Comprehensive Int. Sc. Review Name: _____

Free Body Diagrams – forces involved (applied, friction, gravity and normal)
Net force
Balanced forces

The sum of all the forces acting on an object is the _____.

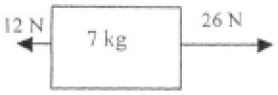
a. acceleration b. friction c. inertia d. net force e. weight.

If you push down on your desk with a force of 10 N, what is the normal force pushing back on you?

a. 0 N b. 5 N c. 10 N d. 20 N

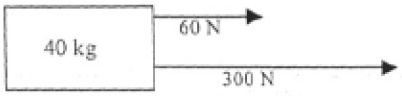
For each of the following problems, give the net force on the block, and the acceleration, including units.

1)



Net Force = _____ a = F/m = _____

2)



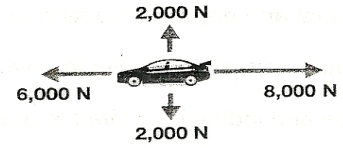
Net Force = _____ a = F/m = _____

If you push down on your desk with a force of 10 N, what is the normal force pushing back on you?

a. 0 N b. 5 N c. 10 N d. 20 N

What is the net force acting on the car below?

a. zero b. 4,000 N up c. 14,000 N right d. 2,000 N left e. 2,000 N right



Velocity(speed) = distance/time

A buggy goes across the room a distance of 2.0 meters in 4.5 seconds. What's the buggy's average velocity?

a. 9.0 m/s b. .44 m/s c. 2.3 m/s d. 6.5m/s

Assume that the same buggy from #9 continues at the same constant velocity you calculated for a total of 7.0 m . How much time will it take the buggy to travel this distance?

a. 16 s b. 3.08 s c. .77 s d. 63 s

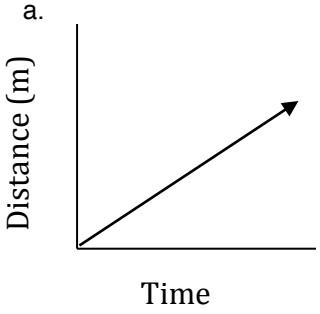
Florence Griffith-Joyner was the world record holder running at 9.43 m/s. She ran for 10.62 sec. How far did she run?

a. 50m b. 100m c. 200m d. 400m

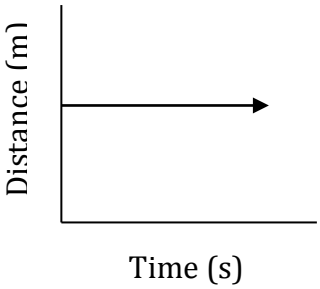
Position Time Graphs – moving away, moving toward, standing still
Straight line – constant velocity; curved line – changing speed
Slope is velocity
Positive is moving away from origin and negative is moving toward origin

Which of the following **distance-time graphs (position–time graph)** best matches a person walking away from the motion detector at a constant speed?

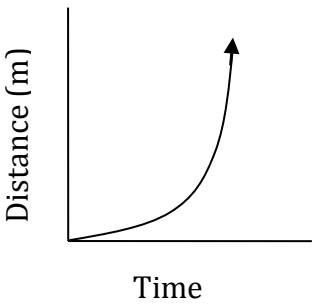
a.



b.



c.

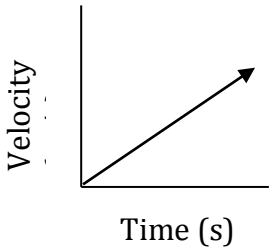


Velocity Time Graphs – constant velocity with positive and negative direction
Slope is acceleration

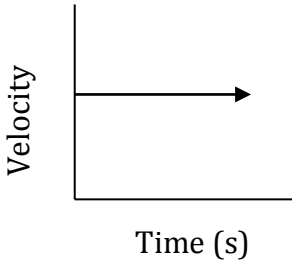
What does the slope of a position-time graph represent?
a. distance b. speed c. velocity d. acceleration

Which of the following **velocity-time graphs** best matches a person walking away from the motion detector at a constant speed?

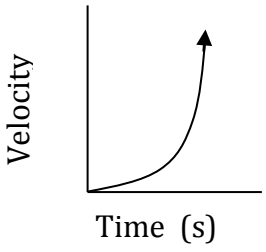
a.



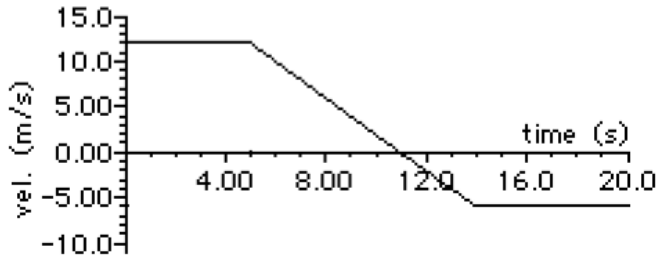
b.



c.



The following velocity-time graph represents a car driving around in a parking lot for 20 seconds. Use the graph to answer questions below.



At what time was the car at rest?

a. 11 seconds b. 13 seconds c. 1 second d. 0-5 sec

During what time period was the car moving to the right at a constant velocity?

a. 0-5 seconds b. 5-11 seconds c. 14-20 seconds

During what time period was the car moving to the left at a constant velocity?

a. 0-5 seconds b. 5-11 seconds c. 14-20 seconds

What does the slope of this graph represent?

