SC20F Warm-Up

1. Draw the bohr diagram for the following atoms:

   a) Fluorine #9 → 9p+, 9e−, 10n° mass = 19

   b) Beryllium #4 → 4p+, 4e−, 5n° mass = 9

column 7

column 2

2. Draw the lewis dot diagram for the following atoms:

   a) Fluorine

   b) Beryllium

3. State whether the following would gain or lose electrons:

   a) Fluorine gain

   b) Beryllium lose

Warm-Up

1. Complete the table:

Element	Draw the Lewis Dot Diagram	Will it Gain or Lose Electrons?	How many electrons will it gain or lose?	What will the charge be?
Sodium	Na	L	1	1+
Calcium	Ca	L	2	2+
Boron	B	L	3	3+
Phosphorus	P	G	3	3−
Oxygen	O	G	2	2−
Iodine	I	G	1	1−

Sep 10-8:34 AM

Warm-Up (Sept 15)

1. Fill in the table

Bond Type	Is a Bond Between what kinds of elements?	Are electrons shared or Transferred?
Ionic	metal & non metal	transferred
Covalent	2 non metals	Shared

2. Identify the following as ionic or covalent bonds:

$CaCl_2$	I	S_2O_3	C
CO	C	$PbCl_4$	I
H_2O	C	CH_4	C
NaCl	I	C_2H_5OH	C
Na_2O	I	NO_3	C
LiF	I	S_8	C
HBr	I	Fe_2O_3	I

H - 1st = metal

H - 2nd = non metal

Sep 11-9:41 AM

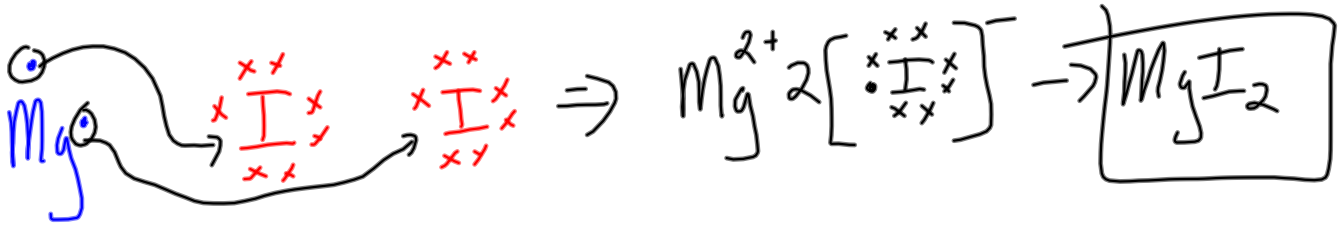
Warm-up

Identify the following as ionic or covalent. Use lewis dot diagrams to show how they will bond

a) Mg + I

ionic

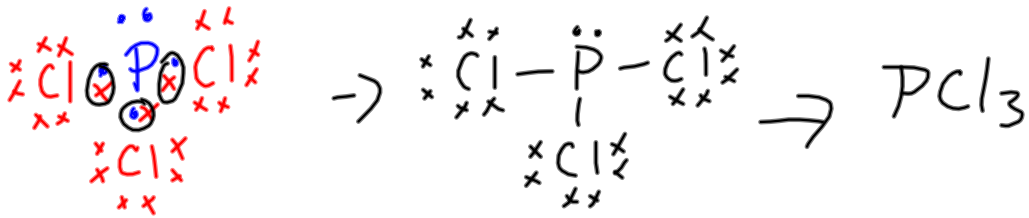
transfer e⁻



b) P + Cl

Covalent

Sharing e⁻



Sep 16-9:39 AM

Warm-up

H - 1st = metal H - 2nd = non-metal

1. Identify the following as ionic or covalent:

a) HCl I

b) NH_3 C

c) NaH I

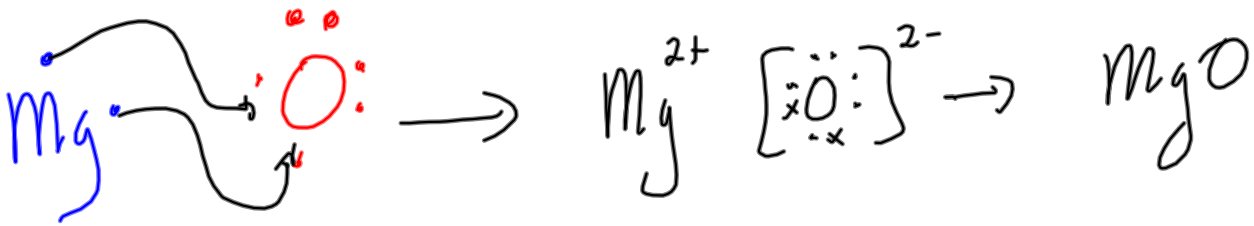
d) H_2O C

e) H_2S I

2. Use lewis diagrams to show the bonding of the following:

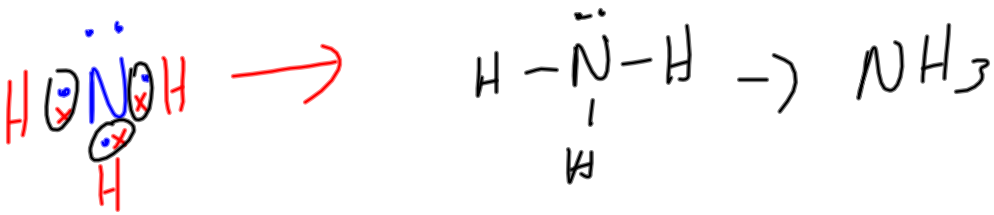
ionic

a) Mg + O



b) NH_3

Covalent



Warm-up (sept 18)

