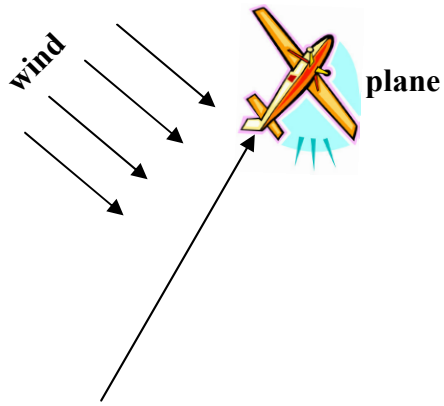
A-Day: Due Fri., Oct 12 (Assigned: 10/10)
B-Day: Due Mon., Oct 15 (Assigned: 10/11)

Two Dimensions 6

1. A plane is flying 120 m/s at 30º. There is a wind blowing 50 m/s at –40º. Look at the diagram below.



   A. Thinking in the y-direction only, is the wind going to speed up, or slow down the plane?
   B. In the x-direction, is the wind going to speed up or slow down?

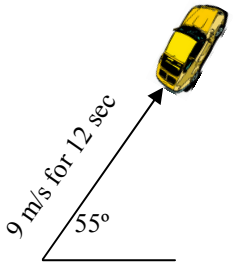
   C. Magnitude of vector 1:
   D. Direction of vector 1:

   E. Magnitude of vector 2:
   F. Direction of vector 2:

   G. Using the notes, add these two vectors together to find the plane's actual speed and direction.

2. A car is driving 9 m/s for 12 seconds.
   A. How far did the car drive in that time?

   B. The car was actually driving at 55º. (see diagram)
   How far did it drive in the y-direction (*in part A you found the hypotenuse of a distance triangle).*



Using your projectile motion notes (especially the example on the back):

3. A projectile is launched from the ground to the ground. It is launched at 37º and 65 m/s.
   A. Find the x and y components of the projectile.

   Vy = Vx =

   B. Now, let's use the components independently. In the y-direction, the object is in freefall. From the ground, to the ground. So, we know that it is going from letter ____ to letter ____ on the freefall diagram.
   C. Write the variables and find time in the y-direction.
   Variables: Equation: Solve:

   D. Now that you have the time that the projectile is in the air, use this in the x-direction (with Vx from part A) to find how far away the projectile lands (known as its range).

More on back

Using the notes below (like bellwork), answer the following questions.

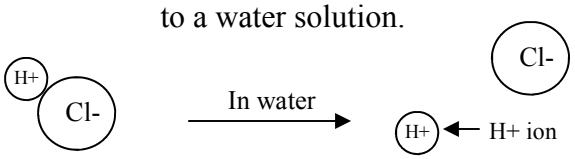
4. Acid or Base?

__ Has fewer OH– ions	___ Has fewer H+ ions	___pH of 1 to 7	__ Feels slippery
__ Has more H+ ions	___ Tastes bitter	___Causes pH to raise	__ Tastes sour
__ Feels squeaky clean	___ Has more OH- ions	___pH of 7 to 14	__ Cause pH to lower

5. You need a pH of 6.2; you have a pH of 5.1. Do you add an acid or a base?
6. You need a pH of 12; you have a pH of 13.4. Do you add an acid or a base?
7. How do you safely dilute an acid?
8. What do you get whenever you add an acid and a base?

Acids

Acids are compounds that add H+ ions to a water solution.



HCl—
Hydrochloric acid:
a very strong acid.

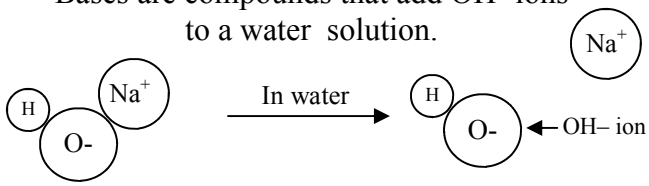
In water HCl breaks up (dissociates) making H^+ ions.

Many of our foods are acidic: citric (lemons; oranges); apples; tomato sauce.

Acids taste **sour** and feel "**squeaky**" when you rub your fingers together.

Bases

Bases are compounds that add OH- ions to a water solution.



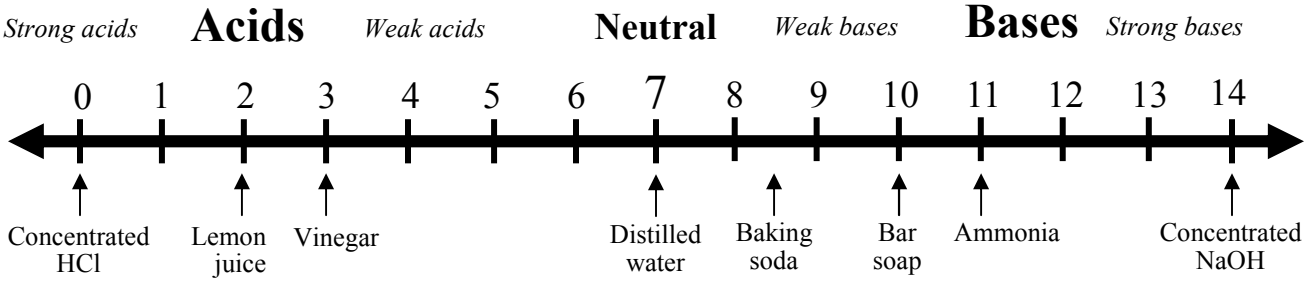
NaOH—
sodium hydroxide:
a very strong base.

In water it breaks up (dissociates) making OH– ions.

Many of our cleaning products are basic (ammonia [Windex]; soap; bleach) because they neutralize acidic food.

Bases taste **bitter** and feel **slippery**.

pH—The Measure of Acids and Bases

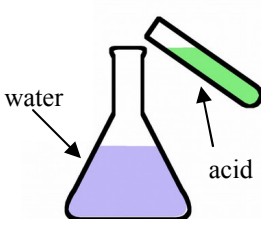


Neutralization (Titration)

When acids and bases are mixed they ***neutralize*** each other. Equal concentrations of acids and bases make neutral salt water.

Diluting Acids

Never add water to a concentrated acid!
You could get burned if the acid splashes up.



Always add acids to water!