer</td>
<td><img src="image" alt="small washer" /></td>
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</tbody>
</table>
(4) Directions: By yourself write 1-2 complete sentences explaining how your partner sorted the solids. Why do you think they did that?

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___________________________________________________________________________________________________

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___________________________________________________________________________________________________
(3) Check ✓ how your partner sorted the objects.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
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</thead>
<tbody>
<tr>
<td>large spoon</td>
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<td>nut</td>
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<tr>
<td>bobby pin</td>
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</tbody>
</table>
(3) Directions: Using the word bank write a complete sentence explaining how your partner sorted the solids. Why do you think they did that?

WORD BANK: hard soft weigh sounds looks feels rough metal silver blue big small red plastic square circle
(2) Check ✓ how your partner sorted the objects.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>large spoon</td>
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<td>bobby pin</td>
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<td>paperclip</td>
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<td>Item</td>
<td>Description</td>
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<tr>
<td>clay</td>
<td>Wooden block</td>
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<tr>
<td>small ball</td>
<td>Large ball</td>
<td></td>
</tr>
<tr>
<td>large washer</td>
<td>Small washer</td>
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</tbody>
</table>

Lynch
(2) Directions: Choose one group and using the word bank, fill in the sentence how your partner sorted the solids. Why do you think they did that?

**WORD BANK:** hard soft weigh sounds looks feels rough metal silver blue big small red plastic square circle

My partner put __________ in the group because they __________ all were __________.
(1) Directions: With the teacher point the solids that should be in the same group. Then point to why.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1</th>
<th>Because...</th>
</tr>
</thead>
<tbody>
<tr>
<td>large spoon</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td>nut</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
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<tr>
<td>gem</td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
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<tr>
<td>cap</td>
<td><img src="image7" alt="Image" /></td>
<td><img src="image8" alt="Image" /></td>
</tr>
<tr>
<td>cork</td>
<td><img src="image9" alt="Image" /></td>
<td><img src="image10" alt="Image" /></td>
</tr>
<tr>
<td>small spoon</td>
<td><img src="image11" alt="Image" /></td>
<td><img src="image12" alt="Image" /></td>
</tr>
<tr>
<td>pipe cleaner</td>
<td><img src="image13" alt="Image" /></td>
<td><img src="image14" alt="Image" /></td>
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<tr>
<td>Object</td>
<td>Image</td>
<td>Description</td>
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</tr>
<tr>
<td>button</td>
<td><img src="image" alt="button image" /></td>
<td>A red button with a triangular shape and green edges.</td>
</tr>
<tr>
<td>marble</td>
<td><img src="image" alt="marble image" /></td>
<td>A small marble with a green body and yellow edges.</td>
</tr>
<tr>
<td>die</td>
<td><img src="image" alt="die image" /></td>
<td>A six-sided die with yellow edges and a green body.</td>
</tr>
<tr>
<td>bobby pin</td>
<td><img src="image" alt="bobby pin image" /></td>
<td>A narrow, thin object with a green edge.</td>
</tr>
<tr>
<td>paperclip</td>
<td><img src="image" alt="paperclip image" /></td>
<td>A narrow, thin object with a green edge.</td>
</tr>
<tr>
<td>clay</td>
<td><img src="image" alt="clay image" /></td>
<td>A small, green item with a yellow edge.</td>
</tr>
<tr>
<td>wooden block</td>
<td><img src="image" alt="wooden block image" /></td>
<td>A block with a green body and yellow edges.</td>
</tr>
<tr>
<td>small ball</td>
<td><img src="image" alt="small ball image" /></td>
<td>A small, green ball with a yellow edge.</td>
</tr>
<tr>
<td>large ball</td>
<td><img src="image" alt="large ball image" /></td>
<td>A large, blue ball with a yellow edge.</td>
</tr>
<tr>
<td>large washer</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>small washer</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
</tr>
</tbody>
</table>
Image Cards:
<table>
<thead>
<tr>
<th>Vocabulary definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All things in the world are made of matter.</td>
</tr>
<tr>
<td>A Chair is an example of a solid.</td>
</tr>
<tr>
<td>Solids can be hard.</td>
</tr>
<tr>
<td>Solids can be soft.</td>
</tr>
<tr>
<td>Compare (Find out what is the same)</td>
</tr>
</tbody>
</table>
Narrative for lesson #3

Providing Background Knowledge and Language and Content Vocabulary development:

In order to pre-tech the essential vocabulary for the modified lesson, I created vocabulary flashcards and reference posters. The cards can be used a quiz, a game, and/or sent home for homework the night before the lesson so the students can practice the meanings. I have also included a few websites that coordinate with the content of the lesson, I have spoken to some parents who have asked for learning websites. These parents allow their children some homework time to play computer games as long as they have to do with learning. The vocabulary cards and posters should remain up in the classroom for the length of study on the unit. The lesson is more comprehensible when the students can reference the meaning of the key vocabulary terms before, during and after the lesson. I have also incorporated gestures and wait time into the modified lesson. I have found that both gestures and wait time are excellent modifications for all the students in the class, gestures allow the teacher to speak with her hands during a quiet time and reinforce what she is currently saying in a pictorial manner. Wait time allows for the more shy and quiet students to think and feel more confident to participate, regardless of their native language. Wait time also allows the ELL students the time to translate from their L1 to English so they are more apt to understand and participate. There are also scaffolded questions which provide a way of asking the harder questions in an easier way. Instead of asking simple “yes/no” questions asking questions that begin with “list…Which of the…was___a____?” allows ELL pre-production students to use what they know to answer higher-order thinking questions. In the modified lesson, I included a lot of teacher talk and modeling content, language and behavior expectations. The modified lesson includes explicit use of realia and images to foster comprehension. As I have said before the pictures and realia bring real-world meaning to the vocabulary and is more likely to create lasting memories of the meaning of the words.

Graphic Depiction of the text:

In the modified lesson, I went to great lengths to make a pictorial graph for the students to work with individually and as a whole class. The graph allows the students to visually see how we are comparing and contrasting and sorting the solid objects. I have also included the previous day’s Venn Diagrams so the students can see the transition for comparing and contrasting to sorting. I also modified the writing expectations for all of the students based on their language levels. The more advanced language leveled students are expected to produce more written response. While they are still receiving support from the vocabulary definition terms, realia, posters and visuals posted around the classroom. The pre-production and emerging language students are still expected to produce a written response to the lesson, they are receiving more support. I modified their worksheets to include a word bank and fill in the blank sentences. They would also receive assistance from their peers as well as small group instruction form the teacher.
Cooperative Groups:

The modified version contains more time for the students to negotiate meaning. They are given time to turn and talk to their neighbors and the meat of the lesson is when they are working in their cooperative groups. One thing I did not mention, is that the teacher would need to set up the groups beforehand. I would suggest posting the partnerships on a poster in the classroom. These partnerships could be used for many other lessons as well, math, reading, writing, etc. As I have said before “Interaction also allows students to co-construct knowledge and provides them with the practice needed to develop their academic language (among many things).”

Teacher and Student Discourse:

The modified lesson includes a lot of teacher think alouds. The think alouds allow the teacher to model language, content and behavior expectations for the task. She should include lots of open-ended questions such as ones that include “opinion, explain, describe, create…” as well as scaffolded questions that include “list, which of the…, was___a___” for the pre-productions students. I have included explicit wording for the teachers.
Original Lessons
Appendix

Pages 2: Original lesson plan from www.newhavenscience.org

Pages 3-4: Original lesson plan for lesson #1 by Leah Lynch

Pages 5-6: Original lesson plan for lesson #2 by Leah Lynch

Pages 7-8: Original lesson plan #3 by Leah Lynch
• Applying tests to investigate new solids and liquids
• Compare the properties of solids with the properties of liquids
• Communicating ideas, observations and experiences through writing, drawing, and discussion

ESSENTIAL QUESTIONS TO GUIDE INSTRUCTION AND ASSESSMENT:
• What are the properties of liquid?
• What are the properties of a solid?
• What are the properties of liquids, solids, and gas?
• How do the properties help determine the usage?

MATERIALS AND SUPPLIES
- STC Solids and liquids Kit
- See Resources

OBJECTIVES AND GOALS

LESSON ONE
Observing and Describing Two Solids
- Students observe, compare, and describe two solid objects
- Students discuss the similarities and differences between the two objects
- Students write about what they know about solids

LESSON TWO
Observing Properties
- Students sort solids on the basis of the properties of color and shape.
- Students describe and discuss the similarities and differences in the ways they have grouped the solids.
- Students discuss the idea that a solid can be described by either its color or shape.

LESSON THREE
Comparing Solids That Roll with Solids That Stack
- Students test a set of solids to determine whether they roll or stack.
- Students apply the results of their test to sort the solids into groups.
- Students describe the similarities among the solids in each group.
- Students discuss the characteristics of the solids that both roll and stack.

LESSON FOUR
Rolling Solids
- Students predict which solids will roll down a ramp and which will roll the farthest.
- Students test their predictions.
- Students discuss the similarities among the solids that roll the farthest and among those that do not roll at all.
- Students determine how far they can make a solid move by blowing on it through a straw.
- Students discuss their observations and record their discoveries.

LESSON FIVE
Testing the Hardness of Solids
- Students arrange a set of solids in serial order on the basis of how hard they are.
- Students discuss and compare the ways they have arranged the solids.
- Students recognize that different words can be used to describe how hard something is.

LESSON SIX
Investigation Solids in Water
- Students investigate what happens when they place solid in water.
- Students describe their observation of the solids in water.
Lesson #1: What is the World Made of?

