Finish these sentences…

- Temperature measures …….. how hot or cold something is
  It is measured in…. degrees Celsius

- Heat is the amount of ….thermal energy
  It is measured in … Joules

Conduction

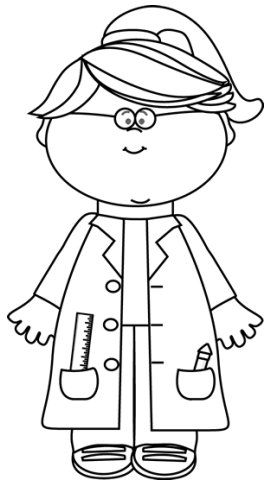
LO: To understand what conduction is

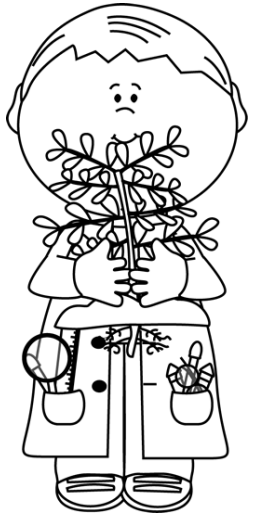
Recognise that hear energy can be transferred by conduction	
Describe how heat transfer occurs through solids using particle theory	
Describe the difference between thermal conductors and insulators	

Key word

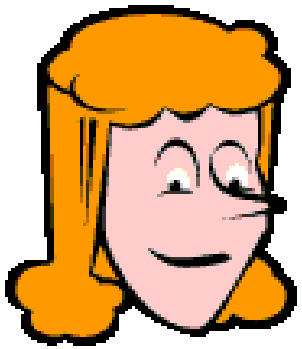
Conduction

Thermal energy is passed from particle to particle in a solid





What is "CONDUCTION"?

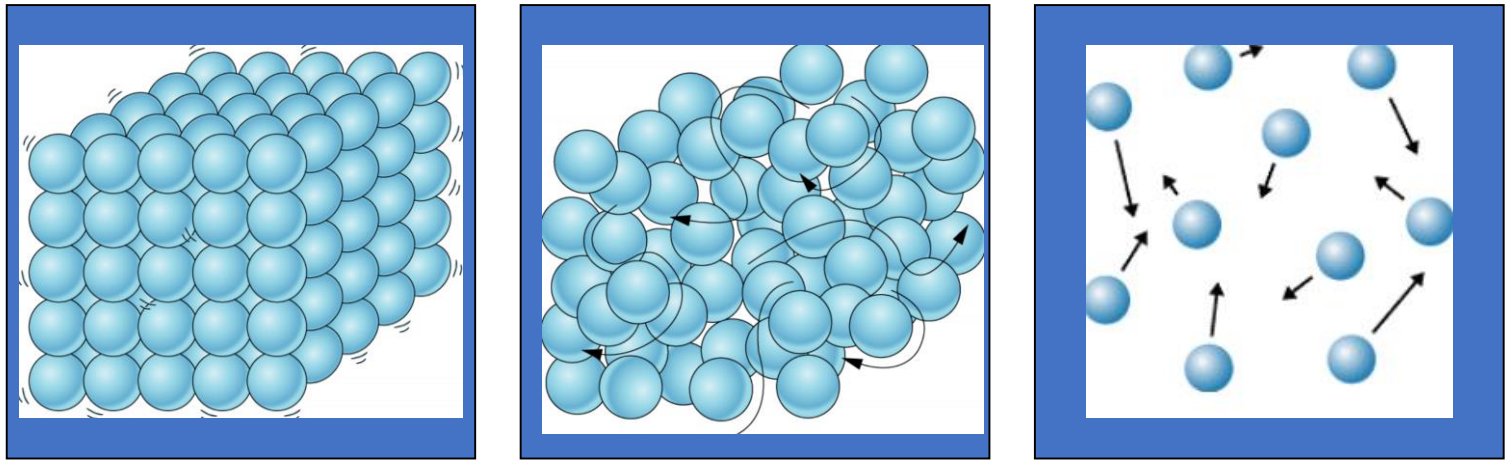


Conduction

- We know that if one end of a metal bar is heated, the other end will eventually become hot.
- We know this because the handle of a teaspoon left in a mug gets hot even though it isn't in the tea!

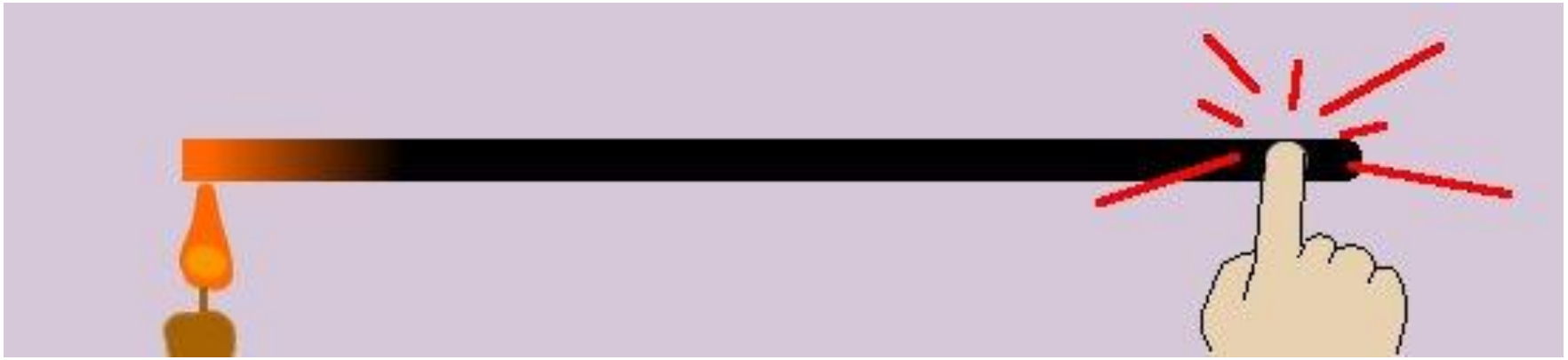
BUT WHY ????

