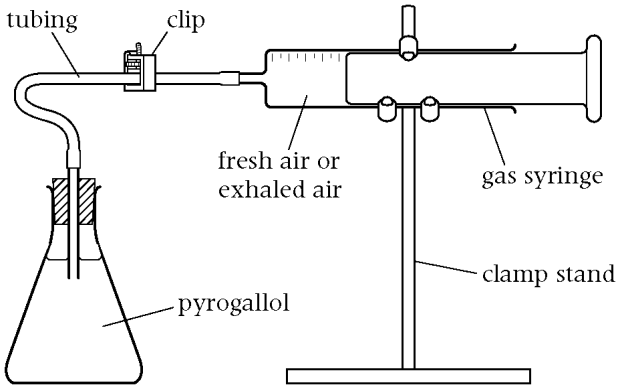
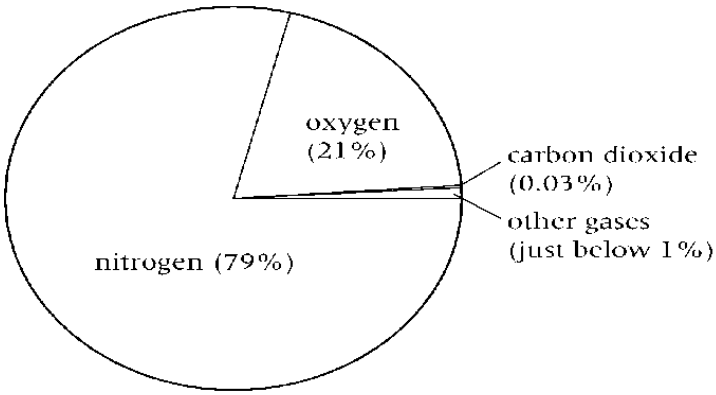
SCIENCE TEACHER.IE

Air and breathing - inquiry activity

The following experiment was set up.





The gas syringe was filled with 100 cm^3 of air. Pyrogallol absorbs oxygen. The apparatus was left for 20 minutes.

1. By how much would you expect the volume of air in the gas syringe to decrease? (Hint: look at the pie chart.)
2. Another conical flask containing potassium hydroxide solution was attached to the gas syringe in place of the one containing pyrogallol. Potassium hydroxide absorbs carbon dioxide. After 20 minutes, the volume of air in the gas syringe appeared to be the same. Explain this observation.
3. This experiment was repeated using exhaled air. Copy and complete the table of results.

	Normal air	Exhaled air
Original volume (cm^3)		
Volume remaining after using pyrogallol (cm^3)		
Volume remaining after using potassium hydroxide (cm^3)		
Volume of oxygen present in the original sample (cm^3)		
Volume of carbon dioxide present in the original sample (cm^3)		

4. What percentage of exhaled air is oxygen?
5. What percentage of exhaled air is carbon dioxide?
6. What percentage of nitrogen do you think exhaled air contains?

7. Draw a pie chart to show the percentages of the gases in exhaled air.
8. Why is more carbon dioxide exhaled than is inhaled?
9. Smoking covers some of the surfaces in the lungs with a thick tar. What effect might this have on the volume of oxygen breathed out? Explain your answer.
10. There is another gas in normal air which exhaled air contains far more of. What is this gas?
11. Describe the mechanism of inhalation and exhalation.