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| **Physical Science: Materials and Motion** | | |
| **Content Area: Science** | | |
| **Unit Title:** Physical Science – Materials and Motion | | |
| **Target Course/Grade Level: Kindergarten** | | |
| **Unit Summary**  The Materials and Motion Module provides early-childhood students with integrated experiences with physical science, earth science, and engineering core ideas that relate to students’ interests and are teachable and learnable. | | |
| **Primary interdisciplinary connections:**  **ELA/Literacy**  RF 2: Demonstrate understanding of spoken words, syllables, and sounds.  RI 1: Ask and answer questions about key details.  RI 2: Identify main topic and retell key details.  RI 3: Describe the connection between two ideas.  RI 4:Ask and answer questions about unknown  words.  RI 7: Describe the relationship between  illustrations and the text.  RI 8: Identify the reasons an author gives to support points.  RI 9: Identify similarities in and differences  between two texts on the same topic.  RI 10: Actively engage in group reading activities  with purpose and understanding.  W 2: Write informative/explanatory text.  W 5: Strengthen writing.  W 8: Gather information to answer a question.  SL 1: Participate in collaborative conversations.  SL 2: Ask and answer questions about key details  and request clarification.  SL 3: Ask and answer questions to seek help,  information, or to clarify.  SL 4: Describe with details  SL 6: Speak audibly, express clearly.  L 1: Use question words; expand complete  sentences in shared language activities.  L 5a: Sort objects into categories.  RL 2: Retell stories, including key details.  **Math**  Reason abstractly and quantitatively. (K-ESS2-1),(K-2-ETS1-1) MP.2  Model with mathematics. (K-ESS2-1),(K-ESS3-2),(K-2-ETS1-1) MP.4  Use appropriate tools strategically. (K-2-ETS1-1) MP.5  Counting and Cardinality (K-ESS3-2) K.CC  Know number names and the count sequence. (K-ESS2-1) K.CC.A  Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1) K.MD.A.1  Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1) K.MD.B.3  Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) 2.MD.D.10 | | |
| **21st century themes:**  Digital media will be used incorporated in project presentations. This module will develop students’ abilities to do and understand scientific inquiry. Students will identify questions, design and conduct scientific investigations to answer those questions, employ tools to gather, analyze, and interpret data. They will use data to construct reasonable explanations, develop and communicate investigations and evidence and understand that scientists use different kinds of investigations and tools to develop explanations using evidence and knowledge. This module will develop and extend students’ understandings about science and technology. Students will work collaboratively in teams and use tools and scientific techniques to make better observations. | | |
| **Learning Targets** | | |
| **Disciplinary Core Ideas:**  **PS1.A: Structure and properties of matter Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (From grade 2) Different properties are suited to different purposes. (From grade 2)  ESS3.C: Human impacts on Earth systems Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and living things.**  **ETS1.A: Defining and delimiting engineering problems Asking questions, making observations, and gathering information are helpful in thinking about problems.  ETS1.B: Developing possible solutions Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.  ETS1.C: Optimizing the design solution Because there is always more than one possible solution to a problem, it is useful to compare and test designs.**  **PS3.C: Relationship between energy and forces A bigger push or pull makes things speed up or slow down more quickly.**  **PS2.B: Types of interactions When objects touch or collide, they push on one another and can change motion.**  **PS2.A: Forces and Motion Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.**  **ESS3.A: Natural resources Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.** | | |
| **PE #** | **Performance Expectations** | |
| **2-PS1-2** | **Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.\*** | |
| **K-ESS3-3** | **Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.\*** | |
| **K-2-ETS1-1** | **Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.** | |
| **K-2-ETS1-2** | **Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.** | |
| **K-2-ETS1-3** | **Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.** | |
| **K-ESS3-1** | **Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.** | |
| **K-PS3-1** | **Make observations to determine the effect of sunlight on Earth’s surface.** | |
| **K-PS3-2** | **Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth’s surface.\*** | |
| **K-PS2-1** | **Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.** | |
| **KPS2-2** | **Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.\*** | |
| **Unit Essential Questions**   * What makes on material different than another? * How can we conserve natural resources? * What causes objects to move? * What happens when objects collide? | | **Unit Enduring Understandings**  **Getting to Know Wood**   * Wood can be described in terms of its properties. * Different kinds of wood come from different kinds of trees. Trees are natural resources. Some kinds of wood are processed and made by people. * Wood floats in water but can be made to sink. * Sawdust is tiny wood pieces that can be recycled. * Basic materials can be transformed into new materials (particleboard and plywood).   **Getting to Know Paper**   * Paper has many observable properties. * People make paper from wood. * The properties of papers determine their uses. * Some papers absorb water, others do not. * Some paper changes when soaked in water. Some paper breaks down into smaller fibers. * Paper can be reused, recycled, and fabricated.   **Getting to Know Fabric**   * Fabric is a flexible material with a wide range of properties. The properties of fabrics determine their uses. * Fabrics can be made of woven threads. * Fabrics can absorb, transmit, or repel water. * Wet fabric dries when water evaporates, leaving the fabric unchanged. * Land, air, water, and trees are natural resources. * The Sun warms the Earth’s surface. * Engineers design and test solutions to problems.   **Getting Things to Move**   * Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. * Gravity pulls things down. * A bigger push or pull makes things go faster. * When objects touch or collide, they push on one another and can change motion. |
| **Unit Learning Targets**  *Students will ...*  engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and designing objects and systems to achieve specific outcomes. Students gain experiences that will contribute to beginning-level understanding of the crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter, and structure and function. | | |
| **Evidence of Learning** | | |
| **Embedded Assessments:**   * **Response Sheets** * **Performance Assessments** * **Science Notebook Entries**   **Benchmark Assessments:**   * **Investigation I-Checks** * **Surveys** | | |
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