

Student name: _____

Which is the summary of a large amount of scientific information?

hypothesis

theory

scientific law

technology

scientific method

What method used by scientists is the systematic approach to the discovery of new information?

analytical method

hypothetical method

chemical method

technological method

scientific method

What is a hypothesis?

a fact that results from extensive experimentation and testing

the summary of a large quantity of information

the result of a single measurement or observation

an attempt to explain an observation, or a series of observations

an observation of a chemical reaction

Which statement concerning the scientific method is FALSE?

The scientific method is an organized approach to solving scientific problems.

The process of explaining observed behavior begins with a hypothesis.

Experimentation is conducted to either support or disprove a hypothesis.

A hypothesis becomes a theory when a single experiment supports it.

A theory explains scientific observations and data and can help predict new observations and data.

What type of change alters the appearance, but not the composition or identity of the substance undergoing the change?

theoretical

physical

analytical

chemical

nuclear

Which statement concerning changes in matter is FALSE?

A physical change alters the appearance of a substance, but not its identity.

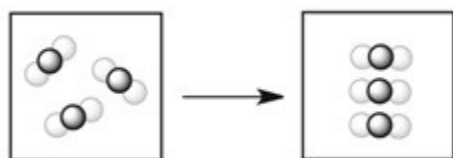
A chemical change alters the identity of a substance.

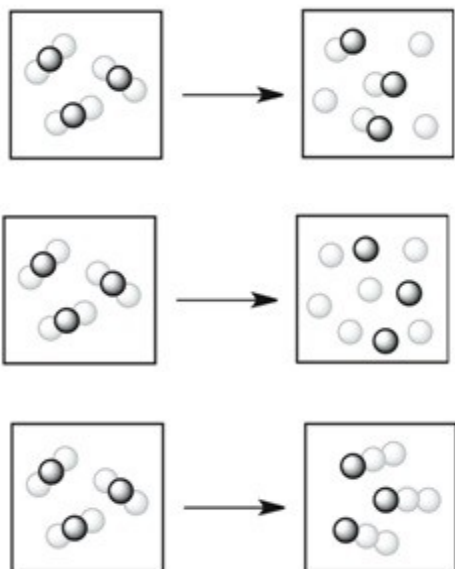
A chemical change always results in the production of a new substance.

A chemical change is also called a chemical reaction.

Melting and freezing are chemical changes that change both the appearance of the substance as well as the identity of the substance.

Which process depicts a physical change?





None of the processes above depicts a physical change.

What statement *best* describes an intensive property?

A property of a substance that does not depend on the quantity of the substance present.

A property of a substance that depends on the quantity of the substance present.

A property of a substance that depends on the mass of the substance, but not the volume of the substance.

A property of a substance that depends on the physical state (solid, liquid, or gas) of the substance.

A property of a substance that changes based on the mass of the material that is present.

Which statement concerning the classification of matter is FALSE?

All matter is either pure substance or a compound.

An element is a pure substance that generally cannot be changed into a simpler form of matter.

A compound is a pure substance made up of two or more different elements combined in a definite, reproducible way.

A pure substance is composed of only one type of component.

A mixture is the physical combination of two or more pure substances in which each substance retains its own identity.

When hydrogen (H_2) and chlorine (Cl_2) gases are mixed, hydrogen chloride (HCl) is produced. Hydrogen chloride is classified as what type of matter?

an element

a compound

a homogeneous mixture

a heterogeneous mixture

a solution

Which of the following is NOT a type of mixture?

homogeneous

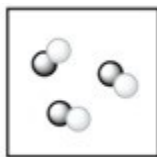
heterogeneous

solution

compound

All of the choices are correct.

Which of the following terms best describes the sample of matter in the diagram? Note: different colored circles represent atoms of different elements.



homogeneous mixture

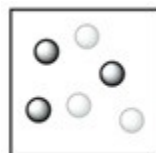
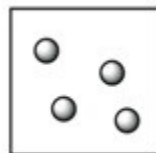
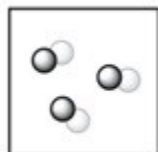
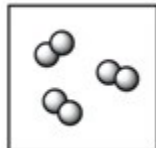
pure substance

heterogeneous mixture

solution

None of the choices are correct.

