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**2017-18 Final Exam Review Sheet**

**Physical and Chemistry Science**

**Directions: Answer all questions on a separate piece of paper and keep in your science binder to study for the final exam.**

**Physical Science**

**Unit 10 – Electricity**

1. Define electric current.

**Electric current is the flow of electrons through a wire.**

1. Define and give an example of a conductor.

**A conductor is material that allows electrons to flow through easily. For example-copper or any metal.**

1. Define and give an example of an insulator.

**An insulator is material that does not allow electrons to flow through them. For example-rubber, plastic or cloth.**

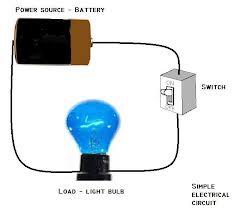
1. Define static electricity and give an example.

**Static electricity is an electric charge at rest. Imbalance of electric charges within or on the surface of a material.**

**Pulling a sweater off over your head.**

1. How do fuses and circuit breakers protect your home?

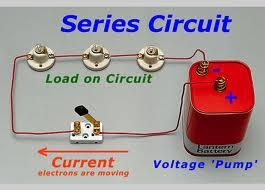
* **fuses automatically melt when the current gets to high**
* **circuit breakers are switches that automatically turn off when the current gets too high**

1. Draw and label a circuit with the following parts: load, energy source, energy pathway and switch. 

energy path

1. Define and draw a series circuit. And give an example of where you would use it.

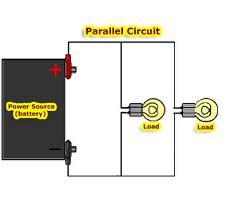
**Has a single path(loop) and if one light goes out the all go out. Used in holiday lights.**

* 1. 

Wire –energy path

1. Define and draw a parallel circuit. And give an example of where you would use it.

**Several different pathways (loops) and if one light goes out the rest will stay on. Use this in a house for lights.**



**Unit 9 – Energy**

1. Define the Law of Conservation of Energy.

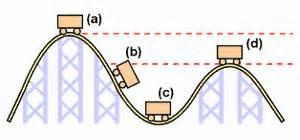
**Energy can NOT be created or destroyed it can only be converted from one form to another.**

1. Define potential energy

**The energy an object has because of its position. Stored energy.**

1. Define kinetic energy

**The energy of motion.**

1. Draw this roller coaster and then answer the following questions.
   1. Which position has the greatest potential energy?

**a**

* 1. Which position has the greatest kinetic energy?

(c)

**b**

* 1. Name an energy conversion taking place as the roller coaster moves.

**mechanical to thermal**

**(heat)**

1. Identify the 7 forms of energy (SACHEML).
   * + 1. **Sound**
       2. **Atomic**
       3. **Chemical**
       4. **Heat (thermal)**
       5. **Electrical**
       6. **Mechanical**
       7. **Light**
2. Describe the energy conversion for a flashlight.

**flashlight-chemical to electrical to light**

1. In all energy conversions, which type of energy is always released?

**In all energy conversions Thermal energy is always released**

1. What type of energy is found in the food you eat?

**Chemical energy is found in the food we eat.**

1. Define and give two examples of a renewable resource.

**A renewable resource is a natural resource that can be replaced at the same rate at which the resource is used (consumed).**

**For example-Solar energy, biomass, wind, water**

1. Define and give two examples of a nonrenewable resource.

**Nonrenewable resources are resources that form at rates much slower than the rate at which it is consumed.**

**For example-oil and coal**

**Unit 8 – Newton’s Laws and Work**

1. Define work.

**When a force causes an object to move in the same direction as the force.**

**(Pushing or pulling an object in the same direction that the object moves) For example-pushing a shopping cart, lifting weights.**

1. How much work is done if a box is moved 6 meters with a force of 7 Newtons? (W=Fxd)

**W=F x d**

**W=7 x 6**

**W=42 Joules**

1. Why are machines never 100% efficient?

**Machines are never 100% efficient due to friction which causes parts to wear down**

1. Define air resistance.

**Air resistance is the force that opposes the motion of objects moving through air.**

1. Define momentum.

**Momentum is the product of the mass and velocity of an object. THE PROPERTY OF ALL MOVING OBJECTS. If something is moving, it has momentum.**

