HEAT TRANSFER
CONVECTION

S2 Physics

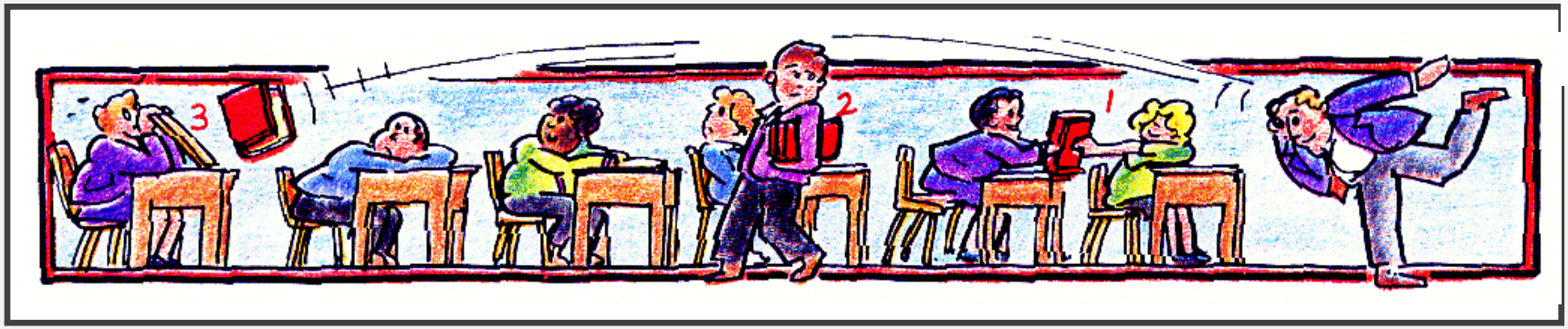
REVIEW

- Heat can be transferred in 3 ways
  - ✓ CONDUCTION
  - ✓ CONVECTION
  - ✓ RADIATION

- Usually heat is transferred in all 3 ways at once.
- Heat ALWAYS travels from Hot places to cold places

CONDUCTION REVIEW

- Conduction occurs in solids.
- Metals are good conductors.
- Non-metals, liquids and gases are bad conductors.
- Bad conductors are called good insulators.

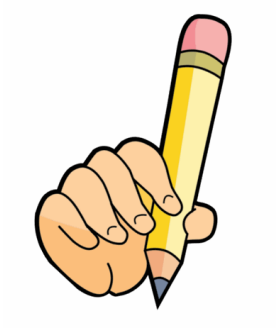


book is like heat energy

2. CONVECTION – book taken by a student to the back of the room. The particles carry the energy to a different place.

https://youtu.be/N7k1D9E-5BU
Play the first 95 s only!

CONVECTION

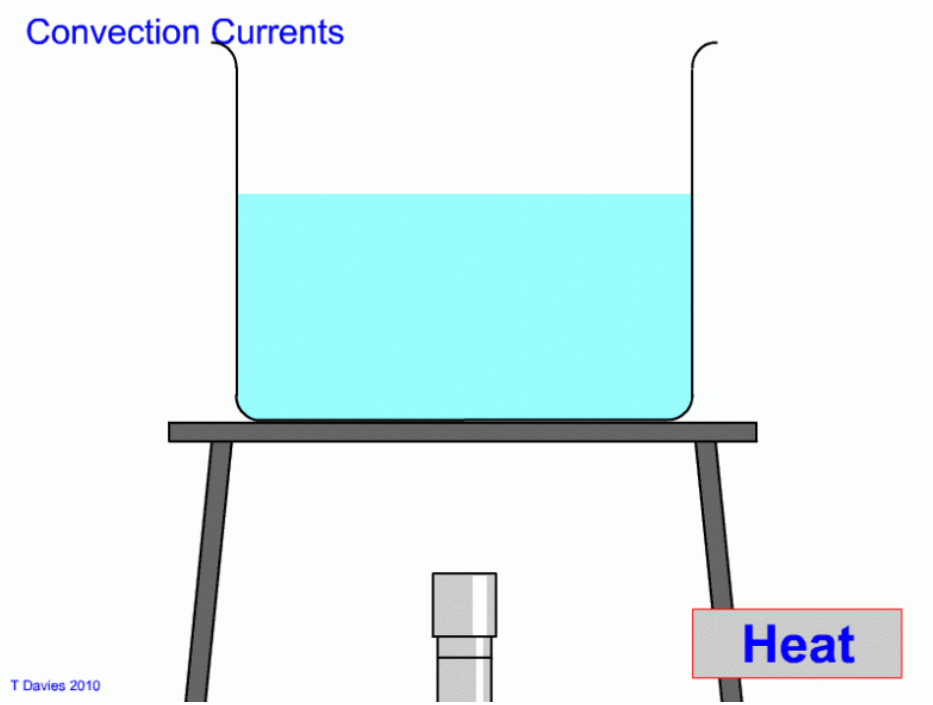


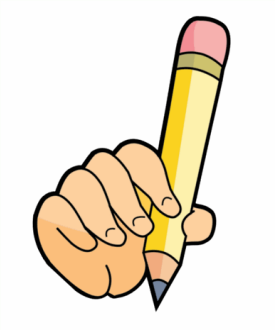
- **CONVECTION this occurs in liquids and gases.**

