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| **Title: Static Ghost** | **Grade Level: PreK-2nd Grade** |
| **Big Idea:Team Building,**  **Collaboration**  Lesson focuses on the students creating a small Kleenex tissue ghost and having it interact with a balloon to learn about static electricity. | **Enduring Understanding:** Students will be given an opportunity to explore static electricity and some of its basic attraction repel properties. |

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| **SCIENCE STANDARDS** | **TECHNOLOGY STANDARDS** | **ENGINEERING**  **STANDARDS** | **MATH STANDARDS** |
| **Habits of the Mind**  **S5-1CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**  a. Keep records of investigations and observations and do not alter the records later.  b. Carefully distinguish observations from ideas and speculation about those observations.  c. Offer reasons for findings and consider reasons suggested by others.  d. Take responsibility for understanding the importance of being safety conscious**.**  **S5-1CS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.**  a. Add, subtract, multiply, and divide whole numbers mentally, on paper, and with a calculator.  b. Use fractions and decimals, and translate between decimals and commonly encountered fractions – halves, thirds, fourths, fifths, tenths, and hundredths (but not sixths, sevenths, and so on) – in scientific calculations.  c. Judge whether measurements and computations of quantities, such as length, area, volume, weight, or time, are reasonable answers to scientific problems by comparing them to typical values.  **S5-1CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.**  a. Choose appropriate common materials for making simple mechanical constructions and repairing things.  b. Measure and mix dry and liquid materials in prescribed amounts, exercising reasonable safety.  c. Use computers, cameras and recording devices for capturing information.  d. Identify and practice accepted safety procedures in manipulating science materials and equipment.  **S5-1CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.**  a. Observe and describe how parts influence one another in things with many parts.  b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.  c. Identify patterns of change in things—such as steady, repetitive, or irregular change—using records, tables, or graphs of measurements where appropriate.  d. Identify the biggest and the smallest possible values of something.  **Focus Standards:**  **Specific to 2nd**  S2P2. Students will identify sources of energy and how the energy is used.  a. Identify sources of light energy, heat energy, and energy of motion.  b. Describe how light, heat, and motion energy are used. | * Demonstrate the ability use technology for critical thinking, decision making, communication, collaboration and creativity and innovation. * Use a variety of age-appropriate technologies (drawings, presentation software to communicate and exchange ideas. | **Next Generation Engineering Standards**   * Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials and time. * Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. * Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. | **8 Mathematical Practices of Math**   1. Makes sense of the problem and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics 5. Use appropriate tools strategically 6. Attend to precision. 7. Look for and make use of the structure 8. Look for and express regularity in repeated reasoning.   **National Math Standards**   * Analyze data and obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose. * Using computational strategies to solve real-world problems cooperatively. |

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| **INSTRUCTIONAL STRATEGIES** | **LEARNING TARGETS** | **ESSENTIAL QUESTIONS:** |
| indirect instruction  experiential learning  demonstration  discussion  work-based learning  journals  cooperative learning | -I can work cooperatively as a group  -I can use critical thinking to solve a confronted problem.  -I can learn about scientist  -I can learn how engineering can help solve society’s challenges. | What is static electricity? |

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| **KEY VOCABULARY:** Force, Motion, Velocity, Hydro-power, Water-Wheel ,Circumference, Pi, Diameter, Radius |

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| **MATERIALS:** Tissues, markers, scissors, balloons, tape, wool cloth |
| **OPENING- (Ask and Imagine Step) 10 minutes** | **EVIDENCE** |
| **Day 1**:   * Handout scientific method worksheet * Go over essential question * Go over vocabulary   **Mini Lesson**  On Worksheet   * **(Research):** * Conduct demonstration of magnets and have students write down observations * Conduct demonstration of static vandergraph machine and have students write down observation * Students use research to write **Hypothesis** concerning their thoughts on what will happen when a balloon that has been rubbed with wool cloths will do to the tissue ghost. | * Student Group Discussions * Scientific Method Worksheet Filled out |
| **WORK PERIOD- (Plan and Create) 30 minutes** | **EVIDENCE** |
| **Day 1**:  On Worksheet   * Experiment: Students watch teacher demonstration of making a tissue ghost and how to charge balloon with wool cloth. * Analysis: Students record observations of their experiment in words and diagram. * Teacher goes over protocol for getting supplies and behavior expectations. * Conclusion: students compares personal hypothesis with experiment results and analysis to determine if they were accurate or incorrect about their hypothesis. | * Scientific method worksheet * Tissue ghost * Photos |
| **CLOSING- ( Improve) 8 minutes** | **EVIDENCE** |
| * Conclusion: students share their conclusions as a class in an open discussion * Teacher poses essential question and ask students for a definitive answer based on experimental observations witnesses in class. | **S**tudent Reflection Sheet with Rubric  Teacher Reflection Survey  Math Extension Activity |