

MAPPING GRADE 3 SCIENCE INSTRUCTION

Concept: Simple and Complex Machines

PWC Strand: Physical Science

CMS Unit Test: Machines

Reporting Category: Force, Motion, Energy, Matter

PWC Objective: 3.4.1

The student will investigate and understand machines and their uses. Key concepts include:

- types of simple machines **(SOL 3.2a)**
- functions of simple machines **(SOL 3.2b)**
- compound machines **(SOL 3.2c)**
- useful machines found at home, school, and work **(SOL 3.2d)**

What Students Should Know (Critical Attributes)	What Students Should Be Able To Do (Essential Skills)
<p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What do simple and compound machines do? • What are some types of simple and compound machines? • What are some examples of simple and compound machines we use every day? <p><u>Critical Attributes:</u></p> <p>Simple machines are tools used to make work easier. They do not make less work; they just make it easier to do work. Doing work requires energy. Examples of tasks made easier include lifting a heavy weight, moving a heavy object over a distance, pushing things apart, changing the direction of a force, or holding an object together.</p> <p>3.2a-d There are six different types of simple machines: lever, screw, pulley, wheel and axle, inclined plane and wedge.</p> <p>3.2a-d The lever is a stiff bar that moves about a fixed point known as the fulcrum. It is a simple machine that is used to push, pull, or lift things. Examples of levers are shovels, crowbars, and seesaws.</p>	<ul style="list-style-type: none"> • Identify and differentiate the six types of simple machines (lever, screw, pulley, wheel and axle, inclined plane, and wedge). • Analyze the application and explain the purpose of each of the six types of simple machines. An example would be that an inclined plane is a ramp to make it easier for a heavy object to be moved up or down. • Differentiate and classify specific examples of simple machines found in school and household items. These include a screwdriver, nutcracker, screw, bicycle, flagpole pulley, ramp, and seesaw.

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What Students Should Know (Critical Attributes)	What Students Should Be Able To Do (Essential Skills)
<p>3.2a-d The inclined plane is a flat surface that is raised so one end is higher than the other. The inclined plane helps move heavy objects up or down. A ramp is an example of an inclined plane.</p> <p>3.2a-d The wedge is wide at one end and pointed at the other to help cut or split other objects. A knife and an ax are examples of wedges.</p> <p>3.2a-d The wheel and axle consists of a rod attached to a wheel. A wheel and axle make it easier to move or turn things. Examples include bicycle wheels, roller skates, and doorknobs.</p> <p>3.2a-d The screw is an inclined plane wrapped around a cylinder or cone. A common use of the screw is to hold objects together. Examples include a jar lid and a wood screw.</p> <p>3.2a-d The pulley is a wheel that has a rope wrapped around it. Pulleys can be used to lift heavy objects by changing the direction or amount of the force. An example is a flagpole.</p> <p>3.2a-d A compound machine is a combination of two or more simple machines. Examples include scissors, wheelbarrows, and bicycles.</p>	<ul style="list-style-type: none">• Design and construct an apparatus that contains a simple machine.• Identify the simple machines that compose a compound machine, such as scissors, wheelbarrows, and bicycles.

MAPPING GRADE 3 SCIENCE INSTRUCTION

Concept: Physical Properties of Matter
PWC Strand: Physical Science

CMS Unit Test: Properties of Matter
Reporting Category: Force, Motion, Energy, Matter

PWC Objective: 3.4.2

The student will investigate and understand that objects can be described by the materials they are made of and their physical properties. Key concepts include:

- objects are made of more than one material **(SOL 3.3a)**
- objects are made of materials that often too small to see without magnification **(SOL 3.3b)**
- the physical properties of objects remain the same, even when the object is reduced in size **(SOL 3.3c)**

What Students Should Know (Critical Attributes)	What Students Should Be Able To Do (Essential Skills)
<p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What physical properties can be used to describe objects? • What are objects made of? <p><u>Critical Attributes:</u></p> <p style="padding-left: 20px;">We can observe and describe the physical properties of objects, including their size, weight, shape, temperature, color, and their ability to react with other substances. Physical properties can be measured using simple tools such as rulers, balances, and thermometers.</p> <p>3.3a Every object that takes up space is made of matter. The matter objects are made of can be more than one kind of matter, such as paper, wood, or metal. The amount of matter in an object is its mass. Objects can be described by the properties of the materials from which they are made.</p> <p>3.3b All materials are composed of parts too small to be seen well with our eyes alone without magnification.</p> <p>3.3c The material that an object is made of remains the same even when one of its physical properties changes. For example, a sheet of paper is still paper, even when we change its physical shape by crumpling it up or cut it in smaller parts.</p>	<ul style="list-style-type: none"> • Infer that objects are made up of smaller parts based on observations of the physical properties that are common to each individual object. • Compare the physical properties of smaller pieces of a material to those physical properties of the material. • Conclude that materials have their own set of physical properties that are observable. • Explain that physical properties are observable characteristics that make objects different from each other. • Design an investigation to determine if the physical properties of a material will remain the same if the material is reduced in size.