**Semester 1 2016/2017**

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Science 10 Final Exam Review – 2016/2017

Science 10 Final Exam Review



Your Final Exam

* Your final exam consists of short answer, multiple choice and numerical response – 30% of your final grade
* This review package is to be used in conjunction with all of your other class materials.
* **Things you should review to study:**
  + The review package
  + Your notes from all units
  + Your old quizzes (you guys know I like to re-use questions)
  + Your past assignments and labs

Best of luck

Biology Review Questions

1. A compound light microscope has more than one
   1. Lens
   2. Stage
   3. Eyepiece
   4. Light source
2. A specimen is viewed with a compound light microscope with the 40x objective lens in place and a 10x eyepiece lens. What is the total magnification of the specimen?
   1. 4x
   2. 10x
   3. 40x
   4. 400x
3. A field diameter of 0.6 mm is equivalent to
   1. 6 µm
   2. 60 µm
   3. 600 µm
   4. 6000 µm
4. Mark observes a specimen under the medium-power objective lens of a microscope and estimated that it takes up two-thirds of the field of view. If the medium-power field diameter is 1.2 mm, what is the length of the specimen in micrometers?
   1. 0.4 µm
   2. 1.2 µm
   3. 800 µm
   4. 1200 µm
5. The course adjustment knob on a microscope should **never** be used with the
   1. Eyepiece
   2. Low-power lens
   3. Medium-power lens
   4. High-power lens
6. A microscope has a low-power magnification of 200x and a high-power magnification of 1600x. If the low-power field diameter is 1.2 mm, calculate the high-power field diameter in micrometers (µm). **Show your work.**
7. The idea that life could emerge from non-living matter is called
   1. Spontaneous generation
   2. Life force
   3. Infusion
   4. Cell theory

***Use the following information to answer question 8***

The following steps are used to prepare a wet mount slide:

|  |
| --- |
| **Step 1:** Place your specimen in the center of the slide  **Step 2:** Gently tap on the slide with a probe to eliminate air bubbles  **Step 3:** Obtain a clean microscope slide and cover slip  **Step 4:** With an eyedropper, place a drop of water on the specimen  **Step 5:** Place the cover slip at an angle with the edge contacting the water, and gently lower the cover slip with a toothpick or probe |

1. Which of the following is the correct order of preparing a wet mount slide?
   1. 1,2,5,4,3
   2. 1,4,2,3,5
   3. 3,1,4,5,2
   4. 3,5,2,1,4

***Use the following information to answer question 9-11***

|  |
| --- |
| Louis Pasteur performed an experiment in which he had several flasks of broth at the same temperature and same light conditions. He had one flask that allowed dust to enter and a second flask that did not allow dust to enter. Pasteur found that mould grew in the flask that allowed dust to enter but now in the one that did not allow dust to enter. He then allowed dust to enter the second flask and found, later, that mould grew in the second flask. |

1. The conditions of same temperature and light conditions is called:
   1. Responding variables
   2. Controlled variables
   3. Manipulated variables
   4. Experiments control
2. The flask that was open throughout the experiment is called the:
   1. Responding variable
   2. Controlled variable
   3. Manipulated variable
   4. Experimental control
3. The mould that grew in the flask is called the
   1. Responding variable
   2. Controlled variable
   3. Manipulated variable
   4. Experimental control
4. Which of the following statements is not part of the cell theory?
   1. Cells come from pre-existing cells
   2. Cells can form spontaneously from non-living matter
   3. All life function take place inside the cell
   4. All living things are made up of one or more cells
5. Which characteristic of an image does staining improve?
   1. Magnification
   2. Contrast
   3. Resolution
   4. Transmission
6. Which microscope can show a detailed view of the surface of a specimen?
   1. Light microscope
   2. Confocal microscope
   3. Scanning electron microscope
   4. Transmission electron microscope
7. The minimum image size that the human eye can see is 0.1mm. What is the minimum magnification required to make an object that is 10 µm visible?
   1. 1x
   2. 10x
   3. 100x
   4. 1000x
8. A system that is able to exchange matter and energy with its surroundings is called a(n)
   1. Basic system
   2. Open system
   3. Free system
   4. Empty system
9. Which statement is true for both plant and animal cells?
   1. They have a cell wall
   2. They have chloroplasts
   3. They have a golgi apparatus
   4. They have centrioles
10. The solvent that provides the environment for all the biological reactions is
    1. Water
    2. Cytoplasm
    3. Nucleic acid
    4. Oxygen
11. The cell membrane consists of
    1. Two layers of lipids, each with a phosphate group attached
    2. Sugar molecules attached to a protein layer
    3. Two layers of carbohydrates attached to a lipid layer
    4. A single layer of lipids with a phosphate group attached on each side
12. Membrane bound sacs in which digestion occurs in a cell are called:
    1. Lysosomes
    2. Ribosomes
    3. Mitochondria
    4. Golgi apparatus
13. Rod-like structures where reactions occur to convert chemical energy in sugars into energy the cell can use are called
    1. Lysosomes
    2. Ribosomes
    3. Mitochondria
    4. Golgi apparatus
14. Which part of the cell receives substances from the endoplasmic reticulum and prepares them for transport out of the cell?
    1. Lysosomes
    2. Ribosomes
    3. Mitochondria
    4. Golgi apparatus
15. Match each description or function with the correct structure or term from the following list

|  |  |  |
| --- | --- | --- |
| i. cytoplasm | Ii. Cell membrane | iii. endoplasmic reticulum |
| iv. chloroplasts | v. lysosome | vi. central vacuole |
| vii. nucleus | viii. lipid | ix. equilibrium |