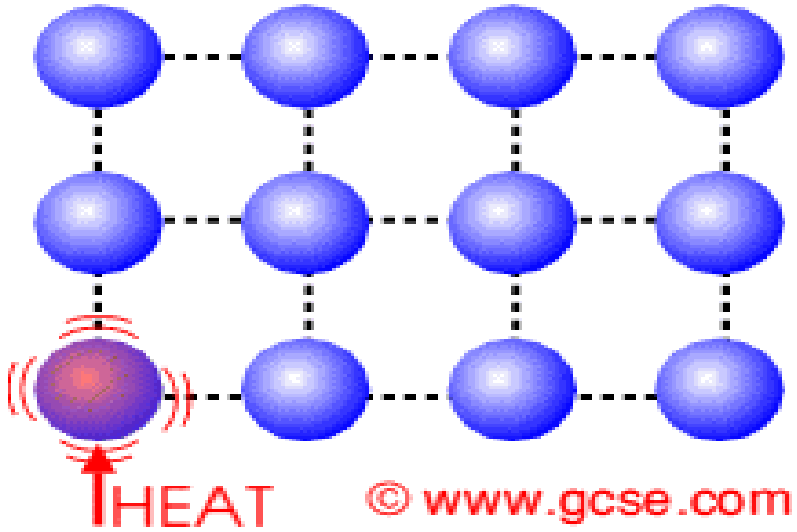
Particles

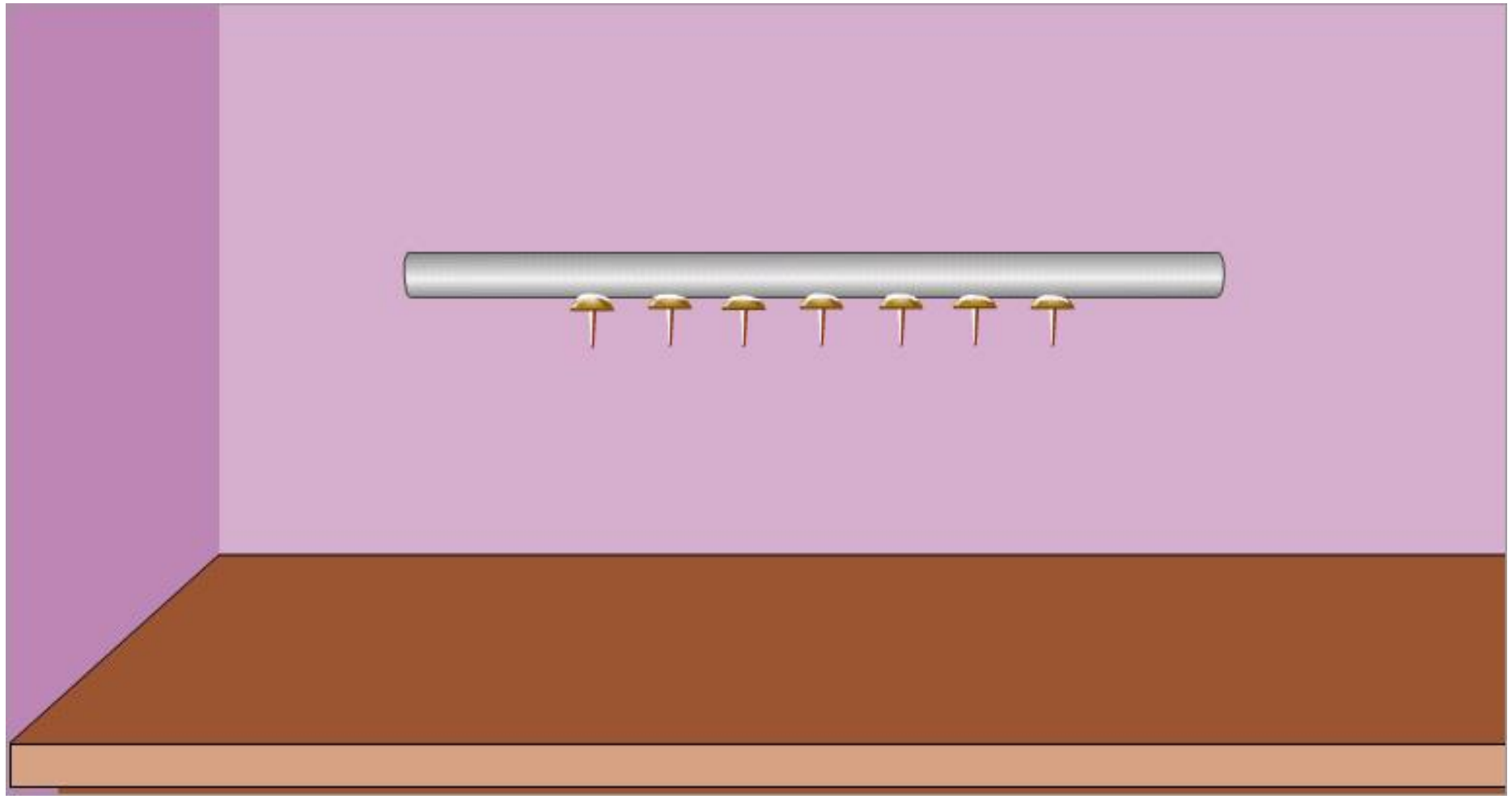


SOLID LIQUID GAS

