

Science Review Notes for **Parents and Students**




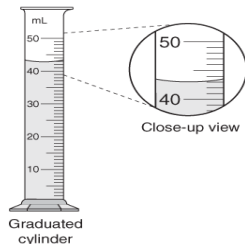


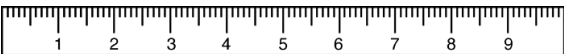
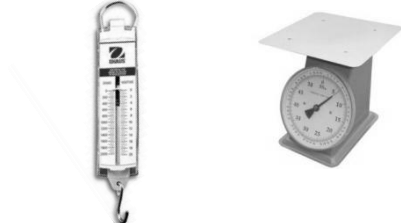
Grade 8 Physical Science 1st Nine Weeks 2013-2014

This resource is intended to be a guide for parents and students to improve content knowledge and understanding in preparation for the cumulative Grade 8 Science Standards of Learning test. The information below is detailed information about the Standards of Learning taught in grade 8 physical science and comes from the *Science Standards of Learning Curriculum Frameworks*, issued by the Virginia Department of Education. The Curriculum Framework in its entirety can be found at the following website.

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

- PS.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
- chemicals and equipment are used safely;
 - length, mass, volume, density, temperature, weight, and force are accurately measured;
 - conversions are made among metric units, applying appropriate prefixes;
 - triple beam and electronic balances, thermometers, metric rulers, graduated cylinders, probeware, and spring scales are used to gather data;
 - numbers are expressed in scientific notation where appropriate;
 - independent and dependent variables, constants, controls, and repeated trials are identified;
 - data tables showing the independent and dependent variables, derived quantities, and the number of trials are constructed and interpreted;
 - data tables for descriptive statistics showing specific measures of central tendency, the range of the data set, and the number of repeated trials are constructed and interpreted;
 - frequency distributions, scatterplots, line plots, and histograms are constructed and interpreted;
 - valid conclusions are made after analyzing data;
 - research methods are used to investigate practical problems and questions;
 - experimental results are presented in appropriate written form;
 - models and simulations are constructed and used to illustrate and explain phenomena; and
 - current applications of physical science concepts are used.
- PS.2 The student will investigate and understand the nature of matter. Key concepts include
- the particle theory of matter;
 - elements, compounds, mixtures, acids, bases, and salts;
 - solids, liquids, and gases;
 - physical properties;
 - chemical properties; and
 - characteristics of types of matter based on physical and chemical properties.
- Systematic investigations require standard measures and consistent and reliable tools. International System of Units (SI or metric) measures, recognized around the world, are a standard way to make measurements.

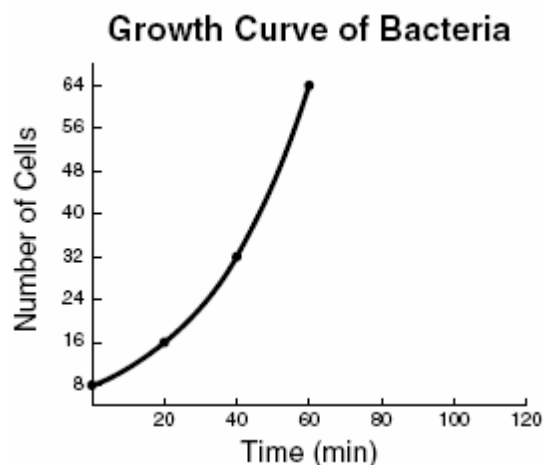
When I measure...	I will use...	The units used are...	The instrument looks like...
Mass	Triple Beam Balance	Milligrams Grams Kilograms	

Volume	Graduated Cylinder	Milliliters Liters	 <p>Graduated cylinder</p>
Temperature	Thermometer	Degrees Celsius Kelvin	
Volume	Beaker	Milliliters Liters	
Length	Metric Ruler	Millimeters Centimeters Meter Kilometers	
Force/Weight	Spring Scale	Newtons	

Systematic investigations require organized reporting of data. The way the data are displayed can make it easier to see important patterns, trends, and relationships. Frequency distributions, scatterplots, line plots, and histograms are powerful tools for displaying and interpreting data.

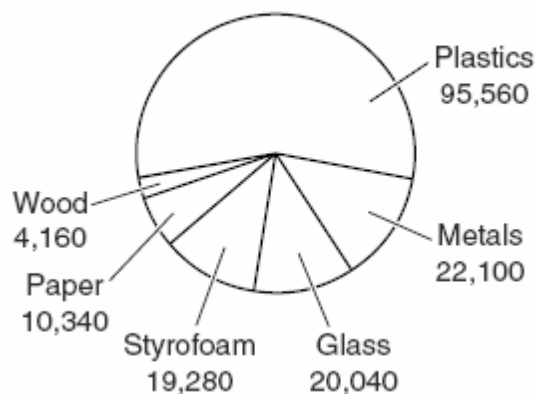
Data Tables

A **line graph** shows data that changes continuously; such as temperature and time



