

Grade 9 Midyear Science Review

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

1) Density Questions

- Find the density of a mysterious liquid with a mass of 4.5 grams and a volume of 16 ml.
- Find the mass of an unknown substance with a density of 7.8 g/ml and a volume of 24 ml.
- 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?
- What is the volume of an item that has a density of 5.42 g/ml and a mass of 16.802 g?
- Convert the following:
1 – 4500 ml = _____ L
2 – 2.45 g = _____ mg
2- 0.65 L = _____ mL
4 – 326.14 mg = _____ g

2) Particle Model

- What are the three phases that matter generally assumes?
- Describe the movement and structure of particles in a solid.
- Describe the movement and structure of particles in a liquid.
- Describe the movement and structure of particles in a gas.

3) Concentration

- What is the mass of solute dissolved in 3200 mL of a 2 g/L solution?
- In a lab, 41 g of solute is placed in 250 ml of solvent to create a solution. What is the concentration of this solution?
- You have 65.3 g of solute and want to make a solution that is 20 g/L. What is the volume of water needed to make this solution?
- A solution has a concentration of 8 g/L and a volume of 7 L. If the concentration of the solution is reduced by half (so the new concentration is 4 g/L), what will happen to the volume of the new solution?

4) Tissues, Organs and Systems

- What is the relationship between cells, tissues, organs and systems?

5) Cell Division and DNA

- a) Give the three main reasons as to why cell division occurs.
- b) Describe mitosis (with at least three characteristics)
- c) Describe meiosis (with at least three characteristics)
- d) How many chromosomes does a diploid cell have?
- e) How many chromosomes does a haploid cell have?
- f) What is DNA?
- g) What is a gene?
- h) What is a genome?
- i) What is genetic diversity?

6) Reproductive System

- a) What is puberty?
- b) What are hormones?
- c) Which hormones trigger puberty?
- d) What are the female sex hormones? The male sex hormones?
- e) What is oogenesis?
- f) What is spermatogenesis?
- g) What is menopause?
- h) What is andropause?
- i) Where is a female ovum fertilized?

7) Nutrition and digestion

- a) Which nutrient is the body's main source of energy?
- b) What are the 6 nutrients? Give an example of a food rich in each nutrient.
- c) What are the building blocks of proteins? Carbohydrates? Fats?
- d) What factors does a person's daily energy requirements depend upon?
- e) Give 2 examples of mechanical transformations that occur during the digestion process.
- f) In which organ are nutrients absorbed?
- g) Where does the absorption of water take place?
- h) What is the name of the muscle contraction that moved food down the esophagus to the stomach?
- i) Which digestive gland targets the breakdown of fats?
- j) Give 2 examples of chemical transformations that occur during the digestion process.
- k) What is important about the location of the first item on an ingredient list? What does this tell us about that ingredient?
- l) Indicate whether the statement is true or false.

- _____ 1. The absorption of water and storage of undigested food occurs in the small intestine
- _____ 2. Fats are an essential component of all diets.
- _____ 3. The small intestine is shorter in length than the large intestine.
- _____ 4. Nutrients are absorbed from the digestive tract to the blood.
- _____ 5. Even a person who sleeps all day consumes energy.
- _____ 6. Typical teenage girls and boys both require the same amount of energy in the form of food each day.

8) Respiration

- a) What are the 6 main parts of the respiratory system?
- b) What is the main goal of respiration?
- c) What happens during inhalation?
- d) What happens during exhalation?
- e) How does gas exchange occur in the lungs? Where exactly does this happen?
- f) What is the name of the small blood vessels that carry the oxygenated blood away from the lungs?

9) Blood compatibility

- a) Which blood type is known as the universal donor? Why?
- b) Which blood type is known as the universal recipient? Why?
- c) Can a person with blood type AB- donate to a person with a blood type of A-? Why or why not?
- d) Can a person with blood type B+ donate to a person with a blood type of B-? Why or why not?
- e) Which blood types would be able to donate to a person with O+ blood?
- f) Which blood types could donate to a person with A+ blood?