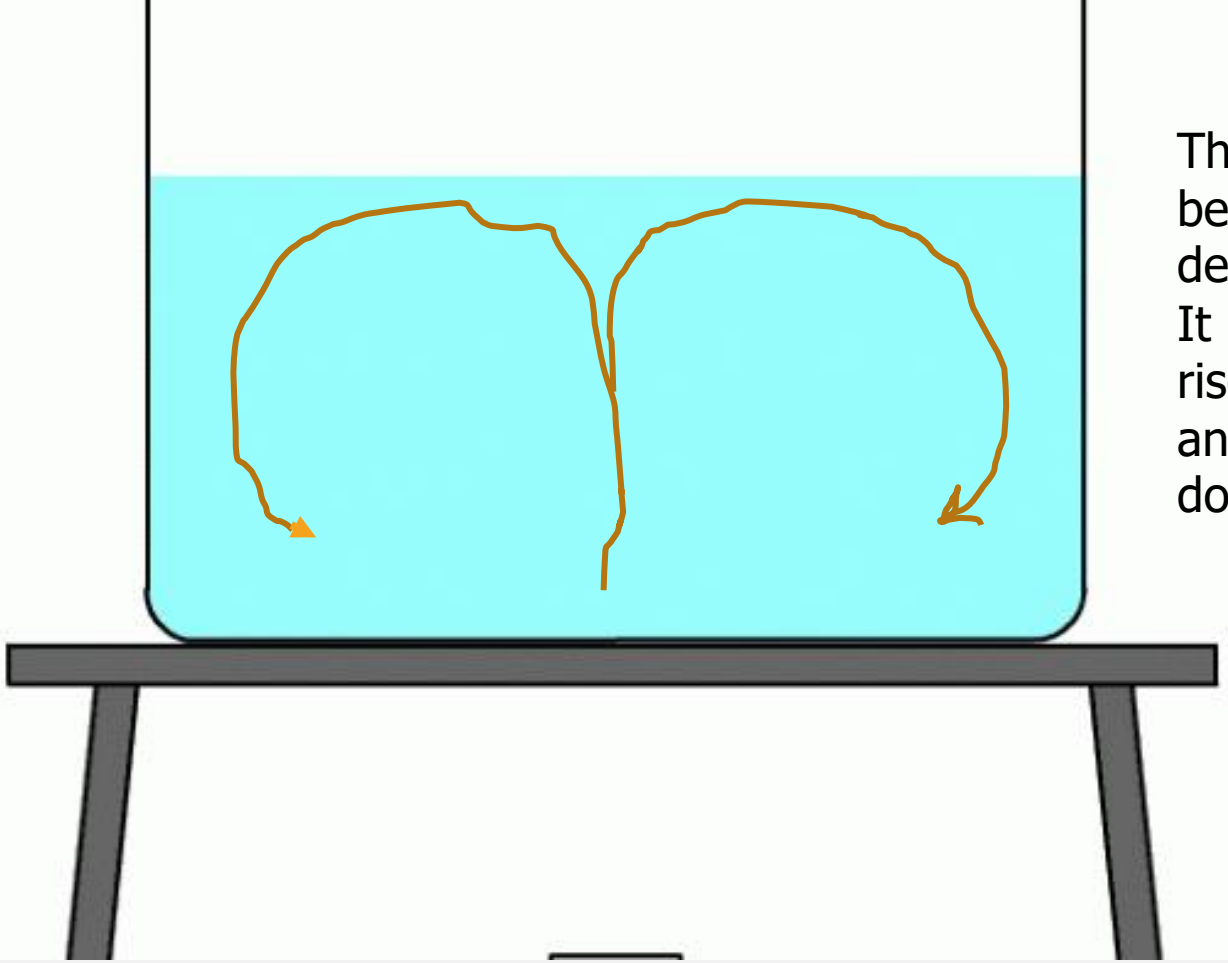
The molecules carry the energy with them. The particles spread out and the fluid becomes less dense.