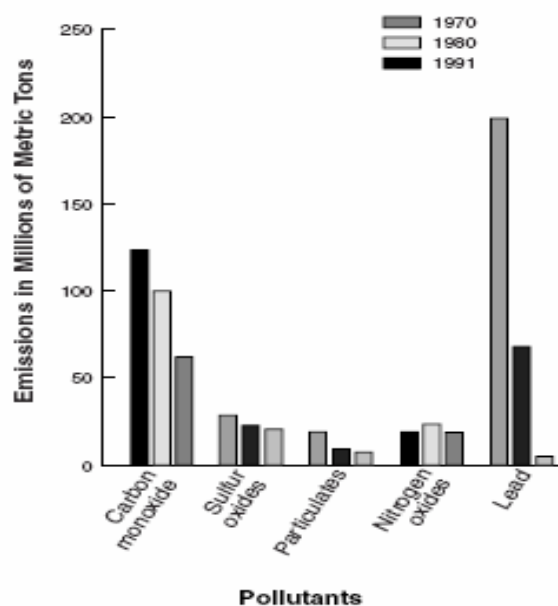
A **circle or pie graph** shows parts of a whole; percentages.

Items Collected in a Beach Cleanup

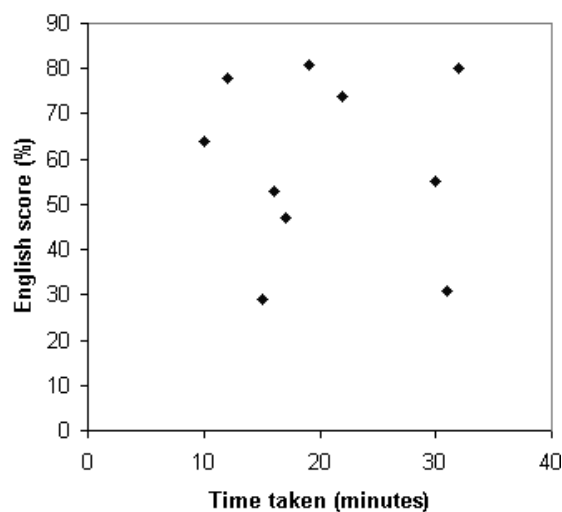


A **bar graph** compares data; trends

Emissions of Air Pollutants, 1970 - 1991



A **scattergram** is a graph in which two sets of data are plotted in pairs.



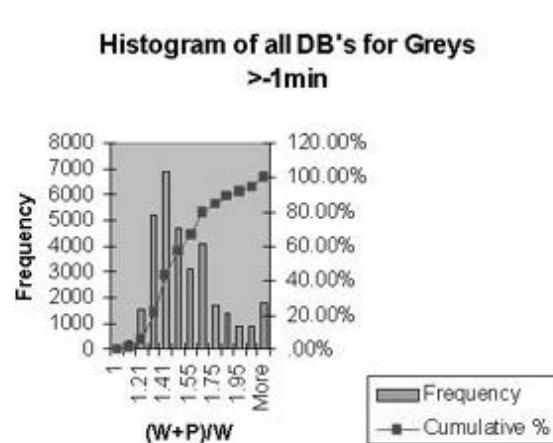
A **frequency distribution** table shows how often each value occurred.

Frequency Distribution				
10/4/04				
Score	Frequency	Cum Frequency	Percentile	Percentile Rank
40	1	20	90.91	97.50
35	1	19	79.55	92.50
34	3	18	77.27	82.50
31	1	15	70.45	72.50
29	2	14	65.91	65.00
28	1	12	63.64	57.50
27	2	11	61.36	50.00
26	2	9	59.09	40.00
24	3	7	54.55	27.50
23	1	4	52.27	17.50
22	2	3	50.00	10.00
17	1	1	38.64	2.50

A **histogram** is a bar graph that shows the frequency of data within specific intervals.

Greyhound Racing

0	0	Frequency	Cumulative %
1	1	0	.00%
1.1	1.1	340	1.04%
1.21	1.21	1592	5.93%
1.31	1.31	5203	21.88%
1.41	1.41	6871	42.96%
1.49	1.49	4692	57.35%
1.55	1.55	3128	66.94%
1.67	1.67	4087	79.48%
1.75	1.75	1713	84.73%
1.85	1.85	1405	89.04%
1.95	1.95	869	91.71%
2.05	2.05	891	94.44%
More		1812	100.00%



- Investigation not only involves the careful application of systematic (scientific) methodology, but also includes the review and analysis of prior research related to the topic. Numerous sources of information are available from print and electronic sources, and the researcher needs to judge the authority and credibility of the sources.
- To communicate the plan of an experiment accurately, the independent variable, dependent variable, and constants must be explicitly defined.
 - The **independent variable (IV)** is the factor that is manipulated or changed.
 - The **dependent variable (DV)** is the factor that is a measured response to the change.
 - The **constants** are the factors that remain the same for each testing group.
 - The **control** is a non-tested group used for comparison with the tested group.
 - The **derived quantity (DQ)** is the mean of the trials for each level of change.

- The number of repeated trials needs to be considered in the context of the investigation. Often “controls” are used to establish a standard for comparing the results of manipulating the independent variable. Controls receive no experimental treatment. Not all experiments have a control, however.