Which diagram represents a mixture? Note: different colored circles represent atoms of different elements.



Which of the following terms is most appropriate when classifying an apple?

pure substance

compound

heterogeneous mixture

homogeneous mixture

solution

1 milligram is equivalent to how many grams?

1000

100

0.1

0.01

0.001

A typical aspirin tablet contains 5.00 grains of pure aspirin analgesic compound. The rest of the tablet is starch. How many aspirin tablets can be made from 50.0 g of pure aspirin? [Use: 1.00 g = 15.4 grains]

17 tablets

154 tablets

250 tablets

649 tablets

770 tablets

A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. What mass of the drug should the patient receive? [1 pound = 454 g]

1.47 g

2.98 g

3.24 mg

1470 mg

6570 mg

A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. The drug is supplied as a solution that contains 25.0 mg of drug per mL of solution. What volume of the drug should the patient receive? [1 pound = 454 g]

0.579 mL

119 mL

362 mL

579 mL

119 L

If one atom of carbon-14 weighs 14.0 atomic mass units and one atomic mass unit is equal to 1.66×10^{-24} grams, what is the mass of 25 atoms of carbon-14 in grams?

5.81×10^{-22}

5.81×10^{-21}

581

2.11×10^{26}

2.11×10^{-21}

A student records the measurement 4.8 m. What type of measurement was made?

mass

volume

length

concentration

time

A patient needs 0.300 g of a solid drug preparation per day. How many 10.0 mg tablets must be given to the patient per day?

3.00 tablets

30.0 tablets

33.0 tablets

300. tablets

330. tablets

What is the number 0.0062985632 written in scientific notation to three significant figures?

0.006

6.00×10^{-3}

6.29×10^{-3}

6.299×10^{-3}

6.30×10^{-3}

What is the number 3,000 written in scientific notation using the proper number of significant figures?

0.003×10^{-3}

0.3×10^4

3×10^3

3×10^{-3}

3.000×10^3

What is the number 0.9050 written in scientific notation using the proper number of significant figures?

0.9×10^4

9×10^{-1}

$$9.05 \times 10^{-1}$$

$$9.050 \times 10^4$$

$$9.050 \times 10^{-1}$$

How should the result of the calculation below be reported using scientific notation and the proper number of significant figures? $(4.3169 \times 10^4) \div (2.02 \times 10^3) = ?$

$$2.14 \times 10^1$$

$$2.1371 \times 10^1$$

$$2.14 \times 10^2$$

$$2.14 \times 10^7$$

$$2.1371 \times 10^9$$

Which of the following measured volumes has the most uncertainty?

10 mL

10.0 mL

10.00 mL

10.000 mL

All values have the same degree of uncertainty.

Where is the uncertainty in the number 101.2°C ?

in the ones place

in the tens place

in the tenths place

in the hundredths place

There is no uncertainty in this number.

A flask contains 145.675 mL of a saline solution. If 24.2 mL of the saline solution are withdrawn from the flask, how should the volume of the saline solution that remains in the flask be reported?

121.475 mL

121.4 mL

121.5 mL

122 mL

121 mL

Which physical property of an astronaut will change depending on whether he or she is on Earth or in orbit?

mass

weight

volume

all would change

none would change

What is the basic unit of volume in the metric system?

milliliter

cubic centimeter

liter

gram

millimeter

Which statement concerning energy is FALSE?

Energy is the amount of heat content in an object.

Potential energy is stored energy due to composition or position.

Kinetic energy is the energy associated with movement.

Heat, light, and electricity are different forms of energy.

Conversion of energy from one form to another is possible.

Which temperature would feel the hottest?

100°C

100°F

100 K

All temperatures would feel equally hot.

A chemical reaction releases 44.3 kJ of heat. What is the equivalent amount of heat expressed in calories? [1 cal = 4.18 J]

10.6 cal

106 cal

185 cal

10,600 cal

18,500 cal

A bolder at the top of a hill breaks free and rolls down the hill. Which statement *best* represents the change in energy that occurs in this process?

The potential energy of the bolder increases.

The potential energy of the bolder is converted to kinetic energy.

The kinetic energy of the bolder is converted to potential energy.

The chemical energy of the bolder is converted to kinetic energy.

