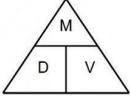
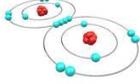
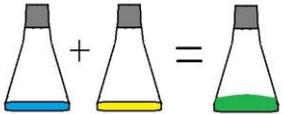


8th Grade Science Final Exam Study Guide

Directions: Fill in charts and blanks where appropriate. Draw when asked. Otherwise, use complete sentences.

Chemistry:

Define each of the following words or phrases and give an example:

WORD	DEFINITION	EXAMPLE
Mass	<i>a measure of the amount of matter in an object</i>	
Weight	<i>a measure of the gravitational force exerted on an object; its value can change with the location of the object</i>	
Volume	<i>a measure of the size of a body or region in three-dimensional space</i>	
Density	<i>the ratio of the mass of a substance to the volume of the substance</i>	
Physical change	<i>a change of matter from one form to another without a change in chemical properties</i>	Freezing
Chemical change	<i>a change when one or more substances change into entirely new substances w/ diff. properties</i>	Rust (oxidation)
Chemical Bond	<i>an interaction that holds atoms or ions together</i>	
Valence Electron	<i>an electron found in the outermost shell of an atom and determines the atom's chemical properties</i>	
Law of Conservation of Mass	<i>mass cannot be created or destroyed in ordinary chemical and physical changes</i>	
Law of Conservation of Energy	<i>energy cannot be created or destroyed but can be changed from one form to another</i>	Rube Goldberg Machine

Name: Key Class: _____ Date: _____

1. What two properties of matter are needed to calculate density?

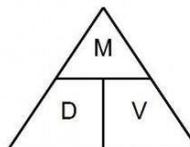
- a. Mass and Volume
b. What is the density of water? 1 g/cm³

2. If a substance has a mass of 35g and a volume of 350 ml, will it float in water? Why?

$$D = M \div V$$

$$D = 35g \div 350ml = 0.1g/mL$$

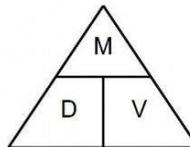
It will float because it is less dense than water.



3. Calculate Volume for a 45 g same of metal that has a density of 9g/ml.

$$V = M \div D$$

$$V = 45g \div 9g/mL = 5mL$$



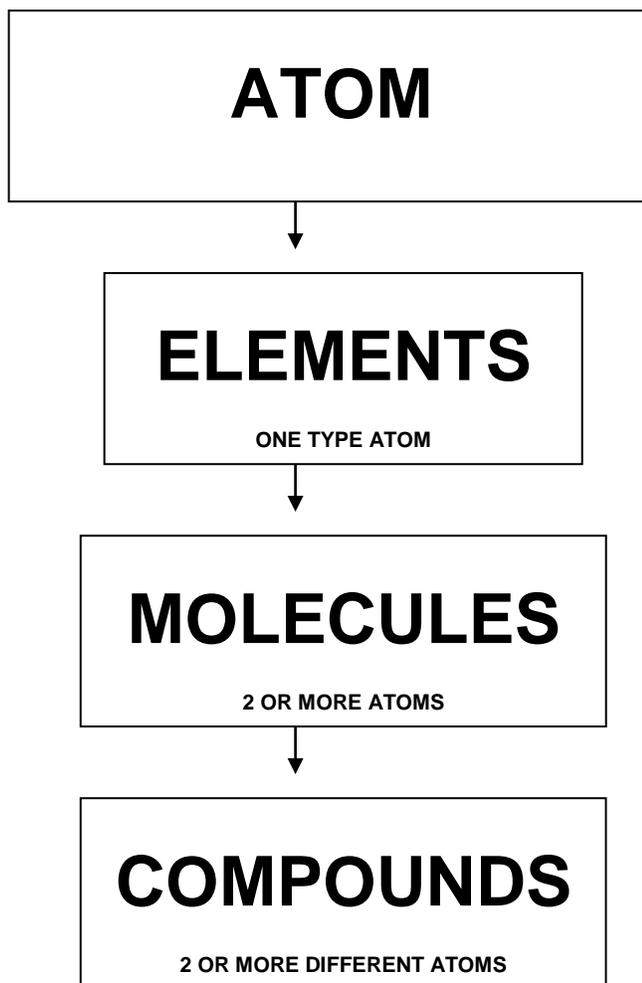
4. How are mass and weight different?

