

## Science DesCartes: General Science – Physical Science

### Skills: Understand the Structure and Function of Matter and Molecules and their Interactions

<b>Students:</b>	<b>DesCartes Skills:</b> (Highlight the skills related to your chosen standard/concept)
	<b>RIT Above 250:</b> <ul style="list-style-type: none"> <li>Analyzes data about phase changes in matter</li> </ul>
	<b>RIT 241-250:</b> <ul style="list-style-type: none"> <li>Describes ductility</li> <li>Gives examples of solutions</li> <li>Evaluates strategies for the qualitative analysis of a given mixture</li> <li>Utilizes classification systems for elements</li> </ul>
	<b>RIT 231-240:</b> <ul style="list-style-type: none"> <li>Selects the appropriate relationship to convert units using dimensional analysis strategies</li> <li>Describes constancy of mass during a physical or chemical change in a system</li> <li>Defines chemical property</li> <li>Distinguishes among examples of physical and chemical properties</li> <li>Classifies mixtures based on their properties</li> <li>Defines solute</li> <li>Recognizes characteristics of compounds</li> </ul>
	<b>RIT 221-230:</b> <ul style="list-style-type: none"> <li>Understands that air and other gases have mass</li> <li>Evaluates to determine the best substance for a given application based on data describing physical properties of substances</li> <li>Makes inferences about appropriate uses of materials from results of tests of properties (e.g., hardness, tensile strength, conductivity)</li> <li>Describes objects in terms of mass</li> <li>Recognizes that mass is measured in grams</li> <li>Identifies the tools needed to determine the volume of an irregularly shaped object</li> <li>Identifies tools needed to calculate the density of an irregularly-shaped object</li> <li>Calculates density of objects, using supplied data</li> <li>Recognizes that conductivity of a substance depends on the freedom of electrons to move from ion to ion of the substance</li> <li>Performs metric conversions (e.g., milliliters to microliters)</li> <li>Describes physical changes in matter (e.g., changes in size, shape, freezing, melting, dissolving)</li> <li>Explains how the addition or loss of heat changes matter (e.g., physical change)</li> <li>Describes examples of physical change</li> <li>Gives examples of chemical change</li> <li>Infers that a chemical change has occurred</li> <li>Describes chemical properties of substances</li> <li>Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form</li> <li>Generalizes how changes in temperature affect the behavior of gas</li> <li>Describes the relative spacing of particles in solids, liquids, and gases</li> <li>Describes physical properties of metals</li> </ul>

	<b>RIT 211-220:</b> <ul style="list-style-type: none"> <li>Identifies the tools and units used to measure weight</li> <li>Makes inferences about the relative mass of objects based on data</li> <li>Recognizes that on a given planet, objects with the same weight will also have the same mass</li> <li>Recognizes that volume is measured in milliliters or liters</li> <li>Measures the volume of liquid in a graduated cylinder</li> <li>Understands that in the SI system, length is measured in meters, kilometers, centimeters</li> <li>Estimates length of common objects using metric units</li> <li>Recognizes that base unit for length in the SI system is the meter</li> <li>Predicts how changes in temperature will affect the density of an object</li> <li>Predicts how objects of differing density will behave when combined</li> <li>Explains that objects of differing density will layer when combined</li> <li>Defines melting point</li> <li>Defines boiling point</li> <li>Describes characteristics of physical change</li> <li>Describes characteristics of a chemical change</li> <li>Gives examples of chemical change</li> <li>Describes properties of solutions</li> <li>Describes properties of mixtures</li> <li>Gives examples of mixtures</li> <li>Understands that evaporation can be used to separate solutions</li> <li>Describes properties of gases</li> <li>Classifies unknown substances as liquids, based on their properties</li> <li>Recognizes properties of gases</li> <li>Describes the process of condensation</li> <li>Describes the process of freezing in terms of phase changes</li> <li>Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form</li> <li>Gives examples of substances which have undergone a change of state</li> <li>Describes how changes in temperature affect the pressure of a gas in a container where volume is held constant</li> <li>Describes the relative freedom of motion of particles in solids, liquids, and gases</li> <li>Explains that as heat is applied to a substance, the particles making up the substance move farther apart</li> <li>Recognizes that as heat is applied to a solid, its molecules move farther and farther apart</li> <li>Interprets diagrams showing the relative spacing and movement of matter in different phases</li> <li>Recognizes that elements do not break down under normal lab conditions</li> <li>Describes characteristics of elements</li> <li>Gives an example of an element</li> <li>Recognizes symbols for elements and compounds</li> <li>Understands the rules of scientific nomenclature of elements and compounds</li> </ul>
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## Science DesCartes: General Science – Physical Science