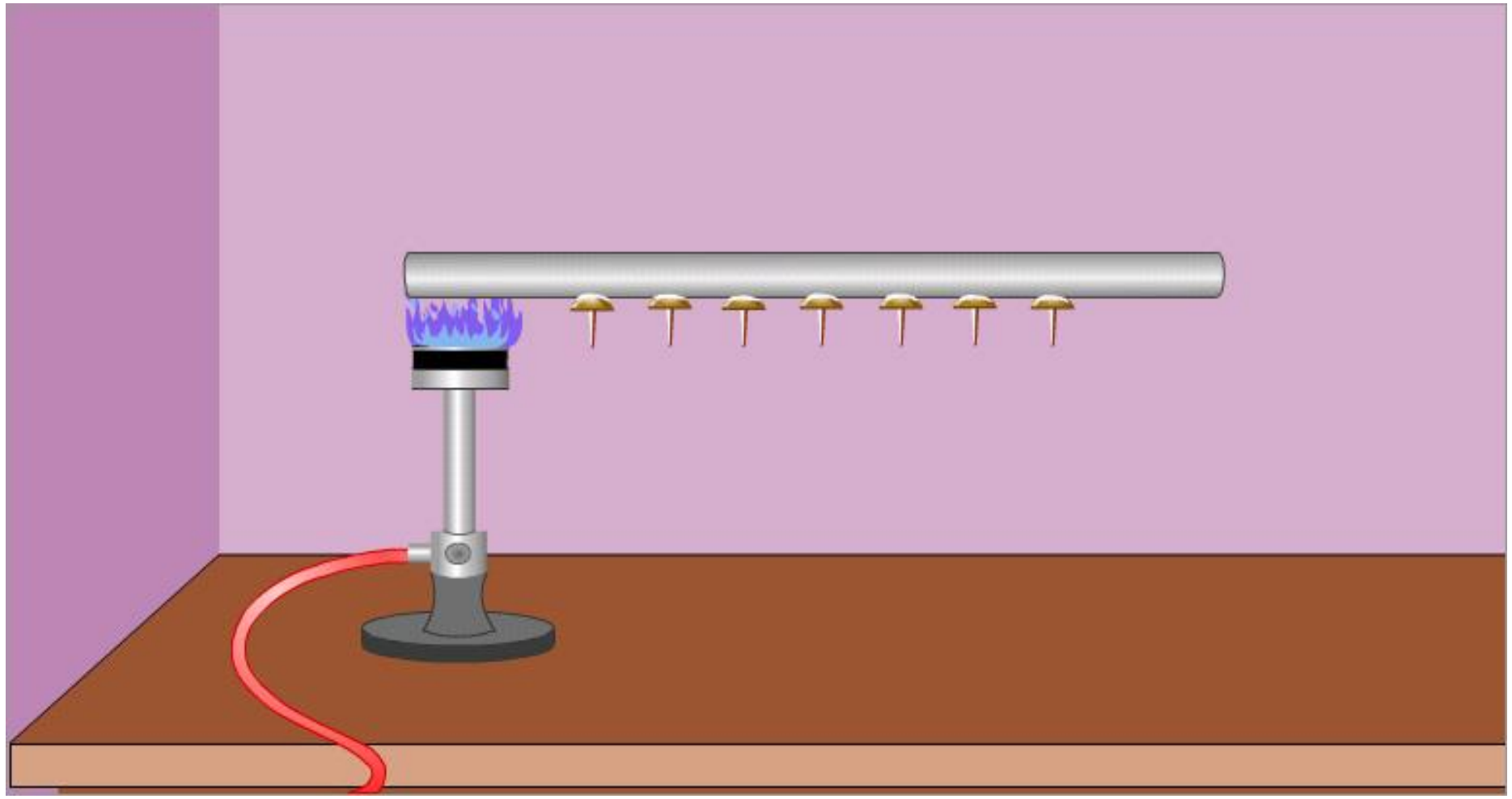
Conduction and Particles



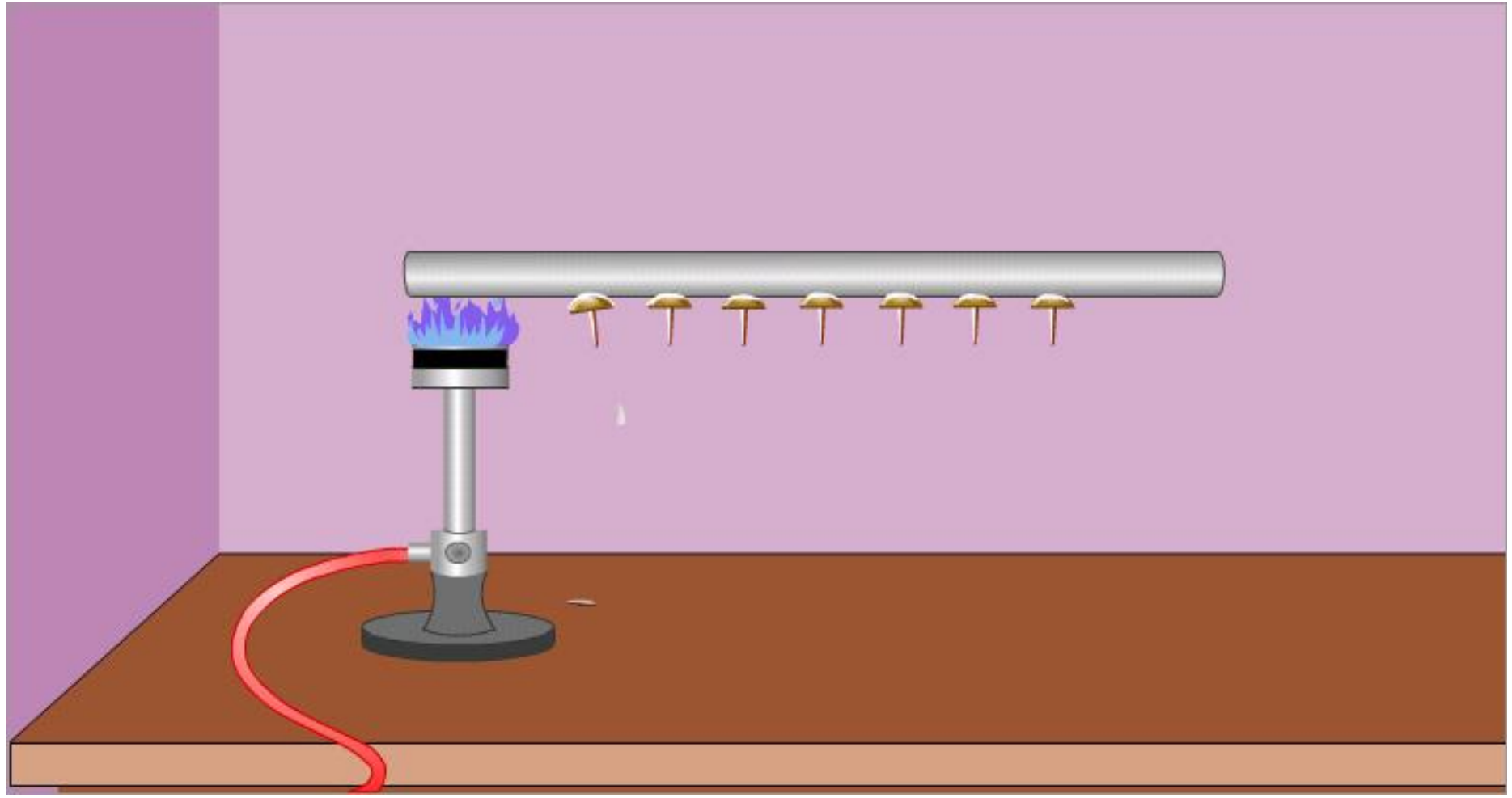




