Lesson Three

Discovery and Formative Assessment

Grade: Fourth Grade

Time: 60 Minutes (w/small group accommodations)

Materials: Based on a class size of twenty, 25 wire segments (w/stripped ends exposing bare wire), 25 C batteries, and 25 miniature light bulbs. Students will need their science journals set up w/ a proper heading including the date. A diagram of a light bulb and its components. Crayons and/or colored pencils.

Objective: Students use three simple household items to make a light bulb illuminate. They will record their observations in written text as well as a simple diagram.

Standards: NYS/National Standards

New York State Standards: Standard One: Analysis, inquiry, and design.

- Scientific Inquiry: Key Idea One, The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing creative process. **S1.1** Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about. **S1.1a** Observe and discuss objects and events and record observations. **S1.3** Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed**. S1.3a** Clearly expresses a tentative explanation or description, which can be tested.

- Key Idea 3**:** Observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena. **S3.2** Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships. **S3.2a**, state orally and in writing, any inferences or generalizations indicated by the data collected.

National Standards:

NS.K-4.2 Physical Science

- As a result of the activities in grades K-4, all students should develop an understanding of the following: properties of objects and materials, position and motion of objects, and light, heat, electricity, and magnetism. Utilized to build an electrical circuit as well as being able to understand electricity and its path traveled.

NS.K-4.1 Science Inquiry

- As a result of the activities in grades K-4, all students should develop abilities necessary to do scientific inquiry, and understanding about scientific inquiry.

Lesson Three (cont.)

Procedure:

1.) The teacher will introduce the students to the three simple household objects. The teacher will have a written question posted on the board as well as state it orally, “Can you make the light bulb illuminate by only using these three simple materials?” They will encourage students that it can be done.
2.) The teacher will refer to the diagram of the light bulb to reference new and unfamiliar words. This is to allow students to physically examine their bulb to see the individual components.
3.) The teacher will then review with students the small group rules we use in the class which are one the poster from the previous lesson. The teacher will explain to students that they will be given about 20 minutes to use these materials to light the bulb. After they have completed this they will be instructed to set up a proper heading in their science journal.
4.) Students will be directed to write a statement in paragraph or list format of exactly how and what they did with the materials to get the bulb to light.
5.) They will then be instructed to draw a diagram not a picture, it is important that the teacher revisits the difference and explains that we are scientists and we use diagrams. Diagrams have labels to better understand them. The diagram is to be completed on the same page as the explanation in their journal. (A teacher sample of written statement and diagram are available in the front of the room for students to refer to)
6.) Students may use crayons or colored pencils to assist in the creation of their diagram.

Teacher observations will be made the entire time as formative assessment, to ensure students are referring and following the small group/science rules, as well as recording their responses in the journals the way they were instructed to. Positive reinforcement will be given for work ethic, response, and inquiry skills. Off task behavior will be redirected and pulled out to work with the teacher if needed.

Conclusion: (Formative Assessment) The teacher will ask students to clean up their materials and leave their journals open. The teacher will then tell the students that they were just assessed, positive feedback will be given in regards to their working with scientific materials in collaborative groups. The teacher will then ask students if any were unable to light the bulb. The teacher will allow students that achieved this to share their methods, and ask why they think they bulb lit. What evidence do they have of this? (Group discussion) The journals will be collected and reviewed by the teacher; feedback will be given to each student in regards to their written response as well as their diagram.