

Skills and Strategies

- Planning and Conducting
- Evaluating
- Applying and Innovating
- Communicating

Safety

- Never eat or drink anything in the laboratory.
- Clean up any spills immediately and inform your teacher.
- Dyes may stain clothing or skin.
- Have your procedure approved by your teacher before you begin.

What You Need

(Suggested)

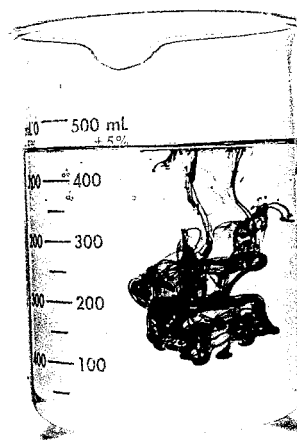
- a variety of clear containers
- graduated cylinders
- dyes of various colours
- thermometer
- stopwatch

Diffusion and the KMT

Planning and performing a controlled experiment lets you investigate your own question about diffusion.

Question

You will determine your own question to investigate. See step 1 of the Procedure.

**Procedure**

1. Your teacher will provide a collection of materials and equipment for you to examine. Think of a question about diffusion that you can investigate using some of the materials provided. Choose one of the questions below or come up with your own:
 - How is the rate of diffusion in water affected by the temperature of the water?
 - How long does it take for dye to diffuse completely in different volumes of water?
 - Do different colours of dye diffuse at different rates in water?
2. Write a procedure to describe how you will carry out an experiment to answer your question. Be sure to consider and include the following details in your procedure:
 - What materials will you need?
 - What safety precautions will you need to take?
 - What variables are involved? How will you control all but one variable?
 - What steps will you take as you carry out your experiment?
 - How many times will you repeat your experiment?

- 5. If you were to repeat your experiment, what changes would you make? Explain why you would make those changes.
- 4. Write a lab report to communicate your findings based on the template provided by your teacher or using these headings: Title, Introduction, Question, Hypothesis or Prediction, Materials, Safety, Procedure, Results, Analysis, Conclusion. Be sure to incorporate images as appropriate, and include links to any videos you took if possible.

Evaluate and Communicate

- 3. Discuss whether and why your hypothesis was correct or not. Does the kinetic molecular theory of matter help you explain your results? Discuss why or why not.
- 2. Are you able to answer your question based on the results of your experiment? Explain why or why not.
- 1. Compile your data into an organized form such as a table or graph.

Process and Analyze

- 4. With your teacher's permission, carry out your procedure. Clean up as directed.
- 3. Write a hypothesis for your experiment. A hypothesis states what you think will happen and why. You can phrase your hypothesis using an "If... then..." format. Use the kinetic molecular theory to help you frame your hypothesis.
- How will you record your observations? For example, you might fill out a table, take point-form notes, make sketches, take photographs, take a video, or do some combination of these.
- How will you analyze and communicate your results?