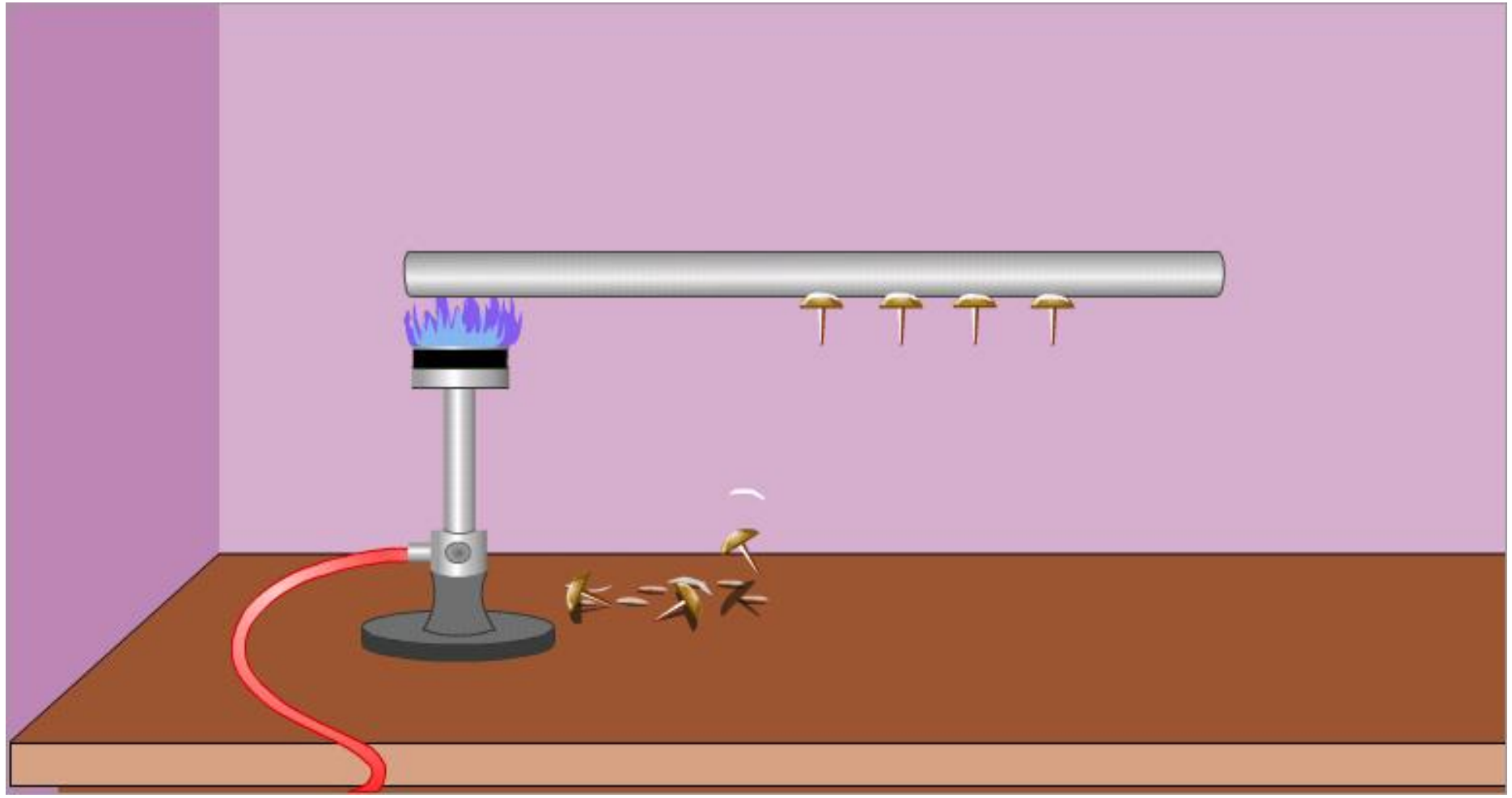
Some students have attached drawing pins to this metal bar.