This is why hot fluids rise. (NB don't say it is the heat rising, it is the particles that transfer the energy)

BEWARE





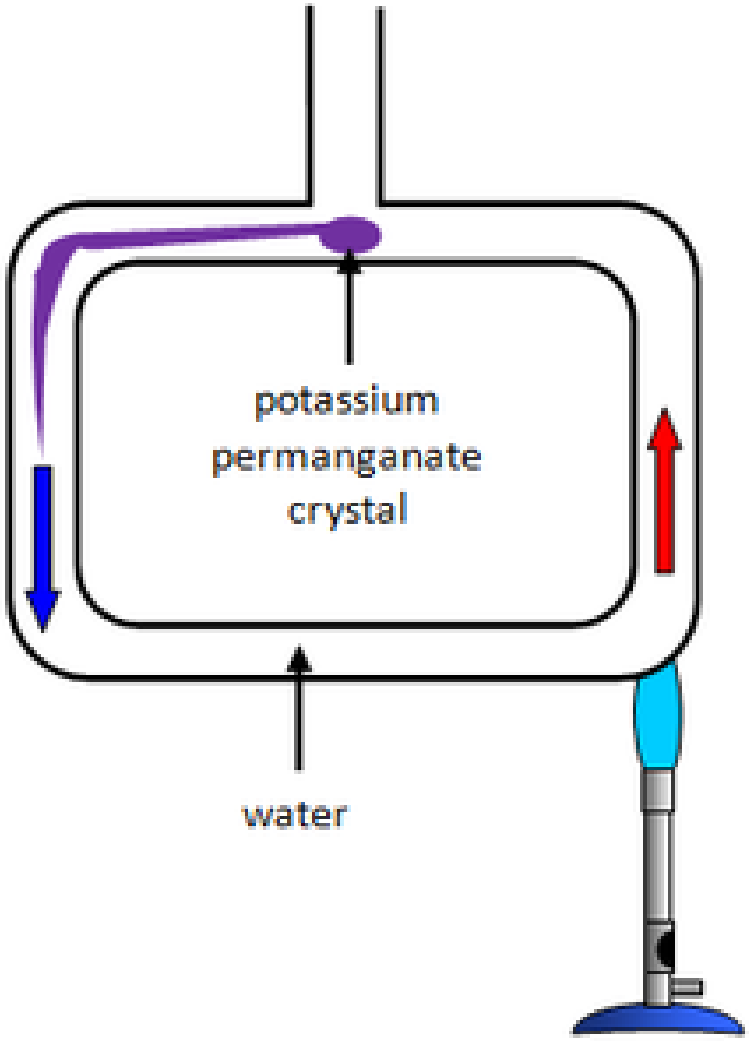


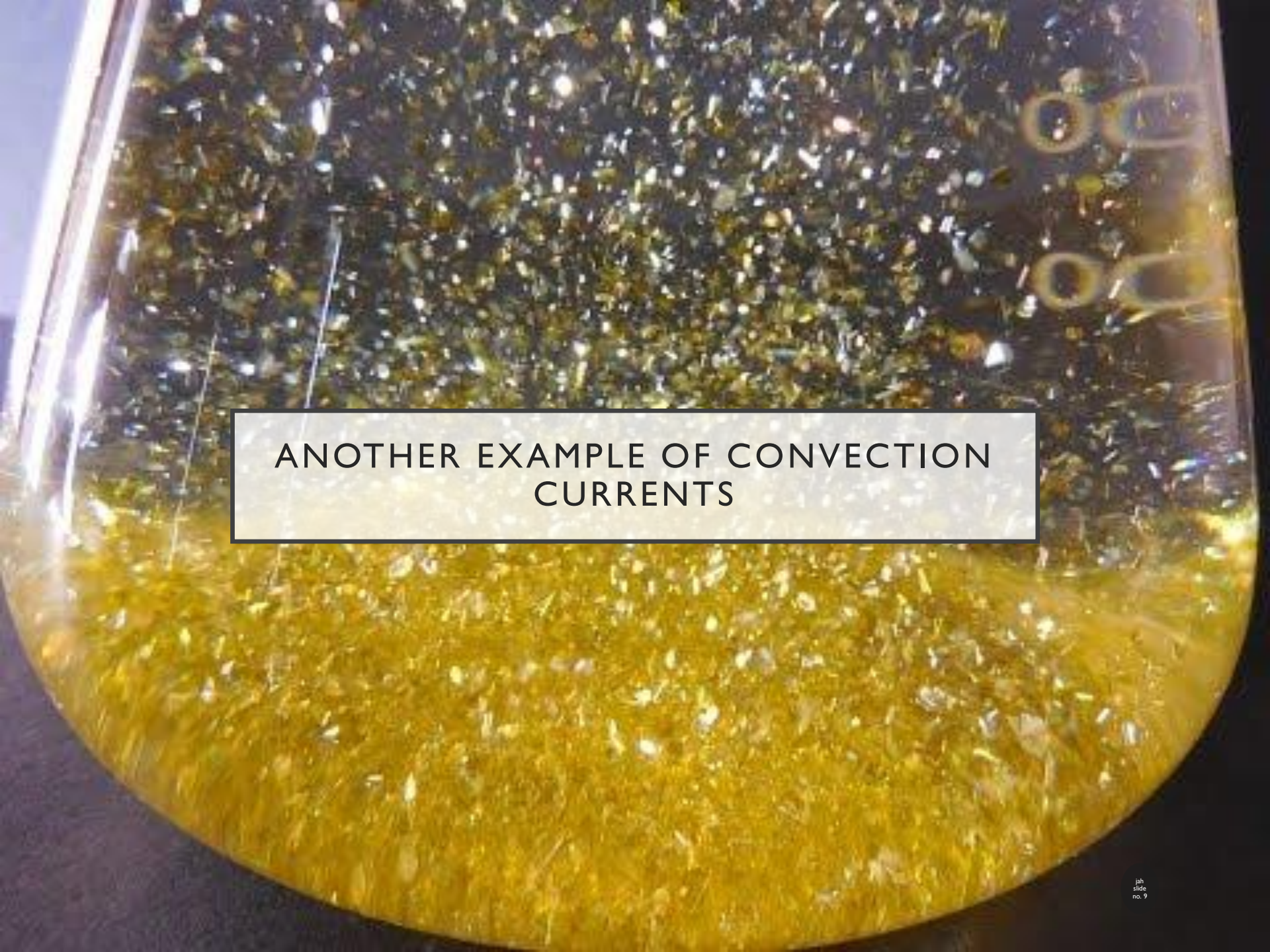
The hot water becomes less dense.
It rises. As it rises it cools and sinks back down.

