**Spring Arbor University School of Education**

**Lesson Plan Guide: Direct Instruction**

**Title: What is Matter? by Megan Muzljakovich**

**Subject: Changing Matter into Another Form**

**Grade Level: 2nd Time Allotted: 45 minutes**

**Materials Required:**

* **Spoons**
* **Paper towels**
* **Half and half cream**
* **Sugar**
* **Vanilla extract**
* **Quart Ziploc bags**
* **Coffee cans**
* **Ice**
* **Salt**
* **Measuring cups**
* **Measuring spoons**
* **The ice cream worksheet**

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**Michigan Curriculum framework: Benchmark and/or GLCE/HSCE/EGLCE**

**E.FE.02.14 Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.**

**R.I.T.02.04 Respond to individual and multiple texts by finding evidence, discussing, illustrating, and/or writing to reflect, make connections, take a position, and/or show understanding.**

**2-G2.0.1 Compare the physical and human characteristics of the local community with those of another community.**

**Common Core: Ask and answer such questions as who, what, what, when, why and how to demonstrate understanding of key details in a text.**

**Objective(s): A portion of a GLCE or HSCE stated in terms of Bloom’s taxonomy**

**The student will be able to construct ice cream by using the different states of matter and this is the creating state of blooms taxonomy.**

**Purpose: To have an understanding of what a solid is and how to turn a liquid into a solid.**

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**Instructional Procedure:**

**Anticipatory Set: 5 minutes**

* 1. Have you ever eaten ice cream that is melting? It melted because it got hotter. In fact, anything solid, like ice cream, melts when it gets hot enough. The temperature at which a solid melts into a liquid is called the melting point. For instance, when solid ice cream reaches its melting point it turns into a sticky puddle of cream. That means that ice cream is just frozen (solid) cream or milk. Today, we’re doing things backwards. We will take a puddle of cream and make it so cold that it turns into ice cream. You just learned that solids become liquids when they get hot enough. Tell your partner what you think happens when a liquid gets very cold.
  2. Explain the meaning of hypothesis
     1. A statement of prediction (What you think is going to happen)
  3. Then the students will fill out the hypothesis part of the ice cream worksheet
  4. Before we move on with our experiment we are going to play a fun game called, Four Corners. **(Strategy #32/ Four Corners)**
     1. I gave each of you a sheet with all of the questions I will be asking you. I want you to write your reasons and gather your thoughts on the worksheet before the game starts.
     2. Each answer will go with one of the corners. For example, if you chose the first answer you would go to corner one.
     3. When you are done gathering your thoughts please put your pencils down and sit quietly in your chair so I know that everyone is ready to begin the game.

**State Purpose and Objective of Lesson: 2 minutes**

* 1. We want the students to learn that there are three kinds of matter and what each type of matter is.
  2. The students need to learn that matter can change forms
  3. It is important to learn the three states of matter so that you know what each type is and how to change matter from one form to another because you change matter to different forms in your daily life.

**Plan for Instruction: 25 minutes**

* 1. Modeling
     1. We are going to compare the characteristics of our community with that of a community in Alaska**.** 
        1. Watch video called, “Life in the Alaska bush #2”

Go to: http://www.youtube.com/watch?v=M9Dhj5\_NjVY&feature=related

* + 1. After watching the video we will compare the communities on how water being in a solid state affects their living verses how it affects our living. Draw a Venn Diagram on the board and as a class fill in a graphic organizer. **(Strategy # 2/ Venn Diagram)**
    2. In our next activity we are going to learn how to change a liquid to the solid form of matter.
    3. Demonstrate how to combine the ingredients and set of the experiment. Once all students have materials, help them tightly close the bag to avoid spills.
  1. Guided Practice**:** 
     1. The ice cream that we are creating today we are going to eat tonight at our ice cream party. We are going to show your parents the ice cream we created and the great work we have done throughout this unit.
     2. Different objects (types of matter) can be mixed together. A mixture is two or more things put together – like salads, soups, cakes, etc. Some mixtures can be easily separated – like picking the tomatoes out of your salad. Some mixtures are hard to separate – like separating the chocolate from your chocolate milk. When a solid (like chocolate powder) completely mixes with a liquid (like milk), we say that the solid has completely dissolved into the liquid. Some objects can be mixed together to create something completely new. We can use a solid and a liquid to create a gas (like the air we breathe – CO2) or we can use different liquids to create a solid. If we change the temperature of some objects, we can create something completely new like ice cream. Heating an object can evaporate it (if it’s a liquid) or melt it (if it’s a solid). By cooling or taking heat away from a liquid, we can freeze it or turn the liquid into a solid, like ice cream
     3. Set out ingredients to make ice cream: cream, sugar, vanilla, ice and salt.
        1. Mix ½ cup cream, 1 tbsp sugar and 1 tsp vanilla into a small Ziploc bag.
        2. Squeeze out extra air and zip the bag closed. Set this bag aside.
        3. Add ¼ cup salt to coffee can filled with ice.
        4. Place small bag inside the coffee can and seal the can tightly.
        5. Shake the can for 10 minutes.
        6. Remove the small bag and observe whether the ice cream is a solid or a liquid.
        7. Open the small bag and use the spoon to enjoy the ice cream!
     4. Explain what an observation is
        1. An observation refers to noting or recording a factor or occurrence
     5. Have students write down their observations on the “Ice Cream Worksheet” during the experiment.
     6. Explain what a conclusion is
        1. After the observations have been made and recorded, the scientist then forms a conclusion and in the process notes whether the observations made and the results recorded support or refute the hypothesis.
     7. Then the students will answer the “Conclusion” questions after they are done with the experiment and compare their answers with another student in the class.
  2. Independent Practice: Each student fills the “Ice Cream Worksheet” out individually throughout the lesson.

**Differentiation Considerations:**

* 1. For the children who are having trouble making the ice cream or filling out the worksheet can raise their hand if they need any help and I will talk them through each step.
  2. For those who finish early have them write down examples of the three states of matter or fill out the “States of Matter” worksheet.

**Assessment: 10 minutes**

Give each child the assessment work sheet, “Changing Matter” to see if they understand the difference between the three states of matter. There will be pictures of all the ingredients we used while making the ice cream and then they will circle which state it is and describe the ingredient. As a class we will go over the worksheet together and each student will share how they described every ingredient.

**Closure: 3 minutes**

Let’s review what we learned today by filling out the “What’s The Matter” worksheet together as a class. We will read over each definition and then you can raise your hand if you know what word is supposed to go in the blank.

1. What state of matter is ice cream?
   * 1. Solid
2. What did we use to make it?
   * 1. milk and vanilla which are liquids and sugar and ice which are solids
3. What did we take away to change from liquid to solid?
   * 1. We took away heat with ice

**Explanation of Identified Instructional Strategies:**

During the anticipatory set I will use the strategy called, “Four Corners” to stimulate student learning through movement and discussion. It’s a great way to encourage students to individually gather their thoughts. For the modeling after the movie as a class we did a Venn Diagram to compare the communities on how water being in a solid state affects their living verses how it affects our living.