

Grade 2 Science

Content Review Notes for Parents and Students

1st Nine Weeks
2017-2018



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**Grade 2 Science Content Review Notes
for Parents and Students
First Nine Weeks
2017– 2018**

This resource is intended to be a guide for parents and students to improve content knowledge and understanding. The information below is detailed information about the Standards of Learning taught during the 1st grading period and comes from the Science Standards of Learning Curriculum Framework, Grade 2 issued by the Virginia Department of Education. The Curriculum Framework may be found in its entirety at the following website.

http://www.doe.virginia.gov/testing/sol/standards_docs/science/2010/curriculum_framework/science2.pdf

Standard 2.1

The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

- a) observations and predictions are made and questions are formed;
- b) observations are differentiated from personal interpretation;
- c) observations are repeated to ensure accuracy;
- d) two or more characteristics or properties are used to classify items;
- e) length, volume, mass, and temperature are measured in metric units and standard English units using the proper tools;
- f) time is measured using the proper tools;
- g) conditions that influence a change are identified and inferences are made;
- h) data are collected and recorded, and bar graphs are constructed using numbered axes;
- i) data are analyzed, and unexpected or unusual quantitative data are recognized;
- j) conclusions are drawn;
- k) observations and data are communicated;
- l) simple physical models are designed and constructed to clarify explanations and show relationships; and
- m) current applications are used to reinforce science concepts.

Overview

Standard 2.1 is intended to develop investigative and inquiry skills and the understanding of the nature of science for all of the other second-grade standards. Standard 2.1 requires students to continue developing a range of inquiry skills and

achieve proficiency with those skills, and develop and reinforce their understanding of the nature of science in the context of the concepts developed in second grade.

- The nature of science refers to the foundational concepts that govern the way scientists formulate explanations about the natural world. The nature of science includes the following concepts:
 - a) the natural world is understandable;
 - b) science is based on evidence, both observational and experimental;
 - c) science is a blend of logic and innovation;
 - d) scientific ideas are durable yet subject to change as new data are collected;
 - e) science is a complex social endeavor; and
 - f) scientists try to remain objective and engage in peer review to help avoid bias.

- Science assumes that the natural world is understandable. Scientific inquiry can provide explanations about nature. This expands students' thinking from just a knowledge of facts to understanding how facts are relevant to everyday life.

- Science demands evidence. Scientists develop their ideas based on evidence and they change their ideas when new evidence becomes available or the old evidence is viewed in a different way.

- Science is a complex social endeavor. It is a complex social process for producing knowledge about the natural world. Scientific knowledge represents the current consensus as to what is the best explanation for phenomena in the natural world. This consensus does not arise automatically, since scientists with different backgrounds from all over the world may interpret the same data differently. To build a consensus, scientists communicate their findings to other scientists and attempt to replicate one another's findings. In order to model the work of professional scientists, it is essential for second-grade students to engage in frequent discussions with peers about their understanding of their investigations.

- In order to communicate accurately, it is necessary to provide a clear description of exactly what is observed. There is a difference between what one can observe and what can be interpreted from an observation.

- An observation is what you actually see, feel, taste, hear, or smell.

- The more times an observation is repeated, the greater the chance of ensuring the accuracy of the observation.

- It is easier to see how things are related if objects are classified according to their common characteristics.

- By constructing and studying simple models, it is sometimes easier to understand how real things work.

- Scientific investigations require standard measures, proper tools (e.g., balance,

thermometer, ruler, magnifying glasses), and organized collection and reporting of data. The way the data are displayed can make it easier to interpret important information.

- When using any standard measurement scale, measure to the marked increment and estimate one more decimal place. Scientists do not round their measurements as this would be inaccurate.
- Students should communicate observations and data publicly.

Standard 2.2

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

- a) magnetism, iron, magnetic/non-magnetic, poles, attract/repel; and
- b) important applications of magnetism.

Overview

This standard continues the focus on magnets. In K.3 students investigate and learn that magnets can be used to make some things move without touching them by either attracting them or repelling them. In 2.2, the study of magnets is expanded as students investigate and understand that magnets can be artificial or natural and have certain characteristics.

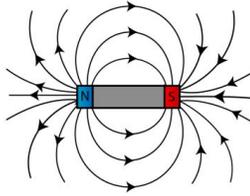
- Magnets have a north and a south pole.



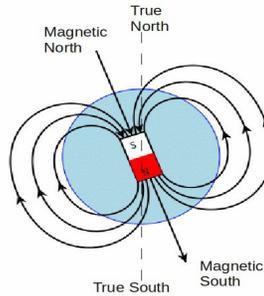
- Unlike magnetic poles attract and like poles repel. The north pole of one magnet attracts the south pole of a second magnet, while the north pole of one magnet repels the other magnet's north pole.



