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Physical Properties of Matter

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UbD Template 2.0

Stage 1 – Desired Results		
<p>4.5A measure, compare and contrast physical properties of matter, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float. Process TEKS 4.4A Collect, record, and analyze information using tools including triple beam balances, graduated cylinders, magnets, and notebooks. 4.2 C construct simple tables and charts to organize, examine, and evaluate data 4.2 F Communicate valid, oral, and written results supported by data. 4.1A Demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations.</p>	Transfer	
	<i>Students will independently use their learning to...</i> Measure and compare and contrast the physical properties of matter	
	Meaning	
	<p>Understandings <i>Students will understand that...</i></p> <p>Matter has measureable physical properties and those properties determine how matter is classified, changed and used.</p> <p><i>La materia tiene propiedades físicas que se pueden medir y esas propiedades determinan como la materia es clasificada, cambiada y usada.</i></p>	<p>Essential Questions</p> <p>How can two objects or substances that appear to be exactly the same be classified and used differently?</p> <p style="text-align: center;">— ¿Cómo pueden dos objetos o substancias que parezcan iguales, ser clasificadas y usadas diferente?</p>
	Acquisition	
<p>Knowledge <i>Students will know...</i></p> <p>...what the physical properties of matter are, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float.</p> <p>...physical properties are observable characteristics of matter</p> <p>...physical properties allow us to distinguish one substance from another</p>	<p>Skills <i>Students will be able to...</i></p> <p>Classify and compare and contrast the physical properties of matter</p> <p>Understand and use the following vocabulary of instruction: Brazos ,calibrar, cubo de un centímetro, clasificar Color, gas, probeta graduada, líquido, masa, Materia, propiedades observables, propiedades físicas, balanza, platillo</p>	

		Sólido, solución, estado, textura, balanza de triple brazo, volumen, densidad, flotabilidad
Stage 2 – Evidence		
CODE (M or T)	Evaluative Criteria (for rubric)	
T	<p>-design of the soccer ball</p> <p>-identifying the physical properties of the ball</p> <p>-explaining how the color and material of the soccer ball would be beneficial for playing soccer</p>	<p>Performance Task(s)</p> <p><i>Students will demonstrate meaning-making and transfer by...</i></p> <p>Present the students with the following scenario: A company that makes sports equipment is looking for new ideas for creating a new type of soccer ball (pick a sport the students are interested in or play during recess.). Your job is to design a new soccer ball that would make the ideal ball for playing soccer. In your design, you have to include what its physical properties are and how these physical properties would make it the ideal ball for playing soccer.</p> <p>-----</p> <p>Other Evidence (e.g., formative)</p> <p>Ticket out the door</p> <p>Journaling</p> <p>Venn diagram comparing the physical properties of two objects</p>
Stage 3 – Learning Plan		
CODE (A, M, T)	<p style="text-align: center;">Pre-Assessment</p> <p style="text-align: center;"><i>How will you check students' prior knowledge, skill levels, and potential misconceptions?</i></p> <p style="text-align: center;">See attached pre-assessment</p>	
	<p>Learning Activities</p> <p><u>Day one: Pre-assessment/ States of Matter</u></p> <p>HOOK: Show the students the following video http://www.youtube.com/watch?v=R9rVaNKwZpQ. After watching the video talk about the states of matter. What is sleet? Solid or a liquid? Explain that it was a liquid or melted snow that when it hits a certain point in the atmosphere, it turns into a solid. Talk about how this affects humans.</p> <p>Draw a chart with the states of matter: solid, liquid, gas. Brainstorm as a class examples of objects for each of the states of matter. Make sure you pose the students with the following questions to assess their understanding of the states of matter: Is a football a solid or a gas? Are</p>	<p>Progress Monitoring (e.g., formative data)</p>

