

School Population:

The school is located in a suburb about 25 miles north of Chicago. My school has approximately 500 students. About 50 % of those students come from working class Latino backgrounds. We also have a transient military population of about 20% which come from a military fort in the community. The remaining 30% come from mainly middle class Anglo backgrounds. It is also important to note that 50% of our students are limited English proficient. I think it goes without saying that our school has many diverse needs. In order to meet these diverse needs, we have several programs at our school. At every grade level, the school has at least one monolingual classroom. Some have two. You will also find a transitional bilingual strand within the school. Students are usually mainstreamed from the transitional bilingual program after 3rd grade. Some students go into a sheltered English program in 4th grade and are then mainstreamed in fifth grade. In addition, we also have one dual language classroom in 4th grade and two dual language classrooms in grades K through three.

My second grade classroom has 8 Spanish native speakers and 7 native English speakers. The majority of my L1 English speakers come from families of high SES and with extensive educational backgrounds. On the other hand, my L1 Spanish speakers come from working class families with limited educational backgrounds. Approximately 80 % of my L1 Spanish speakers are on free or reduced lunch.

UNIT PLANNING GUIDE By: Reyna Sandoval

Theme
Matter/Measurement

Big Idea
Matter is everything we can perceive with our senses.

Lesson 1 big idea

Los científicos clasifican a la materia de acuerdo con sus propiedades físicas.

Lesson 2 big idea

Toda la materia tiene masa, peso, y volumen.

Lesson 3 big idea

Different units and tools can be used to measure matter.

Lesson 4 big idea

Toda la materia es formada por átomos y moléculas.

All Standards are from the State of Illinois Learning Standards: <http://www.isbe.state.il.us/ils/>

State goals for unit on Matter/Measurement:

STATE GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Lesson 1: Scientists classify matter into three states based on characteristics of that form

7.B.1a Given a problem, describe possible methods for estimating a given measure.

11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.

11.A.1e Arrange data into logical patterns and describe the patterns.

11.A.1a Describe an observed event.

11.A.1f Compare observations of individual and group results.

7.A.1a Measure length, volume and weight/mass using rulers, scales and other appropriate measuring instruments in the customary and metric systems

Lesson 2: All matter has mass, weight and volume

11.A.1c Collect data for investigations using measuring instruments and technologies.

7.A.1a Measure length, volume and weight/mass using rulers, scales and other appropriate measuring instruments in the customary and metric systems

11.A.1b Develop questions on scientific topics.

11.A.1d Record and store data using available technologies

Lesson 3: Different units and tools can be used to measure matter

7.C.1 Determine perimeter and area using concrete materials (e.g., geoboards, square tiles, grids, measurement instruments).

7.A.1a Measure length, volume and weight/mass using rulers, scales and other appropriate measuring instruments in the customary and metric systems

7.B.1b Compare estimated measures to actual measures taken with appropriate measuring instruments.

11.A.1a Describe an observed event

11.A.1d Record and store data using available technologies

11.A.1b Develop questions on scientific topics.

Lesson 4: All matter is made from atoms and molecules which change with the input of heat or cold

11.A.1b Develop questions on scientific topics.

11.A.1a Describe an observed event

11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.

Reyna Sandoval, Second Grade, Matter

7.A.1a Measure length, volume and weight/mass using rulers, scales and other appropriate measuring instruments in the customary and metric system

Big Idea/Essential Understanding: La material se clasifica en tres estados de acuerdo con sus propiedades observables.

Language of instruction: Spanish

Preview Stage:

Activities:

Content Objectives – Students will:

- Sort pictures/words into three states
- Predict/guess the labels of the three states of matter
- Participate in a demonstration using the senses to experience the three states of matter

Language Objectives – Students will:

- discuss classifications with a partner
- Share and defend classification
- Listen to a demonstration using senses to experience the three states of matter

Strategies:

- Concept attainment into three states of matter
- Think-pair-share
- Agree/ disagree
- TPR

Differentiation:

Embedded differentiation by pausing to think pair share during the lesson and giving extra wait time

Flexible Grouping

- whole group
- pairs

Instructional Assessment:

individual word sort using similar and same objects to be divided into the three states of matter

Focused Learning Stage

Activities:

Content Objectives – Students will:

- Compare and contrast the physical properties of matter

Language Objectives: - Students will:

- read books about the physical properties of matter
- discuss/share their findings about the physical properties of matter
- write the physical properties of matter

Strategies:

- Jigsaw (first there will three groups, solid, liquid and gas, then groups of three)

Differentiation:

- Word bank from preview stage
- Three circle venn diagram (see attachment)

Flexible Grouping:

- cooperative groups
- whole class

Instructional Assessment:

- A group work rubric will be turned in by every member of the groups of three to be turned in with three circle venn diagram. It will include one open-ended question. What do you think is the most important thing that you learned from this activity?