### Skills: Understand the Structure and Function of Matter and Molecules and their Interactions

	<ul style="list-style-type: none"> <li>• Determines the number of atoms in a compound when given its formula</li> <li>• Describes characteristics of compounds</li> </ul>
	<p><b>RIT 201-210:</b></p> <ul style="list-style-type: none"> <li>• Defines matter as anything that takes up space and has mass</li> <li>• Recognizes that a magnifier allows one to see details that are not otherwise visible</li> <li>• Compares objects in terms of mass</li> <li>• Determines the volume of an object using the displacement method</li> <li>• Estimates length of common objects using metric units</li> <li>• Compares objects in terms of density</li> <li>• Predicts how changes in temperature will affect the density of an object</li> <li>• Defines density</li> <li>• Recognizes that when one divides mass by volume, one is calculating density</li> <li>• Infers that an object is more dense than an object with the same volume, based on differences in mass (as measured by a double-pan balance)</li> <li>• Gives examples of changes in which new substances with new chemical properties are produced</li> <li>• Defines mixture</li> <li>• Names the three different states of matter</li> <li>• Describes how water exists in three states</li> <li>• Recognizes that water expands as it freezes</li> <li>• Describes the process of evaporation</li> <li>• Recognizes that evaporation changes a liquid to a gas</li> <li>• Gives examples of evaporation</li> <li>• Relates surface area to evaporation</li> <li>• Describes the process of evaporation in terms of the changes to the molecules involved</li> <li>• Describes the process of freezing</li> <li>• Describes applications of differential expansion of metals</li> <li>• Explains that heating or cooling materials can cause their state to change</li> <li>• Explains that matter can change from one physical state to another</li> <li>• Predicts, using real-life data, how changes in temperature will affect the volume of a gas</li> <li>• Explains that as heat is applied to a substance, the particles making up the substance increase their motion</li> <li>• Describes characteristics of elements</li> <li>• Identifies elements based on their physical characteristics</li> <li>• Recognizes symbols for elements and compounds</li> <li>• Determines the number of atoms in a compound when given its formula</li> </ul>
	<p><b>RIT 191-200:</b></p> <ul style="list-style-type: none"> <li>• Generalizes that all physical objects are made of matter</li> <li>• Infers that the more matter in an object, the greater the mass of that object</li> <li>• Determines the volume of an object using the displacement method</li> <li>• Recognizes that adding an object to a container of water will raise the water level within the container</li> </ul>

	<ul style="list-style-type: none"> <li>• Relates density to the ability to sink or float</li> <li>• Infers the mass of objects with identical volume, based on their buoyancy</li> <li>• Distinguishes between chemical and physical changes</li> <li>• Describes ways to separate mixtures</li> <li>• Names the three different states of matter</li> <li>• Describes basic properties of solids, liquids, and gases</li> <li>• Gives examples of solids</li> <li>• Classifies objects as solids, liquids, or gases</li> <li>• Recognizes that water can undergo changes in state (e.g., solid, liquid, gas)</li> <li>• Recognizes that ice is the solid form of water</li> <li>• Describes the process of evaporation</li> <li>• Describes the process of melting</li> <li>• Makes inferences about phase changes in matter</li> <li>• Gives examples of forms of matter which have undergone a change from liquid to solid form</li> <li>• Describes the shape of crystals</li> </ul>
	<p><b>RIT 181-190:</b></p> <ul style="list-style-type: none"> <li>• Recognizes that physical properties can be measured using tools</li> <li>• Identifies tools used to measure length</li> <li>• Recognizes that temperature is measured in degrees</li> <li>• Gives examples of gases</li> <li>• Classifies objects as liquids</li> <li>• Classifies objects as gases</li> <li>• Gives examples of water in each state of matter</li> <li>• Explains that the amount of water in an open container will decrease because it goes into the air, but the amount of water in a closed container will remain the same</li> <li>• Interprets data related to freezing</li> </ul>
	<p><b>RIT Below 181:</b></p> <ul style="list-style-type: none"> <li>• Sorts natural and manufactured materials by weight</li> <li>• Classifies objects as liquids</li> </ul>

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**Lesson Title:**

**Standard/Concept for All:**

**Introduction:** (Get Attention; Connect to Prior Knowledge)

**For Students Ready for a Challenge:**

Lesson/Activity:

Resources:

Means of Assessment:

**For Most Students:**

Lesson/Activity:

Resources:

Means of Assessment:

**For Students Needing Extra Support:**

Lesson/Activity:

Resources:

Means of Assessment:

**Closure/Summary for All:**