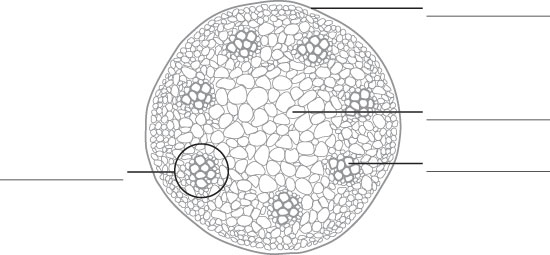
* 1. A series of small interconnected tubes that branch from the nuclear envelope
  2. An organelle that contains the genetic material of the cell and directs all cell activities
  3. A structure containing chlorophyll found in plants and some protists
  4. A large, membrane-bound structure in a plant cell that causes the cell to become turgid when filled with water
  5. A gel-like substance inside the cell membrane that contains the nutrients required by cells
  6. A protective barrier for the cell

1. The movement of water across a cell membrane that does not require energy is called:
   1. Osmosis
   2. Hypertonic diffusion
   3. Facilitated diffusion
   4. Active transport
2. Which factor determines whether movement across a cell membrane is active transport of passive transport?
   1. Energy use
   2. Direction of movement
   3. The concentration of solutes
   4. The type of molecule or particle involved
3. A white blood cell engulfing a bacterium is an example of
   1. Osmosis
   2. Exocytosis
   3. Endocytosis
   4. Facilitated diffusion
4. Which method allows the cell to move particles against the concentration gradient?
   1. Osmosis
   2. Hypertonic diffusion
   3. Facilitated diffusion
   4. Active transport
5. Substances that are soluble in lipids can pass through the cell membrane by:
   1. Diffusion
   2. Facilitated diffusion
   3. Active transport
   4. Attaching to carrier proteins
6. A hen’s egg with the shell dissolved is placed in a 10% salt solution. Relative to the interior of the egg, the salt solution is
   1. Hypotonic
   2. Isotonic
   3. Hypertonic
   4. Semi-permeable
7. A process in which a vesicle fuses with the cell membrane then ruptures to expel wastes to the outside of the cell is known as
   1. Osmosis
   2. Exocytosis
   3. Endocytosis
   4. Plasmolysis
8. Determine whether each statement is true (T) or false (F)
   1. When a cell is put into an isotonic solution, individual water molecules cannot move back and forth across the cell membrane
   2. When a cell is put into a hypertonic solution, there is a net movement of water molecules across the cell membrane into the cell
   3. When a cell is put into a hypotonic solution, there is a net movement of water molecules across the cell membrane out of the cell
   4. The movement of water across a semi-permeable membrane is called osmosis
   5. Carrier proteins have the ability to change shape and physically move molecules across the cell membrane
   6. In facilitated diffusion, the concentration of the molecules to be moved across the cell membrane is higher inside the cell
9. Proteins that stick out of the cell membrane and allow cells to recognize other cells or recognize foreign bodies, such as bacteria, are known as:
   1. Synthetic proteins
   2. Recognition proteins
   3. Receptor proteins
   4. Model proteins
10. Future treatment for diseases, such as HIV, involves
    1. The removal of receptor proteins from the cell membrane
    2. Blocking recognition proteins on the HIV virus
    3. Blocking receptor proteins in the cell membrane
    4. Adding recognition proteins to the cell membrane
11. Gene therapy for cancer treatment involves
    1. Using liposomes to deliver medication to cancer cells
    2. Blocking receptor proteins in the cell membranes of cancer cells
    3. Using liposomes to introduce DNA to cancer cells so they produce toxins
    4. Using liposomes to introduce DNA to healthy cells so they do not become cancerous
12. What moves from an area of lower water concentration to an area of higher water concentration in
    1. Osmosis
    2. Diffusion
    3. Reverse osmosis
    4. Facilitated diffusion
13. Which statement regarding hemodialysis is true?
    1. The dialysate fluid flows into the abdominal cavity through a catheter
    2. The blood is circulated out of the body for cleansing and then returned
    3. The patient is able to move around during the procedure
    4. Wastes move from a region of lower concentration to a region of higher concentration
14. You can check if starch moves across the membrane by performing:
    1. An iodine test on the starch solution inside the membrane
    2. An iodine test on the water outside the membrane
    3. A glucose test on the water outside the membrane
    4. A glucose test on the starch solution inside the membrane
15. To operate efficiently, a cell must
    1. Be large
    2. Have an impermeable membrane
    3. Have a large surface area to volume ratio
    4. Have a small surface area to volume ratio
16. Copy and complete the following table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cell Number** | **Length (cm)** | **Width (cm)** | **Height (cm)** | **Surface Area** | **Volume** | **SA:V ratio** |
| **1** | **6** | **3** | **2** |  |  |  |
| **2** | **12** | **5** | **2** |  |  |  |
| **3** | **20** | **27** | **10** |  |  |  |

