8.2 **Concentration and Solubility**

1. A ________________solution has a larger mass of solute for a certain volume of solvent.

2. A ________________solution has a smaller mass of solute for a certain volume of solvent.

For example 1

Orange juice from a can mixed into water.
1 can of water plus one can of orange juice will form a mixture that is concentrated in orange juice when compared to 3 cans of water mixed with 1 can of orange juice.

Example 2

100 ml of water plus 5 ml of sugar _________________
100 ml of water plus 50 ml of sugar ________________

3. The ________________of a solution may be expressed using numbers like : #grams of solute per litre of solvent (g/L) or % .

Example 1
Mixing Javex in Home Ec for cleaning the counters is a concentration of 10 ml of Javex to 1000 ml (1 litre) of water.

Example 2
Vinegar is 5% acetic acid to 95% water.

If you wanted a more concentrated Javex you could

- add more ___________ b) Take away some _____________

- If you wanted a more concentrated Vinegar you could
- add more _____________ b) take away some___________

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4. A volume of solvent can only dissolve so much solute until it gets “full”. This means all the _________ between the molecules of the solvent are filled with molecules of the _____________.

5. When a solution is full, it is called _____________. This means it will accept no more solute at that temperature.

This looks like a build up of solute on the bottom of the container. If you add extra solute, it has no place to go so it sits on the bottom.

6. An ____________ solution can still dissolve more solute in the solvent at the same temperature.

This means no solute will be on the bottom of the container and if you added some more it would _______ and become invisible.

7. Different solutes have different **solubility or Saturation Points.**

Record the solubility of these substances from greatest to least using the chart of page 264.

Baking soda, Ethanol, Salt, Sugar, and Oxygen.

If Baking soda has 68g/l it is ________ 69g/l it is ________ 70 g/l it is ________________.

8. The solubility (the amount you can dissolve) of most solids in a liquid can be increased by increasing the __________.

Use particle theory to explain why.

9. How fast solutes dissolve is called the _____ __ __________.

10. Stirring a solution increases the ____of dissolving, but not the solubility of a solute (how much).

11. Particle theory explains why stirring increases the rate of dissolving. When you stir, you push _________ around more quickly. Some solvent is concentrated in ________ and has few holes to put more _________ into . When you push ___________ solvent towards the solute, it has more holes so it will accept the _______ faster. See figure 265.

12. Another way to speed up how things dissolve is to increase the ________ ________of the solute exposed to the solvent.

A cough drop in your mouth crushed up has a lot of surface area. ___________ (saliva in your mouth) can easily come in contact with the ________ particles and dissolve them.

An uncrushed or whole cough drop has a smaller _____ _________ so much of the solute particles are not

_____________ to the saliva. It can not dissolve them. It must dissolve the solute on the _________ first before it can reach the inside.
Show two colored sugar cubes. One crushed , one whole.

11. The solubility of gases in a liquid can be increased by decreasing the temperature of the liquid solvent.
C02 dissolves well in water if the water stays ______. When you let pop ________ up, it will release the dissolved gases and become flat.

Pop will also become flat when you remove the _____. The pressure inside the bottle lowers very quickly. This causes the gas to be less soluble. As a result, the gas comes out of solution. That's why you see lots of small bubbles when you open a bottle of pop .

When divers spend a long period of time underwater, their blood dissolves _________ gases into it. When they come up, the blood can no longer keep this gas in solution so it comes _____. If this happens too fast and too much gas enters the blood at once , divers get the ________. It is painful and even dangerous.