PreKindergarten (3–4 year old; MA EEC)
Math: PK.MD.MA.A.2, PK.MD.B.3

PreK-PSI-2(MA). Investigate natural and human-made objects to describe, compare, sort, and classify objects based on observable physical characteristics, uses, and whether something is manufactured or occurs in nature.
Math: PK-MD.MA.3

PreK-PSI-3(MA). Differentiate between the properties of an object and those of the material of which it is made.

1: Matter & Its Interactions
ELA: SL.PK.3

PreK-PSI-1(MA). Raise questions and investigate the differences between liquids and solids and develop awareness that a liquid can become a solid and vice versa.

PreK-PSI-4(MA). Recognize through investigation that physical objects and materials can change under different circumstances. Clarification Statement: Changes include building up or breaking apart, mixing, dissolving, and changing state.
ELA: SL.PK.6

PreK-PS2-1(MA). Using evidence, discuss ideas about what is making something move the way it does and how some movements

Kindergarten (5 year old)

K-PSI-1(MA). Investigate and communicate the idea that different kinds of materials can be solid or liquid depending on temperature. Clarification Statements: Materials chosen must exhibit solid and liquid states in a reasonable temperature range for kindergarten students (e.g., 0-80 F), such as water, crayons or glue sticks. Only a qualitative description of temperature such as hot, warm, and cool, is expected.

2-ESS2-3

Math: K.MD.A.1,2

K-PS2-1. Compare the effects of different strengths or different directions of push or pull.
2-PS1-3. Analyze a variety of evidence to conclude that when a chunk of material is cut or broken into pieces, each piece is still the same material and, however small each piece is, has weight. Show that the material properties of a small set of pieces do not change when the pieces are used to build larger objects.
Clariﬁcation Statements: Materials should be pure substances or microscopic mixtures that appear contiguous at observable scales. Examples of pieces could include blocks, building bricks, or other assorted small objects.

Math: PK.MD.B.MA3, K.MD.B.3

2-PS1-1. Describe and classify different kinds of materials by observable properties of color, ﬂexibility, hardness, texture and absorbency.

Math: 1.MD.C.4

2-PS1-2. Test different materials and analyze the data obtained to determine which materials have the properties that are best suited for an intended purpose.*
Clariﬁcation Statements: Examples of properties could include color, ﬂexibility, hardness, texture, and absorbency. Data should focus on qualitative and relative observations.

2.K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs.*
Clariﬁcation Statements: Data can include observations and be either qualitative or quantitative. Examples can include how different objects insulate cold water or how different types of grocery bags perform.

2-ESS2-1

2-PS1-4. Construct an argument with evidence that some changes to materials caused by heating or cooling can be reversed and some cannot. Clariﬁcation Statements: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples
5-PS1-1. Use a model of matter as made of particles too small to be seen to explain common phenomena involving gases, and phase changes between gas and liquid and between liquid and solid. Clarification Statement: Examples of common phenomena the model should be able to describe include adding air to expand a balloon, compressing air in a syringe, and evaporating water from a salt water solution. State Assessment Boundary: Atomic-scale mechanisms of evaporation and condensation or defining the unseen particles are not expected in state assessment.

5-ESS2-1 7.MS-ESS2-4 8.MS-PS1-4

ELA: W.4.2

5.3-5-ETS3-2(MA). Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.*

7.MS-ETS3-4

5.3-5-ETS3-1(MA). Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.

Math: 4-MD.1

7.MS-ETS3-5

5-PS1-3. Make observations and measurements of substances to describe characteristic properties of each, including color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility. Clarification Statements: Emphasis is on describing how each substance has as unique set of properties. Examples of substances could include baking soda and other powders, metals, minerals, and liquids. State Assessment Boundary: Density, distinguishing mass and weight, or specific tests or procedures are not expected in state assessment.
through experiences, some movements can be controlled.