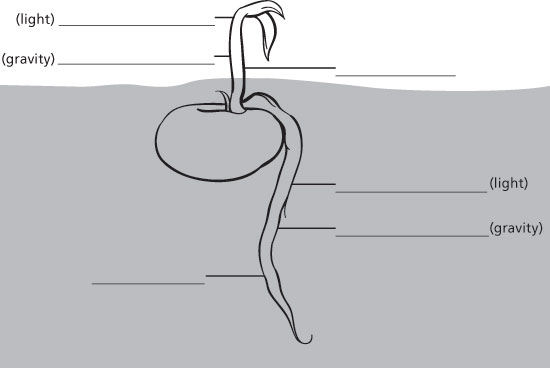
1. An example of xylem tissue is
   1. Openings in leaves
   2. Long fibres in celery
   3. Cells that cover the surface of leaves
   4. Small projections extending from roots
2. Long tubes that carry water and sugar from leaves to the rest of the plant are known as
   1. Phloem tissues
   2. Xylem tissue
   3. Dermal tissue
   4. Ground tissue
3. Tissue that lies beneath the epidermis and makes up the majority of the plant is called
   1. Cuticle tissue
   2. Dermal tissue
   3. Ground tissue
   4. Vascular tissue
4. Label the following cross section of a plant stem using terms from the list provided.

|  |  |  |
| --- | --- | --- |
| * Xylem | * Epidermis | * Vascular bundle |
| * Stomata | * Phloem | * Guard cells |
| * Ground tissue |  |  |

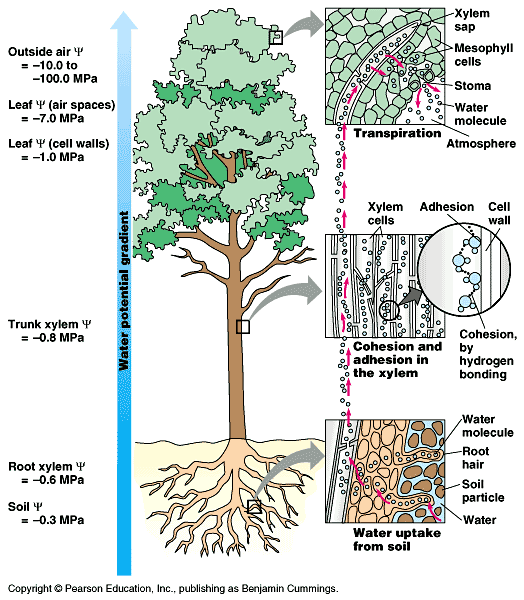


1. The organelles where photosynthesis takes place are
   1. Xylem
   2. Chloroplasts
   3. Chlorophyll
   4. Vascular bundles
2. Which is a reactant in the process of photosynthesis?
   1. Carbon dioxide
   2. Chlorophyll
   3. Oxygen
   4. Glucose
3. Cells directly obtain energy to fuel their activities from
   1. Photosynthesis
   2. Cytoplasmic streaming
   3. Cellular respiration
   4. Cellular transport
4. Specialized cells that regulate the movement of water and other gases in and out of the leaf of the plant are known as
   1. Guard cells
   2. Mesophyll cells
   3. Palisade cells
   4. Companion cells
5. The process of water vapour leaving a leaf through the stomata is called
   1. Transpiration
   2. Transportation
   3. Respiration
   4. Diffusion
6. The attraction of water molecules to other water molecules is known as
   1. Adhesion
   2. Cohesion
   3. Osmosis
   4. Capillary action
7. Answer: why does cutting through the bark of a tree often kill the tree?
8. A plant bends toward a light source as it grows. This is an example of
   1. Positive gravitropism
   2. Negative gravitropism
   3. Positive phototropism
   4. Negative phototropism
9. A corn seed is germinated in the dark. The root grows in a downward direction. This shows the effect of
   1. Positive gravitropism
   2. Negative gravitropism
   3. Positive phototropism
   4. Negative phototropism
10. Write the following terms in the correct blank on the diagram.

|  |  |  |
| --- | --- | --- |
| Positive gravitropism | Negative gravitropism | Positive phototropism |
| Negative phototropism | Seed | Root |
| stem |  |  |



1. How do trees get water that they absorbed in their roots to the leaves at the top?



Chemistry Review Questions

1. Atoms, Protons and Electrons

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Number of Protons** | **Number of Electrons** | **Electric Charge** |
| Li | 3 | 3 | 0 |
| C |  |  |  |
| F |  |  |  |
|  | 19 |  | 0 |
|  | 15 |  | 0 |
|  |  | 10 | 0 |
|  |  | 18 | 0 |
|  | 17 | 17 |  |
|  | 11 | 11 |  |
| Fe |  |  |  |
| Ni |  |  |  |
|  | 82 |  | 0 |
|  | 30 |  | 0 |

1. Ionic compounds – univalent metal ions

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Name** |  | **Formula** |
| a) silver and iodine | silver iodide |  | AgI*(s)* |
| b) magnesium and oxygen |  |  |  |
| c) magnesium and bromine |  |  |  |
| d) calcium and nitrogen |  |  |  |
| e) sodium and sulfur |  |  |  |

1. Name each of the following compounds using IUPAC naming rules.

|  |  |  |
| --- | --- | --- |
| a) MgCI2 |  |  |
| b) Ag3N |  |  |
| c) CsF |  |  |
| d) CdO |  |  |
| e) MgBr2 |  |  |