	<p>clouds really a gas? Is shaving cream a solid, liquid, or gas? Is butter a solid or a liquid? Jelly? Students will use their previous knowledge on the states of matter to tackle this questions.</p> <p>After the class discussion, tell the students that there are other ways to classify matter other than their state. Read aloud: Comparing Properties by Charlotte Guillain</p> <p>Use the information gathered from the read aloud to make a graphic organizer with the different physical properties of matter. Draw pictures for each of the properties to help learn vocabulary and talk about which tools you would use to measure each of the properties</p> <p><u>Day 2: Mass</u></p> <p>Tell the students that today we will be learning about a physical property of matter-mass. Have a class discussion on what mass is and what tools we use to measure mass (make sure to differentiate between mass and weight). The students will use a triple beam balance to find the mass of different objects. Use objects of different sizes. Use study jams video on properties of matter to reinforce concepts http://studyjams.scholastic.com/studyjams/jams/science/matter/properties-of-matter.htm</p> <p><u>Day 3-4: volume</u></p> <p>Tell students that today they will be studying volume, another physical property of matter. Show the following slideshow to the students: http://www.slideshare.net/MMoiraWhitehouse/measuring-volume-4th-grade . After the slide show, the students will have a good idea about what volume is. Then, divide the students into groups, and give them different sized boxes. Use snap cubes to fill the boxes. Students will record how many cubes were able to fit inside each box. After debriefing the activity, talk about the volume of liquids. Use two different sized graduated cylinders to demonstrate how the volume of liquids is measured.</p> <p><u>Day 5-6: Sink or Float</u></p> <p>Ask students the following question: Why do some objects sink while others float? Put students in partners so they can “think pair share”. Then students should share out their answers. As the hook, do a demonstration with an egg floating on salt water while the control is in regular water. Do not tell the students that it is salt water yet. Tell the students that they will be studying another physical property of matter: an objects ability to sink or float (or buoyancy). Divide the students into groups and give them a set of objects to test and see whether they will float or not. Some suggested items are: small sponge, paper clip, toothpick, Styrofoam cup, a marble, plastic spoon, penny, plastic straw, and crayon). Students should make predictions before starting the investigation. Once the students have made their predictions, they will perform the investigations and draw conclusions on what they think made the items float or sink. After discussing their ideas, explain to the students that what causes objects to sink or float is whether the object’s molecules are densely packed together. An object with high</p>	<p>Ticket out the door: how is mass different from weight?</p> <p>Journaling: In their journal students will summarize by writing or drawing what they have</p>
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	<p>density will sink because it has higher density than water. Refer back to the egg floating in water. Explain to the students that the egg is floating on salt water. Because salt increases the density of the water, the egg is able to float since it is now less dense than the salt water.</p> <p>Day 7: Magnetism/Comparing and Contrasting properties of matter Give each group of students an iron nail and a piece of aluminum foil. Have students test for magnetism and record their observations. (This should be a review since they learned about magnetism in 3rd grade). Have a class discussion on what makes objects magnetic to review. Then, The students will study the physical properties of different types of balls (see attached handout): rubber ball, Styrofoam ball, golf ball, tennis ball, ping pong ball. Have a class discussion of why they think each one is made differently. After the class discussion, tell the students that although they are the same shape, they all have different physical properties. The students will be placed in groups and will be given the different types of balls. The students will observe and record the physical properties of each. Students will pick two balls and compare and contrast the physical properties of each using a Venn diagram. Students will record their findings in their science notebooks. Use the following sentence stems: Las propiedades físicas que tenían en común son... Me sorprendió ver que... Algo que ya sabía es que...</p> <p>Day 9-10: Performance Task\Post Test Before presenting the scenario from the performance task, review the activity from the previous day. Discuss why they think the balls are made differently and talk about what they are used for. Pose the following questions: Why would it be useful for the ping pong ball to have those specific physical properties? The golf ball? After having this discussion, present the students with the performance task.</p>	<p>learned about the physical properties of state, mass, size and volume</p> <p>Venn Diagram comparing and contrasting two different objects</p>
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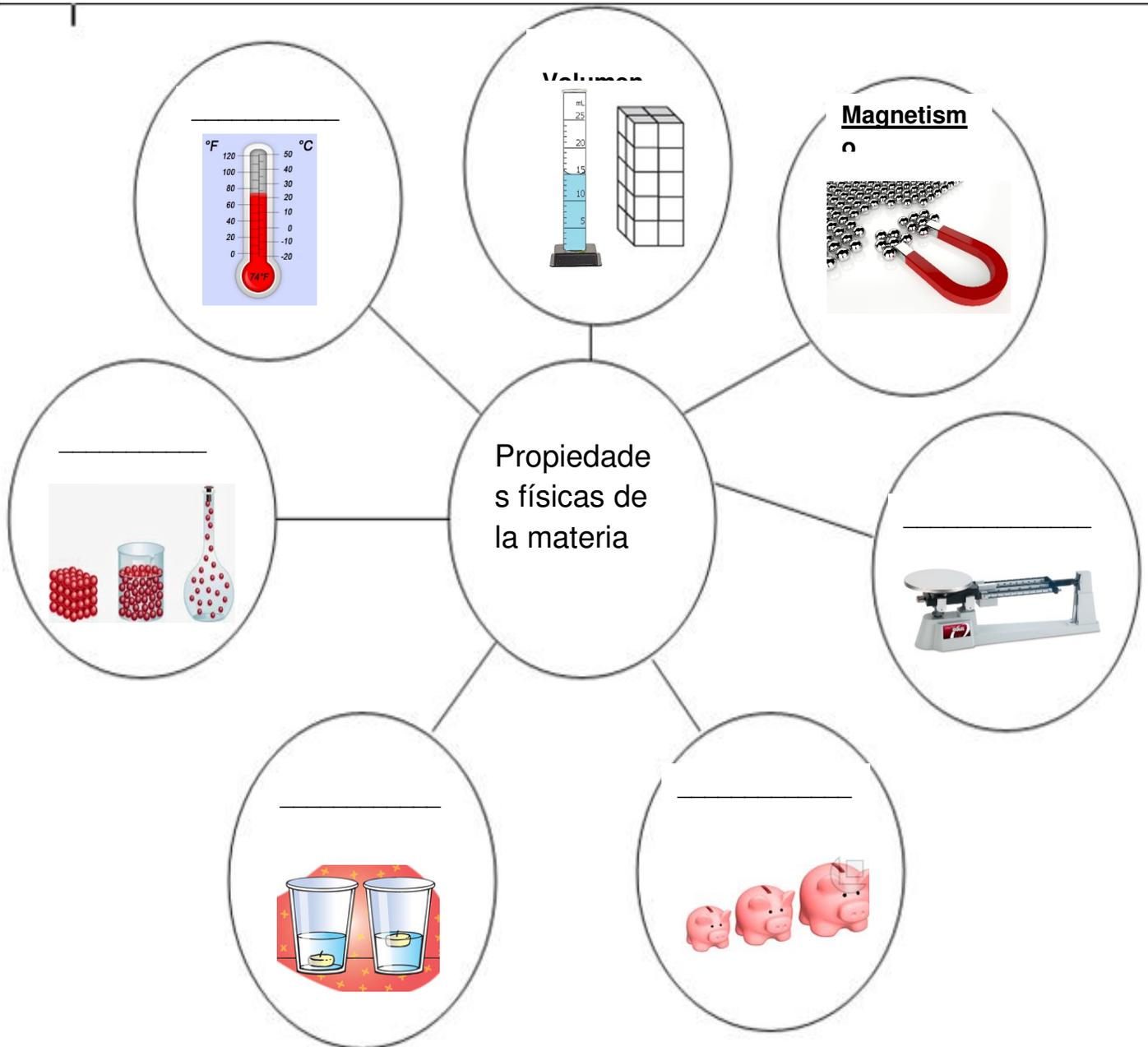
Performance Task Rubric