1. Define acceleration.

**Acceleration is the rate at which velocity (speed and direction) changes overtime. Acceleration changes if speed or direction changes.**

1. Describe the relationship between air resistance and surface area.

**As surface area increases (bigger object), air resistance increases**

**(ex.-flat piece of paper)**

**As surface area decreases (smaller object), air resistance decreases (ex. crumpled piece of paper)**

1. Which of the following will have the greatest acceleration?

a 5 kg box being moved with 15 N or force or

**a 5 kg box being moved with 30 N of force**

(**More force on the same mass means greater acceleration)**

1. What is the formula for force?

**F=ma**

1. If an object has a mass of 20kg and accelerates at a rate of 3m/s² what would the force required?

**F=ma**

**F=20kg x 3m/s²**

**F=60N**

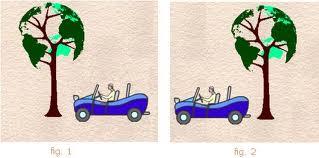
1. What determines the amount of inertia an object has?

**The amount of mass an object has determines its inertia**

**Unit 7 – Forces, Motion and Gravity**

1. Define reference point.

**The object that appears to stay in place is the reference point.**



1. Define force.

**A force is a push or pull**

1. Define acceleration.

**The rate at which velocity (speed and direction) change over time. If speed OR direction changes, velocity is changing.**

1. Define gravity.

**A force of attraction between objects that is due to their masses**

1. What does the Law of Universal Gravitation state?

**All objects in the universe attract each other through gravitational force.**

**The size of the force of gravity depends on the masses of the objects and the distance between them.**

1. Describe the difference between speed and velocity.

**Speed is distance traveled divided by time.**

**Velocity is distance traveled divided by time in a particular *direction*.**

1. What is the speed of a bike that travels a distance of 300 m in 6 seconds? (use the formula)

**S=d/t**

**S=300/6**

**S=50m/s**

1. What is the velocity of a truck that travels 50 km west for 5 hours?

**V=d/t plus direction**

**V=10 km/h west**

1. Identify the three ways an object can accelerate.

**speed up**

**slow down**

**change directions**

1. What type of force causes a change in motion?

**Unbalanced forces cause a change in motion**

1. What is a balanced force? Unbalanced?

**balanced force = no movement = 0 N net force**

**unbalanced force = movement and will not equal 0 N net force**

1. Define friction and describe why it occurs.

**A force that opposes motion between two objects that are in contact. Example: a text book being pushed across a desk.**

1. Name two ways to decrease friction (grip) and two ways to increase friction (grip).

**Decrease friction-Use a lubricant (soap, oil water), smoother surface or reduce the force**

**Increase friction-use a rougher surface or increase the force**

1. Give one example of helpful friction and one example of harmful friction.

**Helpful friction-sand on the road to help tires grip, pencil and paper**

**Harmful friction-machine parts wearing down, holes in your socks**

1. What is the difference between mass and weight?

M**ass is the amount of matter (stuff) in an object**

**Weight is the measure of gravitational force on an object**

1. Explain why a crumpled piece of paper hits the ground before a flat piece of paper.

**A crumpled piece of paper hits the ground before a flat piece of paper because the flat piece of paper has more surface area so it has more air resistance**

**Unit 6 – Periodic Table and Chemical Bonding**

1. What are the elements to the right of the zigzag line on the p-table called?

**The elements to the right of the zigzag line are Nonmetals**

1. What are the elements to the left of the zigzag line on the p-table called?

**The elements to the left of the zigzag line are Metals**

1. What are most of the elements on the p-table?

**Most of the elements on the p-table are Metals**

1. What are the rows called on the p-table and how many are there?

**Rows are called periods and there are 7.**

1. What are the columns called on the p-table and how many are there?

**Columns are called Groups or Families and there are 18.**

1. What do elements in the same family have in common?

**Elements in the same family have the same number of valence electrons.**

1. The modern p-table is arranged by what?

**The modern p-table is arranged by atomic number.**

1. What type of bonding is taking place when atoms share electrons?

**When atoms share electrons it is called Covalent bonding.**

1. Chemical bonds cause atoms to lose, gain, or share what part of an atom?

**Only electrons can be lost, gained, or shared.**

1. How are electrons arranged in atoms?

**Electrons are arranged in energy levels.**

1. What are the electrons called that are involved in chemical bonding?

**VALENCE ELECTRONS-The electrons in the last energy level.**

1. Explain why noble gases in group 18 don’t want to form chemical bonds.

**Noble gases don’t want to form chemical bonds because their valence shell is filled up with 8 electrons we call this being stable.**