1. Name and write the formula for the following multivalent compounds

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Name** |  | **Formula** |
| 1. a) iron and sulfur | iron(III) sulfide |  | Fe2S3*(s)* |
| b) copper and oxygen |  |  |  |
| c) manganese and fluorine |  |  |  |
| d) chromium and chlorine |  |  |  |
| e) nickel and oxygen |  |  |  |
| f) cobalt and bromine |  |  |  |



|  |  |  |  |
| --- | --- | --- | --- |
| **COMBINE** | **IONS (optional)** | **FORMULA** | **NAME** |
| iron(II) & nitrate |  |  |  |
| aluminium & nitrate |  |  |  |
| sodium & sulfate |  |  |  |
| lead(IV) & sulfate |  |  |  |
| magnesium & carbonate |  |  |  |
| gold(III) & sulfite |  |  |  |
| zinc & hydrogencarbonate |  |  |  |
| ammonium & nitrate |  |  |  |
| copper(I) & phosphate |  |  |  |
| silver & hydroxide |  |  |  |
| aluminium & hydroxide |  |  |  |
| lead(II) & phosphate |  |  |  |
| potassium & acetate |  |  |  |
| manganese(V) & sulfate |  |  |  |

1. Classify the compound as ionic or molecular and then name.

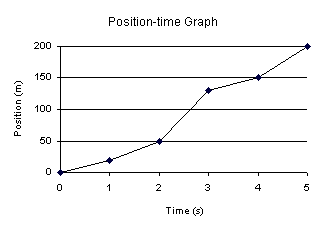
|  |  |  |  |
| --- | --- | --- | --- |
|  | **Type** |  | **Name** |
| a) NaCl*(s)* |  |  |  |
| b) N2O*(g)* |  |  |  |
| c) HCl*(aq)* |  |  |  |
| d) NH4Br*(s)* |  |  |  |
| e) KOH*(s)* |  |  |  |
| h) SCl3*(g)* |  |  |  |
| i) NiCl3*(g)* |  |  |  |
| j) H3PO4*(aq)* |  |  |  |

1. Rewrite the following word equations as formula equations and then balance them:
   1. solid sodium metal reacts with chlorine gas to produce solid sodium chloride
   2. hydrogen gas reacts with oxygen gas to produce liquid water
   3. solid potassium chlorate decomposes into oxygen gas and solid potassium chloride
   4. fluorine gas reacts with aqueous lead(IV) iodide to produce aqueous lead(IV) fluoride and solid iodine
2. Balance the following chemical equations:
   1. \_\_\_\_\_ Na*(s)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ Na2O*(s)*
   2. \_\_\_\_\_ Al*(s)* + \_\_\_\_\_ Cl2*(g)* 🡪 \_\_\_\_\_ AlCl3*(s)*
   3. \_\_\_\_\_ N2*(g)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ NO2*(g)*
   4. \_\_\_\_\_ HI*(g)* 🡪 \_\_\_\_\_ H2*(g)* + \_\_\_\_\_ I2*(s)*
   5. \_\_\_\_\_ NH3*(g)* 🡪 \_\_\_\_\_ H2*(g)* + \_\_\_\_\_ N2*(g)*
   6. \_\_\_\_\_ Al2S3*(s)* 🡪 \_\_\_\_\_ Al*(s)* + \_\_\_\_\_ S8*(s)*
   7. \_\_\_\_\_ BN*(s)* + \_\_\_\_\_ Cl2*(g)* 🡪 \_\_\_\_\_ BCl3*(g)* + \_\_\_\_\_ N2*(g)*
   8. \_\_\_\_\_ SnF4*(aq)* + \_\_\_\_\_ Cr*(s)* 🡪 \_\_\_\_\_ CrF3*(aq)* + \_\_\_\_\_ Sn*(s)*
   9. \_\_\_\_\_ Mg*(s)* + \_\_\_\_\_ HCl*(aq)* 🡪 \_\_\_\_\_ MgCl2*(aq)* + \_\_\_\_\_ H2*(g)*
   10. \_\_\_\_\_ (NH4)3PO4*(aq)* + \_\_\_\_\_ CaBr2*(aq)* 🡪 \_\_\_\_\_ Ca3(PO4)2*(s)* + \_\_\_\_\_ NH4Br*(aq)*
   11. \_\_\_\_\_ Pb(NO3)4*(aq)* + \_\_\_\_\_ K2Cr2O7*(aq)* 🡪 \_\_\_\_\_ Pb(Cr2O7)2*(s)* + \_\_\_\_\_ KNO3*(aq)*
   12. \_\_\_\_\_ AgClO4*(aq)* + \_\_\_\_\_ Na3PO4*(aq)* 🡪 \_\_\_\_\_ NaClO4*(aq)* + \_\_\_\_\_ Ag3PO4*(s)*
3. Balance the following chemical equations:
   1. \_\_\_\_\_ Pb*(s)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ PbO*(s)*
   2. \_\_\_\_\_ N2*(g)* + \_\_\_\_\_ H2*(g)* 🡪 \_\_\_\_\_ NH3*(g)*
   3. \_\_\_\_\_ Na*(s)* + \_\_\_\_\_ H2O*(l)* 🡪 \_\_\_\_\_ NaOH*(aq)* + \_\_\_\_\_ H2*(g)*
   4. \_\_\_\_\_ C4H10*(g)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ CO2*(g)* + \_\_\_\_\_ H2O*(g)*
   5. \_\_\_\_\_ H3PO4*(aq)* + \_\_\_\_\_ KOH*(aq)* 🡪 \_\_\_\_\_ K3PO4*(aq)* + \_\_\_\_\_ H2O*(l)*
   6. \_\_\_\_\_ C5H12*(l)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ CO2*(g)* + \_\_\_\_\_ H2O*(g)*
   7. \_\_\_\_\_ Zn3N2*(s)* + \_\_\_\_\_ H2O*(l)* 🡪 \_\_\_\_\_ Zn(OH)2*(aq)* + \_\_\_\_\_ NH3*(g)*
   8. \_\_\_\_\_ Fe3O4*(s)* + \_\_\_\_\_ H2*(g)* 🡪 \_\_\_\_\_ Fe*(s)* + \_\_\_\_\_ H2O*(l)*
   9. \_\_\_\_\_ Al*(s)* + \_\_\_\_\_ H2SO4*(aq)* 🡪 \_\_\_\_\_ H2*(g)* + \_\_\_\_\_ Al2(SO4)3*(aq)*
   10. \_\_\_\_\_ CrS*(s)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ CrO*(s)* + \_\_\_\_\_ SO2*(g)*
   11. \_\_\_\_\_ HClO3*(aq)* + \_\_\_\_\_ HCl*(aq)* 🡪 \_\_\_\_\_ H2O*(l)* + \_\_\_\_\_ Cl2*(g)*
   12. \_\_\_\_\_ CaC2*(s)* + \_\_\_\_\_ AsBr3*(aq)* 🡪 \_\_\_\_\_ C*(s)* + \_\_\_\_\_ As*(s)* + \_\_\_\_\_ CaBr2*(aq)*
   13. \_\_\_\_\_ 4 NH3*(g)* + \_\_\_\_\_ 5 O2*(g)* 🡪 \_\_\_\_\_ 4 NO*(g)* + \_\_\_\_\_ 6 H2O*(l)*
   14. \_\_\_\_\_ HNO3*(aq)* + \_\_\_\_\_ NO*(g)* 🡪 \_\_\_\_\_ NO2*(g)* + \_\_\_\_\_ H2O*(l)*
   15. \_\_\_\_\_ Al(NO3)3*(aq)* + \_\_\_\_\_ NaOH*(aq)* 🡪 \_\_\_\_\_ NaNO3*(aq)* + \_\_\_\_\_ Al(OH)3*(s)*
   16. \_\_\_\_\_ C2H5OH*(l)* + \_\_\_\_\_ O2*(g)* 🡪 \_\_\_\_\_ CO2*(g)* + \_\_\_\_\_ H2O*(g)*
4. Classify the following reactions as: formation, decomposition, single replacement, double replacement, or combustion