CONVECTION CURRENTS

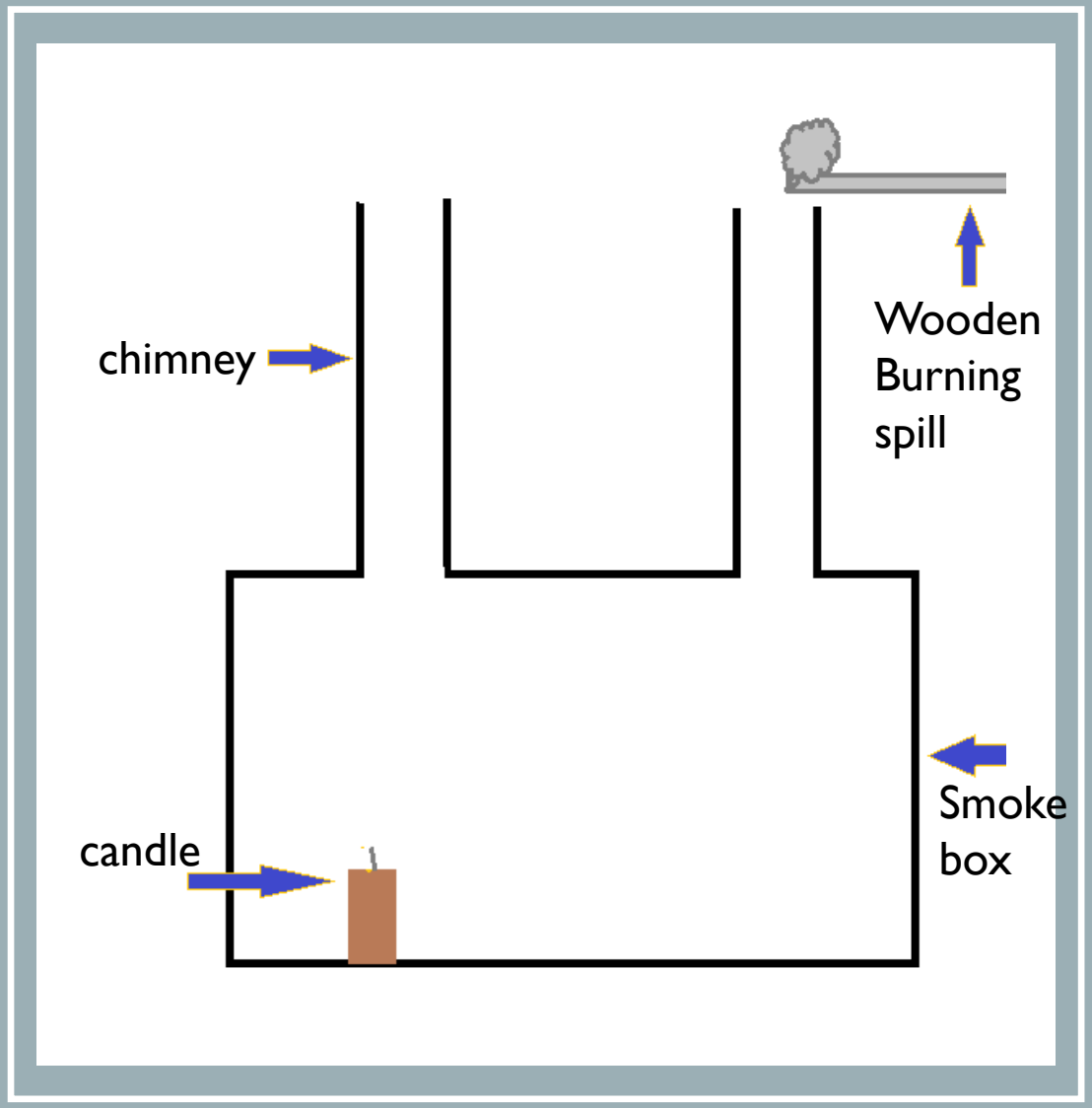
ANOTHER EXAMPLE OF CONVECTION

BEWARE





ANOTHER EXAMPLE OF