8th Grade Science Fact Sheet

This fact sheet belongs to:

Please return it to Mr. Erickson if found!!!

General Science	
1	An **observation** is information that you gather using at least one of your 5 senses (see, feel, hear, smell or taste.)
2	**Evidence** is an observable fact that is used to support a claim or an inference.
3	An **inference** is a prediction of what happened or what will happen based on your observations.
4	A **Claim** is a statement you feel to be true that is usually supported by evidence.
5	A **scientific diagram** has labels and shows the important parts.
6	A **quantitative observation** is one that deals with numbers, measurements and/or counting.
7	A **qualitative observation** cannot be measured. It deals with colors, textures, smells, taste, etc.
8	A **linear relationship** occurs when any change in one variable will always produce a predictable change in the other variable. When you plot a linear relationship on a graph you get a straight line.
9	An **average** is used to analyze similar data. It is found by adding all the data and dividing by the number of data you added up.
10	A **variable** is something that changes in an experiment.
11	A **dependent variable** is what you measure in your experiment.
12	An **independent variable** is what you change in your experiment. It is what you are testing.
13	**Data** is any information or observations you get from an experiment.
14	A **Data Table** is an organized record of all your data. When drawing a data table you should have **Units**, use a **Ruler**, include an **Average**, and have a **Title**. (U RAT)
15	When drawing a **graph**, be sure to: use a **Ruler**; have correct **Units**; **Label** your x and y axis; have **Equal** intervals; **Dependent variable** in title; **Plot** your data correctly; **Independent variable** in title and a **Good** use of space. (RULED PIG)
16	**Bar graphs** are used to compare two or more different things or groups.
17	**Line graphs** are used to track changes over time for one or more groups or anytime there are data points between the data that is collected.
18	A **conclusion** is a summary of what happened in an experiment and contains a claim about your question, evidence from the data, and a reason why this happened.
19	A **unit** is used to identify how you measured something.
20	**Mass** is a measurement of the amount of matter in an object.

21	A **triple beam balance** is a tool used to measure the mass of an object in grams.
Particles	
22	**Matter** is anything that has mass and takes up space.
23	All matter has **physical properties** that do not change and can be used to identify what it is. Some examples are: melting temperature, boiling point, density, hardness, and how well it conducts heat and electricity.
24	**Models** are used in science to represent something we cannot experience directly.
25	**The kinetic theory of matter** is the theory that all matter is made of particles that are constantly in motion.
26	Matter can be in different **phases** (or states), such as solid, liquid or gas, depending on the movement of the particles.
27	**Kinetic energy** is the energy of an object that is in motion.
28	**Temperature** is a measurement of the average kinetic energy of the particles in a substance.
29	Energy can be transferred from object to object through direct contact.
30	**Absolute zero** is the theoretical temperature at which particles stop moving (−273.15°C or -459°F).
Density	
31	**Density** is a property of matter found by dividing the mass of the object by its volume. ($D = \frac{m}{v}$)
32	**Displacement** is the amount of fluid that is pushed out of the way when an object is placed in the fluid.
33	The density of water is 1 g/cm^3 (or 1 g/ml).
34	**Volume** is a measurement of the amount of space an object takes up.
35	A **graduated cylinder** is a tool used to measure the volume of a liquid in liters.
36	1 cubic centimeter equals 1 milliliter (1cm^3=1ml).
37	The **Meniscus** is the downward curve on the surface of water commonly seen in a graduated cylinder. You always measure the bottom of the meniscus.
38	A **fluid** is any substance that flows; it can be gas or liquid.
39	The **Buoyant force** is the upward force that a fluid exerts on an object. It is what makes objects float in a fluid.
40	An object will sink if it has a greater density that the fluid it is in.
Elements & Atoms	
41	**Elements** are pure substances that cannot be broken down into simpler parts. They combine to form all matter.