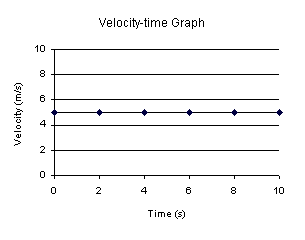
|  |  |
| --- | --- |
| 1. 2 KClO3*(s)* → 2 KCl*(s)* + 3 O2*(g)* |  |
| 2. 3 ZnCl2*(aq)* + 2 K3PO4*(aq)*→ 6 KCl*(aq)* + Zn3(PO4)2*(s)* |  |
| 3. Mg*(s)* + 2 HCl*(aq)* → MgCl2*(aq)* + H2*(g)* |  |
| 4. 2 H2*(g)* + O2*(g)* → 2 H2O*(g)* |  |
| 5. 2 NaCl*(s)* → 2 Na*(s)* + Cl2*(g)* |  |
| 6. CaCl2*(s)* + F2*(g)* → CaF2*(s)* + Cl2*(g)* |  |
| 7. AgNO3*(aq)* + KCl*(aq)* → AgCl*(s)* + KNO3*(aq)* |  |
| 8. 2 C2H6*(g)* + 7 O2*(g)* → 4 CO2*(g)* + 6 H2O*(g)* |  |

Physics Review Questions

1. A car moved 50 km to the North. What is its displacement? What is the distance?
2. A car moved 20 km East then 70 km west. What is the car’s displacement? What is the distance?



1. Using the graph, what is the average velocity during the first 2 seconds?

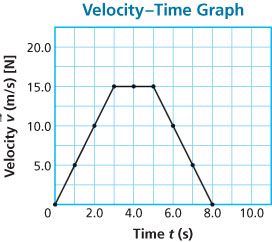


1. Using the graph above, calculate the distance traveled by the car.
2. A high school athlete runs 100 m in 12.20 sec. What is her *speed* in m/s
3. A car moves east at 18m/s for 5.00 min. What is its displacement?
4. A man travels at a speed of 8.00m/s for 25.0s. How far did he get?
5. A bullet is shot from a rifle at 720 m/s. What time is required for the bullet to strike a target that is 3240m east?
6. If a student walks 5.00m in 6.00s how long would it take them to walk 500m?
7. A cart is pushed with a force of 150.0 N for a distance of 10.0 m. How much work was done?
8. 150 J
9. 10.0 J
10. 15.0 J
11. 1.5 x 103 J
12. A car moving at 14.2 m/s accelerates at 9.00 m/s2 to a final velocity of 44.4 m/s. The time it takes to attain this final velocity is
13. 3.36 s
14. 6.51 s
15. 98.3 s
16. 272 s
17. Which graph represents a car which is travelling at a constant velocity?