CONVECTION CURRENTS

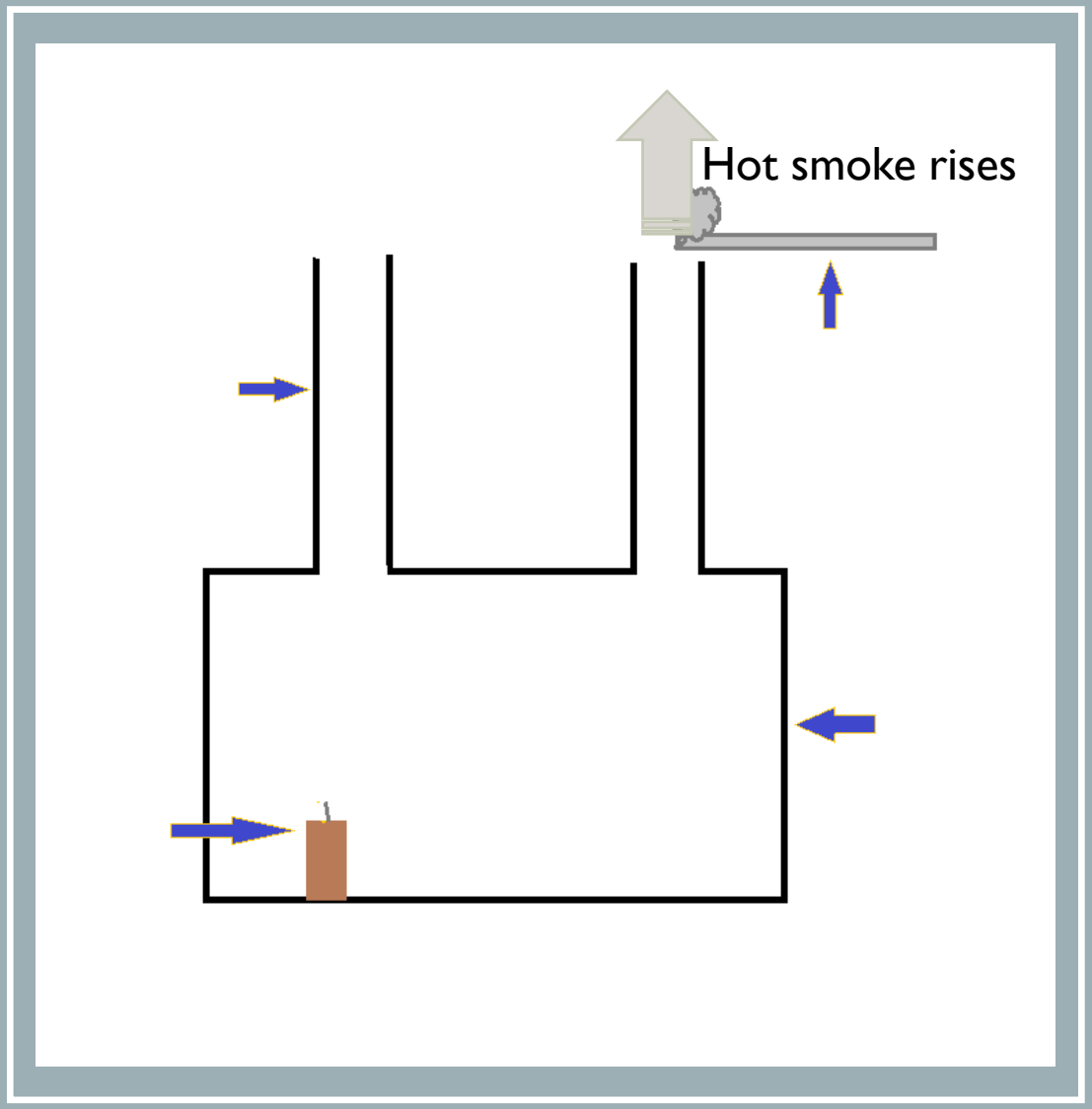


THE SMOKE BOX

Draw out the smoke box twice and label it once.

