Changes

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| Monday  1/9/12 | Objectives:   |  |  | | --- | --- | | 3.01 | Identify three states of matter: solid, liquid, and gas.  (See Resources for Objective explanation/description.) | | 3.04 | Show that solids, liquids, and gases can be characterized by their properties.  (See Resources for Objective explanation/description.) |   *Language Objective*: Students will be able to describe the solids, liquids, and changes found on the Change Cards with a partner.  Students will be able to share their discoveries about the changes that occur when the effervescent tablet is placed in water with the whole class.  Vocabulary:   |  |  | | --- | --- | | gas | a substance that has no shape or volume; most have no color and cannot be seen | | liquid | a substance that has no shape but has volume; it takes the shape of its container | | matter | anything that has weight and takes up space | | properties | something about an object that helps tell what it is | | solid | a substance that takes up space and has its own shape | | states of matter | three forms matter may take – solid, liquid, and gas |   **Focus Question**: How do things change around us?  Invite students to share what they know about solids and liquids. Ask students to explain the meaning of the word change. Record student responses on a bubble map titled “Our Schema About Change”.   * Distribute one Change Card to each pair of students. Prompt students to think about the solids and liquids in the illustrations and how these might change. * Invite each pair to discuss the picture on their Change Card and identify the different states of matter. * Record students observations on the “Looking At Changes” chart as shown in figure 1-4. * Tell students they will add a solid to a liquid and record the changes that take place. * Guide students to use a hand lens to observe an effervescent tablet. * Circulate the classroom and pose questions to guide students’ observations. Prompt students to record their observations in their science notebook. * Lead a making meaning discussion so that students can share their observations and drawing with the class. * Fill ice cube trays for the next lesson and predict what will happen to the water in them. * Read aloud the poem "Changes All Around Us" found in the Teacher's Guide.   **Higher Order Thinking Questions**:   * What solids do you see? * What liquids do you see? * How might the solids or liquids in the pictures change over time? * What did the water look like? * What did the water look like before and after the tablet was dropped in? * Describe the tablet. * How did the water and tablet change? * What words could you use to describe the new matter that was formed? * Did anything surprise you? |
| Tuesday  1/10/12  Melting Race | Objectives:   |  |  | | --- | --- | | 3.02 | Observe changes in states of matter due to heating and cooling of common materials.  (See Resources for Objective explanation/description.) | | 3.03 | Explain how heat is produced and can move from one material or object to another.  (See Resources for Objective explanation/description.) |   *Language Objective:* Students will be able to discuss a time frame and the best method to melt their ice cube during the investigation with a partner.  Students will be able to share their discoveries about melting the ice cube with the whole class.  Vocabulary:   |  |  | | --- | --- | | boiling point | the temperature at which a heated liquid turns into gas | | evaporation | when a liquid changes to a gas | | freezing | when a liquid changes to a solid because heat is removed from the liquid | | freezing point | the temperature at which a liquid become a solid | | melting | when a solid changes to a liquid because heat is added to the solid | | melting point | the temperature at which a solid becomes a liquid | | water vapor | water that has changed to gas |   **Focus Question**: How can a liquid such as water change to a solid or a gas?  Invite students to think about the water you poured into the ice cube trays at the end of Lesson 1.  Ask students in what ways do they think the water has changed in the freezer.  Tell students they will design a method for melting an ice cube in the quickest time possible.   * Explain the Melting Race procedures. * Guide students to record the time their ice cube melts (If you have rubber clock stamps - you can stamp 2 clocks in their science notebook, for students to record the start and end times of the race).  If your students can tell time to the minute, they can just use the school clock to record the time. * Circulate the classroom reminding students to keep the bag sealed and to record the time the ice cube in the bag is completely melted. * Lead a class discussion for students to describe how the ice cube has changed. * Record students’ responses in the appropriate columns of the “Properties” poster. * Invite each pair of students to describe the method they used to melt the ice. * Tell students they will observe another change in water and assist students as they pour the water from the zip bag into the Petri dish. * Have students predict what they think will happen to water in both the covered and uncovered Petri dishes over two or three days.   **Higher Order Thinking Questions:**   * How has the ice cube changed? * What method did you use to melt the ice cube? * Did anything surprise you as you attempted to melt the ice cube? * Why did some of the ice cubes melt faster than others? * What will happen to the covered and uncovered water as it sits for two or three days? |