A)   
   
B)   
 

C) 

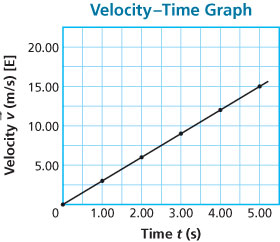
 D) 

1. Describe the motion in the above graph for each time interval

Time 0.0-3.0s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Time 3.0 to 5.0 s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Time 5.0 to 8.0 s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Using the graph what is the acceleration of the object?
2. If a 850kg car gets pushed by another car with a force of 3535N, what is the acceleration?
3. Determine the mass of a block that is pushed with a 7200N force and accelerates at a rate of 5.49m/s2.
4. If a 5.6 x 104 N force is applied to a 8.00 kg sled, what is its rate of acceleration?
5. How much work is done if a 100g box is raised from a height of 3.0m to 6.0m?
6. A 50g bullet in a gun has a potential energy of 3.0 x 105J. How fast will the bullet go when it is released?
7. A 600kg car is traveling at 25m/s takes 3.5s to reach its final speed of 33m/s before hitting the curb. Calculate the force at which the car hits the curb.
8. A man expends 37.5 J of energy to lift a package with a force of 25N. How far did he lift it?
9. The school gym is 10.5m high. If someone dropped a 4.0g pebble of the school gym roof what would its maximum speed be just before impact?
10. If a skydiver jumps from a plane after 12.0s how fast is she going?
11. A 63.0kg carpenter climbs up a ladder to the roof of the school. The gravitational potential energy of the carpenter at this height is 2.57 x 103 J. How high is the carpenter above the ground?
12. A figure skater with a mass of 53.0 kg slides down a sheet of ice at a speed of 5.62 m/s. What is the kinetic energy in the skater?
13. A 55.0 kg high jump athlete leaps into the air in an attempt to clear the bar. At the top of the leap, the athlete has a total mechanical energy of 3.00 x 103 J and is moving at 8.33 m/s. Calculate the gravitational ptotential energy of the athlete.
14. A construction worker drops a 2.00kg hammer from a roof. When the hammer is 50.0 m above the ground, it has a total mechanical energy of 1.88 x 103 J. Calculate the kinetic energy of the hammer.
15. Identify each of the following quantities as either scalar or vector quantities.

|  |  |
| --- | --- |
| a) speed |  |
| b) velocity |  |
| c) distance travelled |  |
| d) displacement |  |
| e) time |  |
| f) acceleration |  |

1. In an experiment to study uniform motion, students measured the distance a toy car travels in specified time intervals. They recorded the results in the following table of values.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time**  ***t* (s)** | **Distance Travelled**  **(cm)** | **Time Interval**  **(s)** | **Average Speed of the Car**  ***v* (cm/s)** |
| 0.00 | 0.0 | 0.00 *–* 1.00 | 30.0 |
| 1.00 | 30.0 | 1.00 *–* 2.00 | 30.0 |
| 2.00 | 60.0 | 2.00 *–* 3.00 | 30.0 |
| 3.00 | 90.0 | 3.00 *–* 4.00 | 30.0 |
| 4.00 | 120.0 | 4.00 *–* 5.00 | 30.0 |
| 5.00 | 150.0 | XXXXXXXXX | XXXXXXXXX |

* 1. Draw and label a graph below of the distance travelled as a function of time. Draw the line of best fit.
  2. On the graph, determine the slope of the line, and explain what the slope represents.

Biology Review Answers

|  |  |  |  |
| --- | --- | --- | --- |
| 1. A | | 1. D | 1. C |
| 1. C | | 1. D | 1. 150 µm |
| 1. A | | 1. C | 1. B |
| 1. D | | 1. A | 1. B |
| 1. B | | 1. C | 1. B |
| 1. B | | 1. C | 1. A |
| 1. A | | 1. A | 1. C |
| 1. D | | 1. a) iii, b) vii, c) iv, d) vi, e) i, f)ii | 1. A |
| 1. A | | 1. C | 1. D |
| 1. A | | 1. C | 1. B |
| 1. a) F, b) F, c)F, d)T, e)T, f)F | | 1. B | 1. C |
| 1. C | | 1. C | 1. B |
| 1. B | | 1. C | 1. 72 36 2.00   188 120 1.57 2020 5400 0.37 |
| 1. B | | 1. A | 1. C |
| 1. ab3c_001_stem   xylem  Ground tissue  Epidermis  Vascular Bundle | | 1. B | 1. A |
| 1. C | | 1. A | 1. A |
| 1. B | 1. Cutting through the bark of a tree cuts the xylem and phloem cells. This creates the sugars (sap) to run out and it reduces the amount of water that can reach the leaves | | 1. C |
| 1. A | 1. ab3c_002_seed-F   Positive Phototropism  Positive gravitropism  Negative Phototropism  stem  Root  Negative gravitropism | | 1. See your notes |

Chemistry Review Answers

1. Atoms, Protons and Electrons

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Number of Protons** | **Number of Electrons** | **Electric Charge** |
| Li | 3 | 3 | 0 |
| C | **6** | **6** | **0** |
| F | **9** | **9** | **0** |
| **K** | 19 | **19** | 0 |
| **P** | 15 | **15** | 0 |
| **He** | **10** | 10 | 0 |
| **Ar** | **18** | 18 | 0 |
| **Cl** | 17 | 17 | **0** |
| **Na** | 11 | 11 | **0** |
| Fe | **26** | **26** | **0** |
| Ni | **28** | **28** | **0** |
| **Pb** | 82 | **82** | 0 |
| **Zn** | 30 | **30** | 0 |