**Science Objectives:**

Unifying Concept: Solids and liquids are two states of matter. Each state has different properties.

Unit Concept: Solids and liquids can be described and classified on the basis of their properties.

Grade-Level Concept: Solids and liquids have unique properties. Testing can identify properties that cannot be detected by the senses alone.

Goal: Solids can be described by their properties.

Grade: 2

Length: Approximately 30 minutes

Materials:

- Book: *What is the World Made Of?* by Kathleen Weidner Zoehfeld
- Chart paper
- Markers
- Science journals or story paper
- Pencils

Procedure:

Day 1 (Introduction and Teaching of solids)

Step 1. Call students to the carpet and read the book, *What is the World Made Of?* aloud.

Step 2. Ask the students to turn and talk to 2-3 partners about what they learned about solids.

Step 3. On chart paper, write the word “solid” in the center of a web.
Step 4. Ask students to share out what they discussed with their small groups. Create a web with the properties and examples of solids.

Step 5. Dismiss students back to their seats and instruct them to include the new vocabulary in order to write 2-3 sentences explaining what a solid is and its properties.

Assessment:

- Science journals and/or Record sheets
- Class lists and charts
- Class discussions
- Teacher observations
- Individual student conferences
Lesson #2: Comparing and Contrasting 2 Solids

CCSS.ELA-Literacy Standards: RI.2.1, W.2.1, W.2.2, SL.2.1, SL.2.2, SL.2.6

Science Objectives:

Unifying Concept: Solids and liquids are two states of matter. Each state has different properties.

Unit Concept: Solids and liquids can be described and classified on the basis of their properties.

Grade-Level Concept: Solids and liquids have unique properties. Testing can identify properties that cannot be detected by the senses alone.

Goal: Students will understand that some solids have different properties

Grade: 2

Length: Approximately 30 minutes

Materials:

- Examples of solids such as: large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay, etc. Enough for two per small group.
- Chart paper
- Markers
- Science journals
- Pencils
- Venn Diagram worksheet

Procedure:

Day 2 (Comparing and contrasting solids)

Step 1. Call students to the carpet review the “properties of solids” poster from the previous day’s lesson.

Step 2. Ask students to get into small groups of 3-4. Pass out two solid objects to each group.

Step 3. Instruct small groups of students to discuss the similarities and differences between the two solids. On chart paper, write the word “solid” in the center of a web.
Step 4. Ask students to share out what they discussed with their small groups. Create a class list of the similarities and differences including the properties and examples of solids.

Step 5. Dismiss students back to their seats and instruct them to individually fill out their Venn diagram worksheets including the similarities and differences amongst their two solids. Students should include the scientific vocabulary and write at least 2-3 sentences.

Assessment:

- Science journals and/or Record sheets
- Class lists and charts
- Class discussions
- Teacher observations
- Individual student conferences
**Lesson #3: Sorting Solids**

**CCSS.ELA-Literacy Standards:** RI.2.1, W.2.1, W.2.2, SL.2.1, SL.2.2, SL.2.6

**Science Objectives:**

- **Unifying Concept:** Solids and liquids are two states of matter. Each state has different properties.
- **Unit Concept:** Solids and liquids can be described and classified on the basis of their properties.
- **Grade-Level Concept:** Solids and liquids have unique properties. Testing can identify properties that cannot be detected by the senses alone.

**Goal:** Students will understand that some properties of solids are color and shape.

**Grade:** 2

**Length:** Approximately 30 minutes

**Materials:**

- One of every object per small group: large spoon, small spoon, cork, pipe cleaner, marble, button, die, cube, gem, nut, cap, bobby pin, small washer, large washer, paperclip, large ball, small ball, wooden block, clay, etc.
- Chart paper
- Markers
- Science journals
- Pencils

**Procedure:**

**Day 3 (Classifying solids based on color and shape)**

- Step 1. Call students to the carpet review the “properties of solids” and comparing and contrasting student-generated list posters from previous days’ lessons.

- Step 2. Ask students to get into small groups of 3-4. Distribute the solid objects, one package to each group.

- Step 3. Instruct small groups of students to discuss and group the solids based on their similarities.

- Step 4. Ask small groups of students to share out what they discussed, how, and why they grouped their solid objects they way they did. Create a class list of the reasons why the students grouped the objects the way they did.
Step 5. Dismiss students back to their seats and instruct them to individually explain what they learned today about the classification of solids based on color and shape. Students should include the scientific vocabulary and write at least 2-3 sentences.

Assessment:

- Science journals and/or Record sheets
- Class lists and charts
- Class discussions
- Teacher observations
- Individual student conferences
Checklists
Write the page numbers and any other identifying features to identify those parts of your lessons that employ the following strategies.

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What is the world made of? Grammar and Language Functions checklists

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