**ELA: PK.SL.5**

**PreK-PS2-2(MA).** Through experience, develop awareness of factors that influence whether things stand or fall. Clarification Statements: Examples of factors in children’s construction play include using a broad foundation when building, considering the strength of materials, and using balanced weight distribution in a block building.

**K-PS3-1.** Make observations to determine that sunlight warms materials on Earth’s surface. Clarification Statements: Examples of materials on Earth’s surface could include sand, soil, rocks, and water. Measures of temperature should be limited to relative measures such as warmer/cooler.

**K-PS3-2.** Use tools and materials to design and build a model of a structure that will reduce the warming effect of sunlight on an area.*
PreK-PS4-2(MA). Connect daily experience and investigations to demonstrate the relationships between the size and shape of shadows, the objects creating the shadow, and the light source.

PreK-LS1-4(MA)

PreK-PS4-1(MA). Investigate sounds made by different objects and materials and discuss explanations about what is causing the sounds. Through play and investigations, identify ways to manipulate different objects and materials that make sound to change volume and pitch.
1-PS4-1. Demonstrate that vibrating materials can make sound and that sound can make materials vibrate. Clarification Statements: Examples of vibrating materials that make sound could include tuning forks, a stretched string or rubber band, and a drum head. Examples of how sound can make materials vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.

Math: 1-MD.4

1.K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change that can be solved by developing or improving an object or tool.*

1.K-2-ETS1-2. Generate multiple solutions to a design problem and make a drawing (plan) to represent one or more of the solutions.*

1-PS4-4. Use tools and materials to design and build a device that uses light or sound to send a signal over a distance.*

3.3-5-ETS1-1. Define a simple design challenge that reflects a need or a want. Incorporate constraints and criteria to modify the design. Clarification Statements: Examples of constraints and criteria could include budget or cost that a potential solution must meet. Examples of constraints could include a design or material limitation, such as a maximum size for a container or a minimum strength for a bridge. Examples of criteria could include a need for the design to be made from recyclable materials or to be easy to assemble.

ELA: RI.3.1, RI.3.2

3.3-5-ETS1-4(MA). Gather information using various informational resources to develop possible solutions to a design problem. Present different representations of a solution.*

Examples of representations could include books, videos, and websites. Examples of informational resources could include the library, the internet, and experts in the field.

6.MS

3.3-5-ETS1-2. Generate several viable solutions to a design problem. Compare and evaluate the relative advantages and disadvantages of each solution. Clarification Statements: Examples of design problems could include designing a toy for children who have a hearing loss or designing a device to clear or collect debris or trash from a drain, or creating safe moveable equipment for a new recess area.

3-ESS3-1

4-ESS3-2
energy can include water in a bucket or a weight suspended at a height, and a battery.

**HS-PS3-3**

4.3-5-ETS1-5(MA). Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem.* Clarification Statement: Examples of design features can include size, shape, and weight.

**5-LS2-2(MA)**

4.3-5-ETS1-3. Plan and carry out tests of one or more elements of a model or prototype in which variables are controlled and failure points are considered to identify which elements need to be improved. Apply the results of tests to redesign a model or prototype.*

**5-ESS3-2(MA)**

4-PS4-1. Develop a model of a simple wave to communicate that waves (a) are regular patterns of motion along which energy travels and (b) can differ in amplitude and wavelength. Clarification Statements: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves. Focus is on mechanical waves (including sound). State Assessment Boundary: Interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength are not expected in state assessment.

**6-MS-PS4-1**

4-PS4-2. Develop a model to describe that light must reflect off an object and enter the eye for the object to be seen. State Assessment Boundary: Specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works are not expected in state assessment.

**6-MS-PS4-2**

4-PS4-3. Develop and compare multiple ways to transfer information through encoding, sending, receiving, and decoding a pattern.* Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1s and 0s representing black and white to send information about a picture, and using Morse code to send text.

**6-MS-PS4-3**