No change in energy occurs; energy cannot be converted from one form to another.

What kind of energy is stored as the result of position or composition?

kinetic energy

activation energy

potential energy

theoretical energy

static energy

The concentration of a patient's blood sugar was determined to be 4850 micrograms per milliliter. Which correctly represents this measurement?

4850 μg /ML

4850 mg/mL

4850 Mg/mL

4850 μg /mL

4850 mg/ML

What is density?

the ratio of the number of particles of a substance to the volume of the solution in which it is dissolved

the ratio of the mass of a substance to the volume of the substance

the ratio of the volume of a substance to the mass of the substance

the ratio of the moles of a substance to the volume of the solution in which it is dissolved

the measure of the amount of heat an object contains

If the density of blood is 1.060 g/mL, what is the mass of 6.56 pints of blood? [1 L = 2.113 pints]

3.29 kg

329 g

2.93 g

2930 g

2.93 kg

What is the density of a solid object that has the following measurements?

mass = 189.6 g, length = 9.80 cm, width = 46.6 mm, height = 0.111 m.
0.267 g/mL

0.374 g/mL

2.67 g/mL

3.74 g/mL

50.7 g/mL

Air has an average density of 0.001226 g/mL. What volume of air would have a mass of 1.0 lb?
[454 g = 1 pound]

37 mL

370 mL

557 mL

2.7×10^{-6} mL

3.7×10^2 L

Which branch of science primarily involves the study of matter and the changes it undergoes?

biology

technology

physics

chemistry

All of the choices are correct.

Which of the following terms is defined as anything that has mass and occupies space?

chemistry

element

matter

compound

volume

In which state does matter have an indefinite shape and definite volume?

solid

liquid

gas

All of the choices are correct.

None of the choices are correct.

In which state of matter are forces between particles least dominant?

solid

liquid

gas

All of the choices are correct.

None of the choices are correct.

Conversion of ice to liquid water or liquid water to steam is an example of what kind of change?

physical

chemical

molecular

analytical

Both physical and chemical are correct.

What type of change is represented by the decay of a fallen tree?

physical

chemical

molecular

analytical

All of the choices are correct.

The green color of the Statue of Liberty is due to a(an) _____ change to the copper metal.

elemental

physical

state

chemical

None of the choices are correct.

What type of property of matter is independent of the quantity of the substance?

chemical

physical

extensive

intensive

nuclear

What are the two classes of pure substances?

elements and atoms

compounds and molecules

elements and compounds

chemical and physical

homogeneous and heterogeneous

What does the prefix "centi-" mean?

10^{-1}

10^{-2}

10^{-3}

10^2

10^3

How many centimeters correspond to 15.68 kilometers?

$1.568 \times 10^6 \text{ cm}$

$1.568 \times 10^5 \text{ cm}$

$1.568 \times 10^4 \text{ cm}$

1568 cm

1.569 cm

How many pounds are represented by 764.6 mg? [1 pound = 454 g]

347.1 lb

3.471×10^8 lb

1.684×10^{-3} lb

1.684 lb

0.7646 lb

If a person smokes 10.0 packs of cigarettes a week and each cigarette contains 5.00 mg of tar, how many years will she have to smoke to inhale 0.250 pounds of tar? [20 cigarettes = 1 pack, 1 pound = 454 g and 1 year = 52 weeks]

2.18 y

2.18×10^{-2} y

1.06 y

28.6 y

0.556 y

The cost of a drug is 125 francs per gram. What is the cost in dollars per ounce? [\$1 = 6.25 francs and 1 ounce = 28.4 g]

\$0.70/oz

\$568/oz

\$27.5/oz

$\$2.22 \times 10^4$ /oz

\$4.65/oz

How many significant figures does the number 5.06305×10^4 contain?

4

5

6

7

9

Provide the answer to the following problem using scientific notation and the proper number of significant digits: $(6.00 \times 10^{-2})(3.00 \times 10^{-4}) = ?$

1.8×10^{-5}

1.80×10^{-5}

1.80×10^{-4}

18.00×10^{-4}

2×10^{-5}

A student measures the mass of three separate samples of a solid: 104.45 g, 0.838 g, and 46 g. If the student mixes all three samples together, how should the total mass be properly reported?