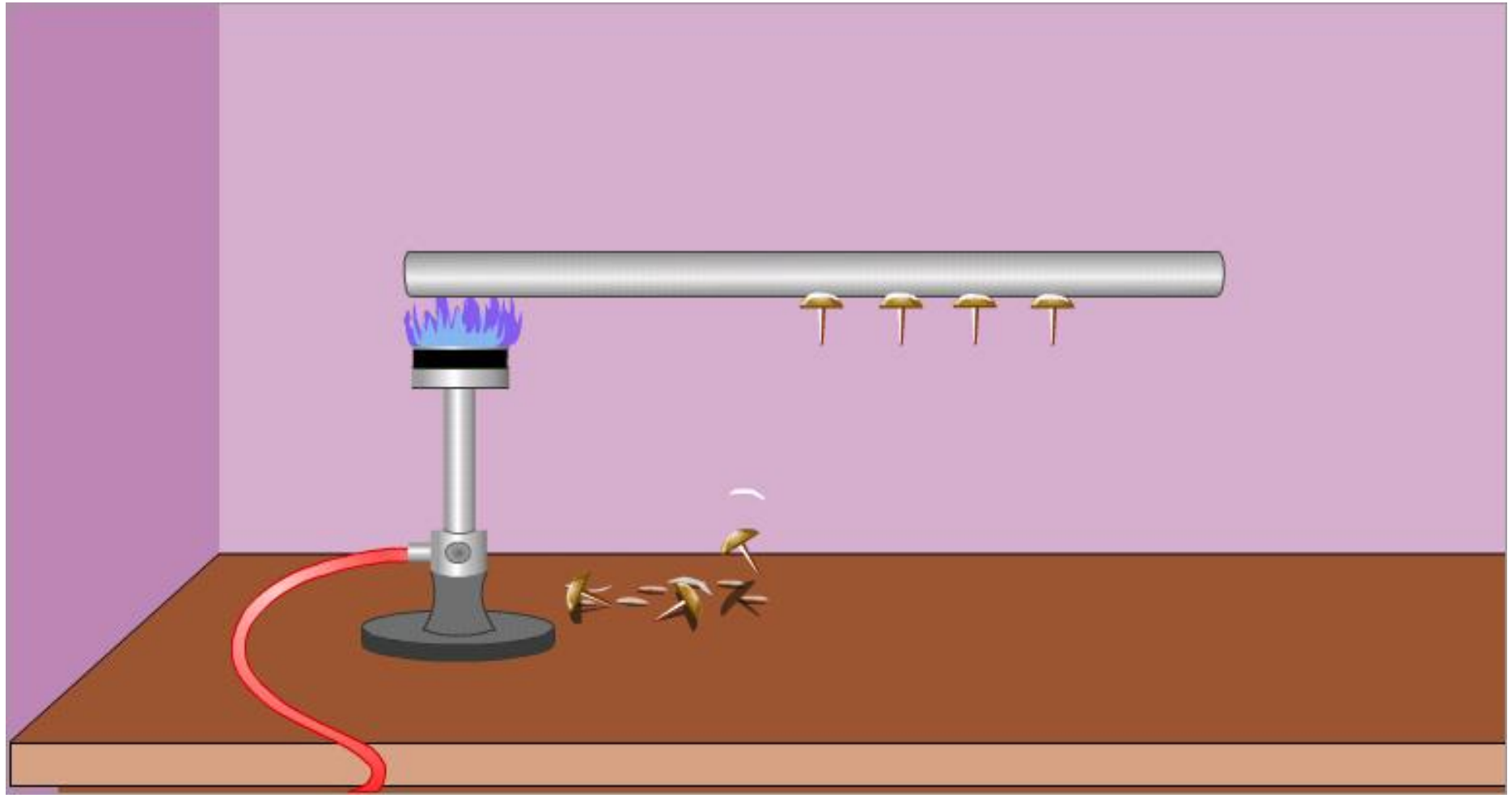
A bunsen burner is used to heat one end of the bar.