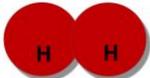
Mass is a measure of the amount of matter in an object and weight is a measure of the gravitational force exerted on an object; its value can change with the location of the object

Classify each of the following words or phrases as a **physical or chemical change**:

Action	Physical or chemical change
Melting	Physical
Burning	Chemical
Conducting electricity	Physical
Oxidation	Chemical
Bubbles when combing vinegar and baking soda	Chemical

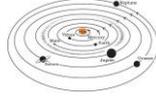
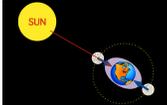
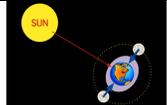
Graphic Organizer: nothing to add but this may help you organize these in your mind



WORD	DEFINITION	EXAMPLES
Atom	the smallest unit of an element that maintains the properties of that element	
Element	cannot be separated or broken down into simpler substances by chemical means	
Molecule	a group of atoms that are held together by chemical forces; the smallest unit of matter that can exist by itself and retain all of a substance's chemical properties	
Compound	a substance made up of atoms of 2+ diff. elements joined by chem. bonds	

Astronomy:

Define each of the following words or phrases and give an example:

WORD	DEFINITION	EXAMPLE
Star	any one of the objects in space that are made of burning gas	
Universe	all existing matter and space considered as a whole; the cosmos	ONLY ONE UNIVERSE
Galaxy	a collection of stars, dust, and gas bound together by gravity	
Solar system	the collection of planets and their moons in orbit around a star, together with smaller bodies	
Planet	a celestial body that orbits a star and is round because of its own gravity	
Moon	the natural satellite of a planet, visible (chiefly at night) by reflected light from its star	
Spring tide	a tide of increased range that occurs two times a month, at the new and full moons	
Neap tide	a tide of minimum range that occurs during the 1st + 3rd quarters of the moon	
Eclipse	an event in which the shadow of one celestial body falls on another	

1. Define gravity and inertia and describe how they are involved in the formation of the planets.

Gravity is the force of attraction due to object's masses and distances from one another.

Inertia is the tendency of an object to resist a change in motion due to its mass. As a planet obtains more mass, it has more gravitational force and more inertia.

2. On what does the gravity between 2 objects depend?

a. Mass and Distance

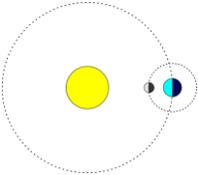
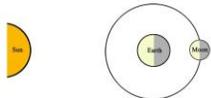
3. How does gravity affect weight?

When an object has more mass, it has more gravitational pull, which is measured by weight.

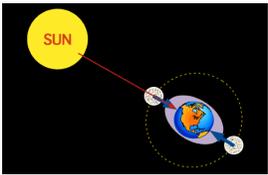
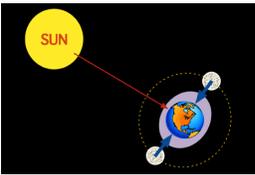
4. What is the difference between rotation and revolution?

Rotation is the spin of a body on its axis. And revolution is the motion of a body that travels around another body in space or one complete trip along an orbit.

5. Review phases of the moon. Draw **earth-moon-sun** diagrams of the following:

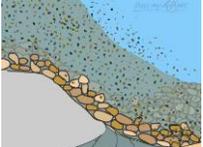
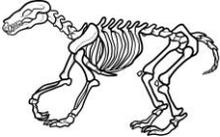
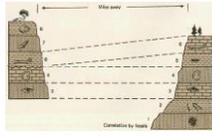
<p>a. New Moon</p> 	<p>b. First Quarter</p>  <p>  Last Quarter  Earth  First Quarter </p>
<p>c. Full Moon</p> 	<p>d. Third (Last) Quarter</p>  <p>  Last Quarter  Earth  First Quarter </p>

6. Draw **earth-moon-sun** diagrams of the following:

<p>a. Spring Tide</p> 	<p>b. Neap Tide</p> 
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Earth Science:

Define each of the following words or phrases and give an example:

WORD	DEFINITION	EXAMPLES
Weathering	the natural process by which atmospheric and environmental agents, such as wind, rain, and temperature changes, disintegrate and decompose rocks	
Erosion	the process by which wind, water, ice, or gravity transports soil and sediment from one location to another	
Deposition	the process in which material is laid down	
Abrasion	the grinding and wearing away of rock surfaces through the mechanical action of other rock or sand particles	
Oxidation	a reaction that removes one or more electrons from a substance such that the substance's valence or oxidation state increases; in geology, the process by which a metallic element combines with oxygen	
Fossil	the trace or remains of an organism that lived long ago, most commonly preserved in sedimentary rock	
Index Fossils	a fossil that is used to establish the age of a rock layer because the fossil is distinct, abundant, and widespread and the species that formed that fossil existed for only a short span of geologic time	

1. Describe how wind, water, ice, gravity, chemicals and climate can affect weathering, erosion and deposition.

They are the agents that pick up and put down sediment as well as by temperature control the rate of weathering.

