

# Title: Diffusion

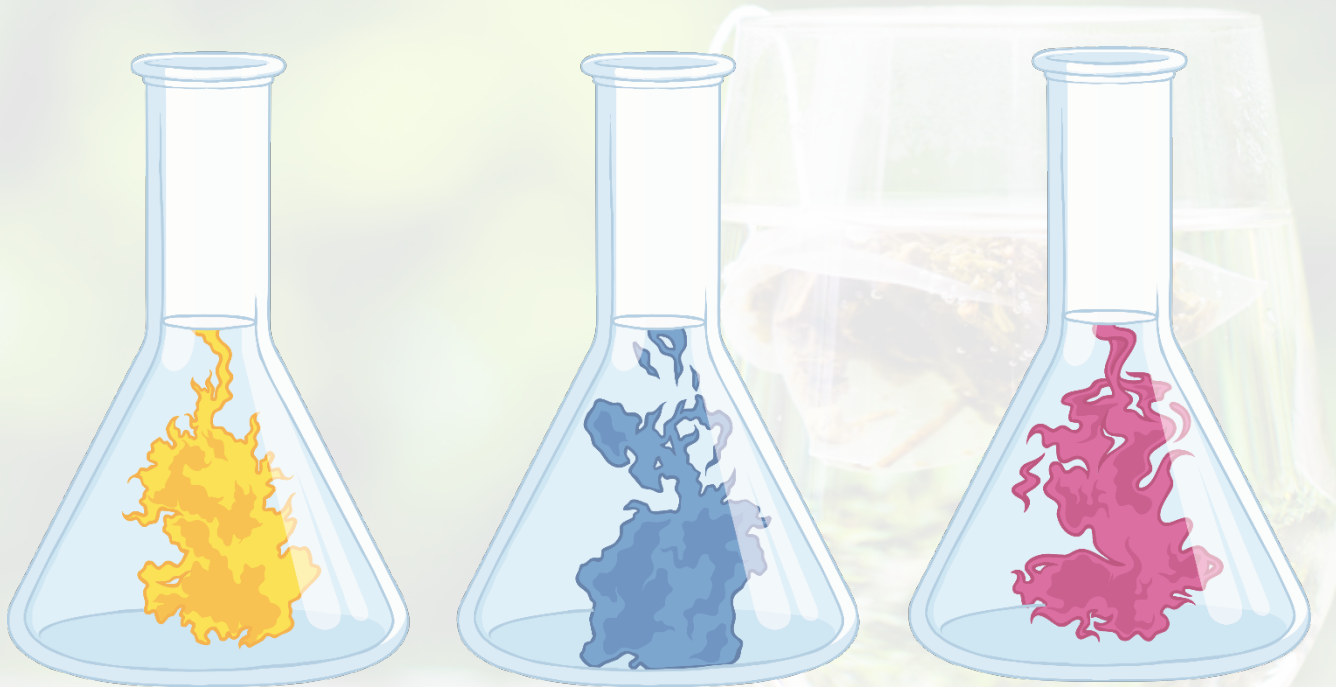
## Learning objectives

1. Define the term 'diffusion'.
2. Recall examples of diffusion.
3. Describe three factors which affect the rate of diffusion.

What's happening?

Why is it happening?

What is this process called?



# Diffusion

- Diffusion is the spreading out of particles from an area of **high concentration to an area of low concentration**.
- It is a passive process, meaning that no energy is needed.





# Diffusion in Everyday Life










What is happening here?

See a more controlled example of diffusion [here](#).