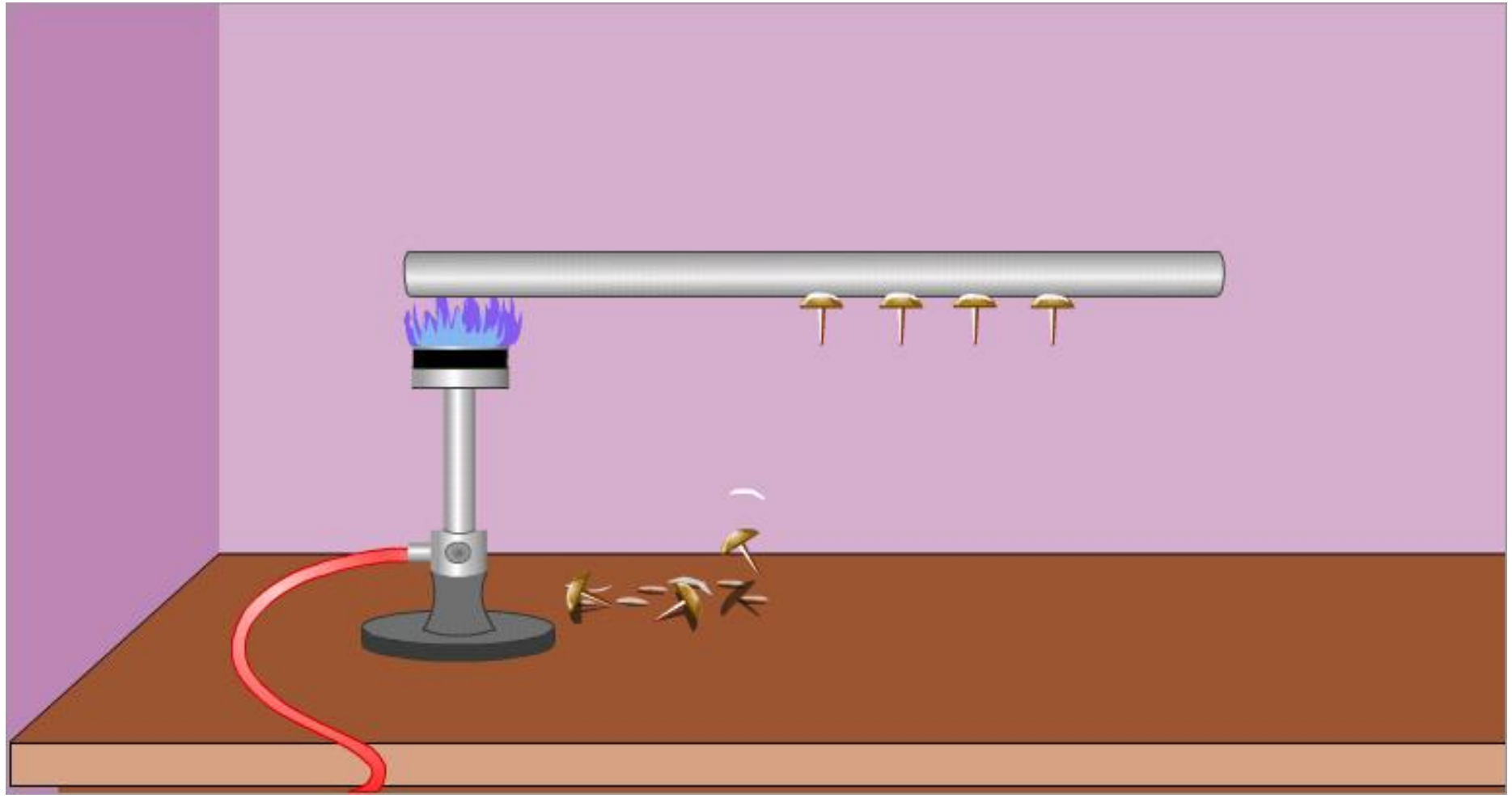
The heat moves along the metal bar.



