**Science D: Explorations**

**Nanotechnology**

**Idaho Content Standards- Science (ICSS):**

* PS1-5-1. Develop a model to describe that matter is made of particles too small to be seen.
* PS1-5-3. Make observations and measurements to identify materials based on their properties.
* PS1-MS-2. Analyze and interpret data on the properties of substances before and after the substances interact.
* PS1-MS-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
* PS2-MS-3. Ask questions about data to determine factors that affect the strength of electric and magnetic forces.

**Math Common Core State Standards (Math-CCSS):**

* n/a

**Next Generation Science Standards (NGSS):**

* 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.
* 5-PS1-3. Make observations and measurements to identify materials based on their properties.
* MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact.
* MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
* MS-PS2-3. Ask questions about data to determine factors that affect the strength of electric and magnetic forces.

**English Language Arts Common Core State Standards (ELA-CCSS):**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.3.A Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
* SL.5.4 Report on a topic or text or present an opinion sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.
* L.5.4.B Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph, photosynthesis).

**littleBits of Energy**

**ICSS:**

* PS1-4-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.
* PS1-4-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
* PS1-4-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
* PS2-MS-3. Ask questions about data to determine factors that affect the strength of electric and magnetic forces.

**Math-CCSS:**

* n/a

**NGSS:**

* 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraint on materials, time, or cost.
* 3-5-ETS1-3. 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.
* 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.
* 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
* 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
* 5-PS1-3. Make observations and measurements to identify materials based on their properties.

**ELA-CCSS:**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.

**Small Will Help All**

**Idaho Content Standards- Science (ICSS):**

* PS1-5-1. Develop a model to describe that matter is made of particles too small to be seen.
* PS1-5-3. Make observations and measurements to identify materials based on their properties.

**Math Common Core State Standards (Math-CCSS):**

* 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
* 3.MD.C.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.
* 3.MD.C.7 Relate area to the operations of multiplication and addition.
* 3.MD.C.7.B Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
* 4.MD.A.1 Know relative sizes of measurement units within one system of units including km,m, cm; kg, g; lb, oz.; L, mL; h, min, sec.
* 4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

**Next Generation Science Standards (NGSS):**

* 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.
* 5-PS1-3. Make observations and measurements to identify materials based on their properties.
* 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraint on materials, time, or cost.
* 3-5-ETS1-2. 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.
* 3-5-ETS1-3. 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.

**English Language Arts Common Core State Standards (ELA-CCSS):**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.3.A Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
* SL.5.4 Report on a topic or text or present an opinion sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.

**Introduction to Nav and Mapping (Parent Lesson)**

**ICSS:**

* n/a

**Math-CCSS:**

* 5.G.A.1Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and*y*-coordinate).

**NGSS:**

* n/a

**ELA-CCSS:**

* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.

**Top Secret Mission**

**ICSS:**

* n/a

**Math-CCSS:**

* 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
* 4.MD.A.1 Know relative sizes of measurement units within one system of units including km,m, cm; kg, g; lb, oz.; L, mL; h, min, sec.
* 5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
* 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
* 5. NF.B.5.A Interpret multiplication as scaling (resizing) by comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
* 6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

**NGSS:**

* n/a

**ELA-CCSS:**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.3.A Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
* SL.5.4 Report on a topic or text or present an opinion sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.

**Search and Rescue on the Big Island of Hawaii**

**ICSS:**

* n/a

**Math-CCSS:**

* 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
* 4.MD.A.1 Know relative sizes of measurement units within one system of units including km,m, cm; kg, g; lb, oz.; L, mL; h, min, sec.
* 5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
* 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
* 5. NF.B.5.A Interpret multiplication as scaling (resizing) by comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
* 6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

**NGSS:**

* n/a

**ELA-CCSS:**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.3.A Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
* SL.5.4 Report on a topic or text or present an opinion sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.

**Global Positioning Systems**

**ICSS:**

* n/a

**Math-CCSS:**

* 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
* 4.MD.A.1 Know relative sizes of measurement units within one system of units including km,m, cm; kg, g; lb, oz.; L, mL; h, min, sec.
* 5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
* 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

**NGSS:**

* n/a

**ELA-CCSS:**

* RF.5.3 Know and apply grade-level phonics and word analysis skills in decoding words.
* RF.5.3.A Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
* RF.5.4 Read with sufficient accuracy and fluency to support comprehension.
* RF.5.4.A Read on-level text with purpose and understanding.
* SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
* SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
* L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words, and phrases choosing flexibly from a range of strategies.