	1 tsp of glycerin	2 tsp of glycerin	3 tsp of glycerin
Trial 1	5 mm	10 mm	10 mm
2	10 mm	25 mm	5 mm
3	10 mm	20 mm	5 mm
DQ	8.3 mm	18.3 mm	6.6 mm

IV: Amount of glycerin

DV: Diameter of the bubble (millimeters)

Constants: Original soap solution (2 parts water to 1 part Joy)

Amount of soap solution

Wands

Control: Original soap solution (no glycerin added)

- The analysis of data from a systematic investigation may provide the researcher with a basis to reach a reasonable conclusion. Conclusions should not go beyond the evidence that supports them.
- Additional scientific research may yield new information that affects previous conclusions.
- When concluding your scientific investigation lab report you will need to develop three paragraphs that will explain what happened in your lab investigation:
- A **conclusion** is a direct interpretation of the data. It should generally analyze the cause-and-effect relationship between the independent and dependent variables established in the hypothesis.

CONCLUSION: Analyze the results and draw conclusions by:

 - Describing the results and explaining what they mean.
 - Describing major findings and site reasons for major findings.
 - Describing how the data supported or did not support your hypothesis.
 - Making recommendations for improving the experiment and what needs to be investigated further.
- Different kinds of problems and questions require differing approaches and research. Scientific methodology almost always begins with a question, is based on observation and evidence, and requires logic and reasoning. Not all systematic investigations are experimental.
- The type of data and the way it is collected depend on the kind of question being studied. The two broad categories are **field research** (usually done in nature) and **experimental research** (usually done in a lab).
- It is important to communicate systematically the design and results of an investigation so that questions, procedures, tools, results, and conclusions can be understood and replicated.

The Scientific Method

1. Identify the problem by asking a question.
2. Form a hypothesis.
3. Perform an investigation/experiment to test your hypothesis. (Repeat 3 times).
4. Analyze the data gained from your investigation/experiment.
5. Draw your conclusion.

- Some useful applications of physical science concepts are in the area of materials science (e.g., metals, ceramics, and semiconductors).
- Nanotechnology is the study of materials at the molecular (atomic) scale. Items at this scale are so small they are no longer visible with the naked eye. Nanotechnology has shown that the behavior and properties of some substances at the nanoscale (a nanometer is one-billionth of a meter) contradict how they behave and what their properties are at the visible scale.
- New discoveries based on nanoscience investigations have allowed the production of superior new materials with improved properties (e.g., computers, cell phones).









NANOSCIENCE DISCOVERIES

*Released Test Items from the Virginia Standards of Learning,
Grade 8 Physical Science Test
Answers are located on the last page of the booklet.*

PS.1. Scientific Investigation

5

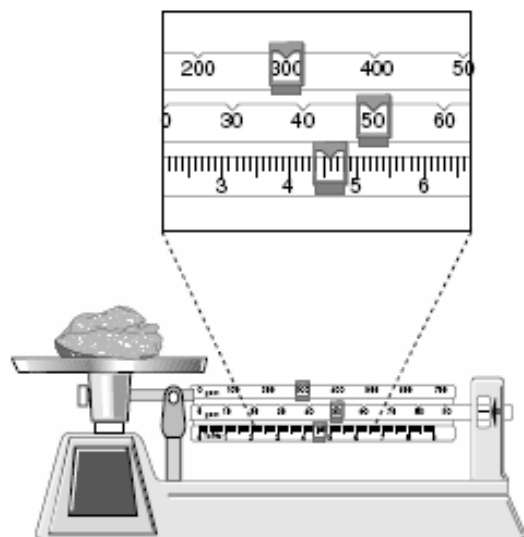
Red	Green	Yellow
		
		
Trial 1	Trial 2	Trial 3

This experiment was set up to test the hypothesis that plants grow faster in green light. What is the independent variable in this experiment?

A Type of plant
 B Amount of water
 C Color of light
 D Size of pot

PS.1, Scientific Investigation

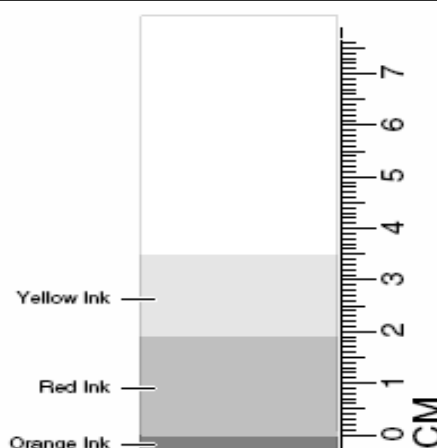
2



What is the mass of the rock?

- F 335.6 g
- G 350.6 g
- H 354.6 g
- J 356.0 g

13

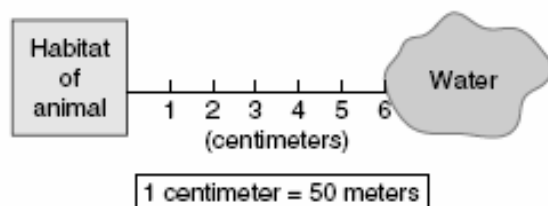


The picture shows the results of putting a drop of orange ink from a marking pen on a piece of filter paper and allowing the colors in the ink to separate. About how much farther on the filter paper has the yellow pigment moved than the red pigment?