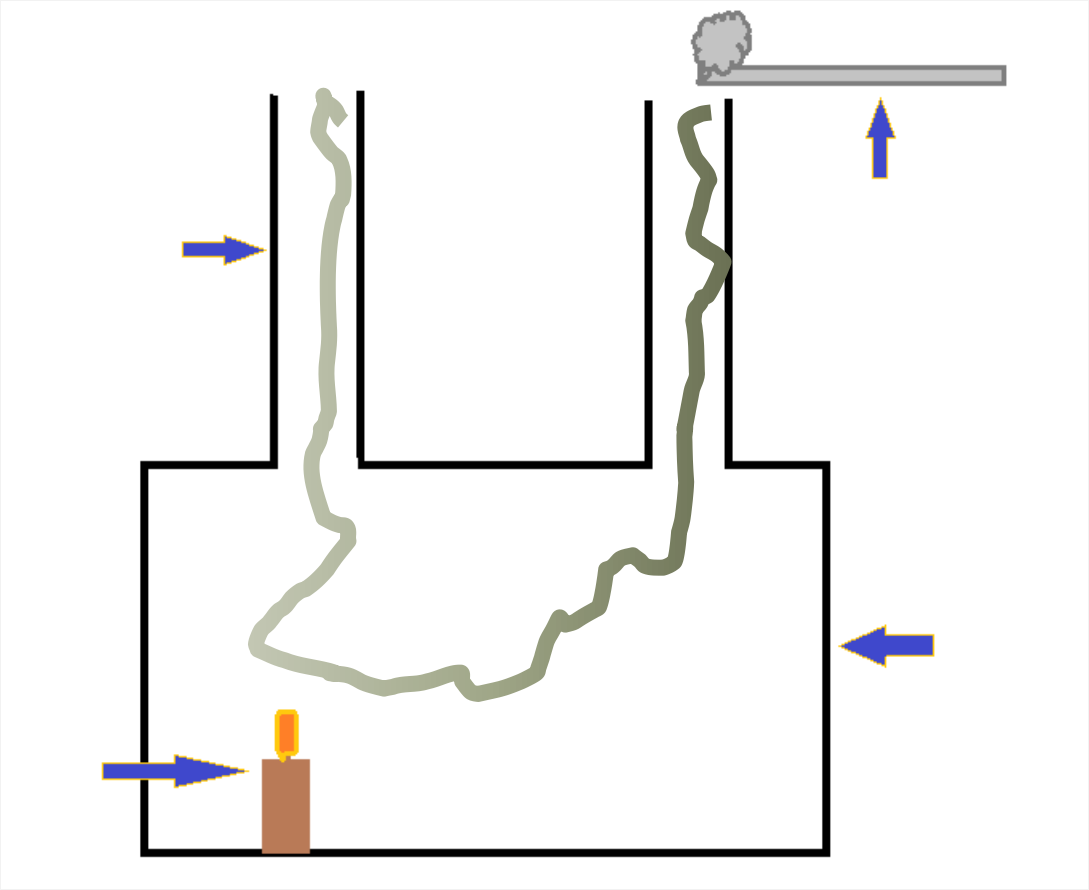
THE SMOKE BOX

Candle unlit



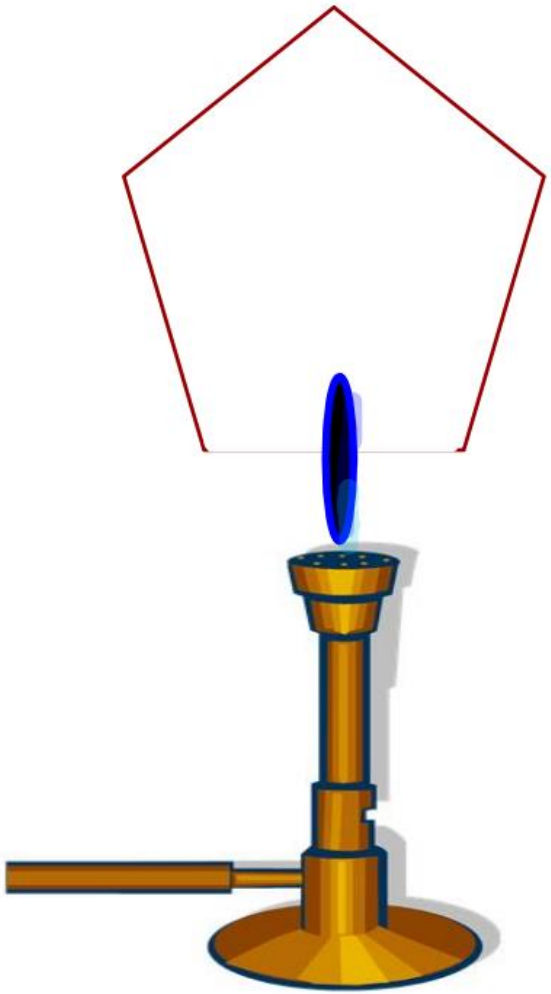
THE SMOKE BOX

Candle lit



THE HOT AIR BALLOON

https://youtu.be/ugsgmFcnszk



Ask your teacher to demonstrate making a hot air balloon.