1. Ionic Compounds – Univalent Metal Ions

|  |  |  |  |
| --- | --- | --- | --- |
| a) silver and iodine | silver iodide |  | AgI*(s)* |
| b) magnesium and oxygen | magnesium oxide |  | MgO*(s)* |
| c) magnesium and bromine | magnesium bromide |  | MgBr2*(s)* |
| d) calcium and nitrogen | calcium nitride |  | Ca3N2*(s)* |
| e) sodium and sulfur | sodium sulfide |  | Na2S*(s)* |

|  |  |  |
| --- | --- | --- |
| a) MgCI2 |  | magnesium chloride |
| b) Ag3N |  | silver nitride |
| c) CsF |  | cesium fluoride |
| d) CdO |  | cadmium oxide |
| e) MgBr2 |  | magnesium bromide |

1. Name and write the formula for the following multivalent compounds.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Name** |  | **Formula** |
| a) iron and sulfur | iron(III) sulfide |  | Fe2S3*(s)* |
| b) copper and oxygen | copper(II) oxide |  | CuO*(s)* |
| c) manganese and fluorine | manganese(II) fluoride |  | MnF2*(s)* |
| d) chromium and chlorine | chromium(III) chloride |  | CrCl3*(s)* |
| e) nickel and oxygen | nickel(II) oxide |  | NiO*(s)* |
| f) cobalt and bromine | cobalt(II) bromide |  | CoBr2*(s)* |



|  |  |  |  |
| --- | --- | --- | --- |
| **COMBINE** | **IONS (optional)** | **FORMULA** | **NAME** |
| iron(II) & nitrate | Fe2+ NO3− | Fe(NO3)2*(s)* | iron(II) nitrate |
| aluminium & nitrate | Al3+ NO3− | Al(NO3)3*(s)* | aluminium nitrate |
| sodium & sulfate | Na+ SO42− | Na2SO4*(s)* | sodium sulfate |
| lead(IV) & sulfate | Pb4+ SO42− | Pb(SO4)2*(s)* | lead(IV) sulfate |
| magnesium & carbonate | Mg2+ CO32− | MgCO3*(s)* | magnesium carbonate |
| gold(III) & sulfite | Au3+ SO32− | Au2(SO3)3*(s)* | gold(III) sulfite |
| zinc & hydrogencarbonate | Zn2+ HCO3− | Zn(HCO3)2*(s)* | zinc hydrogencarbonate |
| ammonium & nitrate | NH4+ NO3− | NH4NO3*(s)* | ammonium nitrate |
| copper(I) & phosphate | Cu+ PO43− | Cu3PO4*(s)* | copper(I) phosphate |
| silver & hydroxide | Ag+ OH− | AgOH*(s)* | silver hydroxide |
| aluminium & hydroxide | Al3+ OH− | Al(OH)3*(s)* | aluminium hydroxide |
| lead(II) & phosphate | Pb2+ PO43− | Pb3(PO4)2*(s)* | lead(II) phosphate |
| potassium & acetate | K+ C2H5O22− | KC2H5O2*(s)* | potassium acetate |
| manganese(V) & sulfate | Mn5+ SO42− | Mn2(SO4)5*(s)* | manganese(V) sulfate |



|  |  |  |  |
| --- | --- | --- | --- |
|  | **Type** |  | **Name** |
| a) NaCl*(s)* | ionic |  | sodium chloride |
| b) N2O*(g)* | molecular |  | dinitrogen monoxide |
| c) HCl*(aq)* | acid |  | hydrochloric acid (or aqueous hydrogen chloride) |
| d) NH4Br*(s)* | ionic |  | ammonium bromide |
| e) KOH*(s)* | ionic |  | potassium hydroxide |
| h) SCl3*(g)* | molecular |  | sulfur trichloride |
| i) NiCl3*(g)* | ionic |  | nickel(III) chloride |
| j) H3PO4*(aq)* | acid |  | phosphoric acid (or aqueous hydrogen phosphate) |

