This is BCE#16.

I recommend you print out this page and bring it to class. Click here to show a set of five BCE16 student responses randomly selected from all of the student responses thus far in a new window.

John , here are your responses to the BCE and the Expert's response.

1. Given a beaker containing only only water, what is/are the specie(s)/substances/ions (if any) in the sample? Write the formula (be sure include charge if ions are present) and provide the name.

H^+(aq) and OH^-(aq)

The primary component in water, H_2O, is H_2O. Conductivity measurements suggest a small amount (low concentration) of H^+ ions and ^-OH ions.

2. Provide a short definition of an acid.

An acid is a substance which donates an H^+ when added to water

An acid is a substance that when added to water increases the concentration of H^+ ions. This is the Arrhenius definition of an acid.

3. Provide a short definition of a base.

An base is a substance which donates an OH^- when added to water

A base is a substance that when added to water increases the concentration of ^-OH ions. This is the Arrhenius definition of a base.

4. Make a list of some acids you know, if you can provide a name and a formula. You do not have to look examples up in a book, I'm interested in what you can recall.

HF, HCl, HBr, HI, H2SO4, HC2H3O2, HClO4, H2CO3, H3PO4

CH_3COOH
citric acid
$(C_6H_8O_7)$
$(H_3C_6H_5O_7)$

Formula	Name

HCl(aq)	hydrochloric acid
HF(aq)	hydrofluoric acid
$HNO_3(aq)$	nitric acid
$H_3PO_4(aq)$	phosphoric acid
$HClO_4(aq)$	perchloric acid
$HC_2H_3O_2(aq)$ $CH_3COOH(aq)$	acetic acid

5. Make a list of some bases you know, if you can provide a name and a formula. You do not have to look examples up in a book, I'm interested in what you can recall.

LiOH, NaOH, KOH, CsOH, Mg(OH)2, Ca(OH)2, Ba(OH)2, Al(OH)3, NH3, CH3NH2

Formula	Name
NaOHaq)	sodium hydroxide
CsOH(aq)	cesium hydroxide
$Ba(OH)_2(aq)$	barium hydroxide
$Ca(OH)_2(aq)$	calcium hydroxide
$NH_3(aq)$	ammonia
$CH_3NH_2(aq)$	methyl amine

H_2O

$NaHCO_3$

6. For acids what does the term strong acid mean to you?

A strong acid completely dissociates into H^+(aq) ions and anion when added to water

A strong acid is an acid that completely dissociates into ions.

7. What does the term weak acid mean?

A weak acid only partially dissociates, less than 5%, into H^+(aq) ions and anions when added to water

A weak acid is an acid that does not completely dissociate into ions.

8. Recalling the concept of the equilibrium constant, indicate what you believe the size of the equilibrium constant might be for a strong acid? a weak acid?

The equilibrium constant would be 1 x 10^5 or greater.

A strong acid completely dissociates into ions means that the following reaction must have a very large equilibrium constant, K, because at equilibrium the amount of HCl is close to zero.

$$HCl(aq) \rightleftharpoons H^+(aq) + Cl^-(aq)$$

a weak acid?

The equilibrium constant would be 1 x 10^-5 or smaller.

A weak acid partially dissociates into ions which means that the following reaction must have a small equilibrium constant, K, because the concentration of H^+ (aq) and $C_2H_3O_2^-$(aq) are very small.

$$HC_2H_3O_2(aq) \rightleftharpoons H^+(aq) + C_2H_3O_2^-(aq)$$

9. Is there anything about the questions that you feel you do not understand? List your concerns/questions.

nothing

10. If there is one question you would like to have answered in lecture, what would that question be?

nothing