State the **noble gas** that the following ions will have the same electron arrangement as:

lost $1e^-$

a) Li^+ has the same arrangement as He.

b) F^- has the same arrangement as Ne.

c) Ca^{2+} has the same arrangement as Ar.

d) S^{2-} has the same arrangement as Ar.

e) Br^- has the same arrangement as Kr.

f) Rb^+ has the same arrangement as Kr.

g) Mg^{2+} has the same arrangement as Ne.

h) N^{3-} has the same arrangement as Ne.

i) Al^{3+} has the same arrangement as Ne.

Sep 18-8:54 AM

C = prefixes

Warm-up (sept 22)

1. Determine if the following compounds are ionic or covalent, then name them:

a) N_2O_7 – C

dinitrogen heptoxide

b) Mg_2N_3 – I

Magnesium Nitride

c) CO – C

Carbon monoxide

d) $MgBr_2$ – I

Magnesium Bromide

e) HCl – I

Hydrogen chloride

f) BF_3 – C

Boron trifluoride

2. Determine if the following compounds are ionic or covalent, then write the formula:

a) Sodium Sulphide – I

$Na^+ S^{2-}$ Na_2S

b) Dihydrogen monoxide – C

H_2O

c) Magnesium iodide – I

$Mg^{2+} I^-$ MgI_2

d) Sodium oxide – I

$Na^+ O^{2-}$ Na_2O

e) Carbon tetrafluoride – C

CF_4

f) Disulphur dioxide – C

S_2O_2

Warm-up (sept 25)

1. Give the formula for the following:

   a. Copper (II) sulphide

   $Cu^{2+} S^{2-}$ $\boxed{CuS}$

   b. Lead (II) fluoride

   $Pb^{2+} F^{-}$ PbF_2

   c. Tin (IV) nitride

   $Sn^{4+} N^{3-}$ ×3 ×4

   Sn_3N_4

   d. Chromium (III) chloride

   $Cr^{3+} Cl^{-}$ $CrCl_3$

2. Give the name, using the Stock System, for the following:

   a. CuO

   2+ 2-

   Copper (II) oxide

   b. MnO_2

   4+ 4- 2- 2-

   manganese (IV) oxide

   c. PbI_4

   4+ 4- 1- 1- 1- 1-

   Lead (IV) iodide

   d. Cu_2O

   2+ 2- + +

   Copper (I) oxide

Warm-up (sept 24)

1. Name the following Chemicals:

a) CF_4 - C

Carbon tetrafluoride

b) MgF_2 - I

Magnesium fluoride

c) Fe_2O_3 - I

3+ 3+ 3- 2-

Iron(III) oxide

d) NO_3 - C

Nitrogen trioxide

2. Write the formula for the following Chemicals:

a) Dinitrogen pentoxide - C

N_2O_5

b) Gold (III) oxide

Au^{3+} O^{2-}

Au_2O_3

c) Stronum nitride - I

Sr^{2+} N^{3-}

Sr_3N_2

d) Copper (I) sulphide

Cu^+ S^{2-}

Cu_2S

Sep 24-8:33 AM

Warm-up (sept 29)

S P Tu

1. Name the following Chemicals:

a) NH_3 – C

nitrogen trihydride

b) $CaCl_2$

Calcium chloride

c) PbO_2

4+ 2-
4+ 4-

lead (IV) oxide

d) NS_3 – C.

nitrogen trisulphide

2. Balance the following reacons:

4 Si + S_8 → 2 Si_2S_4

$_{Li2}O$ + H_2O → 2 LiOH

3 Ca + 2 $AlCl_3$ → 3 $CaCl_2$ + 2 Al

X + X

Sep 24-8:33 AM

Warm-Up (sept 30)

Write and balance the following reactions:

Fe^{3+} O^{2-}

1. iron (III) oxide + carbon → iron + carbon monoxide

$Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

Mg^{2+} N^{3-} Ca^{2+} I^- Ca^{2+} N^{3-} Mg^{2+} I^-

2. Magnesium nitride + calcium iodide → calcium nitride + magnesium iodide

$Mg_3N_2 + 3CaI_2 \rightarrow Ca_3N_2 + 3MgI_2$

Sep 30-9:17 AM

Warm-Up (Oct 1)

Write and balance the following reactions:

1. Lead (II) chloride + sodium → Lead + sodium chloride

2. Methane (CH_4) + oxygen gas → carbon dioxide + water

Idenfy the type of reacon for each of the above.

