**Grade 9 Midyear Science Review December 2017 ANSWER KEY**

You are not allowed your notes, a memory aid, and formulas will NOT be written on the board!

Studying prior to the exam is essential!

**Chapters 9 and 10 – Earth & Space, Origins of Life**

1. **What conditions are needed for new life to be able to form?**

- Presence of essential chemicals (Carbon, Oxygen, Hydrogen, and Nitrogen)

- Presence of an Energy Source

- Presence of Liquid Water

- A very long period of time

**Chapter 1 and Density**

1. **Density Questions**
2. Find the density of a mysterious liquid with a mass of 4.5 grams and a volume of 16 ml.
3. Find the mass of an unknown substance with a density of 7.8 g/ml and a volume of 24 ml.



1. When a solid is placed in 105 ml of water in a graduated cylinder, the water level rises to   
   118 ml. If the density of this solid is 2.6 g/ml, what is the mass?
2. What is the volume of an item that has a density of 5.42 g/ml and a mass of 16.802 g?



1. Convert the following:

4500 ml = **4.5 L** 0.65 L = **650 mL**

2.45 g = **2450 mg** 326.14 mg = **0.32614 g**

1. **Describe the movement and structure of particles in a solid, a liquid and a gas.**

* In a solid, there is very little movement, packed very close together.
* In a liquid, there is more movement than solids, packed close together.
* In a gas, there is lots of movement, spread far apart

1. **What is the difference between a mixture and a pure substance?**

* A pure substance has only one kind of atom or molecule.
* A mixture has a number of different pure substances mixed together.

1. **What are the 2 types of mixtures? Give 2 examples of each.**

* Homogeneous -- gold ring, apple juice, air, vinegar
* Heterogeneous -- vegetable soup, rock, smog, pizza

1. **What are the 2 types of pure substances? Give an example of each.**

* Element -- Copper, Silver, Iron
* Compund -- Water, Salt, Carbon dioxide

1. **Check off what type of mixture or pure substance each of the following is.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Mixtures** | | **Pure Substances** | |
|  | **Homogeneous** | **Heterogeneous** | **Element** | **Compound** |
| Chocolate Chip Cookie |  | **X** |  |  |
| Chicken Noodle Soup |  | **X** |  |  |
| Iron (Fe) |  |  | **X** |  |
| Blood | **X** |  |  |  |
| Carbon Dioxide(CO2) |  |  |  | **X** |
| Chocolate Milk | **X** |  |  |  |
| Water (H2O) |  |  |  | **X** |
| Urine | **X** |  |  |  |
| Gold (Au) |  |  | **X** |  |

**Chapter 2 - Energy**

1. **Explain the difference between an energy transformation and energy transfer.**

E**nergy transfer** is the movement of energy from one object to another without changing its form. For example, electrical energy from a power station to electrical energy to your home.

**Energy transformation** is the movement of energy from one object to another that changes forms. For example, a toaster transforms electrical energy into thermal energy.

1. **Define the three types of physical changes listed below:**

a. Phase Change (or Change of State): changes from 1 state to another (solid liquid)

b. Dissolution: dissolving a solute in a solvent (salt water)

c. Deformation: changing the shape of the material

1. **Give the definition of the following chemical changes:**

a. Synthesis: forming a complex molecule from simple molecule (putting together)

b. Decomposition: breaking down complex molecules into simple ones

c. Oxidation: chemical reaction involving oxygen

d. Precipitation: forming a solid when 2 solutions are mixed

1. **Energy that comes from the movement of particles is what type of energy?**

a) Solar Energy:

b) \* Thermal Energy

c) Sound Energy

d) Hydraulic Energy

1. **What is decomposition?**

a) \*The transformation of complex molecules into simpler ones

b) A chemical reaction involving oxygen

c) A physical change that changes the shape of a material

d) None of the above

1. **Energy that is contained in and transported by electromagnetic waves is called:**

a) \*Radiant Energy

b) Thermal Energy

c) Elastic Energy

d) Wind Energy

1. **State whether the following are examples of energy transformation or energy transfer:**

I. A lamp’s electrical energy changes into radiant energy: Transformation

II. Electricity travels along wires from a power plant to homes: Transfer

III. Eating an apple and then dancing around: Transformation

IV. Heat moving around our homes: Transfer

V. Turning on the TV in a dark room, and the TV lights up the room: Transfer

**Chapter 3 - Fluids & Pressure**

1. **What is the difference between an incompressible fluid and a compressible fluid? Provide an example of each.**

A compressible fluid, the volume can change. Gases are compressible fluids.

In an incompressible fluid, the volume does not change. Liquids are incompressible fluids.