- A 0.5 cm
- B 1.6 cm
- C 2.7 cm
- D 3.5 cm

Note that due to varying printer properties, measurement items may not appear in exact proportions.

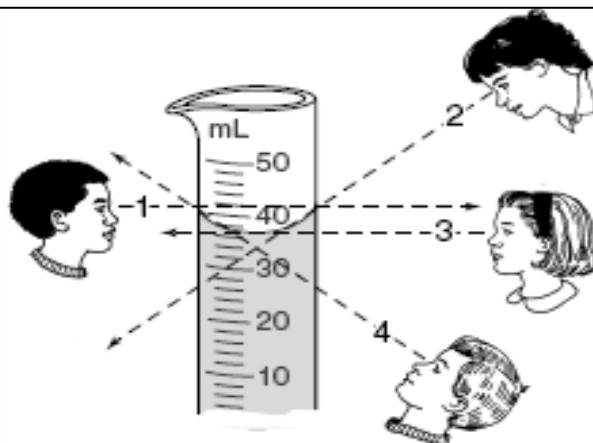
43



The picture above illustrates the habitat of a population of animals and its distance from the nearest water source. How far does an animal have to travel to obtain water?

- A 6 centimeters
- B 12 meters
- C 50 meters
- D 300 meters

4



The diagram shows a graduated cylinder containing water. From which position will the most accurate measure of the volume of the water be made?

- F Position 1
- G Position 2
- H Position 3
- J Position 4

PS.1, Scientific Investigation

5

Rubber Band Data

Rubber Band	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
A	3.7 cm	3.9 cm	3.7 cm	3.4 cm	3.6 cm
B	2.5 cm	2.7 cm	2.8 cm	2.7 cm	2.7 cm

A lab group measured how far two rubber bands stretched when attached to 100-gram masses. Five measurements were made for each rubber band. What is the range of the data collected for rubber band B?

- A** 0.3 cm
- B** 0.5 cm
- C** 2.7 cm
- D** 2.8 cm

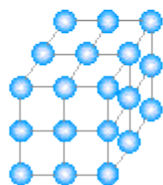
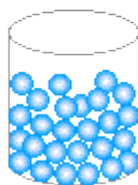
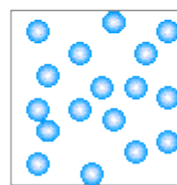
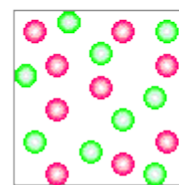
- PS.2 The student will investigate and understand the nature of matter. Key concepts include
- a) the particle theory of matter;
 - b) elements, compounds, mixtures, acids, bases, and salts;
 - c) solids, liquids, and gases;
 - d) physical properties;
 - e) chemical properties; and
 - f) characteristics of types of matter based on physical and chemical properties.

The critical scientific concepts developed in this standard include the following:

- Matter is anything that has mass and occupies space. All matter is made up of small particles called atoms. Matter can exist as a solid, a liquid, a gas, or plasma.

According to the **particle theory of matter**, the phase of matter is determined by its particles and motion of particles.

States of Matter

**SOLID****LIQUID****GAS****PLASMA**

Characteristics of Solids, Liquids, Gases and Plasma			
solids	liquids	gases	plasma
<ul style="list-style-type: none"> • retain a fixed volume and shape 	<ul style="list-style-type: none"> • have a fixed volume • take the shape of the container it is in 	<ul style="list-style-type: none"> • take the shape and volume of the container it is in 	<ul style="list-style-type: none"> • no fixed shape • no fixed volume
<ul style="list-style-type: none"> • are not easily compressible • have little free space between particles 	<ul style="list-style-type: none"> • are not easily compressible • have little free space between particles 	<ul style="list-style-type: none"> • are compressible • have lots of free space between particles 	<ul style="list-style-type: none"> • is compressible • particles are broken apart
<ul style="list-style-type: none"> • do not flow easily • have particles that cannot move/slide past one another 	<ul style="list-style-type: none"> • flow easily • have particles that can move/slide past one another 	<ul style="list-style-type: none"> • flow easily • have particles that can move/slide past one another 	<ul style="list-style-type: none"> • particles flow easily • stars/sun • extremely high temperatures

- Matter can be classified as elements, compounds, and mixtures. The atoms of any element are alike but are different from atoms of other elements. Compounds consist of two or more elements that are chemically combined in a fixed ratio. Mixtures also consist of two or more substances, but the substances are not chemically combined.

Elements are classified as metals, metalloids, and nonmetals.

METALS	METALLOIDS	NONMETALS
Conduct electricity and heat well	Semiconductors	Poor conductors of electricity and heat
Malleable	Somewhat malleable and ductile	Brittle
Ductile	Can be lustrous or dull	Dull
Most are solids at room temperature		
Lustrous		

- Compounds can be classified in several ways, including:
 - acids, bases, salts
 - inorganic and organic compounds.

