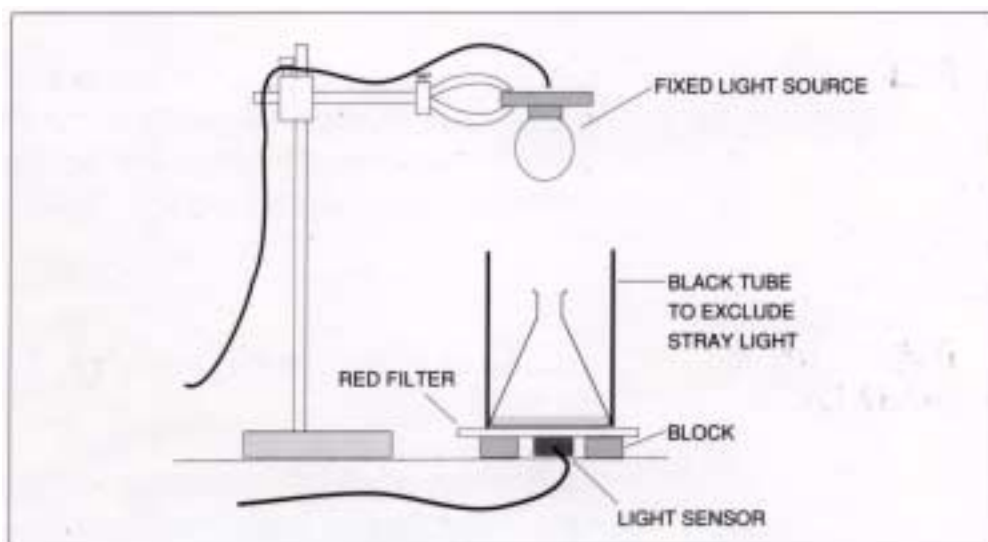


## CHEMICAL REACTIONS AND MATERIALS

### 3. RATE OF REACTION BETWEEN HYDROCHLORIC ACID AND SODIUM THIOSULPHATE

A local conservation group has asked you to carry out some tests on samples of water, which they think have been contaminated by a local firm dumping hydrochloric acid into local rivers and streams. Your task is to devise a test to find out the concentration of the acid by measuring its rate of reaction with sodium thiosulphate. This type of reaction produces a cloudy liquid.



**PLAN** Think carefully about the way in which you are going to carry out this investigation.

What parameters must you control?

What volumes of thiosulphate will you use?

How will you work out the concentration of hydrochloric acid in the samples supplied to you?

You will need to carefully consider how you are going to set up your equipment.

Remember that safety must be considered at all times.

How will you ensure that you are carrying out a fair test? (Note that temperature might affect the speed of reaction).

**APPARATUS**

Light level sensor  
Power supply  
Light source  
Syringes or measuring cylinders  
Sodium thiosulphate  
Red monochromatic filter  
Flasks (250ml)  
Wooden blocks  
Test samples  
Test tubes  
Black sugar paper

**COMPUTER**

Inputs: 1. Light Intensity

Timespan: 10 minutes

**DISCUSS AND FIND OUT**

Can you work out the concentration of acid in each sample?

Look at the graphs for each reaction and work out the rate of reaction for each investigation.

**REPORT**

Compile a report of your findings to the conservation group. You must be very clear about what tests you have done and what your findings are as they may use them as evidence when questioning the company.

**GOING FURTHER**

Carry out an investigation to find out if temperature affects the rate of the chemical reaction.