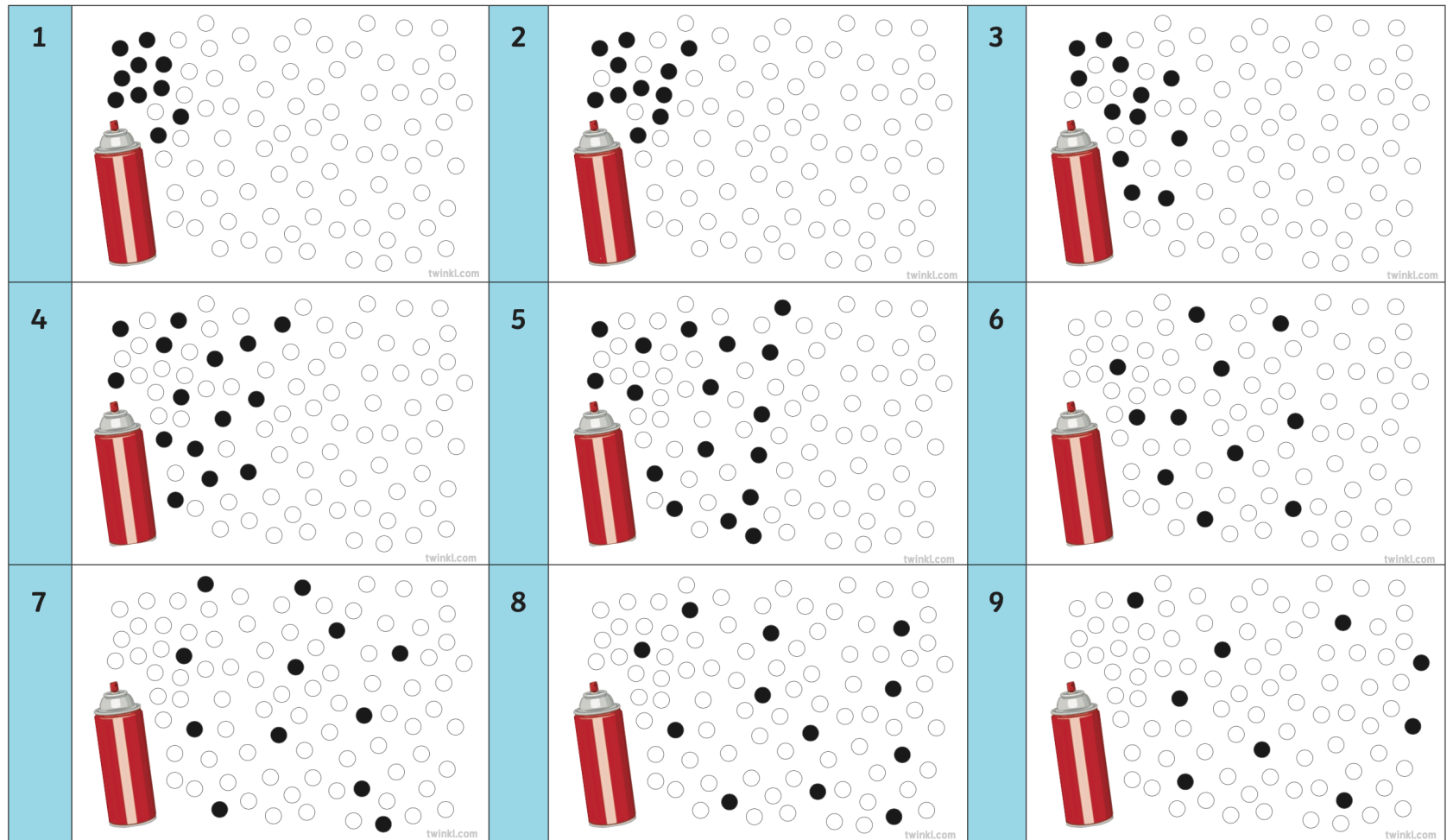


# Flip Book

- Using the template provided, make a flip to show how diffusion happens.
- Once completed, stack the ages in order and staple along the blue area.
- If you cannot make a flip book, complete the boxes to show how diffusion happens.

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 |    | 2 |    | 3 |    |
| 4 |   | 5 |   | 6 |   |
| 7 |  | 8 |  | 9 |  |

# Does your work look like this?





There is a temperature increase.