Compounds can be classified in several ways, including acids, bases, salts

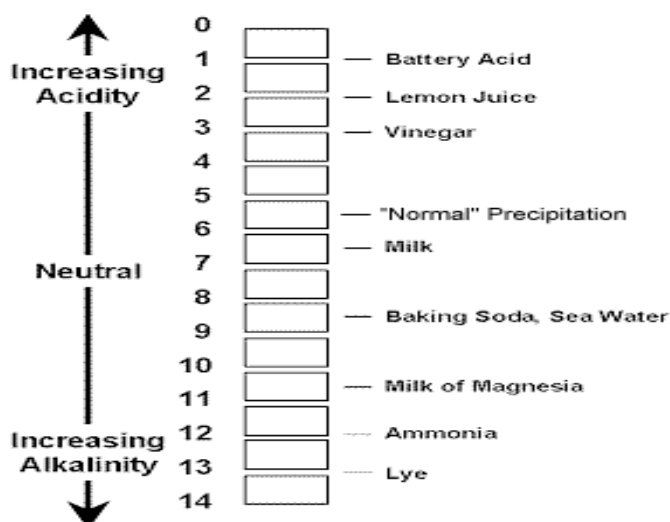
ACIDS	BASES
• Taste sour	• Taste bitter
• Produce a burning or itchy feeling on skin	• Feel slippery to the touch
• Are corrosive	• Are corrosive
• Dangerous chemicals	• Dangerous chemicals
• Produce hydrogen ions in water	• Produce hydroxide ions in water
• Examples: vinegar and lemon juice	• Examples: soap and ammonia
• When testing for acids, acids turn blue litmus paper pink.	• When testing for bases, base turn red litmus paper blue
• Acids have a pH of 1, 2, 3, 4, 5, or 6	• Bases have a pH of 8, 9, 10, 11, 12, 13, 14
• The lower the pH number the stronger the acid (pH 1, pH 2, pH 3)	• The higher the pH number the stronger the base (pH 12, pH 13, pH 14)
• The closer the pH number is to 7, the weaker the acid	• The closer the pH number is to 7, the weaker the base

Salts are formed by chemically combining an acid and a base. Salts are a neutral substance having a pH of 7.

- inorganic and organic compounds.

Organic compounds contain carbon and inorganic compounds do not.

- Acids make up an important group of compounds that contain hydrogen ions. When acids dissolve in water, hydrogen ions (H^+) are released into the resulting solution. A base is a substance that releases hydroxide ions (OH^-) into solution. pH is a measure of the hydrogen ion concentration in a solution. The pH scale ranges from 0–14. Solutions with a pH lower than 7 are acidic; solutions with a pH greater than 7 are basic. A pH of 7 is neutral. When an acid reacts with a base, a salt is formed, along with water.

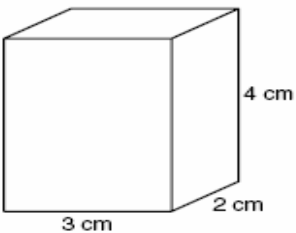


- Matter can be described by its physical properties, which include shape, density, solubility, odor, melting point, boiling point, and color. Some physical properties, such as density, boiling point, and solubility, are characteristic of a specific substance and do not depend on the size of the sample. Characteristic properties can be used to identify unknown substances.
- Equal volumes of different substances usually have different masses.
- Matter can also be described by its chemical properties, which include acidity, basicity, combustibility, and reactivity. A chemical property indicates whether a substance can undergo a chemical change.

Physical Changes	Chemical Changes
Aluminum foil is cut in half.	Milk goes sour.
Clay is molded into a new shape.	Jewelry tarnishes.
Butter melts on warm toast.	Bread becomes toast.
Water evaporates from the surface of the ocean.	Rust forms on a nail left outside.
A juice box in the freezer freezes.	Gasoline is ignited.
Rubbing alcohol evaporates on your hand.	Hydrogen peroxide bubbles in a cut.
	Food scraps are turned into compost in a compost pile.
	A match is lit.
	You take an antacid to settle your stomach.
	Your body digests food.
	You fry an egg.

PS.2. Basic Nature of Matter

13 Density = $\frac{\text{mass}}{\text{volume}}$
Mass = 12 g



The density of this box is —

A 0.5 g/cm³
B 1.0 g/cm³
C 1.5 g/cm³
D 2.0 g/cm³

15 Which property is required of a liquid in order for it to be a good fuel?

- A Its acidity
B Its combustibility
C Its density
D Its boiling point

29 Compounds are made up of more than one element. Which of the following represents a compound?

- A H₂
B NH₃
C O₃
D N₂

38 Which of these would be different for an object if measured on the Earth and on the moon?

- F Mass
- G Weight
- H Volume
- J Density

40 A solution may be prepared by dissolving crystals of a salt in water. Which of the following would probably *not* affect the rate of solubility?

