



Glow sticks

Theme: Heat (Thermal Energy)

Curriculum Area: Physical Science

Activity:

Ever wondered how a glow stick glow? Well it's all about chemiluminescence which means the glow happens from a chemical reaction that happens when the glow stick is snapped. The electrons increase in energy level when this reaction happens. When the electron starts to settle down, the energy is released and shows the glow of the light. In cold water, the electrons is slowed down and stops glowing all together. In hot water, the electrons go haywire and start to glow crazy to make the glow brighter. Students will place three glow sticks in different temperatures, one leaving it out, one in ice water, and the 3rd one in hot water. Students will then compare all three glow sticks to see which glow stick is the brightest.

Age of Children: 5-6th grade

Materials Needed:

Things we need
3 Glow sticks
Ice water
Hot water
2 cups

Developmental Objectives/Domains: By participating in this activity, children will:

1. Compare how bright the glow sticks are at different temperatures
2. Determine whether the glow stick reaction is exothermic or endothermic
3. Investigate the effect of temperature on the rate of a chemical reaction.
4. Understand increasing the temperature increases the average speed of the reactant molecules.

5. be able to explain, on the molecular level, why the temperature of the reactants affects the speed of the reaction.

Procedure:

1. Place ice water in one cup and hot water in another cup.
2. Break the glow sticks, and place one in each of the cups (one will be room temperature)
3. Observe the reactions and record.
4. Take the glow sticks out and record the findings.
5. Then place the glow from the hot water to the ice water and then place the ice water one in hot water.
6. Record your findings.

- MS-PS1-4.** **Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.** [Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawing and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]

Reference:

<https://www.discoveryexpresskids.com/blog/the-science-behind-glow-sticks-how-does-temperature-affect-the-glow-intensity>

Video: <https://youtu.be/fu4OlsrsQy8>