1. Rewrite the following word equations as formula equations and then balance them:
   1. 2 Na*(s)* + Cl2*(g)* 🡪 2 NaCl*(s)*
   2. 2 H2*(g)* + O2*(g)* 🡪 2 H2O*(l)*
   3. 2 KClO3*(s)* 🡪 3 O2*(g)* + 2 KCl*(s)*
   4. 2 F2*(g)* + PbI4*(aq)* 🡪 PbF4*(aq)* + 2 I2*(s)*
2. Balance the following chemical equations:
   1. 4 Na*(s)* + O2*(g)* 🡪 2 Na2O*(s)*
   2. 2 Al*(s)* + 3 Cl2*(g)* 🡪 2 AlCl3*(s)*
   3. N2*(g)* + 2 O2*(g)* 🡪 2 NO2*(g)*
   4. 2 HI*(g)* 🡪 H2*(g)* + I2*(s)*
   5. 2 NH3*(g)* 🡪 3 H2*(g)* + N2*(g)*
   6. 8 Al2S3*(s)* 🡪 16 Al*(s)* + 3 S8*(s)*
   7. 2 BN*(s)* + 3 Cl2*(g)* 🡪 2 BCl3*(g)* + N2*(g)*
   8. 3 SnF4*(aq)* + 4 Cr*(s)* 🡪 4 CrF3*(aq)* + 3 Sn*(s)*
   9. Mg*(s)* + 2 HCl*(aq)* 🡪 MgCl2*(aq)* + H2*(g)*
   10. 2 (NH4)3PO4*(aq)* + 3 CaBr2*(aq)* 🡪 Ca3(PO4)2*(s)* + 6 NH4Br*(aq)*
   11. Pb(NO3)4*(aq)* + 2 K2Cr2O7*(aq)* 🡪 Pb(Cr2O7)2*(s)* + 4 KNO3*(aq)*
   12. 3 AgClO4*(aq)* + Na3PO4*(aq)* 🡪 3 NaClO4*(aq)* + Ag3PO4*(s)*
3. Balance the following chemical equations:
4. 2 Pb*(s)* + O2*(g)* 🡪 2 PbO*(s)*
5. N2*(g)* + 3 H2*(g)* 🡪 2 NH3*(g)*
6. 2 Na*(s)* + 2 H2O*(l)* 🡪 2 NaOH*(aq)* + H2*(g)*
7. 2 C4H10*(g)* + 13 O2*(g)* 🡪 8 CO2*(g)* + 10 H2O*(g)*
8. H3PO4*(aq)* + 3 KOH*(aq)* 🡪 K3PO4*(aq)* + 3 H2O*(l)*
9. C5H12*(l)* + 8 O2*(g)* 🡪 5 CO2*(g)* + 6 H2O*(g)*
10. Zn3N2*(s)* + 6 H2O*(l)* 🡪 3 Zn(OH)2*(aq)* + 2 NH3*(g)*
11. Fe3O4*(s)* + 4 H2*(g)* 🡪 3 Fe*(s)* + 4 H2O*(l)*
12. 2 Al*(s)* + 3 H2SO4*(aq)* 🡪 3 H2*(g)* + Al2(SO4)3*(aq)*
13. 2 CrS*(s)* + 3 O2*(g)* 🡪 2 CrO*(s)* + 2 SO2*(g)*
14. HClO3*(aq)* + 5 HCl*(aq)* 🡪 3 H2O*(l)* + 3 Cl2*(g)*
15. 3 CaC2*(s)* + 2 AsBr3*(aq)* 🡪 6 C*(s)* + 2 As*(s)* + 3 CaBr2*(aq)*
16. 4 NH3*(g)* + 5 O2*(g)* 🡪 4 NO*(g)* + 6 H2O*(l)*
17. 2 HNO3*(aq)* + NO*(g)* 🡪 3 NO2*(g)* + H2O*(l)*
18. Al(NO3)3*(aq)* +3 NaOH*(aq)* 🡪 3 NaNO3*(aq)* + Al(OH)3*(s)*
19. C2H5OH*(l)* + 3 O2*(g)* 🡪 2 CO2*(g)* + 3 H2O*(g)*
20. Classify the following reactions as: formation, decomposition, single replacement, double replacement, or combustion

|  |  |
| --- | --- |
| 1. 2 KClO3*(s)* → 2 KCl*(s)* + 3 O2*(g)* | **decomposition** |
| 2. 3 ZnCl2*(aq)* + 2 K3PO4*(aq)*→ 6 KCl*(aq)* + Zn3(PO4)2*(s)* | **double replacement** |
| 3. Mg*(s)* + 2 HCl*(aq)* → MgCl2*(aq)* + H2*(g)* | **single replacement** |
| 4. 2 H2*(g)* + O2*(g)* → 2 H2O*(g)* | **formation** |
| 5. 2 NaCl*(s)* → 2 Na*(s)* + Cl2*(g)* | **decomposition** |
| 6. CaCl2*(s)* + F2*(g)* → CaF2*(s)* + Cl2*(g)* | **single replacement** |
| 7. AgNO3*(aq)* + KCl*(aq)* → AgCl*(s)* + KNO3*(aq)* | **double replacement** |
| 8. 2C2H6*(g)* + 7O2*(g)* → 4 CO2*(g)* + 6 H2O*(g)* | **combustion** |

Physics Review Answers

1. Displacement = 50 km [N], Distance = 50 km
2. Displacement = 50 km [W], Distance = 90 km
3. 20 m/s – find the slope!
4. 50 m = 5 x 101 m
5. 8.20 m/s
6. 5400 m [E] = 5.4 x 103 m [E] 🡪 remember to change minutes to seconds
7. 200 m
8. 4.50 s
9. 6.0 x 102 seconds 🡪 Find velocity for 5.00 m in 6.00 s first then calculate the time for 500 m
10. D (1.50 x 103 J 🡪 This is proper sig figs)
11. A
12. C
13. Time 0.0-3.0 🡪 Increasing Velocity, Time 3.0-5.0s 🡪 Constant Velocity, Time 5.0-8.0s 🡪 Decreasing Velocity
14. 3.00 m/s2 (find the slope)
15. 4.16 m/s2
16. 1.31 x 103 kg
17. 7.0 x 103 m/s2
18. *HINT: Work is the same thing as Energy. So, calculate Ep(grav)* **Answer: 2.9 J**
19. *HINT: When the bullet leaves the gun, the potential energy becomes kinetic energy so use Ek formula and arrange for velocity.* **Answer: 3.5 x 103 m/s**
20. 1.4 x 103 N
21. 1.5 m
22. *HINTS: First step – calculate Ep(grav). We can then assume that all the potential energy is converted into Kinetic Energy. So your value for Ep(grav) is the same as Ek. Use the Ek formula and re-arrange for v to find your speed.* **Answer: 14 m/s**
23. 118 m/s
24. 4.16 m
25. 837 J
26. Use formula Em = ½ mv2 + mgh 🡪 Em = ½ mv2 + Ep(grav) Answer = 1.09 x 103 J
27. Use formula Em = ½ mv2 + mgh 🡪 Em = Ek + mgh Answer = 899 J
    1. Scalar (no direction needed)
    2. Vector (direction needed)
    3. Scalar
    4. Vector
    5. Scalar
    6. Vector

* 1. Slope represents the velocity of the toy car.