- F Reducing the air pressure on the solution
- G Grinding the crystals to make them smaller
- H Stirring the water after adding the crystals
- J Increasing the temperature of the water

39 Which of the following materials is composed of only one kind of atom?

- A Water
- B Helium
- C Air
- D Sugar

42 Which of these *best* shows that calcium is different from all other elements?

- F Its positive electrical charge
- G Its presence in milk
- H Its number of protons
- J Its ability to combine with oxygen

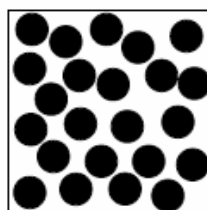
19 Which of these *cannot* be separated into its parts by an ordinary chemical or physical process?

- A A mixture of salts (NaCl, KI)
- B A compound of nitrogen (NH_3)
- C An atom of carbon (C)
- D An acid of chlorine (HCl)

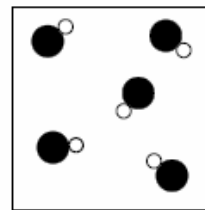
20 A student determined the mass and volume of a gold ring. What physical property of the gold can be determined using these two measurements?

- F Its reactivity
- G Its expansion rate
- H Its density
- J Its melting point

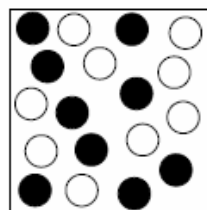
21 Which of these *best* shows particles in a mixture?



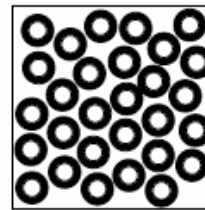
A



C



B



D

37 A compound is a molecule made up of atoms from at least two elements. Which of the following gases is a compound?

- A Ozone (O_3)
- B Oxygen (O_2)
- C Methane (CH_4)
- D Nitrogen (N_2)

PS.2, Basic Nature of Matter

17 Several centuries ago, men called alchemists tried to transform common metals into gold. Even though they tried many different chemical and physical methods, they never succeeded because —

- A they could not heat common metals to extremely high temperatures
- B the common metals they worked with were not pure
- C they did not add the correct material to the common metal
- D elements cannot be changed to other elements by physical or chemical means

27 Which of the following is a physical property of copper?

- A Ductile, can be drawn into a wire
- B Liquid at room temperature
- C Readily reacts with water to form an acid
- D Readily reacts with oxygen

23 Which of these is best classified as a mixture?

- A Carbon dioxide
- B Water
- C Soil
- D Iron

46 The density of an object is dependent upon the object's mass and —

- F height
- G area
- H volume
- J weight

16 When a base is mixed with an acidic solution, neutralization occurs because the —

- F base reaches absolute zero
- G acid evaporates
- H base chemically reacts with the acid
- J mass of the solution increases

24 Because zinc can combine with other substances but cannot be changed into a simpler substance by an ordinary chemical process, zinc is classified as —

- F a compound
- G a mixture
- H an element
- J an acid

PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include

- a) physical changes;
- b) chemical changes; and
- c) nuclear reactions.

The critical scientific concepts developed in this standard include the following:

- Matter can undergo physical and chemical changes. In physical changes, the chemical composition of the substances does not change. In chemical changes, different substances are formed. Chemical changes are often affected by the surface area/volume ratio of the materials involved in the change.

Physical Changes	
<ul style="list-style-type: none"> are changes in shape, size, and phase that do not change the identity of a material or create a new substance 	<u>Examples:</u> <ul style="list-style-type: none"> Shattering glass (a change in size and shape) Water changing from a liquid to a solid (a change in phase)
<ul style="list-style-type: none"> involve physical properties 	
<ul style="list-style-type: none"> most can be easily reversed 	<u>Examples:</u> <ul style="list-style-type: none"> water (a liquid) changes to ice (a solid) by freezing ice (a solid) can be changed back to water (a liquid) by melting
<ul style="list-style-type: none"> beginning and ending material is the same 	
<ul style="list-style-type: none"> are affected by temperature 	<u>Examples:</u> <ul style="list-style-type: none"> An increase in temperature causes materials to expand A decrease in temperature causes materials to contract
<ul style="list-style-type: none"> can combine one substance with another substance without creating a new substance 	
<ul style="list-style-type: none"> materials/substances can be separated physically 	<u>Example:</u> <ul style="list-style-type: none"> Sugar can be dissolved in tea. (If left in a cup, over time the tea would evaporate leaving sugar crystals in the cup.) Raisins and bananas can be combined in a bowl. (The raisins and bananas can be separated by sorting.)

- The Law of Conservation of Matter (Mass) states that regardless of how substances within a closed system are changed, the total mass remains the same. The Law of Conservation of Energy states that energy cannot be created or destroyed but only changed from one form to another.

PS.5a, Physical Changes

50 Tearing paper is an example of a —

- F** physical change
- G** chemical change
- H** chemical reaction
- J** solution

31 If you break a piece of glass, the shape of the glass changes, but the properties in the fragments remain the same. Which of the following has occurred?