Sep 30-9:17 AM

Warm-Up (Oct 2)

Write and balance the following reactions:

Cr^{3+} S^{2-} Na^+ Cl^- Na^+ Na^+ S^{2-} Cr^{3+} Cl^-

1. chromium(III) sulphide + sodium chloride → sodium sulphide + chromium(III) chloride

$$Cr_2S_3 + 6NaCl \rightarrow 3Na_2S + 2CrCl_3$$

D.R.

K^+ K^+ O^{2-}

2. Potassium + oxygen gas → potassium oxide

$$4K + O_2 \rightarrow 2K_2O$$

Synth.

Idenfy the type of reacon for each of the above.

Sep 30-9:17 AM

Warm-up (oct 7)

Rewrite the following reactions. Balance them and state the Type of reaction.

$CH_4 + O_2 \rightarrow CO_2 + H_2O$

$NaCl \rightarrow Cl_2 + Na$

$AgCl + Al_2O_3 \rightarrow Ag_2O + AlCl_3$

$Al + Na_2O \rightarrow Al_2O_3 + Na$

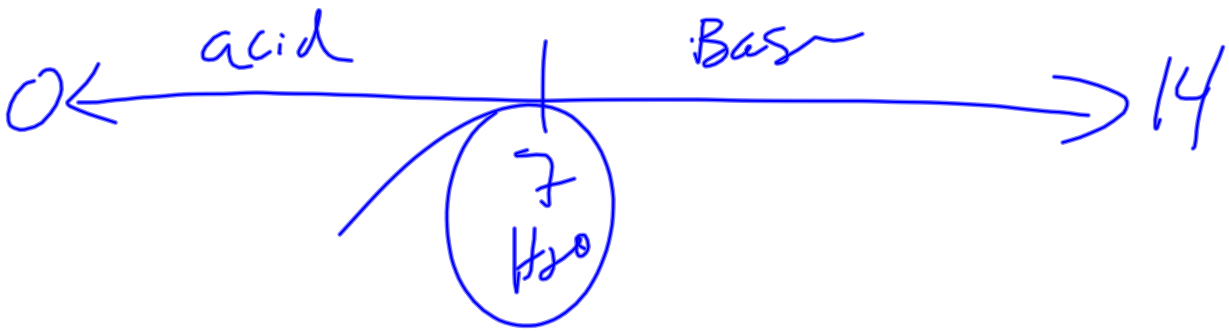
$K + O_2 \rightarrow K_2O$

Oct 1-8:46 AM

Warm-up (oct 8)

1. Fill in the table with respect to acids and bases:

Property	Acids	Bases
Taste	Sour	Bitter
pH	< 7	> 7
Contains what ion?	H^+	OH^-
Caustic or corrosive?	corrosive	caustic
phenolphthalein colour?	colourless	pink.



Oct 8-8:24 AM

HCl ←

Acetic ←

Warm-up (oct 9)

1. Identify whether the following are acidic, basic or neutral:

a) Tap water - pH = 5.5 A

b) Saliva - pH = 6.9 A

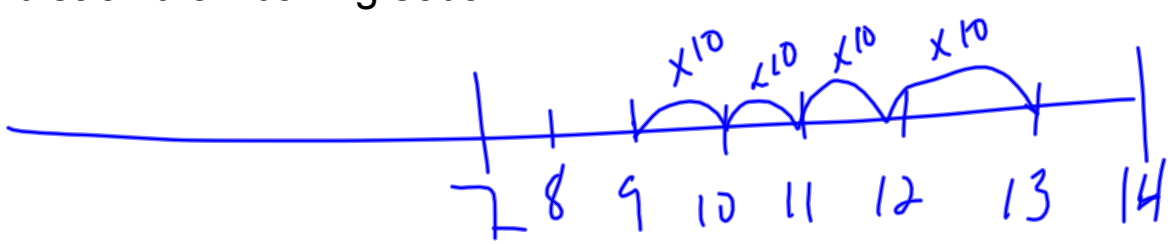
c) Seawater - pH = 8.1 B

d) pure water - pH = 7 N.

e) milk - pH = 7.1 B

f) Pepsi - pH = 4.1 A

2. Bleach has a pH = 13, baking soda has a pH = 9. How many times more basic is bleach than baking soda?



$10^4 = 10,000$

Oct 9-8:55 AM

Warm-Up (oct 20)

Define the following terms and give an example of each:

Autotroph - produces own food ex) plants

Heterotroph - eats others ex) us.

Habitat - where organisms live park

Niche - job - producers/consumers/decomposers

Abiotic factor - non-living → dead tree, rock O_2

Biotic Factor - living → organisms

Oct 20-9:21 AM

Warm-Up (Oct 21)

1. Give 2 ways carbon is released to the atmosphere.

   Combustion

   Respiration

2. How is carbon pulled out of the atmosphere?

   photosynth

3. Define the terms:

   a) Nitrogen fixation

   $N_2 \rightarrow$ to nitrates & NH_3 (ammonia) $\rightarrow N_2$ out of atmosphere

   b) Defnitrification

   Nitrates & Ammonia to N_2 gas

Oct 21-6:18 PM

Warm-up (oct 27)

1. What is nitrogen fixation → Taking N_2 from atmosphere
   N_2 $N \equiv N$ ↳ Nitrates / ammonia

2. What is denitrification?
   Nitrates / ammonia → atmosphere (N_2)

3. Give one way that we disrupt the:

   a) Carbon-oxygen cycle
   forest fires, burning fossil fuels

   b) nitrogen cycle
   too much fertilizer.