42	An **atom** is the smallest piece of an element. It has all the properties of that element and it is made of a protons, neutrons and electrons.
43	All the elements currently known are organized by atomic number in **The Periodic Table of the Elements**.
44	A **proton** is a subatomic particle that has a positive charge and is found in the atom's nucleus.
45	A **neutron** is a subatomic particle that has no charge and is found in the atom's nucleus.
46	An **electron** is a subatomic particle that has a negative charge and is found in a cloud surrounding the atom's nucleus.
47	A **valence electron** is an electron that is involved in the bonding of other atoms.
48	An **ion** is an atom that has a different number of protons and electrons. It has a positive (+) or negative (-) charge.
49	An atom's **atomic number** is determined by the number of protons in that atom.
50	An atom's **atomic mass** is determined by the number of protons and neutrons in that atom.
51	An **isotope** is an atom of the same element that has different numbers of neutrons. The atomic mass of different isotopes of the same element can be different.
52	A **metal** is an element that tends to be shiny, easily shaped and a good conductor of electricity and heat. They can be found in the middle and to the left of the Periodic Table of the Elements.
53	A **nonmetal** is an element that is not shiny, very brittle and a poor conductor of electricity and heat. They can be found on the upper right side of the Periodic Table of the Elements.
54	A **metalloid** is an element with properties of metal and nonmetals. They can be found between the metals and the nonmetals of the Periodic Table of the Elements .
<u>Chemical Reactions</u>	
55	A **molecule** is a group of 2 or more atoms that are bonded together and move as a single unit.
56	**Compounds** are formed by combining two or more <u>different</u> elements.
57	Properties of compounds are different from the elements that make up the compound.
58	**Chemical reactions** are processes in which atoms are rearranged into different combinations of molecules and new materials are created.
59	In a chemical reaction, you start with one or more **reactants** and yield (or produce) one or more **products**.
60	**The Law of Conservation of Mass** states that the total mass always stays the same in a chemical reaction. This means even though the atoms are rearranged, the number of atoms stay the same.
61	There are many things that give evidence of a chemical reaction such as, • Change in temperature • Changes state (turns solid, liquid or gas(fizzing or bubbling)) • Giving off an odor • Color change
62	**Exothermic reactions** give off heat (gets hot).

63	**Endothermic reactions** absorb heat (gets cold).
64	**Synthesis reactions** occur when new compounds are formed by combining simpler reactants.
65	**Decomposition reactions** occur when the reactants break down into simpler products.
66	**Combustion reactions** are any chemical reaction that involves oxygen.
67	**pH** is a 14 point scale that measures the concentration of hydrogen ions in a solution (H^+).
68	The pH of a solution can be identified as an acid or a base using an **indicator**.
69	An **acid** has a pH below 7. It has extra hydrogen ions (H^+).
70	A **base** has a pH above 7.
71	A solution with a pH of 7 is **neutral**.
72	Carbon is the most important element in living things.
73	Carbon in common in living things because it easily combines with itself and other elements in many ways.
74	The most common elements in living organisms are carbon, hydrogen, nitrogen, and oxygen.
<u>Forces & Motion</u>	
75	A **Force** is a push or pull on an object. It has a magnitude and a direction.
76	**Magnitude** refers to the size or strength of something.
77	**Gravity** is a downward force caused by the mass of an object.
78	A **normal force** is the force of something that is being supported by another object.
79	An **applied force** is the force of something pushing against something else such as when you push an object.
80	An **elastic Force** is a force caused by the squeezing or stretching of an object.
81	**Friction** is a force that resists motion between two objects.
82	**Static friction** is the force that prevents objects from moving.
83	**Sliding friction** is the force that slows an object down that is in motion.
84	**Air resistance** (wind resistance or drag) is a form of sliding friction caused by an object moving through air.
85	When an object is subject to two or more forces at once, the **net force** is the sum of all the forces.
86	When the forces on an object are balanced, the motion of the object does not change. This means that it does not speed-up, slow down or start moving.

87	**Motion** is a change of position of an object relative to other objects.
88	The distance an object moves can be found by subtracting the object's initial position from its final position.
89	Average **speed** is the total distance traveled divided by the total time it took to travel that distance. ( ) $S = \frac{d}{t}$
90	The **velocity** of an object must be described by specifying both the direction and the speed of the object.
91	**Acceleration** is when the speed of an object changes. It can be positive (speeding up) or negative (slowing down).
<u>The Universe & Solar System</u>	
92	An **astronomical unit** (AU) is the distance between the Earth and the Sun. It is used to measure objects in our solar system.
93	There are 8 planets in our solar system. They are (in order): Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
94	A **dwarf planet** is a body in the solar system which is large enough to become round due to its own gravity, but has not cleared its orbit of other objects. Pluto, Eris and Ceres are examples of Dwarf Planets
95	The light we see from objects in our solar system is reflected light from the Sun.
96	A **comet** is a small icy object in our solar system with a very elliptical orbit. When it gets close to the sun it produces a visible coma (sometimes called a tail).
97	An **asteroid** is a small rocky body that orbits the Sun. Most asteroids in our solar system are in the "asteroid belt" between Mars and Jupiter.
98	**Waxing** is a phase of the Moon when its apparent size is gets larger, it forms a D shape in the sky.
99	**Waning** is a phase of the Moon when its apparent size is gets smaller, it forms a C shape in the sky.
100	During a **Crescent moon**, you see less than half of the visible side of the Moon.
101	During a **Gibbous moon**, you see more than half of the visible side of the Moon.
102	The Sun is one of many stars in the Milky Way galaxy.
103	A **light year** is the distance that light travels in one year. It is used to measure the distance between the stars.
104	Stars may differ in size, temperature, and color.
105	**Galaxies** are clusters of billions of stars and may have different shapes.
106	The Milky Way galaxy is 100,000 light years wide and 1000 light years thick. It contains about 200 billion stars.