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Predicting Differentiation Chemical Processes

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CMST SCOLLARCITY Lesson Plan Template-Lesson Plan using **TI Technologies** (Due Tuesday, July 27th)

Submit as hard copy AND electronically through ANGEL

Name: Kendra Brewster

Grade level(s)/Subject taught: 7th grade General Science

Objectives: (Remember…*How will the modeling tool help the student better learn the objective?)*

Students will be able to…

- infer and predict possible outcomes of chemical reactions.
- graph data using a TI calculator.
- interoperate graphs to determine if a chemical reaction is endothermic or exothermic.
- differentiate between chemical and physical changes.
- describe what happens to the energy in a chemical reaction and relate it to products and reactants.

The TI calculator will allow students to view the data collected in the lab activity. I rather the students focus on how to read the

1b. *Write* the Science Concept or "key idea" that TI Technologies will be used to teach:

Key Idea 3.2- Distinguish between chemical and physical changes.

Key Idea 4.3- Observe and describe energy changes as related to chemical reactions.

Assessment of prior knowledge

Science Starter- Students will be asked to brainstorm items in their house that are made by the process of putting different substances together it by the process of chemical reactions. The students will then be asked to pick two of the items on their list and then asked to answer the following question. What items do you think where used to make this item? A class discussion will occur, students will share their findings. Possible questions that I may ask. What was needed in order to make this item. How do you think it was made? Can you make it in your home? Why or why not?

Students will then be asked to observe the following items that would be placed in front of the classroom for observation. An ice cube, a jar full of jell-o, a rusted can and a spoiled piece of fruit. I will briefly describe each item to the students. Students will be told that each item is an example of a chemical or physical change. In groups of 2 students will be asked to identify which items are examples of physical or chemical change and make a set of rules or a rule that can be applied to each item to distinguish it as a chemical or physical change. I will move around to each group to help with the process. I can ask the following questions to help guide students. Question that could be used are; What is the item made up of, how did they combine, if the item is made of different substances can you separate them, if a change occurred can you get the original item back?

Class discussion and lecture will occur. We will discuss the difference between chemical and physical changes, what is needed in order for chemical changes to occur and what different chemical reactions can take place, and other examples from our everyday life of physical and chemical changes will be discussed. The vocabulary terms endothermic and exothermic, heat, energy, products and reactants will be introduced to students. An overhead projector will be used to give examples of chemical equations to show the products and reactants.

Students will then work in groups of 3 for the following activity. Each student will have a role, such as timer, recorder, and reader. Each group will have a thermometer, graduated plastic cup, vinegar, plastic spoon, baking soda, clock and paper towels. Each cup will be filled with 30mL of vinegar and will have the thermometer in the cup. One spoon full of baking soda will be added stirred briefly then the temperature will be recorded at the following times, 30 seconds, 1 min, 1.5 min, 2 min, 3 min, 5 min, 10 min. Students will also be asked to write down any observations and data will be recorded in their science journal. After all the data and observations are collected each group will select a person to record their data on the overhead, after each group has posted their data, the class will use the calculator to get an average temperature for each time interval. Students will then follow along how to enter the data into a stat list that can create a graph of the data recorded on a TI calculator to create a graph of the class average. After I show the students how to use the TI to graph data I would then ask each group to repeat the steps using their individual group data and compare the two graphs. I would explain that a graph is the same as a data table but the information is displayed in a different way. Using the graph students will be able to describe what happened to the energy in the following reaction and predict what would happen if we continued to take temperatures for a total of 15 minutes.

The TI calculator would be used to help students have a quicker way of graphing two equations without creating the graph themselves. This will allow more time for the students to focus on what information the graph gives and how the graph can be used to predict values that may not

be able to meet during class time. Using TI in science class also gives students another opportunity outside of math class to practice using and interpreting values in graph form. This can strengthen their graph reading skills and make them more comfortable using TI calculators.

Students will be asked to answer the following questions in their science journal.

1. What happened when you added the baking soda to the vinegar? Describe at least two observations that show that a chemical reaction occurs.
2. Look at the following equation below. Circle the reactants and underline the products of in the chemical equation. What do you know about the products of the chemical reaction?

   NaHCO + C H O NaC H O + H O + CO
3. Did your groups graph look like the class graph? Why or why not?

4. Look at the graph, explain what is happening to the energy from the beginning of the reaction to the end of the reaction at ten minutes. Use detail and your data to support your answer.
5. Is the chemical reaction endothermic or exothermic, use your data to support your answer.
6. What would happen if you let the reaction continue until 15 minutes. Use your graph to support your answer.

	5	**3**	**1**
Procedure	All directions are followed as given, no additional assistance from teacher was needed.	Directions are not followed completely and some teacher assistance was needed.	Directions were not followed at all and extra help from the teacher was needed
Group Work	Student was cooperative while working in group and stayed on task at all times.	Student was mostly cooperative while in group and stayed on task most of the time.	Student was not cooperative and did not stay on task.
Data and Observations	All data and observations were recorded in the science journal. All information is complete, has details and easy to understand.	Some of the data and observations were incomplete or hard to understand.	Most of the data and observations is incomplete, hard to read and has few details.
Interpreting Data	All questions were answered with detail that supported the answer and were complete and easy to understand.	5-4 of the questions were answered with some detail that supported the answer and were somewhat easy to understand.	3 or fewer of the questions were not answered in detail and were hard to understand.