**K.PS1: Matter and Its Interactions**

1) Plan and conduct an investigation to describe and classify different kinds of materials including wood, plastic, metal, cloth, and paper by their observable properties (color, texture, hardness, and flexibility) and whether they are natural or human-made.

2) Conduct investigations to understand that matter can exist in different states (solid and liquid) and has properties that can be observed and tested.

3) Construct an evidence-based account of how an object made of a small set of pieces (blocks, snap cubes) can be disassembled and made into a new object.

**K.ETS1: Engineering Design**

1) Ask and answer questions about the scientific world and gather information using the senses.

2) Describe objects accurately by drawing and/or labeling pictures.

**K.ETS2: Links Among Engineering, Technology, Science, and Society**

1) Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.

**3.PS1: Matter and Its Interactions**

1) Describe the properties of solids, liquids, and gases and identify that matter is made up of particles too small to be seen.

2) Differentiate between changes caused by heating or cooling that can be reversed and that cannot.

3) Describe and compare the physical properties of matter including color, texture, shape, length, mass, temperature, volume, state, hardness, and flexibility.

**3.ETS1: Engineering Design**

1) Design a solution to a real-world problem that includes specified criteria for constraints.

2) Apply evidence or research to support a design solution.

**3.ETS2: Links Among Engineering, Technology, Science, and Society**

1) Identify and demonstrate how technology can be used for different purposes.

**Review particle nature of matter:**

*Observing matter:*

1. Materials:

Pipe cleaner

Sticky bug

Marble

Porcupine ball

Feather

Sand paper

Twizzler

Cotton ball

Rock

Popsicle stick

Hand Lenses

1. Observing properties of these objects and record in the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Object** | **Texture** | **Shape** | **Color** | **Flexibility**  **(yes/no)** |
| Pipe cleaner |  |  |  |  |
| Sticky bug |  |  |  |  |
| Marble |  |  |  |  |
| Porcupine ball |  |  |  |  |
| Feather |  |  |  |  |
| Sandpaper |  |  |  |  |
| Twizzler |  |  |  |  |
| Cotton ball |  |  |  |  |
| Popsicle stick |  |  |  |  |
| Rock |  |  |  |  |

1. Ask open ended questions to foster higher order thinking.
   1. What evidence do you have…?
   2. How could you prove…?
   3. What properties do these materials share?
   4. What would happen if…?

*Building blocks of matter:*

1. Materials

6 building blocks

1. Build something using the pieces.
2. Describe your object.

|  |  |
| --- | --- |
| Parts |  |
| Size |  |
| Mass |  |
| Shape |  |
| Texture |  |
| Flexibility |  |

1. Rearrange the parts to build something new. Describe.

|  |  |
| --- | --- |
| Parts |  |
| Size |  |
| Mass |  |
| Shape |  |
| Texture |  |
| Flexibility |  |

1. What properties were the same? What were different? What evidence do you have?
2. Review the particle nature of matter using states of matter cups and ping pong ball models.
   1. What is a solid?
   2. What is a liquid?
   3. What is a gas?
   4. What is the evidence for each?
   5. How can they change from one state into another?
   6. Do the pieces change?
   7. Does the matter change?

*Changes in properties/ matter:*

1. Materials:

Gobstoppers

Food coloring

Chocolate kisses

Rubbing alcohol

Cotton balls

Clear plastic cups

1. Fill 2 plastic cups ½ way with water. Place on a stable table.
2. Cup #1- place 5 different colored gobstoppers in the bottom of the cup.
   1. Observe what happened over the next 20 minutes.
   2. What changes do you see?
   3. Can you draw a picture of it?
   4. Can you draw a picture of it using particles?
   5. While waiting, continue to cup #2.
3. Cup #2- drop 1 drop of food coloring in the still water. Observe what happens.
4. Chocolate kiss- make observations of the kiss in its wrapper

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Cool** | **warm** | **Cooled after warming** |
| Mass |  |  |  |
| Height |  |  |  |
| Shape |  |  |  |
| Texture/ flexibility |  |  |  |

* 1. What properties changed when warm?
  2. What cooled back down?
  3. Did the chocolate change its identity?

1. Rubbing alcohol- Wet a cotton ball with rubbing alcohol and wipe is across your desk top. What do you observe immediately and after 5 minutes?

|  |  |  |
| --- | --- | --- |
| Immediately |  |  |
| After 5 minutes |  |  |

1. What happened to the alcohol?
2. What evidence do you have?
3. Can you draw a particle picture of what happened?