Oct 27-9:13 AM

Warm-up (oct 28)

Briefly describe each of the following. You can draw a diagram to help your answer:

1. Pyramid of Energy

2. Pyramid of Biomass

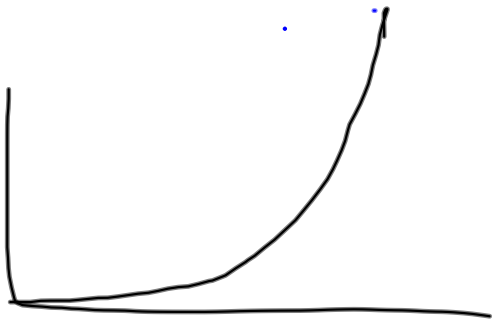
Oct 27-9:13 AM

Warm-up (oct 29)

A mouse and an eagle are both in the same food chain. Which would be more affected by bioaccumulation? Explain why

Sketch an:

Exponential population growth curve



Logistic population growth curve

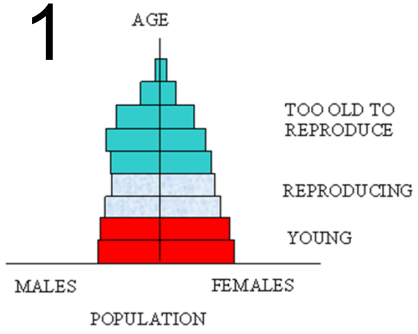
Oct 27-9:13 AM

Warm-up (oct 30)

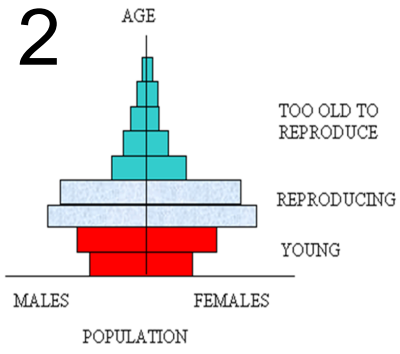
Given the following histograms, identify which shows a population that is:

a) Increasing b) decreasing c) staying constant

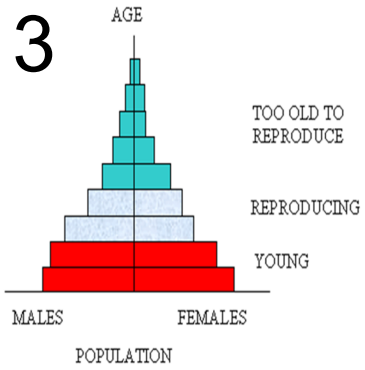
1



2



3



Oct 27-9:13 AM

Warm-Up (nov 4)

Biologists want to study populaon growth of fruit flies over a month. In a small ecosystem 210 die and 350 are born. 85 leave the populaon and 50 immigrate in. What is the change in populaon?

$$PG = (B + I) - (D + E)$$

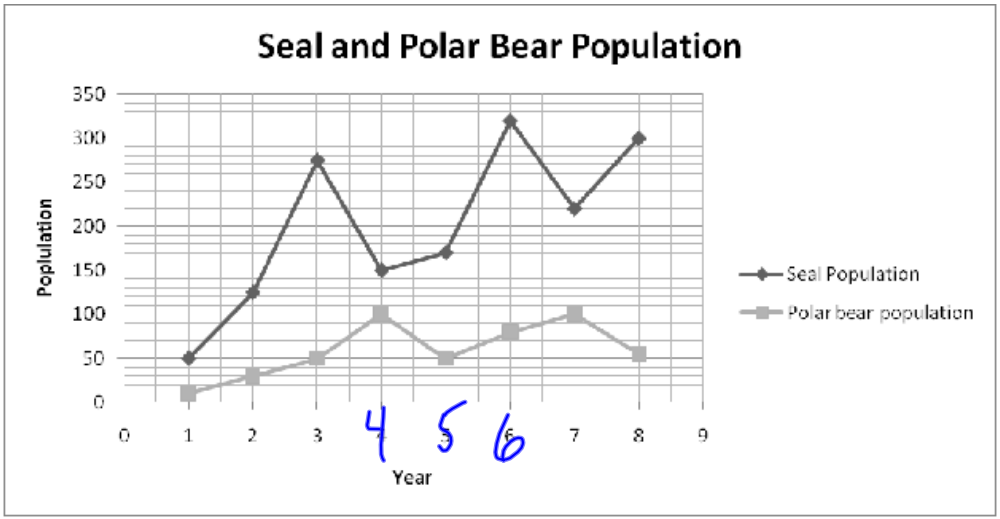
$$= (350 + 50) \quad (210 + 85)$$

$$= 400 - 295$$

$$PG = +105$$

Nov 4-8:07 AM

Warm-Up (nov 5)



Use the graph to explain:

a) The decrease in the polar bear population between years 4 and 5.

