**Big Idea**

Scientists construct mental and conceptual models of phenomena to represent current understandings, aid in dev

Matter can be understood in terms of the types of atoms present and the interactions both between and within a

Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer

Interactions between any two objects can cause changes in one or both of them.

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Scale, Proportion, and Quantity: Changes in scale, proportion, and quantity affect a system's structure and/or performance.

Structure and Function: The way in which an object or living thing is shaped determines many of its properties and
Data must be presented in a form that can reveal any patterns and relationships and that allows results to be communicated to others.

Scientists construct mental and conceptual models of phenomena to represent current understandings, aid in dev
Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact over a wide range of temporal and spatial scales.
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.

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Measurement attributes can be quantified, and estimated using customary and noncustomary units of measure.

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| Essential Questions |
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| How do scientists and engineers develop and use models? |
| How can one explain the structure, properties, and interactions of matter? |
| How is energy transferred and conserved? |
| How can one explain and predict interactions between objects within systems? |
| How can one explain the structure, properties, and interactions of matter? |
| How do changes in structure and performance affect a system? |
| How is form related to function? |
| In what ways are data analyzed, interpreted, and communicated? |
| How do scientists and engineers develop and use models? |
| How and why is Earth constantly changing? |
| How and why do organisms interact with their environment and what are the effects of these interactions? |
| How can one explain and predict interactions between objects within systems? |
| How can one explain and predict interactions between objects within systems? |
| How and why do organisms interact with their environment and what are the effects of these interactions? |
| How is energy transferred and conserved? |
| Why does “what” we measure influence “how” we measure? |
| How and why do organisms interact with their environment and what are the effects of these interactions? |

| Concepts |
| --- |
| Gravitational force of Earth acting on another object near Earth's surface pulls that object toward the planet's cer |
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| Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists |
| The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not z |
| Measurements of a variety of properties can be used to identify materials. (PS1.A) |
| No matter what reaction or change in properties occurs, the total mass of the substances does not change. |
| Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and cr |
| Evaluate the personal characteristics and traits necessary for success in a virtual work environment. |
| Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, o |
| Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (ESS2.A) |
| A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a rela |
| Explain that the mechanical advantages produced by simple machines helps to do work (physics) by either overco |
| The amount of energy transfer needed to change the temperature of a sample depends on the nature of the matt |
| Organisms can survive only in environments in which their particular needs are met. (LS2.A) |
| The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not z |
| Two dimensional figures |
| Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. ( |

**Competencies**

Given certain conditions (ex. temperature, pressure, space available), select appropriate materials, based on their

Apply concepts of volume to solve problems.

Communicate qualitative observations and information graphically and mathematically to represent how an objec

Develop a simple model using given data that represents the relationship of gravitational interactions (force, mas

Make observations and measurements to identify given materials based on their properties.

Communicate qualitative observations and information graphically and mathematically to represent how an objec

Generate, analyze and compare patterns.

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Research and communicate how communities are using science to protect resources and environments. (5-ESS3-1

Utilizing observations and data, explain the patterns of weather in a given location. (5-ESS2-1)

Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosy
Given a scenario involving simplemachines, qualitatively compare the mechanical advantage of each. Based on this analysis, argue which machine is best for the task.
Plan and conduct an investigation to determine whether the mixing of two or more substances results in new substances (e.g., cooking, baking, burning, etc.). (5-PS1-4)
Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosystems. (5-LS2-1)
Communicate qualitative observations and information graphically and mathematically to represent how an object's relative position, velocity, and direction of motion are affected by forces acting on the object.

Represent and interpret data using appropriate scale.

Use models to trace the cycling of particles of matter between the air and soil and among plants, animals, and mi

| Vocabulary |
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| Gravitational force, model, mass, weight |
| Gravitational force, model, mass, weight |
| Friction, wheels, axle, distance, model |
| Acceleration, Balanced, Distance, Force, Motion, Graphs, Newton's 1st Law, Newton's 2nd Law, Position, Speed, |
| Condensation, Evaporation, Matter, Particles, density, solution, mass, weight |
| mass, weight, displacement, balanced, unbalanced, structure, reinforced, conservation, volume |
| States of Matter, symmetry, degrees, reflection, rotation |
| Code, direction, language, blocks, workspace, sequence, loop, commands |
| Atmosphere, Human impact, Research, Resources |
| Atmosphere, Biosphere, Geosphere, Hydrosphere, Precipitation,Transpiration, Water cycle,Water system |
| Ecosystem, Invasive, Noninvasive, Species, System, Consumer, Ecosystem, Food chain, Food web, Niche, Predator |
| Force, Mechanical advantage, Simple machines, Work |
| Chemical change vs. physical change, Mass, Temperature, Volume, Conduction, Convection energy, Insulator, Rad |
| Resource availability, Researchable, Species,Web of life |
| Data, Graphical display, Patterns, Mass, Temperature, Volume, Gas, Liquid, Kinetic vs. Potential energy |
| scale, ratio, fractions, reduce, enlarge |
| Energy flow, Flow chart, Model, Photosynthesis, Cycles, Matter, Microbes |

| Proposed lab |
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| Toothpick Towers |
| Towers Support Weight |
| Air Powered Vehicles |
| Airplane Variables Testing |
| Density lab |
| Cargo Capacity of Paper Boats |
| Snowflake Symmetry |
| Hour of Code |
| Recycled Material Inventions/Invention Convention |
| Weather Measuring and Tracking |
| Plant Characteristic Dichotomous Keys |
| Simple machines |
| Inertia/Pressure, Heat/Friction activities |
| Outdoor Education Week |
| Water Bottle Rocketry |
| Map & Scale Activities |
| Horticulture Project |

**Resources**

Tooth Picks, Modeling Clay, assorted weights, tracking sheet

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recycled materials, craft supplies, car kits, lab sheets

Airplane kits, paper, scissors, recyclable materials, lab sheets

Salt, water, measuring cups, food coloring, test tubes, lab sheets

Assorted weights, test bins, water, paper, crafting tools

Crafting tools, snowflake worksheets, white paper, rulers

Computers or iPads, internet access

Recycled materials, craft supplies, poster board, lab sheets, Invention guide

Recycled materials, crafting tools, hot glue

Laminated leaves,  Research Materials, Computer access, notebook paper

Small spring scales, student size simple machine models, asssorted weights

Assorted wood blocks, dowel rods, trimmed branches, string and rope, craft materials, craft tools

Provided by Camp Kon-O-Kwee

Empty two liter bottles, craft materials, teacher built launchers, air pump with gauge, soccer field, measurement t

Scale Conversion Charts, Local maps

Highland Courtyard, Seeds, Gardening Hand tools

CC.2.4.5.A.5 -Apply concepts of volume to solve problems and relate volume to multiplication and to addition.

x

x

x

x

x

x

x

x

x

x

x

x

x

CC.2.4.5.A.1 -Solve problems using conversions within a given measurement system. CC.2.4.5.A.2-Represent and

**Assessment Anchor, Eligible Content**

interpret data using appropriate scale.