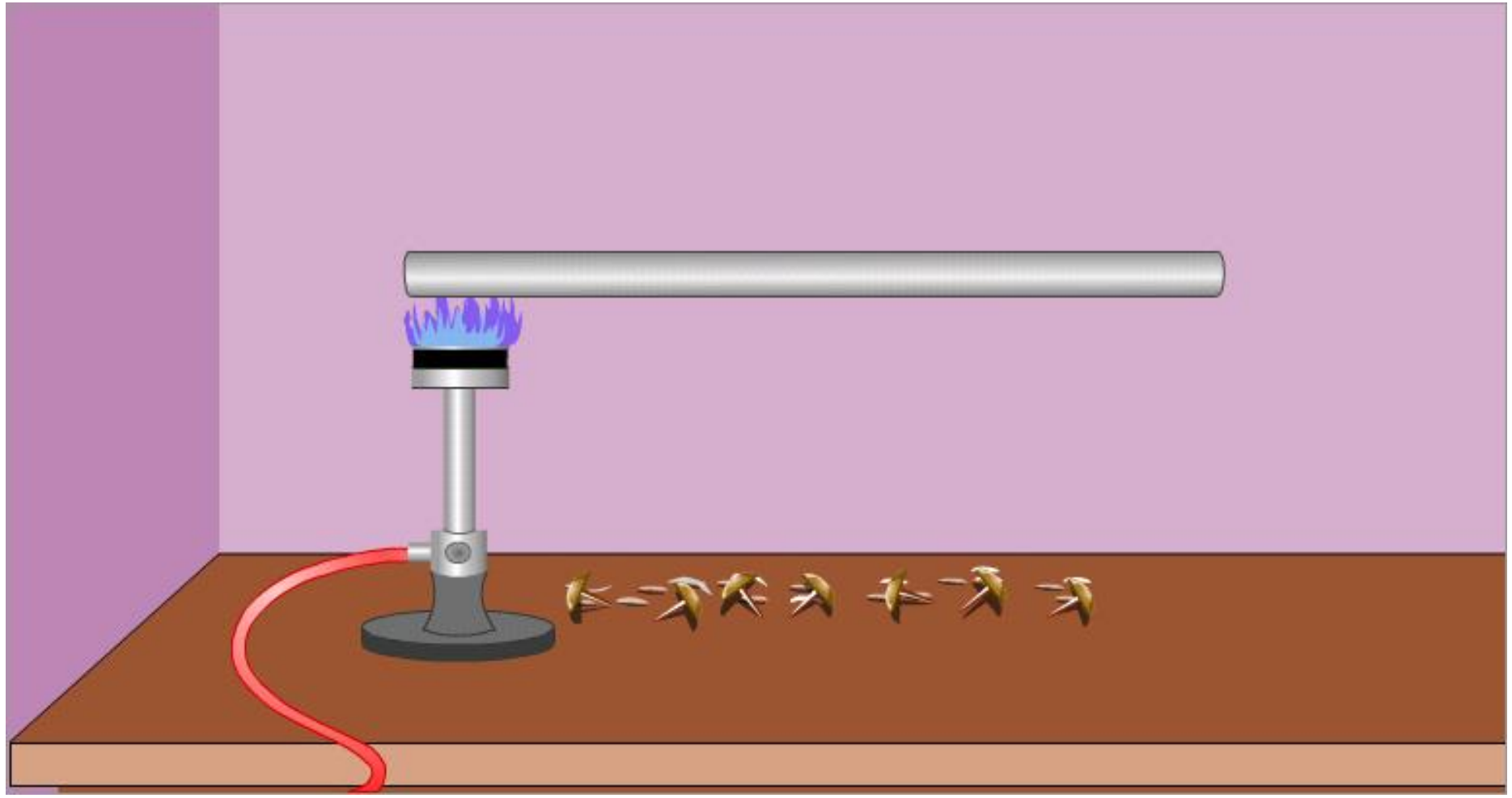
When the bar gets hot enough, the pins will fall.



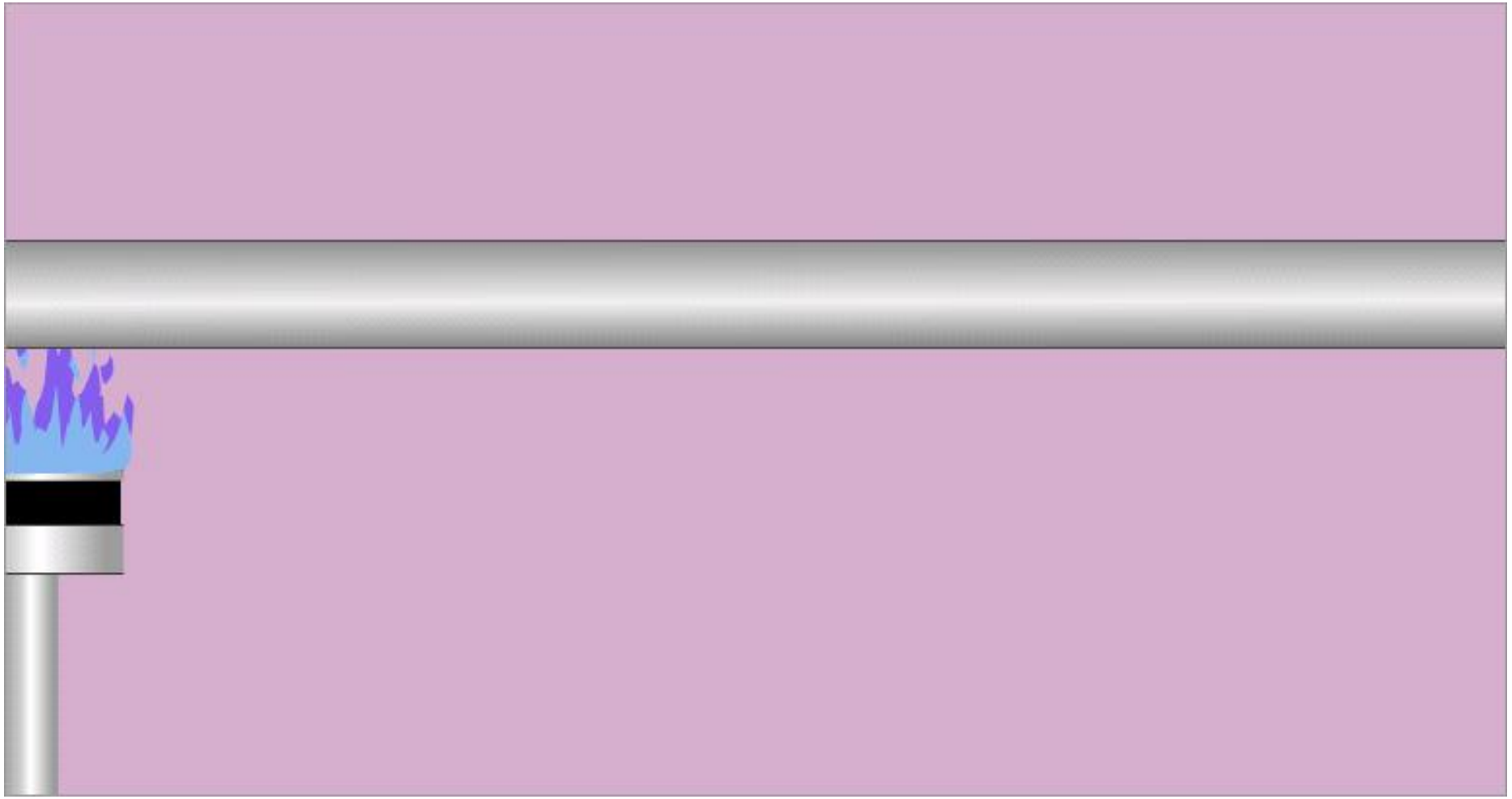
This is because the wax will melt.