Seal pop ↓ in years 3-4, so polar bears starve

b) The subsequent increase in the seal population between years 5 and 6.

less polar bears to eat them

Nov 4-8:07 AM

Warm-Up (nov 12)

1. Define Carrying Capacity

Maximum pop. of a species in a habitat

2. Give 4 factors that limit a population at or around its carrying capacity.

- Stress
- Competition
- disease
- predation

weather
nat. disaster

Nov 4-8:07 AM

Warm-Up (Nov 18)

1. Define Scalar and Vector.

   Vector: magnitude + direction

   Scalar: only magnitude

2. Identify the following as scalar or vector:

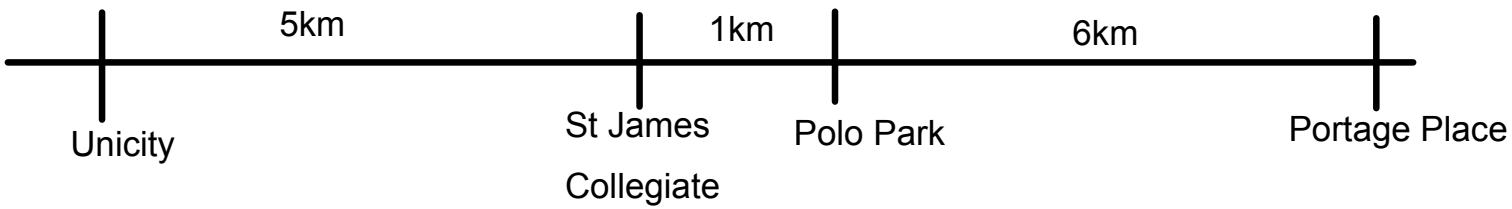
   a) Distance — S
   b) Displacement — V
   c) Speed — S
   d) Velocity — V

3. Identify the following as either a distance or a displacement:

   a) 30 m — d
   b) 100 yds — d
   c) 5 km [N] — $\vec{d}$
   d) 0.9 mi [W] — $\vec{d}$

Nov 18-9:44 AM

Warm-up (nov 19)



Dalal is looking all over for the new 1-D album, cause she LOVES their Awesome music. She leaves school and head to polo park where it is sold out everywhere. She heads to unicity and can't find it there either. She hops on the big white limo and heads to Portage place where, much to her relief, she snags the last copy.

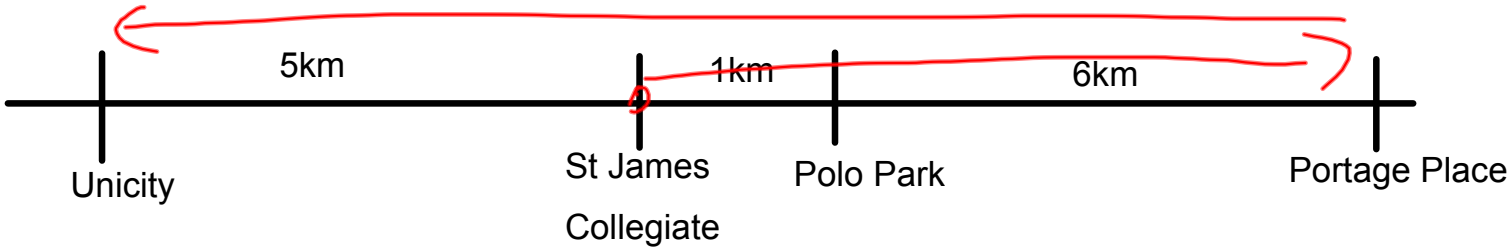
a) what is Dalal's distance travelled? 19 km

b) what is Dalal's displacement?

7 km [E] OR +7 km

Nov 19-11:45 AM

Warm-up (nov 20)



Dalal got Joaquin hooked on 1-D. He HAS to own their Awesome album. He leaves school and heads to portage place where it is sold out everywhere. He sees on their fan club twitter feed that Walmart in Unicity just got a shipment. He rushes there as fast as he can and cries tears of joy when he is able to buy a copy.