	Acercarse a las Expectativas	Satisfacer las Expectativas	Sobrepasar las expectativas
Propiedades Físicas	En tu explicación, no incluiste todas las propiedades físicas del balón de futbol.	En tu explicación, incluiste todas las propiedades físicas del balón de futbol.	En tu explicación, incluiste todas las propiedades físicas del balón que diseñaste. También explicaste como las propiedades físicas hacen tu creación el balón ideal para jugar fútbol.
Dibujo	El dibujo del balón no está coloreado	El dibujo balón está coloreado	El dibujo del balón está coloreado y explicaste como el color del balón afectaría un partido de fútbol.
Diseño	El balón que diseñaste no sería el mejor para jugar fútbol conforme a las propiedades físicas de la pelota.	La pelota que diseñaste sería adecuada para jugar fútbol.	La pelota que diseñaste sería la más adecuada para jugar fútbol conforme a las propiedades físicas de la pelota.
Materiales de tu balón de futbol	El balón que diseñaste es muy semejante al balón tradicional y no explicaste de qué materiales está hecho tu balón de futbol.	El balón que diseñaste es interesante pero los materiales que usarías para construirlo no serían los más apropiados.	El balón que diseñaste es único y tomaste en cuenta los materiales que usarías para hacer este balón de fútbol.

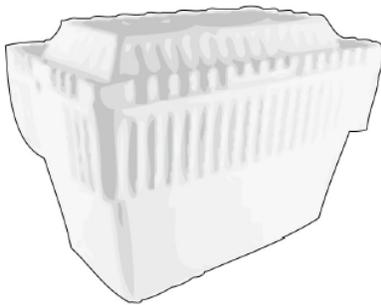
Propiedades de la Materia (Properties of Matter Pre/Post Test)

1. ¿Qué es la materia?

2. Completa el siguiente diagrama con las 7 propiedades físicas de la materia. Algunas ya han sido escritas.



3. La contaminación de los ríos y mares es un problema muy grande que nos afecta hoy en día. La basura que las personas no echan en el basurero a veces termina en los ríos y mares. Encierra en un círculo los objetos que flotarían en el agua si terminaran en un cuerpo de agua.



hielera de poliestireno



cubiertos de metal



vasos de plástico



botella de agua vacía



frasco de vidrio con pepinillos

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Justifica tu respuesta usando tu conocimiento previo sobre porque unos objetos flotan en el agua y otros no.

Cierto o Falso

4. Masa es lo mismo que peso **C** **F**
5. Volumen es el espacio que ocupa un objeto **C** **F**

Observaciones de las propiedades físicas de diferentes tipos de pelotas

<u>Tipo de pelota</u>	<u>Estado (sólido, líquido o gas)</u>	<u>Masa</u>	<u>Longitud</u>	<u>Magnetismo</u>	<u>Flotabilidad</u>
Pelota de goma		_____ g	_____ cm		
Pelota de golf		_____ g	_____ cm		
Pelota de poliestireno		_____ g	_____ cm		
Pelota de ping-pong		_____ g	_____ cm		
Pelota de tenis		_____ g	_____ cm		