- A** A chemical change
- B** A temperature change
- C** A phase change
- D** A physical change

8 Which process is a physical change?

- F** Rusting iron
- G** Burning coal
- H** Tarnishing silver
- J** Melting ice

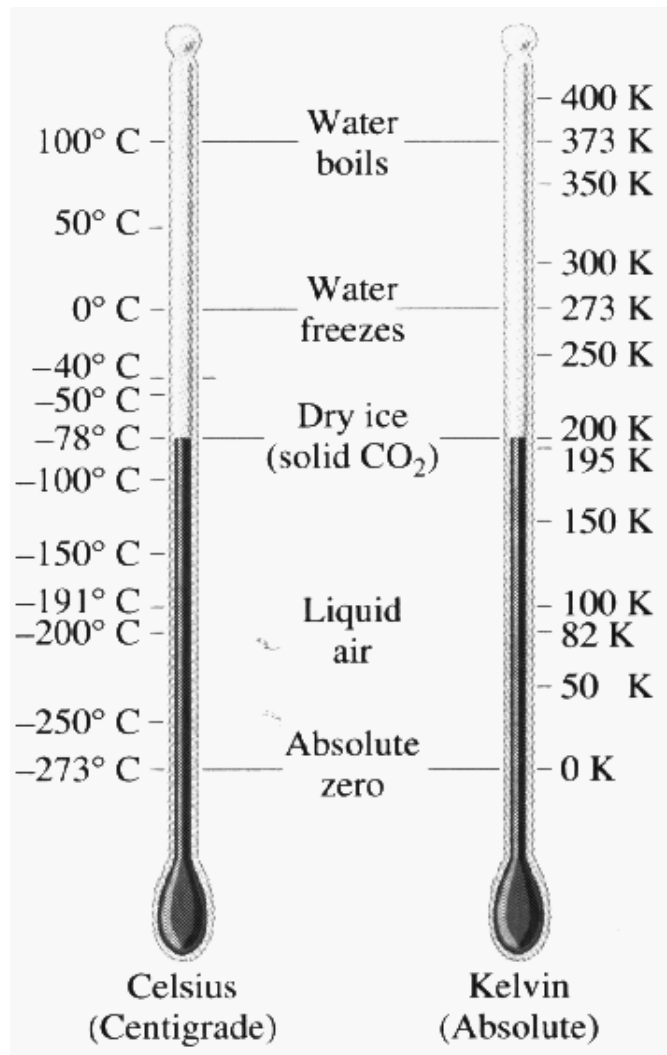
PS.7 The student will investigate and understand temperature scales, heat, and thermal energy transfer. Key concepts include

- a) Celsius and Kelvin temperature scales and absolute zero;
- b) phase change, freezing point, melting point, boiling point, vaporization, and condensation;
- c) conduction, convection, and radiation; and
- d) applications of thermal energy transfer.

The critical scientific concepts developed in this standard include the following:

- Heat and temperature are not the same thing. Heat is the transfer of thermal energy between substances of different temperature. As thermal energy is added, the temperature of a substance increases.

- Temperature is a measure of the average kinetic energy of the molecules of a substance. Increased temperature means greater average kinetic energy of the molecules in the substance being measured, and most substances expand when heated. The temperature of absolute zero ($-273^{\circ}\text{C}/0\text{ K}$) is the theoretical point at which molecular motion stops.

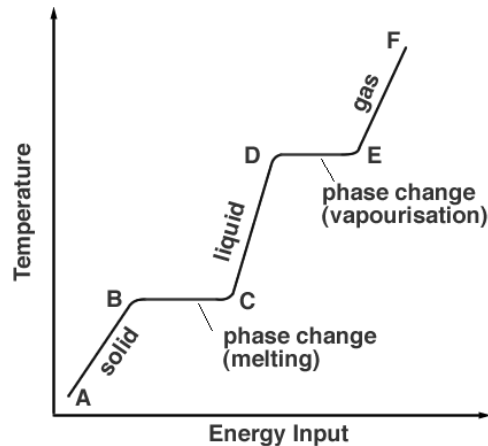


- Atoms and molecules are perpetually in motion.
- The transfer of thermal energy occurs in three ways: by conduction, by convection, and by radiation.

CONDUCTION	CONVECTION	RADIATION
Heat is transferred from one particle of matter to another by direct contact.	Heat is transferred through a liquid or gas by the movement of particles of matter as currents.	Heat is transferred through matter and space as electromagnetic waves.
Particles resonate and collide with one another transferring heat.	Particles spread apart and rise.	
<u>Example:</u> A spoon placed a hot bowl of soup	<u>Example:</u> Boiling water in a pot or heating and cooling systems	<u>Example:</u> Warmth from a campfire or the sun warming the Earth's surface

- As thermal energy is added to or taken away from a system, the temperature does not always change. There is no change in temperature during a phase change (freezing, melting, condensing, evaporating, boiling, and vaporizing) as this energy is being used to make or break bonds between molecules.

Phase changes occur when heat is subtracted or added to matter.



Heat added to a solid changes the solid to a liquid by melting.

Heat added to a liquid changes the liquid to a gas by boiling/vaporization/evaporation.

Heat subtracted from a gas changes the gas to a liquid by condensation.

Heat subtracted from a liquid changes the liquid to a solid by freezing.

Heat subtracted from a solid such as dry ice changes to a gas by sublimation.