a) what is Joaquin's distance travelled? 19 km

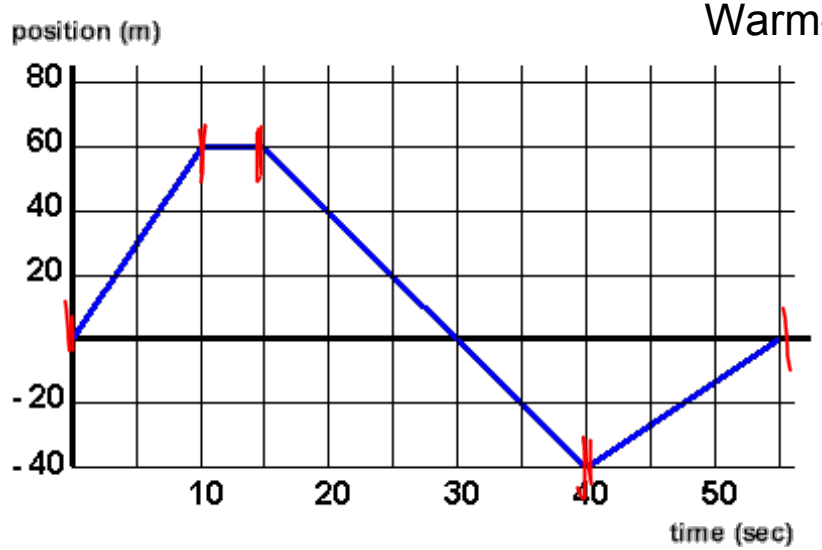
b) what is Joaquin's displacement?

5 km [W]

_ 5 km

Nov 19-11:45 AM

Warm-up (Nov 25)



Describe the motion in each of the following time intervals:

a) 0-10 seconds

Constant +ve velocity

b) 10-15 seconds

Not moving

c) 15-40 seconds

Constant -ve velocity

d) 40-50 seconds

+ve const. speed.

Nov 21-9:44 AM

Warm-up (Nov 27)

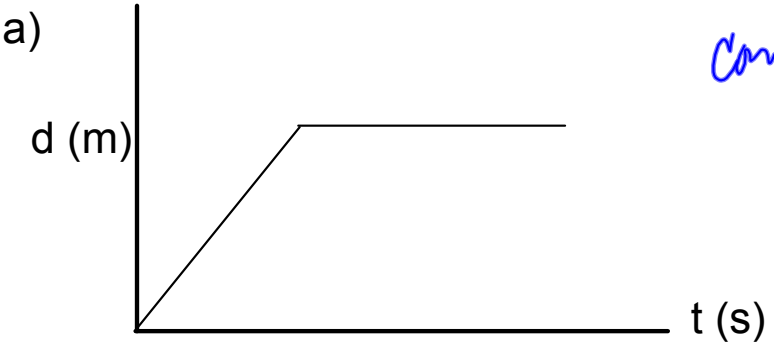
1. What does the slope of the following graphs tell you:

   a) d vs t Speed

   b) v vs t acceleration

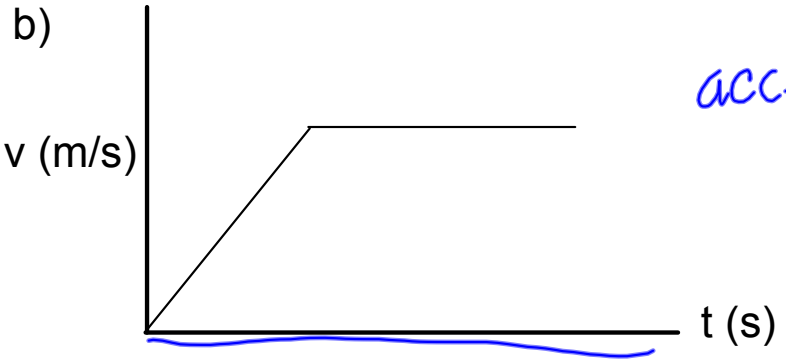
2. Describe the motion in the following graphs:

a)



constant +ve speed, then stopped

b)



accelerating, then const. speed

Warm-up (Dec 4)

$15\,min \times \frac{1\,hr}{60\,min} = 0.25\,hr$

1. A car that started at +50km and ended at +25km in 15min. Calculate the velocity in:

a) km/hr $V = \frac{\Delta d}{\Delta t} = \frac{+25km - (+50km)}{0.25\,hr} = -100\,km/hr$

b) m/s $100 \div 3.6 = -27.8\,m/s$

$13.8\,m/s$

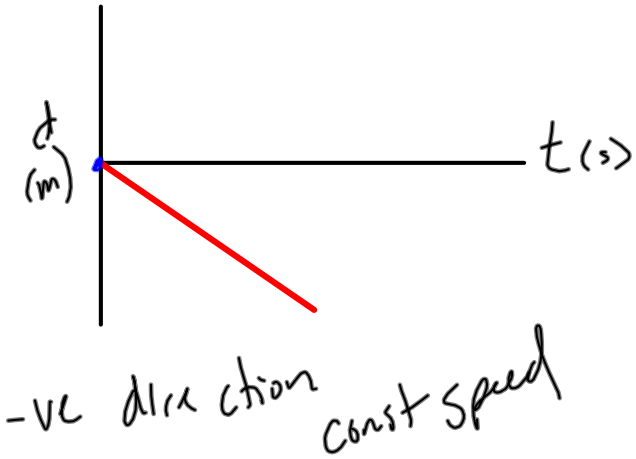
2. A car was driving 50km/hr west. It slammed on its brakes and stopped in 5s to avoid a deer in the road. Calculate the acceleration in m/s².