| Wednesday  1/11/12  Where Did the Water Go? | Objectives:   |  |  | | --- | --- | | 3.02 | Observe changes in states of matter due to heating and cooling of common materials.  (See Resources for Objective explanation/description.) |   *Language Objective:* Students will be able to describe their observations of the petri dish investigations with the whole class.  Students will be able to share their discoveries about the cool and warm water investigations and the process of condensation with the whole class.  Vocabulary:   |  |  | | --- | --- | | condensation | the process by which water vapor cools and changes to a liquid | | evaporation | the process by which a liquid becomes a gas | | humid | a weather condition when the air is saturated with moisture | | water cycle | the process by which water moves through the ground, evaporates from earth into the air, forms clouds, and falls back to earth as rain or snow |   **Focus Question**: Where does water that has evaporated go?  Ask students to collect their Petri dishes and discuss with their partners the changes they observe. Invite students to share their observations with the class and compare their results with the predictions they made at the end of lesson 2. Ask students to brainstorm what happened to the water and discuss how the covered Petri dishes may be different. Let students know they will set up an investigation to explore how water changes from a liquid to a gas.   * Ask students to draw a line down the center of a page in their science notebooks and label one column “cool” and the other “warm.” * Select students to distribute the materials for the investigation. * Guide students to set up an investigation of cool and warm water in cups, and observe the process of condensation. * Circulate the classroom filling cups with warm water from the thermos. * Direct students to draw their observations in the appropriate columns in their science notebooks. * Lead a making meaning discussion. Guide students to think of situations when they have observed water droplets as they did in the lesson (e.g., a foggy bathroom mirror, a wet, cold soda can). * Record then new ideas that the students have about water as a solid, liquid, and gas on the “Properties” poster.   **Higher Order Thinking Questions:**   * What observations can you make about these cups? * Has the inside of each cup changed? If so, how? * How did the water change when it was in the freezer? * How did the water change when it was removed from the freezer? * How did the water change when it was in the uncovered dish? Where did the water go? * How do you know from this investigation that the water went into the air? * Think about the cup of warm water. What happened when the water in the air touched the large cup? |
| Thursday  1/12/12  Mixing & Separating Solids | Objectives:   |  |  | | --- | --- | | 3.05 | Investigate and observe how mixtures can be made by combining solids, liquids or gases and how they can be separated again.  (See Resources for Objective explanation/description.) |   *Language Objective:* Students will be able to discuss the procedures and observations of the mixing investigation with a partner.  Vocabulary:   |  |  | | --- | --- | | mixture | a blend of two or more substances |   **Focus Question**: What happens when two solids are mixed together and do the materials change?  Gather students and ask them what they know about mixing things. Record their responses on the “What We Know about Mixing” poster. Place a check mark beside duplicate responses to acknowledge all student contributions. Let students know they will mix two solids – salt and gravel.   * Distribute the Students Instructions and materials to each pair of students. * Discuss each step of the instructions and direct students to complete them step by step. * Circulate the classroom and provide assistance to students when necessary and pose questions to focus their observation. * Conduct a making meaning discussion so students can discuss the changes they observed. * Record new ideas or questions students may have about mixing and separating substances.   **Higher Order Thinking Questions:**   * What two solids did you mix? * How did the solids change when you mixed them? Did they change size? Color? * How might the pieces of your mixture change when they are separated? * What happened when you mixed the salt and gravel? Describe the mixture. * How did using the sieve change the mixture? * In what ways is the gravel the same as before you mixed it with the salt? * Did the gravel change as a result of the mixing? |
| Friday  1/13/12 | Data Notebooks |