PS.7 Temperature and Heat/Heat Transfer

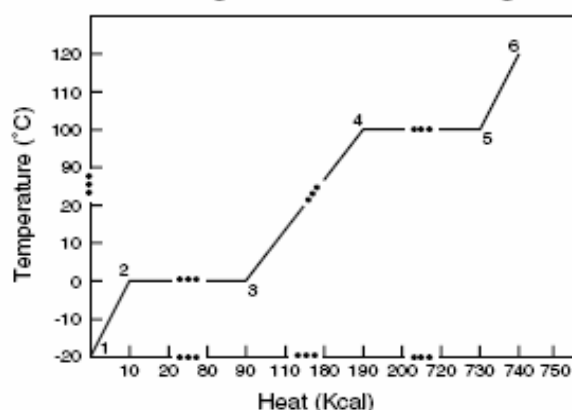
14 Which of these processes in the water cycle causes dew to form in the morning?

- F Condensation
- G Evaporation
- H Transpiration
- J Precipitation

23 The Earth is warmed by solar energy. How is this energy transferred from the sun to the Earth?

- A Radiation
- B Convection
- C Conduction
- D Ultrasonic

35 1 Kilogram of Water Heating



Between points 4 and 5, energy is being used to change water from a —

- A solid to a liquid
- B solid to a gas
- C liquid to a gas
- D liquid to a solid

3 Which of these will cause water to change to ice?

- A Removing heat from the water
- B Stirring the water
- C Adding salt to the water
- D Putting the water in the sunlight

5 Insulation materials reduce heat loss because they —

- A are poor conductors
- B block out the sun
- C reduce evaporation
- D promote convection

30 Convection is the result of —

- F currents caused by the motion of heated molecules
- G increases in the density of solids
- H colder portions of liquids rising
- J the lack of heat transfer

August 7, 2013

SOL PS.1

hypothesis	A possible explanation or answer to a question
independent variable	A manipulated/changed factor which is indicated on the X axis of a graph
dependent variable	Measurable/response to change factor which is indicated on the Y axis
constants	A factor that does not change in a specific inquiry/lab
controls	A factor of comparison in a scientific inquiry that is not tested

SOL PS.5

physical change	A change that affects one or more physical properties of a substance. (Many physical changes are easy to undo)
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August 7, 2013

SOL PS.2

matter	Anything that has volume and mass
particle theory of matter	All matter is composed of tiny particles called atoms.
element	A pure substance that cannot be separated or broken down into simpler substances by physical or chemical means
compound	A pure substance composed of two or more elements that are chemically combined
mixture	A combination of two or more substances that are not chemically combined
solvent	The substance in which a solute is dissolved to form a solution
ph scale	A measure of hydronium ion concentration in a solution

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SOL PS.2 (continued)

base	Any compound that increases the number of hydroxide ions when dissolved in water
salt	An ionic compound formed from the positive ion of a base and the negative ion of an acid
acid	Any compound that increases the number of hydrogen ions when dissolved in water
solute	The substance that is dissolved to form a solution
inorganic compound	A compound that does not contain carbon
organic compound	A compound that contains carbon
density	The amount of matter in a given space; mass per unit volume

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SOL PS.2 (continued)

physical property	A property of matter that can be observed or measured without changing the identity of the matter
chemical property	A property of matter that describes a substance based on its ability to change into a new substance with different properties

SOL PS.7 (continued)

convection	The transfer of thermal energy by the movement of a liquid or a gas
radiation	The transfer of energy through matter or space as an electromagnetic wave
heat transfer	the process whereby heat moves from one body or substance to another by radiation, conduction, or convection

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SOL PS.7

Celsius temperature scale	The temperature scale used by most scientist
Kelvin temperature scale	The SI unit for temperature
absolute zero	Lowest temperature on the Kelvin scale
heat	The transfer of energy between objects that are at different temperatures
temperature	Measure of the average kinetic energy of the particles in an object
phase change	The conversion of a substance from one physical form to another

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SOL PS.7 (continued)

freezing point	The change of state from a solid to a liquid
melting point	The temperature at which the substance changes from a solid to a liquid
boiling point	The temperature at which a liquid boils
vaporization	The change of state from a liquid to a gas
condensation	The change of state from a gas to a liquid
conduction	The transfer of thermal energy through direct contact

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Released Test Answers (1st Nine Weeks)

SOL PS.1 (Scientific Investigation)

- | | |
|-------|-------|
| 5. C | 23. C |
| | 46. H |
| 2. H | |
| 13. B | 16. H |
| 43. D | 24. H |
| 4. H | |

SOL PS.5a Physical Changes

- | | |
|-----|-------|
| 5.A | 50. F |
|-----|-------|

SOL PS.2 Matter

- | | |
|-------|-------|
| 13. A | 31. D |
| 15. B | 8. J |
| 29. B | |
| 38. G | |
| 39. B | |
| 40. F | |
| 42. H | |
| 19. C | |
| 20. H | |
| 21. B | |
| 37. C | |
| 17. D | |
| 27. A | |

SOL PS.7 Temperature and Heat

- | |
|-------|
| 14. F |
| 23. A |
| 35. C |
| 3. A |
| 30. F |
| 5. A |