- A magnet creates an invisible area of magnetism all around it called a magnetic field.



- The north end of a magnetic compass always points roughly toward Earth's North Pole and the south end of the compass needle always points toward Earth's South Pole. That is because Earth itself contains magnetic materials and behaves like a gigantic magnet.



- When a magnetized metal, such as a compass needle, is allowed to swing freely, it displays the interesting property of aligning with Earth's magnetic fields.



- A magnet is strongest at its poles.
- The farther away the magnetic poles are from each other, the weaker the magnetic force.
- If you cut a bar magnet in half, you get two new, smaller magnets, each with its own north and south pole.



- Magnets can attract objects made of iron, nickel, or cobalt.

- Magnets can be artificially made from special metals or can occur naturally. Naturally occurring magnets are composed of a mineral called magnetite or lodestone.



- Magnets have important applications and uses in everyday life
 1. refrigerator magnets and chalkboard letters
 2. toys
 3. door latches
 4. paper clip holders
 5. computers
 6. motors
 7. credit card magnetic strips.

Released Practice Items
Virginia Standards of Learning Science Test

Follow this link to find released tests:

http://www.doe.virginia.gov/testing/sol/released_tests/index.shtml

Note: The answers are shaded in gray.

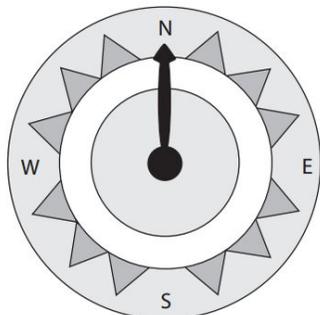


Which of these is the BEST title for the picture?

- A How Magnets Attract
- B Using the Sense of Touch
- C How to Measure Distance
- D Using a Magnetic Compass

While a sailor was out fishing, he got lost at sea. Which object would help him direct the boat back to shore?

- A Rope
- B Magnetic compass
- C Blanket
- D Measuring tape



What makes the needle on the compass in the picture point north?

- A Rainfall
- B Evaporation
- C Wind currents
- D Magnetism

Which picture shows the way that two magnets will attract?

- A
- B
- C
- D

Standard 2.3

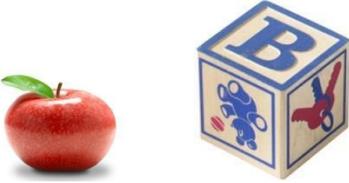
The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include

- identification of distinguishing characteristics of solids, liquids, and gases;
- measurement of the mass and volume of solids and liquids; and
- changes in phases of matter with the addition or removal of energy.

Overview

This standard continues to focus on matter. In K.4 physical properties of matter are investigated and the properties of water are observed and tested. In 1.3 students investigate how common materials interact with water. In 2.3 students investigate, by conducting simple experiments, the properties of solids, liquids, and gases.

- All substances are made of matter.
- Matter is anything that has mass and takes up space.
- Matter most commonly occurs in three phases: solids, liquids, and gases.

Solid	Liquid	Gas
<p>Solids have a definite shape and volume.</p> <p>It does not take the shape of its container.</p> <p>It has a definite shape.</p>	<p>Liquids have a definite volume.</p> <p>Takes the shape of the container.</p> <p>It moves</p>	<p>Gas does not have a shape.</p> <p>Takes the shape of the container. It will completely fill any closed container.</p> <p>It assumes the volume of its container.</p> <p>Example: Helium gas put into a balloon takes the shape of the balloon because the balloon defines its shape.</p>
		

- Mass is a measure of the amount of matter.
- Weight is the measure of the gravitational pull on an object.
- Volume is the measure of the amount of space occupied by matter.
- Matter most commonly occurs in three phases: solids, liquids, and gases.
- Matter can change from one phase to another.

Changes of Phases		Temperature	Process
Solid 	 To	Liquid 	Hot Melting 
Liquid 	 To	Solid 	Cold Freezing 
Gas 	 To	Liquid 	Cool Condensation 
Liquid 	 To	Gas 	Hot Evaporation 