Application Stage:

Activities:

Content Objectives – Students will:

- make oobleck
- measure a solid and a liquid using standard units
- decide whether oobleck is a solid or a liquid

Language Objectives: - Students will:

- write observations about oobleck using the five senses minus taste
- listen to peer presentations
- defend their decision about oobleck being a solid or a liquid to the class
- discuss verbs that we can employ to help us observe oobleck

Strategies:

- Inquiry process

Differentiation:

- cooperative groups
- Student roles are clearly outlined

Flexible Grouping:

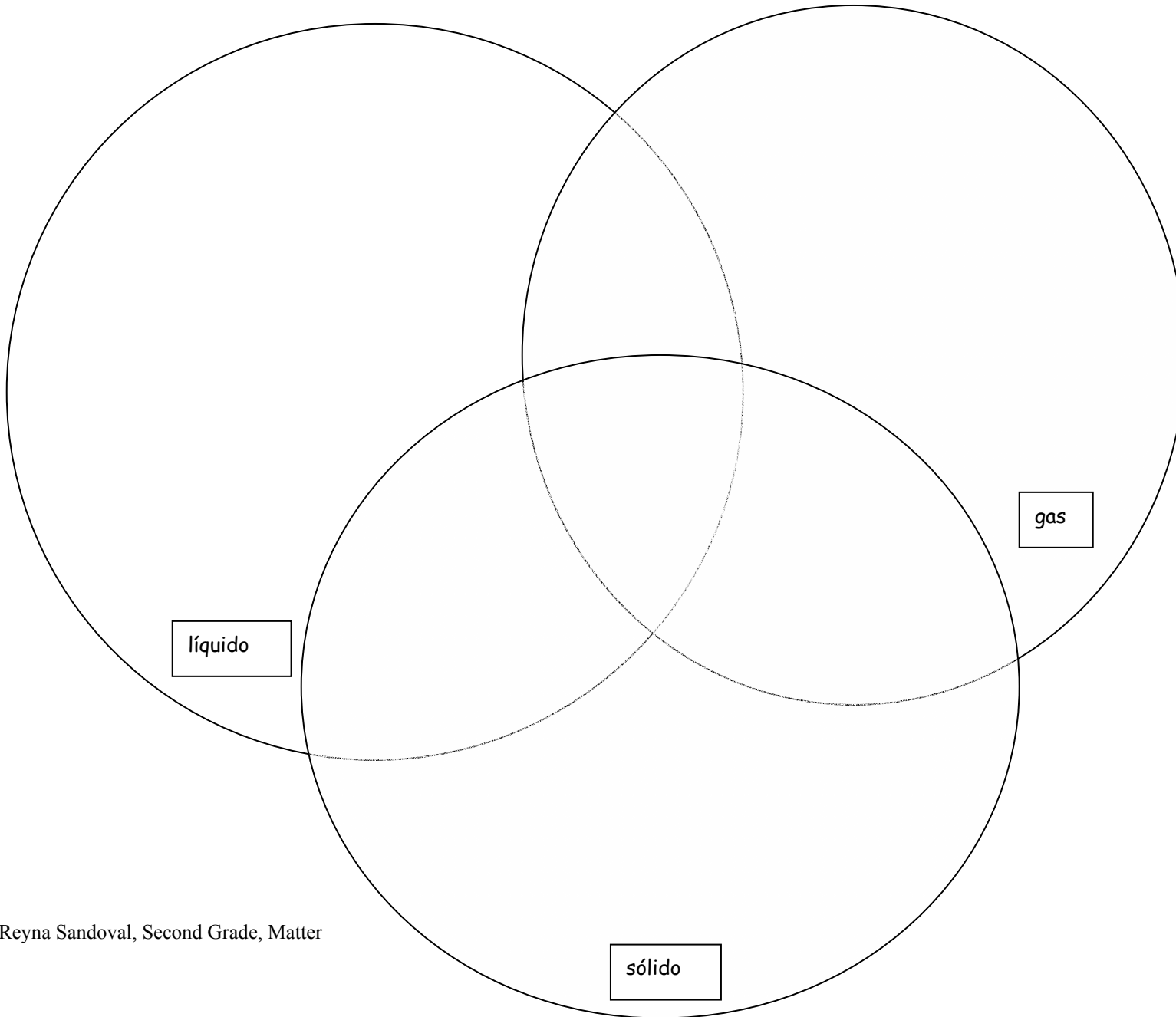
- cooperative groups
- whole group

Instructional Assessment:

- A group work rubric will be turned in by every member of the groups of three to be turned in with three circle venn diagram. It will include one open-ended question. What do you think is the most important thing that you learned from this activity?