1. Elements in the same **Group or Family** have similar chemical properties.

**Unit 5 – Atomic Structure**

1. What does the atomic number tell you?

**The atomic number tells you the number of protons in an atom and electrons in a neutral atom.**

1. When are ions formed?

**Ions are formed when an atom either gains or loses an electron.**

1. What is the smallest particle of an element that still has all of its properties?

**The smallest part of an element that still has all of its properties is an atom.**

1. Which of the 3 subatomic particles has the least mass?

**Of the 3 subatomic particles the electron has the least mass.**

1. What are the 3 subatomic particles? Identify their location in an atom.

**Neutron and proton in the nucleus. Electrons in the energy levels outside the nucleus.**

1. How do you determine the atomic mass of an element?

**Atomic mass = protons + neutrons**

1. How do you determine the number of protons in an element?

**Protons = atomic mass – neutrons or atomic number.**

1. How do you determine the number of electrons in an element?

**Protons = electrons in a neutral atom**

1. How do you determine the number of neutrons in an element?

**Neutrons = atomic mass - protons**

1. If an atom has 6 protons, how many electrons would it have? WHY?

**It would have 6 electrons because atoms are neutral**

1. How many protons are in Lithium? How many electrons? How many neutrons?

**Atomic mass = 7 Atomic number = 3 (atomic mass and atomic number come from the periodic table) protons = electrons = 3 7 – 3 = 4 neutrons**

1. How many protons are in Magnesium? How many electrons? How many neutrons?**Atomic mass = 24 Atomic number = 12 (atomic mass and atomic number come from the periodic table) protons = electrons = 12 24 – 12 = 12 neutrons**

**Unit 4 – Elements, Mixtures, Compounds, and Solutions**

1. What is the smallest piece of a compound?

**The smallest piece of a compound is an element (molecule).**

1. Give 2 examples of a compound.

**H₂0 and CO₂ are compounds because compounds are made of elements**

1. Name 3 ways to separate a compound.

**Three ways to separate a compound are a Chemical reaction, heat, and electricity**

1. What do elements and compounds have in common?

**Elements and compounds are both pure substances**

1. What is the difference between an element, a compound, and a mixture? Give an example of each.

**Element: a pure substance that can’t be separated or broken down into simpler substance by physical or chemical means. Example = Hydrogen**

**Compound: a pure substance composed of 2 or more elements chemically combined. They don’t keep their own properties. Example = H₂0**

**Mixture: is when 2 or more substances are combined but DO NOT chemically combine.**

1. How many atoms are in C12H22O11? How many elements?

**45- atoms and 3 elements**

1. What are the 2 types of mixtures? Give an example of each.

**Homogeneous(looks the same) = milk**

**Heterogeneous(looks different) = vegetable soup**

1. Name 4 ways to separate a mixture.

**Four ways to separate a mixture are to pick it apart, evaporation, filter, and magnets**

1. What are the 2 parts of a solution?

**Two parts of a solution are the Solute and solvent(usually water)**

1. What is the solute and solvent in salt water?

**Salt is the solute and water is the solvent**

1. What does it mean if something is soluble? Give an example.

**Soluble means something will dissolve into the solvent. Sugar is soluble**

1. What does it mean if something is insoluble? Give an example.

**Insoluble means something can’t dissolve. A pencil in water is insoluble.**

1. What 3 things can increase solubility?

**The 3 things that can increase solubility are temperature, increase surface area(break up a sugar cube into smaller pieces), and add more solvent(water)**

1. What can decrease solubility?

**These can decrease solubility lower temperature, smaller surface area, and more solute than solvent**

109 If sand, salt, and water were mixed together in a glass, explain why the

salt will no longer be visible and why the sand will sink to the bottom of

the glass.