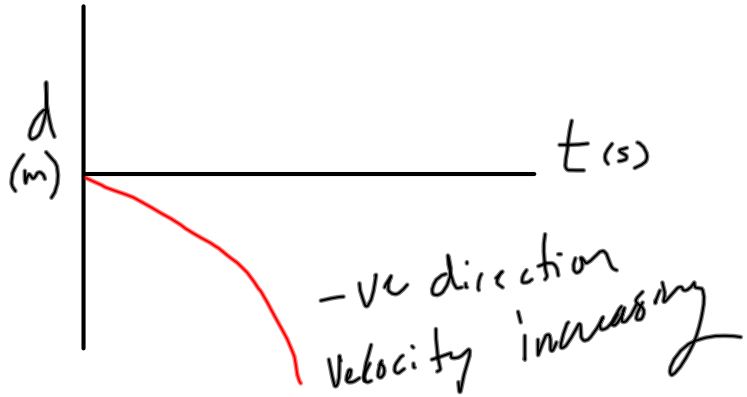
$a = \frac{v_2 - v_1}{\Delta t} = \frac{0\,m/s - (-13.8\,m/s)}{5\,s} = +2.76\,m/s^2$

Nov 28-8:57 AM

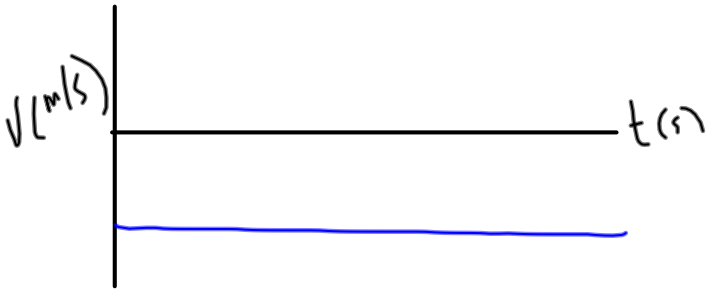
Warm-Up (Dec 8)

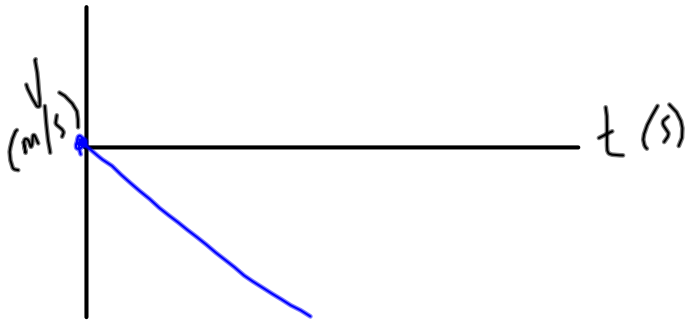
Given the following d-t graphs, describe whats happening:





Sketch what a v-t graph would look like for the motion in each of the above graphs.





Dec 8-8:02 AM

Warm-Up (Dec 9)

$V = \frac{\Delta d}{\Delta t}$ $a = \frac{\Delta V}{\Delta t}$ $F = ma$

1. A car travelled 200km in 2 hours. find the speed.

$d = 200km$

$t = 2 hrs$

$V = \frac{\Delta d}{\Delta t} = \frac{200km}{2hr} = 100 km/hr$

2. If the car in question 1 was travelling east, state the velocity.

100 km/hr [E]

3. Find the acceleration (in m/s²) of a car that was going 60km/hr slowed down to 30km/hr in 20s

16.7m/s

8.3m/s

$a = \frac{\Delta V}{\Delta t}$

$= \frac{(8.3m/s - 16.7m/s)}{20s} = -0.42 m/s^2$

4. What is the force on a car that weighs 1000kg and accelerates 2m/s²

$F = ma$

$= (1000kg)(2m/s^2) = 2000 N$

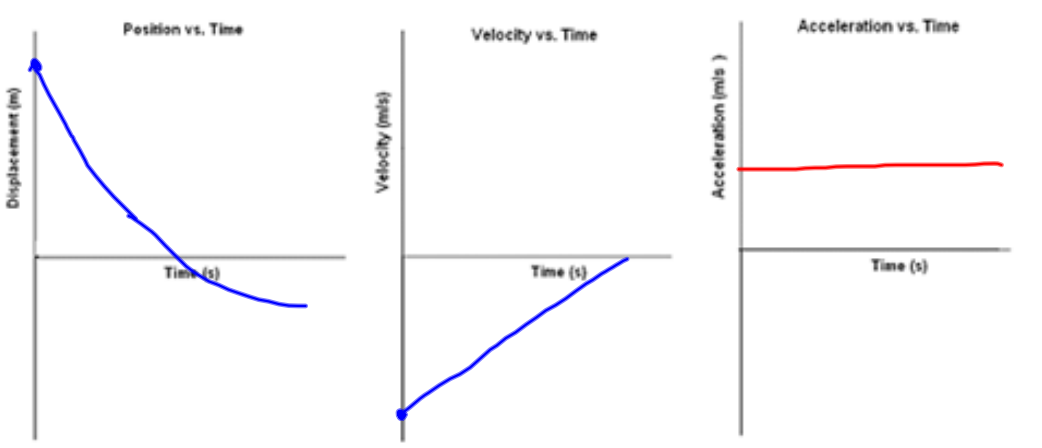
Warm-Up (Dec 10)