Describe Los Tres Estados de Materia

El banco de
Palabras



Forma

Espacio

Moléculas

Evaporar

Tamaño

Observable

Clasificar

Materia

Estados

Propiedades

Big Idea/Essential Understanding: Different units and tools can be used to measure objects of matter

Language of instruction: English

Preview Stage:

<p>Activities: <i>Content Objectives</i> – Students will</p> <ul style="list-style-type: none"> • <u>sort</u> pictures/words into two categories standard and non-standard units of measure • <u>predict</u> category labels • <u>measure</u> themselves using various objects which will yield standard/ non-standard results <p>Language Objectives – Students will:</p> <ul style="list-style-type: none"> • <u>present</u> findings to the class 	<p>Strategies:</p> <ul style="list-style-type: none"> • Concept attainment • Think-pair-share • Agree/ disagree • TPR <p>Differentiation: Embedded differentiation by pausing to think pair share during the lesson and giving extra wait time</p>	<p>Flexible Grouping</p> <ul style="list-style-type: none"> • whole group • pairs <p>Instructional Assessment: individual word sort using similar and same objects</p>
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Focused Learning Stage

<p>Activities: <i>Content Objectives</i> – Students will:</p> <ul style="list-style-type: none"> • <u>research</u> things we measure <p>Language Objectives: - Students will:</p> <ul style="list-style-type: none"> • <u>read</u> books about volume, mass, weight, and air pressure • <u>record</u> their findings in learning logs 	<p>Strategies:</p> <ul style="list-style-type: none"> • Active reading • Learning log with KWL <p>Differentiation:</p> <ul style="list-style-type: none"> • cooperative topic based groups • students will choose their group • important questions will be highlighted • student roles will be outlined in a checklist • guided reading groups on topic 	<p>Flexible Grouping:</p> <ul style="list-style-type: none"> • cooperative topic based groups <p>Instructional Assessment:</p> <ul style="list-style-type: none"> • A checklist will be given to students. • Did every member participate? • Did all students take turns reading? • Did everyone say something that they learned after every section?
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Application Stage:

<p>Activities: Content Objectives – Students will:</p> <ul style="list-style-type: none"> • <u>prepare</u> demonstration of measuring objects of matter (i.e. ball, water, classroom, toy car) • <u>design</u> similar poster using Frayer model (see attachment) • <u>draw</u> proper measurements for poster • <u>draw or find</u> pictures for poster <p>Language Objectives: - Students will:</p> <ul style="list-style-type: none"> • <u>present</u> finding to class • <u>listen</u> to peer presentations 	<p>Strategies:</p> <ul style="list-style-type: none"> • student presentations with Frayer model poster • student demonstration <p>Differentiation:</p> <ul style="list-style-type: none"> • cooperative groups • Frayer model graphic organizer 	<p>Flexible Grouping:</p> <ul style="list-style-type: none"> • cooperative topic based groups <p>Instructional Assessment:</p> <ul style="list-style-type: none"> • A checklist will be given to students • Did every member participate? • Did all students take turns reading? • Did everyone say something that they learned after every section?
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definition

What does it measure, gas, liquid, solid or all?

In what unit do we measure?

How do you measure? What do you use to measure?

Students write what physical property they are researching in this circle (i.e. mass, volume, weight, air pressure, etc).

Resources:

Websites:

1. <http://personal1.iddeo.es/romeroa/materia/> --This website comes from Spain and is entirely in Spanish. I think that it could be very useful for the second grade dual language classroom for many reasons. First of all this website has a very simple design and is easy to manage. It starts off with a dense definition of matter. Due to the dense nature of this definition, it would be important to introduce vocabulary through the preview phase and guided reading. Under this definition you will find several icons leading to the introduction of several properties of matter. These then lead you to more definitions and simple demonstrations. I feel that this site can enrich the language of my students if they are given the literary tools and vocabulary as a foundation before reading. I would introduce this webpage during lesson one, in the focused learning stage to help students describe the physical properties of matter.
2. <http://www.escolar.com/cnat/02prop.htm> --This is a great overall website that provides information on many social studies, mathematic, and science topics in Spanish. I found one page that dealt with matter. This webpage has dense vocabulary but some simple explanations. Important words are highlighted and definition windows pop up when you scroll over the word. This webpage would have to be supplemented with simpler texts. I do, however, like that this webpage explains that there are two types of changes that matter can undergo, physical and chemical. Since this is the only page I would go to in this website, I would probably do a shared reading with the children in the computer lab. I would use this webpage during lesson four to help us explain what happened in some simple demonstrations such as popping popcorn or making ice cream in a bag.
3. <http://www.thetech.org/exhibits/online/topics/50a.html> -- This is a very simple website in English. It describes many aspects of matter such as properties, states and atoms. It's very interesting because it takes the students through a series of organized steps with excellent simulations and experiments. In fact this website takes the students to another website that conducts the oobleck experiment described in lesson one. I would not lead students to this section of the website because I will prepare the students for this experiment in Spanish. I would however, take them to other parts of the website that talks about the properties. This website is a perfect resource to help students prepare for their demonstrations and presentations in lesson three.
4. http://www.juntadeandalucia.es/averroes/recursos_informaticos/concurso99/007/ -- This is another website from Spain. It appears to be from a governmental group in Andalucía called "Consejería de Educación" or educational council. I had a difficult time navigating the site, but this was mostly due to my lack of knowledge about Spain. I did, however, find one page that gave me a good definition for matter. I would introduce this webpage during the focused learning stage of lesson one.
5. <http://www.chemistry.ohio-state.edu/betha/nealGasLaw/> -- This website has some excellent demonstrations and visuals for explaining gases in English. Gases are the most difficult state of matter for the students conceptualize due to its typically invisible nature. This demonstration

takes you down to the atom and explains what is going on. It also has some good visuals which bring “color” to gases so that students may see how gases take on the shape of whatever container or area that they are in. This is a website that I would bring into an ESL group. It is supported with visuals and is explained clearly.

Books

1. Catala, Ellen. *¿Por qué medimos?*, Capstone Press, 2005 –This is a book with excellent pictures to go along with the text. It is written at a first grade level but provides essential vocabulary. I think this book would be useful as part of guided reading during the focused learning stage. Also, I would use this book with cooperative research groups during the focused learning and application stage.

2. Martin, Elena. *¡Todo es materia!*, Capstone Press, 2005 –This is a good book to share with the entire class during the preview stage and to use with cooperative research groups during the focused learning stage. It is written at a first grade level and provides pictures that support the text. Students will be able to make many connections to their own world.

3. Frost, Helen. *El agua como gas/Water as a Gas*, Capstone Press, 2004

4. Frost, Helen. *El agua como líquido/Water as a liquid*, Capstone Press, 2004

5. Frost, Helen. *El agua como sólido/Water as a solid*, Capstone Press, 2004

6. Frost, Helen. *El ciclo del agua/The Water cycle*, Capstone Press, 2004

The preceding four books are part of a bilingual series. They are written in both Spanish and English. For this reason, I might cover up the text of the non-teaching language. They provide excellent pictures of familiar scenes. Students will be able to relate to this book because it depicts water, a daily necessity, in the three most common stages of matter. These books are great for research groups during the focused learning stage.

7. Adler, David A. *How Tall, How Short, How Faraway*. Illustrated by Nancy Tobin. Holiday House. 1999 --This book introduces measuring systems from a historical perspective. It will take you to many cultures, such as ancient Egypt, and introduce its measuring system. The students will be able to make many connections to social studies as well as measurement. This book also, clearly explains the difference between customary and metric systems. This would be a good book to use as a read aloud or in cooperative research groups.

8. Cobb, Vicki. *I Fall Down*. Illustrated by Julia Gorton. HarperCollins Publishers. 2004 This book introduces students to the concepts of gravity and weight. Since weight and mass are often confused, I feel that this book provides a clear explanation of weight and gravity. The effect of gravity is essentially what differs from weight to mass. This book will help students understand that mass never changes from here to outer space. However, weight does! This book is written at a kindergarten level and will therefore work for ESL groups or independent reading.

9. Weidner, Kathleen. ***What is the world made of?:***. Illustrated by Paul Meisel. Harper Trophy.1998 – This book comes to us from the Let's-Read-and-Find-Out-about Science series. It is written in English for the beginning reader. The illustrations provide everyday demonstrations closely related to the text. This would be a good book to introduce during the focused leaning stage to use in research groups.

10. Hunter, Rebecca., **Solids, Liquids, and Gases: the facts about (Science the Facts)**. Smart Apple Media, 2004 –This book provides great information, at a 3-5 reading level. It is great to use during research groups when students will be working at different reading levels. The text is supported by pictures and demonstrations.