**Salt is the soluble material and dissolves.**

**Sand is the insoluble material and cant’ dissolve.**

**Water is the solvent in this solution.**

110 What physical change would happen to the water after 10 days?

**The solvent(water) will evaporate.**

111 How can this physical change happen faster?

**This physical change can happen faster if you add heat.**

112 Why does granulated sugar dissolve faster than a sugar cube?

Granulated sugar will dissolve faster than a sugar cube **because granulated sugar has more surface area than sugar cubes.**

113 What are NHɜ, H₂O, and HCl examples of?

**They are all examples of Compounds**

114 How is a compound different from a mixture?

**Compounds are formed by combining 2 or more elements that form one completely new substance. Example is NaCl.**

**Mixtures are when 2 or more substances combine but do not chemically react so they keep their original properties. Example is a salad.**

**Unit 3 – Matter**

115 What is a physical change? Give an example.

**A physical change is when an object undergoes a change that doesn’t alter their chemical properties. Biting an apple.**

116 What is a chemical change? Give an example.

**A chemical change is when a substance reacts with another substance and a new substance is formed. Burning something**

117 What are physical properties? Give some examples.

**Physical properties are properties that do not change the chemical nature of matter. Example: color, density, hardness, smell, boiling point, melting point.**

118 What are chemical properties? Give some examples.

**Chemical properties are properties that do change the chemical nature of matter. Example: rusting, corrosion, flammability, heat of combustion.**

119 What are the four states of matter?

**The 4 states of matter are Solid, liquid, gas, plasma**

120 Which state of matter has the least amount of energy? WHY?

**Solids have the least amount of energy because they have the least amount of kinetic energy.**

Use the diagram to answer questions 121 and 122.



121 The diagram represents four phase changes, labeled A, B, C, and D, that occur when water changes phase. Label each phase change:

**Condensation: remove heat**

**Freezing: remove heat**

**Melting: adding heat**

**Vaporization: adding heat**

122 Which two processes increase the motion of the molecules?

1. A and B **3. C and D**

2. B and C 4. D and A

123 The diagram below shows a model of a sample of gas particles at room

temperature.



124 Circle the diagram which best shows the results of removing heat from this sample until it freezes?



1 **2**  3 4

125 Circle the graph which best represents the relative distance between the particles of most substances in their solid, liquids, and gaseous states?



126 When does a phase change occur?

**A phase changes occurs when heat energy is absorbed or released**

127 How do you give a material more energy? Less energy?

**You give a material more energy by increasing the temperature and less energy by decreasing the temperature**

128 Name the phase change that occurs from a solid to a liquid. **MELTING**

129 Name the phase change that occurs from a liquid to a solid. **FREEZING**

130 Name the phase change that occurs from a liquid to a gas. **VAPORIZATION**

131 Name the phase change that occurs from a gas to a liquid.

**CONDENSATION**

132 When a material goes from a solid straight to a gas, what is the phase

change? **SUBLIMATION**

133 What is the phase change called when a material goes from a gas straight to a solid? **DEPOSITION**

**Unit 2 – Measurement and Density**

134 What system of measurement do all scientists use? **Metric System**

135 Explain why mass and weight are NOT the same thing.

**Mass is the amount of matter in an object and Weight is the measure of the pull of gravity on an object**

136 What tool is used to measure mass? **Triple Beam Balance**

137 What is the unit/label when measuring mass? **Grams: g**

138 A student placed a rock on a triple beam balance. She moved the arrows

until the scales were balanced.



What is the mass of the rock?

1. 34.2g 3. 340.21g

**2. 342.1g** 4. 340g

139 What tool is used to measure the volume of a liquid? **Graduated Cylinder**

140 What is the unit/label when measuring the volume of a liquid? **Liter**

141 Which instrument could you use to measure the volume of an irregularly

shaped solid?  **Graduated Cylinder**

142 Does the density of an object change if you cut it into pieces? Explain why

or why not.

**The density of an object doesn’t change if you cut it into pieces because density will always reduce to the same answer.**

**Unit 1 – Scientific Method**

143 What is the scientific method?

**A series of steps a scientist follows to solve a problem**

144 What is a hypothesis?

**A hypothesis is an educated guess.**

145 What is a control group?

**The control group is the part of the experiment that remains the same and is needed for comparison**