Name: Key _____ Class: _____ Date: _____

2. What might speed up or slow down weathering, erosion and deposition.

Weathering has an element of chemical change in addition to physical change. Temperature, concentration and pressure all affect the speed of a chemical reaction.

3. What is differential weathering?

Differential weathering is the process by which softer, less weather resistant rocks wear away at a faster rate than harder, more weather resistant rocks do

4. How is chemical weathering different from mechanical weathering? Give examples of each.

Chemical weathering is the process by which rocks break down as a result of chemical reactions. An example is acids in living things like lichen/moss. Mechanical weathering is the process by which rocks break down into smaller pieces by physical means. An example is abrasion.

5. What are glaciers and how do they affect weathering, erosion and deposition?

A glacier is a large mass of moving ice. It is an agent of erosion and deposition as it picks up sediment and rocks and then puts it down in another location. It also can erode the land through abrasion.

6. Describe two types of glaciers.

Continental glaciers are very large and tend to expand across entire continents. Alpine glaciers are smaller and form in mountainous ranges.

7. How does gravity affect the movement of glaciers?

Glaciers are so massive that the pull of gravity causes them to flow slowly.

8. How does the movement of glaciers affect landforms on the surface of the earth?

Continental glaciers smooth the landscape because they cover it entirely and scrape away older surface features. Alpine glaciers create rugged landscapes because they cover only portions of mountains. As alpine glaciers move downhill, they cut into the mountains and create dramatic features that were not there before.

9. What evidence (glaciers, rock layers, landforms) show that the earth's surface has changed over time?

- Superposition
- Matching continental shores
- Isotopes
- Plate tectonics

10. What are index fossils? How do index fossils help scientists determine the age of rocks?

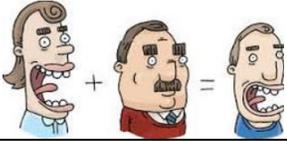
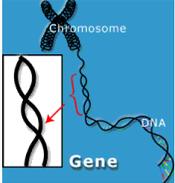
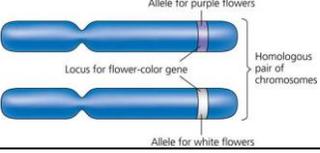
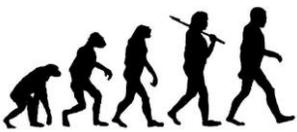
Because index fossils are organisms that lived during a relatively short, well-defined time span and are found in rock layers throughout the world, index fossils can be used to obtain relative dates for rock layers.

11. Why do we use topographic maps? Explain the markings, symbols, contour lines, and index contours.

A topographic map shows the surface features of the Earth. A contour interval is the difference in elevation between two adjacent contour lines. Relief is the difference in elevation between the highest and lowest points of the area being mapped.

Genetics and Heredity:

Define each of the following words or phrases and give an example:

WORD	DEFINITION	EXAMPLES
Heredity	the passing of genetic traits from parent to offspring	
Genes	a unit of heredity that is transferred from a parent to offspring and is held to determine some characteristic of the offspring	
Alleles	one of the alternative forms of a gene that governs a characteristic, such as hair color	
Chromosomes	in a eukaryotic cell, one of the structures in the nucleus that are made up of DNA and protein; in a prokaryotic cell, the main ring of DNA	
Adaptation	a characteristic that improves an individual's ability to survive and reproduce in a particular environment	
Extinction	the death of every member of a species	
Evolution	the process in which inherited characteristics within a population change over generations such that new species sometimes arise	

1. What advantages do organisms that reproduce sexually have over organisms that reproduce asexually?

Genetic diversity among its offspring.

2. Why do sex cells have only ½ the chromosomes of other cells?

Sex cells have half the number of chromosomes as other body cells due to the process of meiosis. Meiosis is a process in cell division during which the number of chromosomes decreases to half the original number by two divisions of the nucleus, which results in the production of sex cells

3. Describe the process of natural selection.

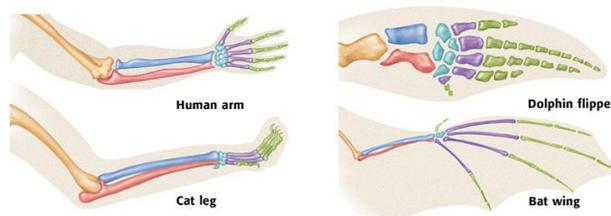
It is the process by which individuals that are better adapted to their environment survive and reproduce more successfully than less well adapted individuals do; a theory to explain the mechanism of evolution.

