Particles: draw the particles and watch diffusion

Name: Class: Date:

Page 1 has boxes to draw the particles of a substance in. Page 2 is a practical to watch food colouring spread through cold water and hot water.

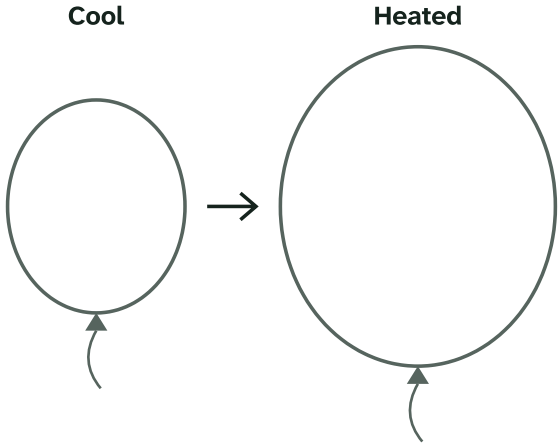
DRAWING Draw the particles

1. Draw each particle as a small circle. Make every circle the same size, in every box.
2. Show how close together the particles are, and whether they are in a pattern.
3. Add short arrows to show how the particles move: a small zigzag for vibrating, and longer arrows for moving about.

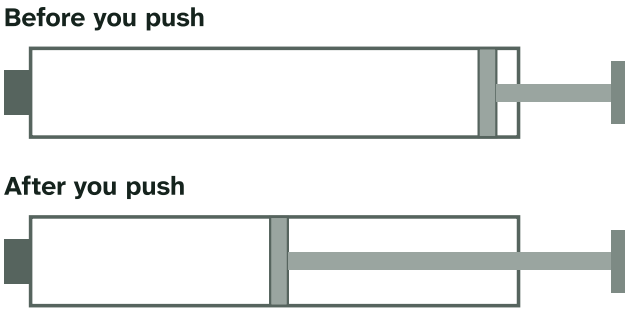
Solid	Liquid	Gas
How the particles move:	How the particles move:	How the particles move:

Draw the same number of particles in both pictures of each pair.

The gas in a balloon



The air in a syringe with its end blocked

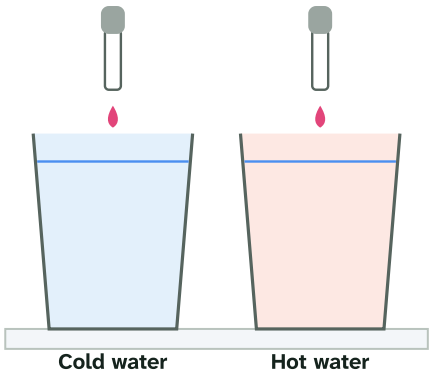


1. What stays the same about the particles in all of your drawings?

2. Use your drawings to explain why you can squash a gas but can hardly squash a solid.

PRACTICAL Food colouring in cold and hot water

Each group needs: two clear beakers or clear plastic cups of the same size, cold water, hot water from your teacher, food colouring with a dropper, a stopwatch and a sheet of white paper.



> **Safety.** Your teacher will give you the hot water, no hotter than about 50 °C, because hot water from a tap can scald. Use beakers or plastic cups, not drinking glasses, and carry them carefully. If glass breaks, tell your teacher and don't pick it up. Wipe up spills straight away; food colouring can stain clothes and skin.

1. Put the beakers on the white paper. Fill one with cold water and the other with hot water, to the same level.
2. Leave them for three minutes without touching them, so that the water is as still as possible.
3. Predict which beaker the colour will spread through faster, and write your prediction below.
4. Add one drop of food colouring to the middle of each beaker at the same time. Don't stir the water or bump the table. Start the stopwatch.
5. At each time in the table, describe or sketch how far the colour has spread in each beaker.
6. Stop when the colour has spread through one of the beakers, and write down the time.

My prediction: _____

Time	Cold water	Hot water
30 seconds		
1 minute		
2 minutes		
3 minutes		
5 minutes		

The colour had spread through the whole beaker after: _____

1. In which beaker did the colour spread faster? Was your prediction right?

2. Use particles to explain your result.

3. Why must the beakers be the same size, with the same amount of water and one drop in each?

4. Why mustn't you stir the water or bump the table?