1. **A mother and child are walking through deep snow. Who will sink deeper in the snow and why?**

a) \*The mother will sink deeper in the snow because she has a greater mass, and exerts a greater pressure.

b) The mother will sink deeper in the snow because she has a greater mass, and exerts a lower pressure.

c) They will both sink to the same level because mass doesn’t affect pressure.

1. **Which of the following is NOT a fluid?**

a) Milk

b) Blood

c) Oxygen

d) \*Sand

1. **A test tube is filled with a solution. There are two holes in the test tube marked by A and B.   
   Which of the following statements is true concerning the pressure of these two holes?**

a) The liquid coming out of A will spurt out farther because there’s more pressure at the top.

b) \*The liquid coming out of B will spurt out farther because there’s more pressure at the

bottom.

c) The liquid coming out of B will spurt out farther because there’s less pressure at the bottom.

d) The liquid will spurt out of both spots equally as the pressure is the same throughout the

graduated cylinder.

1. **When we inhale, our lungs fill with air and the volume of air in our lungs increase. During inhalation, what happens to the pressure in our lungs?**

As volume increases the pressure decreases

**Chapter 5 – Cellular Specialization and Reproduction**

1. **What is the relationship between cells, tissues, organs and systems?**

Cells Tissues Organs Systems (smallest to largest)

1. **Give the three main reasons why cell division occurs.**

Growth, repair and sexual reproduction

1. **Describe mitosis (with at least three characteristics)**

- 1 cell makes 2 identical cells

- Start with 46 chromosomes end with the same amount

- For growth and repair

1. **Describe meiosis (with at least three characteristics)**

- 1 cell makes 4 non-identical daughter cells

- Start with 46 chromosomes end with 23 chromosomes

- For sexual reproduction

1. **How many chromosomes does a diploid cell have?**

46

1. **How many chromosomes does a haploid cell have?**

23

1. **What is DNA? What is a gene? What is a genome?**

DNA: Located in the cell’s nucleus, shaped like a double helix

Gene: Segment of DNA

Genome: Complete set of genetic information

1. **What is genetic diversity?**

**Genetic diversity** refers to the variety of genes within a species.

**Reproductive System**

1. **What is puberty?**

The changes that prepare the body to be able to reproduce

1. **What are hormones?**

Chemical messengers that are transported by the blood

1. **Which hormones trigger puberty?**

FSH & LH

1. **What are the female sex hormones? The male sex hormones?**

Female: progesterone & estrogen

Male: testosterone

1. **What is oogenesis?**

Process of ovum production in the female through meiosis.

1. **What hormones cause the menstrual cycle to start?**

A decrease in progesterone causes the start of the menstrual cycle

1. **Where is a female ovum fertilized?**

In the fallopian tube

1. **What is spermatogenesis?**

Process of sperm production in the male through meiosis.

**Chapter 6 – Nutrition Digestion Respiration**

1. **Which nutrient is the body’s main source of energy?**

Carbohydrates

1. **What are the 6 nutrients? Give an example of a food rich in each nutrient.**

Carbohydrates: bread, spaghetti

Proteins: steak, eggs

Fats: dairy

Vitamins: fruits

Minerals: vegetables

Water: soups

1. **Where proteins are first digested? Carbohydrates? Fats?**

Proteins: stomach

Carbohydrates: mouth

Fats: small intestines

1. **Give 2 examples of mechanical transformations that occur during the digestion process.**

Chewing and churning

1. **In which organ are all nutrients absorbed?**

Small intestines

1. **Where does the absorption of water take place?**

Large intestines

1. **What is the name of the muscle contraction that moved food down the esophagus to the stomach?**

Peristalsis

1. **Which digestive gland targets the breakdown of fats?**

Liver

1. **Give 2 examples of chemical transformations that occur during the digestion process.**

Saliva in the mouth & intestinal glands

1. **What is important about the location of the first item on an ingredient list?**

It is the main ingredient

1. **What are the 6 main parts of the respiratory system?**

Nasal cavity, pharynx, larynx, trachea, bronchi, & lungs

1. **What is the main goal of respiration?**

Extract oxygen from the air and to expel carbon dioxide

1. **What happens during inhalation?**

Lung volume increases, air pressure inside the lungs decreases, oxygen rich air flows in & diaphragm contracts

1. **What happens during exhalation?**

Lung volume decreases, air pressure inside the lungs increases, carbon dioxide rich air flows out & diaphragm relaxes

1. **How does gas exchange occur in the lungs? Where exactly does this happen?**

Gas exchange occurs by diffusion and it happen in the alveoli.

1. **What is the name of the small blood vessels that carry the oxygenated blood away from the lungs?**

Pulmonary veins