151.288

151.28

151.29

151

1.5×10^2

Which measurement represents the largest volume?

4.6 L

4.6×10^{-3} L

46 cL

460 mL

All represent the same volume.

What term is used to describe the summary of a large quantity of information?

hypothesis

theory

law

model

result

Which state of matter has neither a definite shape nor a definite volume?

liquid

solid

gas

vapor

Both gas and vapor are correct.

Which of the following is NOT a physical property of matter?

odor

compressibility

flash point

melting point

color

The distance between two hydrogen atoms in a hydrogen molecule (H₂) is 7.461×10^{-11} m. What is the equivalent distance expressed in inches? [2.54 cm = 1 in]

2×10^{-9} in

1.895×10^{-12} in

294×10^{-11} in

2.937×10^{-9} in

2.94×10^{-8} in

What kind of change always results in the formation of new materials?

molecular

exothermic

endothermic

physical

chemical

Which of the following is a chemical property?

flammability

color

hardness

temperature

melting point

Which one of the following is an example of an extensive property?

density

specific gravity

mass

hardness

boiling temperature

Which one of the following is an example of a pure substance?

ethanol

sugar water

salt and pepper

milk

sand

Air is a/an

element.

compound.

mixture.

molecule.

pure substance.

The speed of light is 186,000 miles per second. What is its speed in centimeters per second?
[5280 feet = 1 mile; 12 inches = 1 foot; 2.54 cm = 1 inch]

3.01×10^{11} cm/s

3.15×10^{10} cm/s

6.06×10^{12} cm/s

$$3 \times 10^{11} \text{ cm/s}$$

$$2.99 \times 10^{10} \text{ cm/s}$$

1 centimeter equals how many millimeters?

$$10^{-6}$$

$$10^{-3}$$

$$10$$

$$10^4$$

$$10^6$$

Round 0.052018 to three significant figures.

$$0.05$$

$$0.052$$

$$0.0520$$

$$0.05201$$

$$0.05202$$

Select the answer that *best* expresses the result of the following calculation: $1.86 + 246.4 - 79.9208 = ?$

$$168$$

$$168.3$$

$$168.34$$

$$168.339$$

$$168.3392$$

What is the appropriate number of significant figures necessary to express the result of the calculation below? $(51.6) \times (3.1416)$

1

2

3

4

5

What Celsius temperature corresponds to -4.6°F ?

-20°C

-20.3°C

-23.0°C

-10.9°C

-68.4°C

What Fahrenheit temperature corresponds to -40.0°C ?

-8°F

16.8°F

-36.9°F

-40.0°F

-1.94°F

What Kelvin temperature corresponds to 98.6°F ?

310 K

310.2 K

31.00 K

132.0 K

199 K

Which temperature scale does not use a degree sign?

Celsius

Kelvin

Centigrade

Fahrenheit

Absolute zero

If the density of carbon tetrachloride is 1.59 g/mL, what is the volume in L, of 4.21 kg of carbon tetrachloride?

0.149 L

0.378 L

2.65 L

6.69 L

6690 L

What is the specific gravity of an object that weighs 13.35 g and has a volume of 25.00 mL? The density of water under the same conditions is 0.980 g/mL.

1.335

0.545 g/mL

0.534 g/mL

0.545

0.980

Which of the following is FALSE concerning the gas state?

Gases have no definite shape.

Gases have no definite volume.

Particles are far apart from each other.

Particles are usually in a regular or organized pattern.

When gas molecules collide, they do not lose energy.

Which of the following is an example of physical change?

boiling water

burning paper

a metal losing electrons to become a cation

cooking eggs

lighting a match

Which statement is FALSE?

Mass is an example of an extensive property.

Volume is an example of an extensive property.

Temperature is an example of an intensive property.

An intensive property is one that does not depend upon the amount of the substance.

An extensive property is synonymous with a physical property.

NaCl is *best* classified as a/an

pure substance.

element.

compound.

homogeneous mixture.

Both pure substance and compound are correct.

Which of the following numbers has only one significant figure?

3.0×10^1

0.003

3.00

30.0

All of the choices are correct.

