Activity sheet

Investigating the solubility of gases in water

Name:

Class:

Thinking skill: Right-angle thinking

Right-angle thinking is a tool to help you associate observations and ideas in order to generalise about your conclusions.

From these activities, you will associate the observation of gases in water with the behaviours of organisms and systems.

Focus activity: Dissolving air in water

Air is made up of 20% oxygen and 80% nitrogen.

Materials

- 2 small glass vials with plastic caps

Method

1 Two-thirds fill the first vial with normal tap water.

2 Two-thirds fill the second vial with water that has been boiled and cooled to the same temperature as the tap water.

3 Seal each vial with a plastic cap and shake each vigorously for 30 seconds.

4 Hold each vial upside down and slowly loosen the cap. Using all your senses, what do you observe? How do you explain the difference?

Focus activity: Dissolving carbon dioxide in water

Materials

- 1 small glass vial with a plastic cap
- thistle funnel
- 250 mL flask
- marble chips
- dilute HCl
- rubber stopper with two holes
- rubber tubing small enough to fit through hole in stopper

Method

1 A carbon dioxide generator can be made by reacting $NaCO_3$ with dilute HCl (see Figure 1).

2 Set up your equipment as shown in Figure 1.

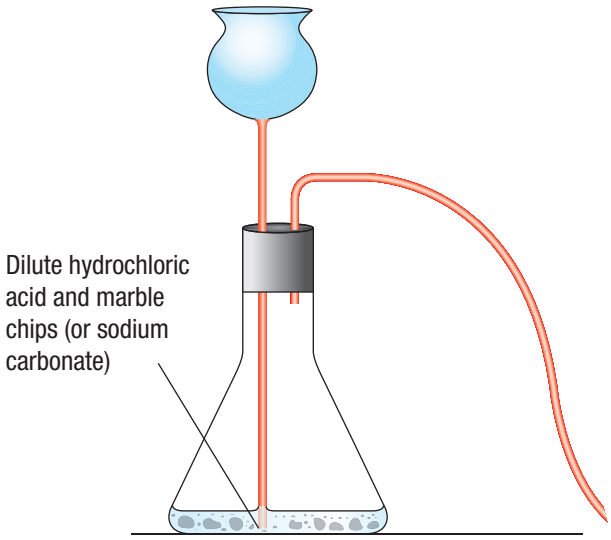

Figure 1 Carbon dioxide generator

What are the risks in doing this activity?	How can you manage these risks to stay safe?
Although the acid provided is dilute (1.0 M HCl) take care not to splash any on your skin.	Wash any accidental splashes with copious water.

2 Two-thirds fill the vial with tap water.

3 Run gas from the CO_2 generator above the liquid for about 15 seconds.

4 Seal the vial with the plastic cap and shake it vigorously for 30 seconds.

5 Hold the vial upside down and slowly loosen the cap. Using all your senses, what do you observe? How do you explain the difference?

Right-angle thinking: Gas solubility in liquids and homeostasis