4. What evidence supports evolution?

- A sequence of fossil organisms show how the characteristics of modern animals could have evolved from those of ancient animals.
- Genetics provides a tool with which to analyze and explain what happens inside of cells as organisms evolve.

5. How are cats, dolphins, bats, and humans arms similar? What does that tell us about their ancestors?

The structure and order of bones of a human arm are similar to those of the front limbs of a cat, a dolphin, and a bat. These similarities suggest that cats, dolphins, bats, and humans had a common ancestor. Over millions of years, changes occurred in the limb bones. Eventually, the bones performed different functions in each type of animal.



6. Create a Punnett Square for a green pea plant (GG) is crossed with a green pea plant (Gg) yellow is the recessive color.

	G (green)	G	
G	GG green	GG green	
(green) g	Gg green	Gg green	

Genotype= 2 GG: 2 Gg: 0 gg

Phenotype= 4 Green pea plants: 0 yellow pea plants

Ratio = 4:0

green 100%, yellow 0%

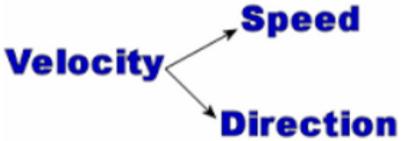
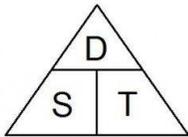
Genetics and Heredity:

Complete the chart:

	How are they similar?	How are they different?	How do they affect heredity?
Dominate trait & Recessive trait	They describe how likely it is for a certain phenotype to pass from parent offspring.	Dominant means that one of the versions overrides the recessive.	You have two copies of each gene that you inherited from your mother and your father.
Heterozygote & Homozygote	They are the combined alleles that influence the inheritance of a trait.	Heterozygous is two different alleles. Homozygous is two identical alleles	They are two matching sets of chromosomes. And it allows the DNA sequence of a gene to vary from one individual to another.
Genes & Chromosomes	They carry very factor in inheritance and specify the structure of particular proteins that make up each cell.	A gene is located on a chromosome.	They are part of what makes each organism what they are including everyone who has ever lived.
Sexual & Asexual reproduction	They allow for the creation of new offspring.	Asexual requires one organism and sexual requires two.	Supplies a set of coded instructions for specifying each organism's traits.

Physics: Define each of the following words about motion.

1. Mass = a measure of the amount of matter in an object
2. Push or Pull = a force with size and direction
3. Force = a push or a pull exerted on an object in order to change the motion of the object; force has size and direction
4. Inertia = the tendency of an object to resist a change in motion unless an outside force acts on the object
5. Friction = a force that opposes motion between two surfaces that are in contact
6. Action and Reaction = in every interaction, there is a pair of forces acting on the two interacting objects

TERM	DEFINITION & FORMULA (if applicable)	EXAMPLE
Velocity	the speed of an object in a particular direction	
Speed	the distance traveled divided by the time interval during which the motion occurred	
Acceleration	the rate at which velocity changes over time; an object accelerates if its speed, direction, or both change	$\bar{a} = \frac{v_2 - v_1}{t_2 - t_1} = \frac{\Delta v}{\Delta t}$
Motion	an object's change in position relative to a reference point	
Reference point	a location that you can use to describe the location of other things	

7. Which of the following best represents acceleration as presented on a graph?

- a. motion change vs. time
- b. distance change vs. time
- c. speed change vs. time
- d. velocity change vs. time

8. State Newton's 3 Laws of motion.

- a. An object at rest remains at rest, and an object in motion remains in motion at constant speed and in a straight line unless acted on by an unbalanced force.
- b. The acceleration of an object depends on the mass of the object and the amount of force applied. $F = ma$
- c. Whenever one object exerts a force on a second object, the second object exerts an equal and opposite force on the first.

9. Which of the following would be a good reference point to describe the motion of a dog?

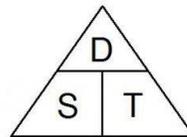
- a. the ground
- b. another dog
- c. a tree
- d. all of the above

10. An arrow is shot from a bow and travels 1800m meters in 4 seconds. What was its average speed?

$$S = D \div T$$

$$S = 1800m \div 4s$$

$$S = 450m/s$$



11. A car is driving down the highway at an average speed of 55 miles per hour (mph).

How far has it traveled after 1 1/2 hours?

$$D = S \times T$$

$$D = 55mph \times 1.5h$$

$$D = 82.5 \text{ miles}$$