Give the answer to the following calculation to the correct number of significant figures. $(5.0 \times 10^{-4}) - (6 \times 10^{-5}) = ?$

4.4×10^{-4}

4.4×10^{-5}

4×10^{-4}

4×10^{-5}

4.40×10^{-4}

The area of a rectangle is determined by the formula: $\text{area} = \text{length} \times \text{width}$. If a rectangle has a length of 32.6 cm and a width of 72.6 cm, what is the area of the rectangle to the correct number of significant figures?

2,400 cm²

$$2,370 \text{ cm}^2$$

$$2,367 \text{ cm}^2$$

$$2,366.8 \text{ cm}^2$$

$$2,366.76 \text{ cm}^2$$

Consider the following set of numbers. If the true value is 12.6 cm^2 , which of the following *best* describes the set of numbers?

12.6 cm^2 , 12.5 cm^2 , 12.6 cm^2
accurate but not precise

not accurate but precise

accurate and precise

neither accurate nor precise

More information is needed to determine if the measurements are accurate.

How many cm are in $3.5 \times 10^{-2} \text{ km}$?

$$3.5 \times 10^{-1} \text{ cm}$$

$$3.5 \times 10^{-7} \text{ cm}$$

$$3.5 \times 10^2 \text{ cm}$$

$$3.5 \times 10^5 \text{ cm}$$

$$3.5 \times 10^3 \text{ cm}$$

Tire pressure in the U.S. is measured in lb/in^2 . Convert 25 lb/in^2 to g/cm^2 . $454 \text{ g} = 1 \text{ lb}$, $2.54 \text{ cm} = 1 \text{ in}$

$$0.39 \text{ g/cm}^2$$

$$1.8 \times 10^3 \text{ g/cm}^2$$

$$4.7 \times 10^3 \text{ g/cm}^2$$

$$3.0 \times 10^4 \text{ g/cm}^2$$

$$2.4 \times 10^2 \text{ g/cm}^2$$

What volume, in milliliters, will 2.00 g of air occupy if the density is 1.29 g/L?

$$2.72 \times 10^3 \text{ mL}$$

$$2.20 \text{ mL}$$

$$1.43 \text{ mL}$$

$$1.55 \times 10^3 \text{ mL}$$

$$4.59 \times 10^2 \text{ mL}$$

Concentration is a measure of the number or mass of particles of a substance that are contained in a specified volume.

true

false

Hypotheses are not acceptable in the scientific method.

true

false

In the scientific method, a law carries more weight than a hypothesis.

true

false

Each piece of data is the individual result of a single measurement.

true

false

The presence of some error is a natural consequence of any measurement.

true

false

The number 0.0680 has 3 significant figures.

true

false

The terms mass and weight are identical.

true

false

Mass is the force resulting from the pull of gravity upon an object.

true

false

Equal masses of glass and steel at the same temperature will have different heat energies.

true

false

Energy may be defined as the heat content of an object.

true

false

One calorie is the amount of energy needed to raise the temperature of one gram of water one degree Celsius.

true

false

Density and specific gravity can be expressed in the same units.

true

false

What are the five phases of the Study Cycle?

study, flash cards, concept maps, class notes, solve problems

big ideas, flash cards, repetition, participation, assess

attend, review, study, repetition, assess

preview, attend, study, repetition, identify big ideas

preview, attend, review, study, assess

According to the Study Cycle, what is the recommended study session frequency?

1 long, intense session per week

1-2 long, intense session per day

3-5 short, intense sessions per week

3-5 short, intense sessions per day

None of these choices are correct.

According to the Study Cycle, what is the recommended study session format?

Establish goal in first 1 min, study with focus for 10-20 min, take a 5-10 min break, and then review another 5 min.

Study with focus for 30-50 min, take a 10-20 min break, and then review another 10-20 min.

Study with focus for 50 min, take a 50 min break, and then review another 10-20 min.

Study with focus for 30-50 min, take a 10-20 min break, and then review another 30-50 min.

Establish goal in first 2-5 min, study with focus for 30-50 min, take a 5-10 min break, and then review another 5 min.

Answer Key

Test name: CH1 General Organic E11

C

E

D

D

B

E

A

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D

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TRUE

TRUE

TRUE

TRUE

FALSE

FALSE

TRUE

FALSE

TRUE

FALSE

E

D

E