MAPPING GRADE 2 SCIENCE INSTRUCTION

Concept: Solids, Liquids, Gases
PWC Strand: Physical Science

CMS Unit Test: *Matter*
Reporting Category: *Force, Motion, Energy, Matter*

PWC Objective: 2.4.1

The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include:

- mass and volume **(SOL 2.3a)**
- processes involved with changes in matter from one state to another (condensation, evaporation, melting, freezing) **(SOL 2.3b)**

What Students Should Know (Critical Attributes)	**What Students Should Be Able To Do** (Essential Skills)
Essential Questions: • What are mass and volume? • What are the three basic types of matter? • How can we describe each of the three basic types of matter? • What are the processes that allow matter to change from one state to the other? **Critical Attributes:** 2.3a Every object and substance on Earth, including air, is made of matter. Matter is anything that takes up space and has mass . We can measure the mass and the volume (the amount of space the matter occupies). 2.3a There are three basic types of matter around us. A solid has a definite shape, and the material it is made of is packed tightly together. The matter of a liquid is not as tightly packed together, so the liquid can flow and when poured into a container, will fill the container's shape. The matter of gases is spread even farther apart than a liquid. It also has no definite shape and will spread out to fill its container.	• Classify materials as to whether they are liquids, solids, or gases. • Measure the mass of solids and the volume of liquids in metric and Standard English units.

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What Students Should Know (Critical Attributes)	**What Students Should Be Able To Do** (Essential Skills)
2.3b The space between materials in matter can change. When this happens, the matter can change its state (solid, liquid, or gas). We can change the amount of space in matter by changing the temperature of the matter. When we apply heat energy to a solid (like ice), it *melts* into a liquid. When we apply more heat energy, the liquid expands (becomes larger) and *evaporates* and becomes a gas (water vapor). As water vapor cools, *condensation* takes place. When we cool a gas down (like water), it contracts (becomes smaller) and changes into a liquid, and when we cool the liquid some more, it *freezes* into a solid (ice). 2.3b When matter changes from one state to another, these changes are referred to as physical changes.	• Describe the transformation of a solid (ice) to a gas (water vapor). • Design an investigation to observe the condensation of water. • Describe and identify condensation, evaporation, melting, freezing, expanding, and contracting of water. • Design an investigation to determine basic factors that affect the evaporation of water. • Identify the uses of water in the home and at school.

MAPPING GRADE 2 SCIENCE INSTRUCTION

Concept: Magnets
PWC Strand: Physical Science

CMS Unit Test: *Magnets*
Reporting Category: *Force, Motion, Energy, Matter*

PWC Objective: 2.4.2

The student will investigate and understand that natural and artificial magnets have certain characteristics and attract specific types of metals. Key concepts include:

- vocabulary related to magnets (magnetism, iron, magnetic/nonmagnetic; poles; opposites; attract/repel) **(SOL 2.2a)**
- important applications of magnets, including the compass **(SOL 2.2b)**

What Students Should Know (Critical Attributes)	**What Students Should Be Able To Do** (Essential Skills)
Essential Questions: • What can magnets do? • What kinds of objects do magnets affect? • How do magnets react to other magnets? • What is a magnetic compass and what does it do? **Critical Attributes:** 2.2a Magnets contain iron and produce a magnetic field around them that pushes or pulls on other materials containing iron or nickel. 2.2a Magnets push (repel) or pull (attract) metals. If they do not contain iron or nickel (are non-metal), they cannot be pushed or pulled by a magnet. 2.2a A magnet has two ends called *positive* and *negative poles*. Located at the poles of a magnet is where the magnet's pull is the strongest. Magnets will react with each other. Opposite ends of two magnets—the positive pole of one and the negative pole of the other—attract each other, and the positive ends of one and the positive end of another—or two negative poles—repel each other.	• Predict which materials will be attracted to magnets, test the predictions, and create a chart that shows the results. Classify materials as to whether they are attracted to magnets or not. • Compare natural magnets (lodestone or magnetite) and artificial magnets. • Identify the north and south magnetic poles of magnets.

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What Students Should Know (Critical Attributes)	**What Students Should Be Able To Do** (Essential Skills)
2.2b The two ends of the earth—the North Pole and the South Pole—have opposite magnetic fields. A compass has an iron-containing needle or pointer that is allowed to swing freely and is attracted to the North Pole by aligning with the earth's magnetic field. A compass can help us find north, south, east, and west directions by turning it so the needle points to the "north" on the compass. 2.2b Magnets are used in everyday life. Examples include refrigerator magnets and chalkboard letters, toys, door latches, and paper clip holders.	• Use magnetic compasses to determine directions of north and south poles. • Identify important applications of magnets in everyday life: o refrigerator magnets and chalkboard letters o toys o door latches o paper clip holder • Create a new application for using a magnet. • Design an investigation to determine how the different poles of magnets react to the poles of other magnets.