The cells have a large surface area or high surface area to volume ratio.

There is a steep concentration gradient (particles are not spread out yet).

There is a temperature decrease.

The molecules need to travel a long distance.

Which of these boxes will increase the rate of diffusion?

Which of these boxes will decrease the rate of diffusion?

There is a temperature increase.

The cells have a large surface area or high surface area to volume ratio.

There is a steep concentration gradient (particles are not spread out yet).

There is a temperature decrease.

The molecules need to travel a long distance.

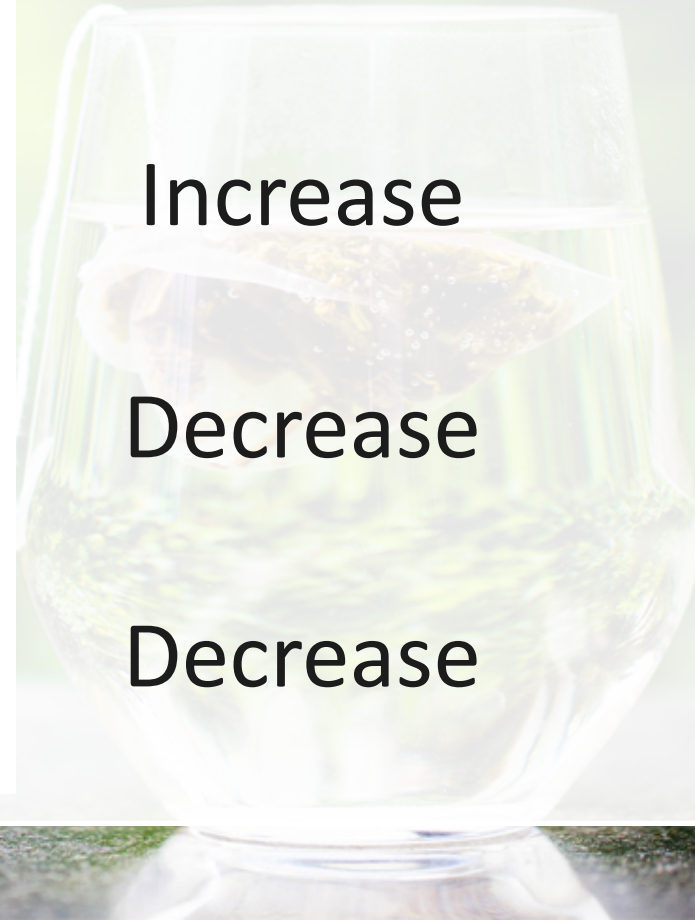
Increase

Increase

Increase

Decrease

Decrease





# Influencing Factors

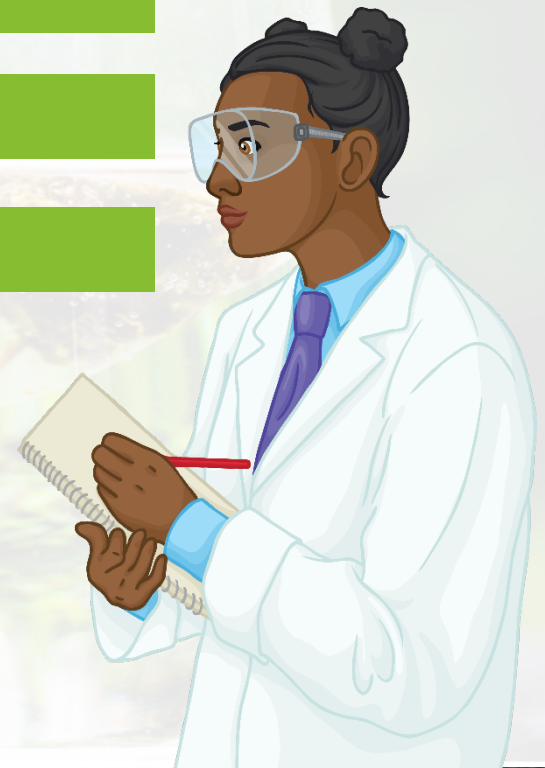
The rate of diffusion is affected by the:

temperature

concentration

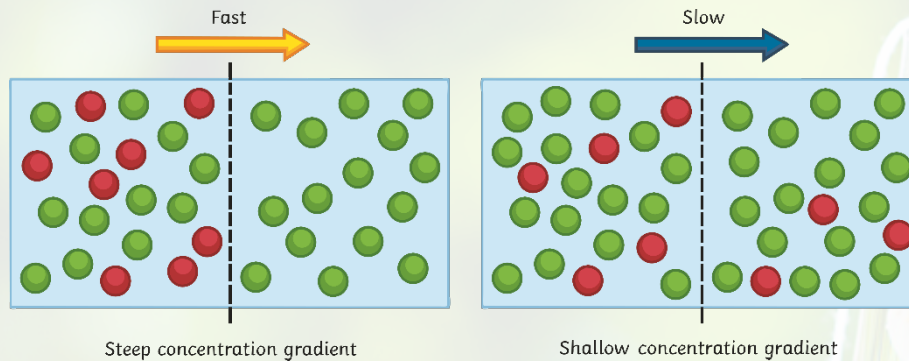
surface area

molecule size



# Concentration

Particles move from an area of high concentration to an area of low concentration. Think about the cooking smells from the kitchen; slowly, they make their way into different rooms. If they didn't do this, the smells would permanently be in the kitchen!



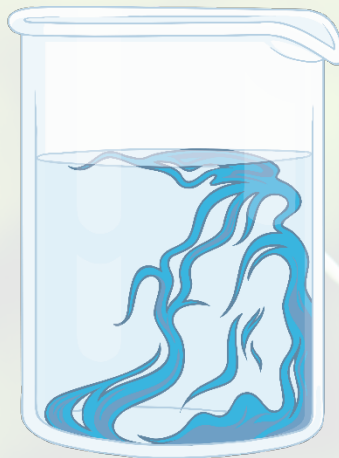
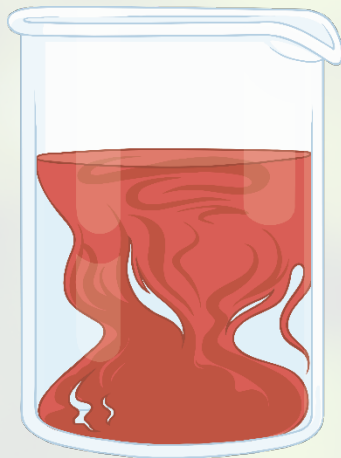
**Question: Why does increasing the concentration increase the rate of diffusion?**



# Temperature

If we tried making a cup of tea with cold water, we'd have to wait a very long time for the tea to diffuse – if it even diffused at all. We make it with hot water because the heated particles in the water move faster, speeding up the process of diffusion and therefore bringing the flavour out.

Not to mention that nobody likes cold tea!



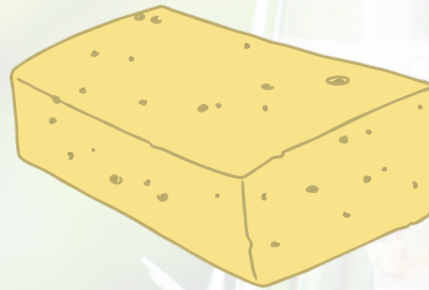
**Question: Why does increasing the temperature increase the rate of diffusion?**



# Surface Area

The larger the surface area, the faster the diffusion rate. This is because more particles can move from area to area at the same time.

This is why a sponge has thousands of tiny holes in it. The increased surface area means water particles are able to diffuse into it in more places. A smooth sponge with no holes wouldn't be very absorbent.



**Question: Why does increasing the surface area increase the rate of diffusion?**

# Plenary

Describe diffusion to someone in your house