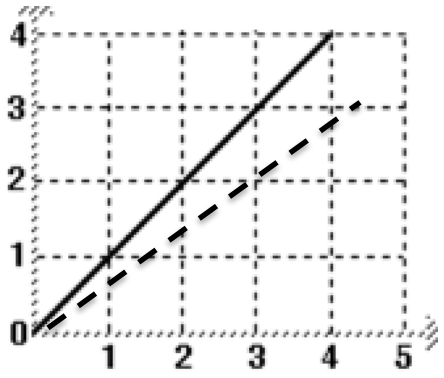
a. velocity b. density c. acceleration d. speed

Calculating Slope $y_2 - y_1 \ / \ x_2 - x_1$

The best fit line shown on the graph below represents the relationship between mass vs. volume for water and an unknown substance. Then you need to answer the questions 14-19 with reference to the graph.

Mass Vs.Volume

Mass (g)



Solid Line = Water
Dashed Line = Unknown Substance

Volume (mL)

What kind of relationship does the graph display?

a. direct b. indirect c. no relationship d. incorrect

Which is the dependent variable?

a. volume b. mass

The slope of the graph represents _____.

a. volume b. mass c. density d. velocity

Which substance has the smallest density?

a. water b. unknown

All of the following statements are true concerning this graph **except**

a. The density for water is 1g/ml.
b. The density for the unknown is 1.5 g/ml.
c. The density for the unknown is .67 g/ml.

If the unknown substance had a mass of 2.0 g, the volume would be _____?

a. 1 g/ml b. 1.5 g/ml c. 1.5 ml. d. 3 ml.

Final velocity = acceleration x time + initial velocity

Acceleration Formula

Acceleration rates falling toward earth – feather & hammer on moon

The rate at which velocity changes is defined as _____.

a. acceleration b. friction c. inertia d. net force e. weight.

Newton's Laws of Motion

Law of Inertia

The inertia of an object and its mass

a. the variables are directly related b. the variables are indirectly related

Which object has the greatest inertia?

a. bowling ball b. Ping-Pong ball c. toothpick d. pencil

A person in a head-on collision, who is not wearing a seat belt, continues to move forward at the same speed of the car because of _____.

a. friction b. weight c. gravity d. inertia

Equal and Opposite Forces

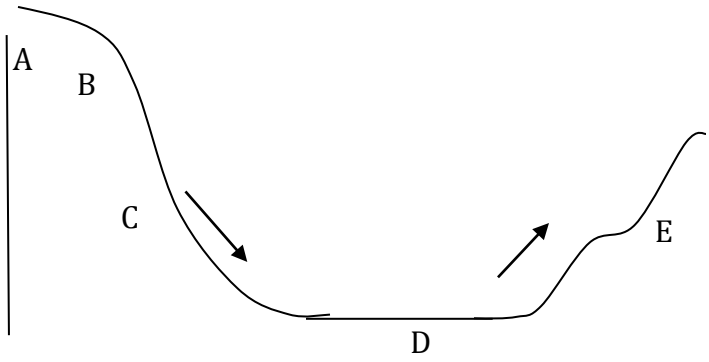
Force of gravity is dependent on mass so incr. mass, incr. gravity

Assume that a student has a mass of 50 kg. The student's mass would be the greatest:

a. on earth b. on the moon
c. in deep space d. it will be the same in all of these places

Potential Energy / Kinetic Energy – conserved but can be lost as heat & sound
Formula – PE = mgh **Heating & Cooling Curves – (temp. incr. KE incr.)**
KE = $1/2mv^2$

Use the following Diagram for #48-50



The ball will have the greatest potential energy at:
a. point A b. point B c. point C d. point D e. point E

The ball will be moving fastest at:
a. point A b. point B c. point C d. point D e. point E

Matter

Be able to identify elements, compounds and mixtures by looking at diagrams.

A. B. C. D.

_____ _____ _____ _____

Atomic Structure

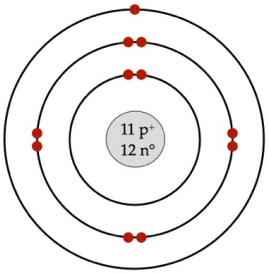
_____ are located in the nucleus and have a _____ charge.
_____ are located in the nucleus and have a _____ charge.
_____ are located outside the nucleus and have a _____ charge.

Mass number = protons + neutrons
Atomic number = number of protons (same element)
Isotopes are elements with the same atomic # and different number of neutrons.
Neutral atoms have the same number of protons and electrons.

Complete ALL of the missing information for the following **ISOTOPES** in the table below.

Element Name	Element Symbol	Mass Number	Atomic Number	Number Of Protons	Number Of Neutrons	Number Of Electrons
Carbon - 12						
Chlorine - 36						

Bohr models showing number of protons & neutrons inside with electrons in energy levels.



Using the above Bohr Model:

_____ = # of protons _____ = # of electrons _____ = # of neutrons

_____ = atomic # _____ = mass # _____ Element Name and Symbol

Periodic Table

Metals _____ electrons and are on the _____ side of the periodic table.
Nonmetals _____ electrons and are on the _____ side of the periodic table.
Periodic trends – elements in the _____ group have similar chemical properties and behavior.

Group number tells the # of valence electrons and is the same for the entire group

Group #1 = 1 valence e-	Group #2 = 2 valence e-
Group #13 = 3 valence e-	Group #14 = 4 valence e-
Group #15 = 5 valence e-	Group #16 = 6 valence e-
Group #17 = 7 valence e-	Group #18 = 8 valence e-

Each element forms an ion and reacts with other ions in order to have a full octet.
List properties of metals and nonmetals:

Bonding

Elements cannot be further broken down.
Compounds can only be chemically separated, not physically.

Chemical Reactions

Signs of a chemical change: bubbling, unexpected color change, change in odor, temperature change, gas production, formation of a precipitate

Reactants are on the left hand side of a chemical reaction and products are on the right hand side.

Law of Conservation of Matter: mass of reactants = the mass of the product