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TE 804, Science

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Instructional Approach: Daily Lesson Plans

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #1/Day 1	Energy All Around	<p>Students explore different forms of energy: light, sound, wind, heat and energy of motion. Students discover how these forms are similar and different. Each form of energy is a station, and students explore each station for five minutes.</p> <p>Light: students are given a flashlight and radiometer. Sound: tuning forks and a pan of water. Heat: hot plate and a beaker of water. Wind: fan and a pinwheel. Energy of motion: a ball and a ramp. Students are invited to explore the materials to figure out what they do. Students are not prompted by teacher prior to centers, students make their own conclusions about each form of energy from the materials given. Students reflect on what they have learned: There are five different forms of energy.</p>	<p>Engages and considers that there are five different forms of energy and elicits student ideas about how each one works. Explores sound, heat, wind, light and energy of motion using different tools and shares student ideas in groups about what each form of energy is.</p> <p>Adaptations: None.</p> <p>Assessment: Students will submit a reflection piece in their science journal explaining what the five forms of energy are. Students will participate in a discussion about the five forms of energy.</p> <p>Essential Questions: What are the five forms of energy? How are they similar? How are they different?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #2/Day 2,3	Energy: Form to Form	Students explore each form of energy in depth, demonstrate how one form of energy can change into another form. For instance, how wind energy can be transformed into energy of motion when placing a fan on a pinwheel. Or, how wind energy is transformed into sound energy when blowing into the top of a bottle. Teacher will demonstrate how each form can be transformed into another form.	<p>Establishes and considers that one form of energy can be transformed into another form of energy and elicits student ideas about how this happens. Explores sound, heat, wind, light and energy of motion using different tools and shares student ideas during class discussion.</p> <p>Adaptations: Students who have difficulty writing will be paired with another student, who will write their ideas for them in their journals.</p> <p>Assessment: Students will submit a reflection piece in their science journal explaining what the five forms of energy are. Students will participate in a discussion about the five forms of energy.</p> <p>Essential Questions: How can one form of energy be transformed into another form of energy?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #3/Day 4	Electrical Energy	Students are introduced to the idea that electricity is a form of energy used in everyday life. Students receive a battery, bulb and wire and must construct a simple closed circuit.	<p>Establishes and considers that electricity is a form of energy and elicits student ideas about how to construct a closed circuit. Explores electrical energy and the construction of a circuit and shares student ideas in groups about how to light the bulb.</p> <p>Adaptations: None</p> <p>Assessment: Students will draw a picture in their science journal about how to successfully construct a closed circuit.</p> <p>Essential Questions: How do you construct a closed circuit?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #4/Day 5	Circuit Challenge	Students receive multiple batteries, wires, bulbs and switches and must construct a circuit. Students work in small groups to create the circuit.	<p>Students explore circuits through working with materials and testing their ideas. Students look for patterns in their investigation by discovering how to successfully light the bulb in small groups. Shares student ideas and discuss explanations in a whole group setting. Explains how circuits work.</p> <p>Adaptations: Students who have difficulty writing will be paired with another student, who will write their ideas for them in their journals or on their student pages.</p> <p>Assessment: Students will write step by step instructions of how to successfully light a bulb when given two batteries, 4 wires, 1 bulb and 1 switch in their science journals.</p> <p>Essential Questions: How do you construct a closed circuit when working with multiple batteries, wires, bulbs and switches?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #5/ Day 6	Happenin' Heat	Students explore how heat is transferred through convection. Students measure the change in temperature of the air inside foam cups, each of which has a small container of boiling water in it, and also measure change in temperature in the water. Students draw conclusions about heat transfer.	<p>Students explore heat transfer through working with materials and testing their ideas about how heat moves. Students look for patterns in their investigation by collecting evidence and recording their observations. Shares student ideas and discuss explanations in a whole group setting.</p> <p>Adaptations: Students who have difficulty writing will be paired with another student, who will write their ideas for them in their journals.</p> <p>Assessment: Students will explain in their science journals how heat moves from something hot to something cooler.</p> <p>Essential Questions: What is heat transfer? How does heat move?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #6/ Day 7	Sun- Sational	Students investigate whether there are differences in heating and cooling with different earth materials (sand, water and soil). Students expose these materials to sunlight (or a strong lamp on a cloudy day) and measure the changes in temperature of each of the three materials.	<p>Students apply what they have learned about heat transfer to investigate and explore the effect of heat on three different earth materials. Students look for patterns, collect data, and record their observations. Students also explain how heat absorption by drawing conclusions.</p> <p>Adaptations: Students who have difficulty writing will be paired with another student, who will write their ideas for them in their journals.</p> <p>Assessment: In their science journals, students will explain which earth material absorbed the most heat and why.</p> <p>Essential Questions: Which earth material gained the most heat? Do lighter colored objects or darker objects absorb more sunlight? Why?</p>

Activity #/ Day #	Title/Label	Short Description	Function/Rationale
Activity #7/ Day 8	Heat Energy and Insulation	Students explore different insulation materials and their effectiveness of reducing the loss of heat energy. Groups are given shoeboxes (their “buildings”) and a different type of insulating material (such as cotton balls, fabric, foam board, felt or cotton squares). Students place a boiling cup of water (their “heaters”) inside of the box and measure the temperature of the water and the air in the closed shoebox over a period of time.	<p>Students apply what they have learned about heat transfer to investigate and explore how heat is insulated using different materials. Students look for patterns, collect data, and record their observations.</p> <p>Adaptations: Students who have difficulty writing will be paired with another student, who will write their ideas for them in their journals.</p> <p>Assessment: In their science journals, students will explain which insulating material worked the best (or kept the most heat inside their “buildings”), and why.</p> <p>Essential Questions: What is insulation? Which material kept the most heat in?</p>