For the graphic above, determine the following:

The sign of the velocity? −

The sign of the acceleration? +

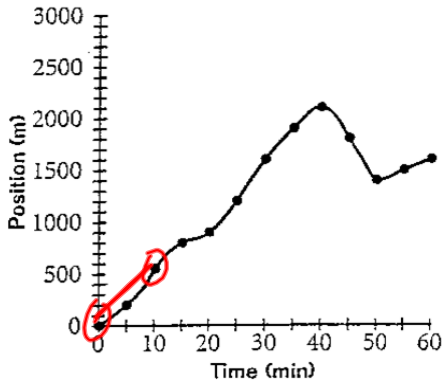
Sketch what the following graphs would look like:



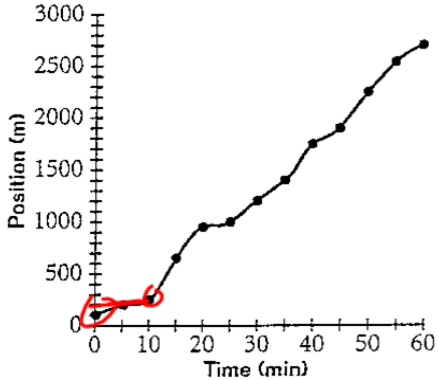
Dec 10-8:21 AM

Warm-Up (dec 11)

Elf A



Elf B



The graphs show the change in position of 2 of santa's elves...

1. Which elf has the greatest average velocity over the whole time? B
2. Which elf had the greatest velocity from 0-10 min A
3. Is the velocity of elf "A" always positive? NO
4. Is the velocity of elf "B" always positive? yes

Dec 11-11:52 AM

Warm-Up (Dec 15)

1. What two factors affect the amount of momentum an object has?

$P = m \cdot v$ mass & velocity

2. What two factors affect the amount of impulse applied on an object?

$I = Ft$ force & time

3. What is true about impulse and momentum in a car crash?

=

4. How do things like airbags and crumple zones help to protect passengers in a car crash?

increase time

Dec 15-9:38 AM

Warm-up (Dec 16)

You are driving 110km/hr on the highway (k=0.15). You see a deer in the road and slam on your breaks. You have a reaction time of 1s.

1. Determine your reaction distance.

$d = ?$

$v = 110 km/hr = 30.5 m/s$

$t = 1 s$

$V = \frac{d}{t}$

$30.5 m/s = \frac{d}{1 s}$

$d = 30.5 m$

174 m

2. Determine your braking distance.

$k = 0.15$

$v = 30.5 m/s$

$d = kV^2$

$d = (0.15)(30.5 m/s)^2$

$d = 139.5 m$

3. What is the total stopping distance?

$139.5 + 30.5 = 170 m$

Dec 16-9:21 AM

Warm-Up (Jan 6)

1. What is the difference between weather and climate?

short term (day to day)

long term (years)

2. What are the two main gases that make up our atmosphere? Give their percentages.

$N_2 \rightarrow 78\%$

$O_2 \rightarrow 21\%$

3. What is a variable gas? Give an example.

Changes amounts

H_2O vapour

Jan 6-10:48 AM

Warm-Up (Jan 7)

1. List the layers of the atmosphere in order (as you leave the earth and travel to space).

tropo → strato → meso → thermo → Exo

2. About how much of the water on earth is easily accessible and drinkable?

1%

3. Water is a very good heat sink. What does this mean?

↳ absorbs heat well

4. What does the ozone layer do?

filters uv light

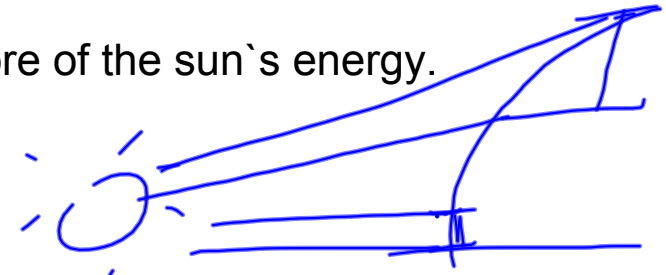
Jan 7-8:47 AM

Warm-Up (Jan 12)

1. The coriolis force pushes to the Right in the northern hemisphere, and to the Left in the southern hemisphere.

2. Why does the equator get more of the sun`s energy.

more direct



3. Why does warm air rise and cold air fall?

Cold air is more dense (heavier)

4. What is a Jet Stream?

- high speed winds in upper troposphere
- caused by convection currents

Jan 12-9:59 AM

Warm-Up (Jan 13)

1. How does the melting polar ice caps affect earth's radiation budget?

Absorb more NRG

2. Give 2 characteristics of the following:

a) Prevailing Winds

- West to east
- close to earth
- slow

b) Jet Streams

- fast
- upper troposphere
- W -> E

3. About how much of the sun's energy is absorbed by the earth?

≈ 50%

Jan 13-10:00 AM

Jan 15-2:22 PM