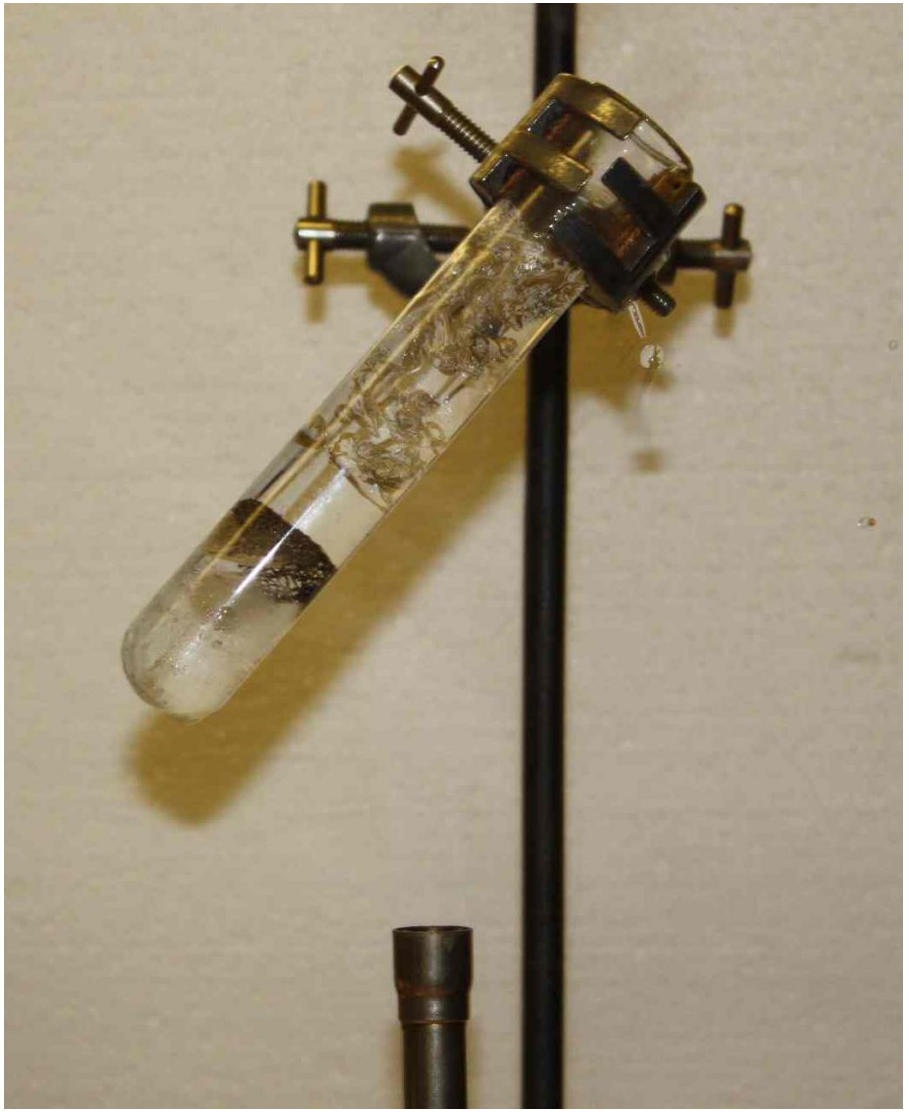
- **Describe what happens and why.**

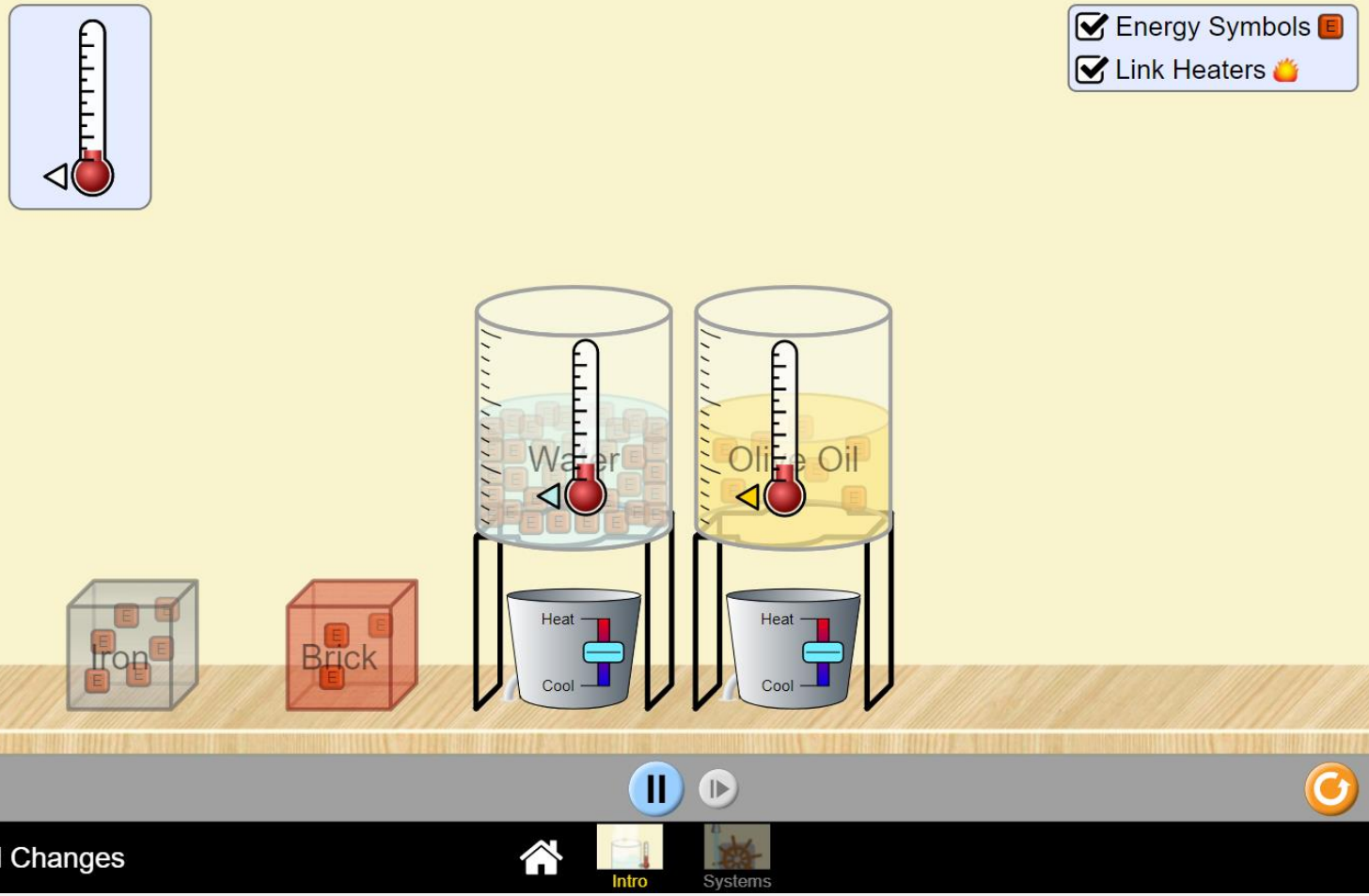
THE HOT AIR BALLOON

TURNING SPIRALS- HOW YOUR FAKE FIRE WORKS!

ALL 3 STATES AT ONCE! HOW?

https://vimeo.com/384229447#





HTTPS://PHET.COLORADO.EDU/SIMS/HTML/ENERGY-FORMS-AND-CHANGES/LATEST/ENERGY-FORMS-AND-CHANGES_EN.HTML

HEAT LOSS FROM HOUSES

Have you thought about what you can test?

Have you thought how you can test this in the lab?

What will be your variable?

What will you keep the same?

How long will you run your experiment?

CONVECTION SUMMARY

- CONVECTION occurs in fluids (liquids and gases).
- The particles with more energy (heat) vibrate more and need more space to move around (like pupils in the PE hall rather than a maths room). As the fluid becomes less dense it rises.
- As the fluid rises it cools and so becomes more dense and falls.
- This movement is called a convection current.