Ice Cream Investigations

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| Teacher: ETEAMS |
| Date: 9-22-15 |
| Subject/ Grade Level: Science/3rd |
| Teachers: Ms. Baker, Ms. Barrios, Ms. Benavides, Ms. Deal, Ms. Poore, Ms. Sloan, Ms. Stevens |
| Materials:   * Milk * Big Measuring Cup * Small Measuring Cups * Cups * Vanilla extract * Sugar * Rock Salt * Crushed Ice * 1 Gallon Sized Ziploc Bags * 1 sandwich sized Ziploc Bags * Thermometer that reads -20 degrees celsius |
| TEKS: (5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to: (A) measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float; (B) describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container; |
| **Engagement**: 5 minutes  1) Tell students that today we will be doing an experiment involving ice and salt, and that we are going to begin by watching a video. Explain that in places where it snows in the winter, salt is put on the roads to help drivers/ask if any of the students have experienced snow.  2) Tell students that by the end of the video, they should be able to answer the question: How does Salt Melt Ice?  3) Show the students the video: How Does Salt Melt Ice?  <https://www.youtube.com/watch?v=JkhWV2uaHaA>  **Transition** statement: Salt can be used to melt ice, but it can also be used to make a sweet treat. |
| **Exploration**: 30 minutes   1. Today we are going to explore the different states of matter.  * Use water as an example   + What are the different states of water?   + Can water be a solid, gas, and liquid?   + Give me examples.   2. Pass out lab packet. Students will use their lab packet to examine the materials listed and tell whether they are a solid state of matter or a liquid state of matter.   |  |  |  | | --- | --- | --- | | Materials | Solid | Liquid | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |   3. Discuss the characteristics of the states of matter   * + Solids do not take the shape of another container. Liquids take the shape of their container. * Ask students how can you change water (a liquid) to ice (a solid)?   4. Tell students that they will be working in groups to make ice cream. It is very important that they follow the procedure.  Procedure for making the ice cream: *(Also found in student lab booklet)*   1. In the plastic cup, mix together milk, sugar and vanilla. Add additional topping, if desired. 2. Carefully, pour the mixture from the cup into the sandwich size Ziploc® bag. Close the bag while carefully removing air. Make sure the bag has a tight seal. 3. In the large Ziploc® bag, add 3-4 cups of ice.   D. Take the temperature of the ice with a thermometer. Make sure to take the temperature in Celsius. Record the temperature on observation section of the packet. Point out how the liquid mixture is taking the shape of the bag.  E. The students will draw a picture of their solution and write a few observations (can include what they see, what they smell….no tasting yet!)  F. The students will form a hypothesis and use the fill in the black hypothesis statement section of their lab packets to help them.   * **A hypothesis is testable and measurable statement! NOT AN EDUCATED GUESS.**   **Hypothesis: I think that the mixture of milk, sugar, and vanilla will change states from a\_\_\_\_\_\_\_\_\_\_ to a \_\_\_\_\_\_\_\_\_\_ BECAUSE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**  G. Add the rock salt to the ice.  H. Place the small bag inside the large bag. Carefully close the bag while removing any excess air. Make sure the bag has a tight seal.  I. Get ready to shake it up! After 5-10 minutes, the ice cream should be hard enough to eat.  J. Take a temperature reading of the ice and salt mixture. Record your findings on your data sheet.   1. Find the difference in temperature between the ice and the ice-salt mixture. Record your findings on your data sheet. 2. Draw a picture and write down two observations (things you can see, smell, feel….and taste!) 3. Have students measure the temperature of their ice cream and record their data under the Observation Record section of their lab packet. 4. Finally, the moment you have been waiting for... place the bag of ice cream on a paper plate, open up the bag, grab your spoon and enjoy!! |
| **Explain** (10 minutes)  The students will write in their lab packets and explain their results.   * 1. Did the experiment support your hypothesis? How?   2. What state of matter did the mixture start out in?   3. What did we do to the mixture that made it change from a liquid state to a solid?   4. How did adding ice change the liquid mixture to a solid? |
| **Elaboration** (5 minutes):  Have the students consider variables that might have an effect on the way the ice cream came out.   * 1. Describe what would happen if we added more ice? What would happen if we had put less ice?   2. Would there be a change in the solution if we shook the bag for longer?   3. Would a different type of milk have an effect on how the ice cream turned out?   4. Can you think of anything else that might change the results of this experiment? |
| **Evaluation** (5 minutes)  The students will fill out an Exit Slip:  3 things you learned  2 ways you contributed  1 question you still have |