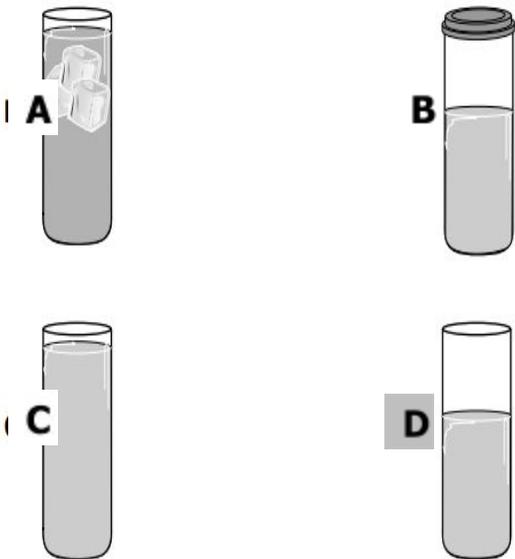
- **Condensation:** Gas changes into a Liquid. When gas is cooled in the air, the gas is changed into a liquid.
- **Evaporation:** Liquid changes into a Gas. Liquid is heated and rises into the air as a gas.
- **Melting:** Solid changes to a liquid. When solids are heated they become liquids.
- **Freezing:** Liquid changes to a Solid. When liquids are cooled they become solids.
- When matter changes from one phase to another, these changes are referred to as physical changes.
- Changes from solid to liquid to gas require the addition of energy.

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<p>Which of these glasses will MOST likely become empty first because of evaporation?</p>  <p>A B C D</p>	<p>Which of these describes water in a solid state?</p> <p>A Vapor rising in the sky B Hail during a storm C Waves crashing on the seashore D Rain falling from the clouds</p>
<p>A puddle of water on a concrete driveway will disappear after a few hours during a sunny day. Where does the water go as it disappears?</p> <p>A It goes into the air. B Animals drink it. C It soaks into the concrete. D It becomes a different substance.</p>	<p>Ice cubes are an example of which form of water?</p> <p>A Gas B Liquid C Solid D Natural</p>

<p>2.1</p> <p>hypothesis</p>	<p>A hypothesis is a statement written in a manner that describes the cause and effect relationship between the independent and dependent variables in an experiment.</p>
<p>2.1, 3.1</p> <p>predictions</p>	<p>Predictions are statements of what is expected to happen in the future based on past experiences and observations.</p>
<p>2.1, 3.1</p> <p>conclusion</p>	<p>A conclusion is a summary statement based on the results of an investigation.</p>
<p>2.1</p> <p>volume</p>	<p>Volume is the amount a container can hold; the amount of space occupied by an object.</p>
<p>2.1, 3.1</p> <p>length</p>	<p>Length is the distance between two points.</p>
<p>2.1</p> <p>mass</p>	<p>Mass is the amount of matter an object has.</p>
<p>2.1</p> <p>gram</p>	<p>A gram is a metric unit of mass equal to 1 thousandth of a kilogram.</p>
<p>2.1</p> <p>temperature</p>	<p>Temperature is the measure of the amount of thermal energy in the atmosphere.</p>
<p>2.1</p> <p>Celsius</p>	<p>Celsius is the metric unit for measuring temperature; on this scale water freezes at 0 ° and boils at 100°.</p>

<p>time</p> <p>2.1</p>	<p>Time is a number representing a specific point in hours, minutes, and seconds.</p>
<p>minute</p> <p>2.1</p>	<p>A minute is a unit of time equal to 1 sixtieth of an hour; 60 seconds.</p>
<p>magnet</p> <p>2.2</p>	<p>A magnet is any piece of iron, steel, or lodestone that has the properties of attracting iron or steel.</p>
<p>magnetic compass</p> <p>2.2</p>	<p>A magnetic compass is a compass having a magnetized needle generally in line with the magnetic poles of the earth.</p>
<p>attract</p> <p>2.2</p>	<p>Attract means to pull together</p>
<p>repel</p> <p>2.2</p>	<p>Repel means to push apart</p>
<p>natural magnets</p> <p>2.2</p>	<p>Natural magnets are composed of a mineral called <u>magnetite (lodestone)</u>.</p>
<p>artificial magnets</p> <p>2.2</p>	<p>Artificial magnets are manmade magnets.</p>
<p>iron, nickel, cobalt</p> <p>2.2</p>	<p>Iron, nickel, and cobalt are examples of magnetic metals.</p>

2.3	matter	Matter is anything that has mass and takes up space.
2.3	liquid	Liquid has a definite volume and takes the shape of the container.
2.3	solid	A solid has a defined shape and volume.
2.3	gas	A gas will completely fill any closed container (take the shape of its container) and assume the volume of its container. (e.g., Helium gas put into a balloon takes the shape of the balloon because the balloon. defines its shape.)
2.3	condensation	Condensation will happen when a gas changes back into a liquid form of matter
2.3	evaporation	Evaporation happens when a liquid changes into a gas.
2.3	melting	Melting is a process when a solid is turned into a liquid.
2.3	freezing	Freezing is a process when a liquid is turned into a solid.