Watch the pattern as the pins drop off.



This sort of heat flow is called conduction.



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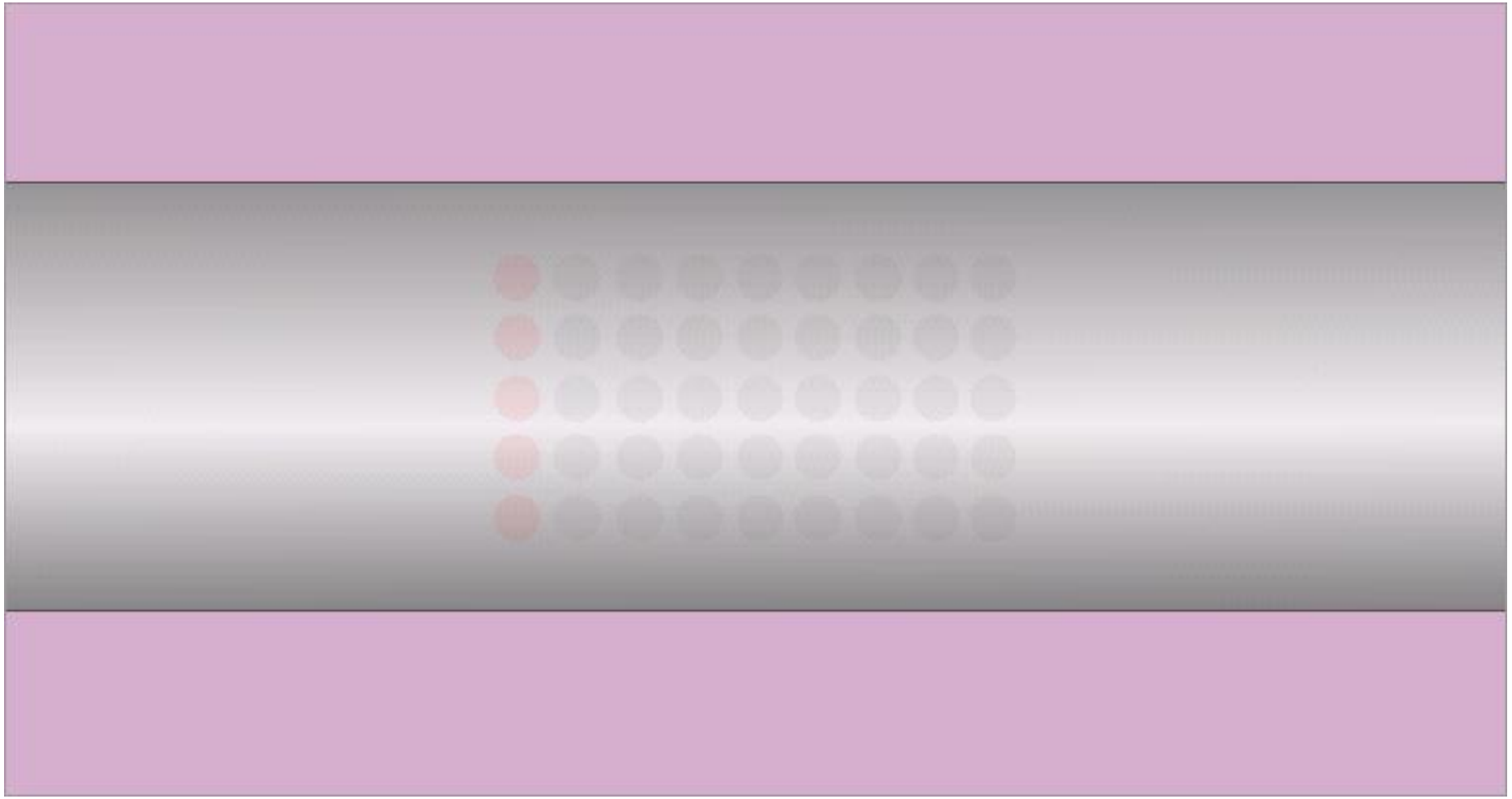

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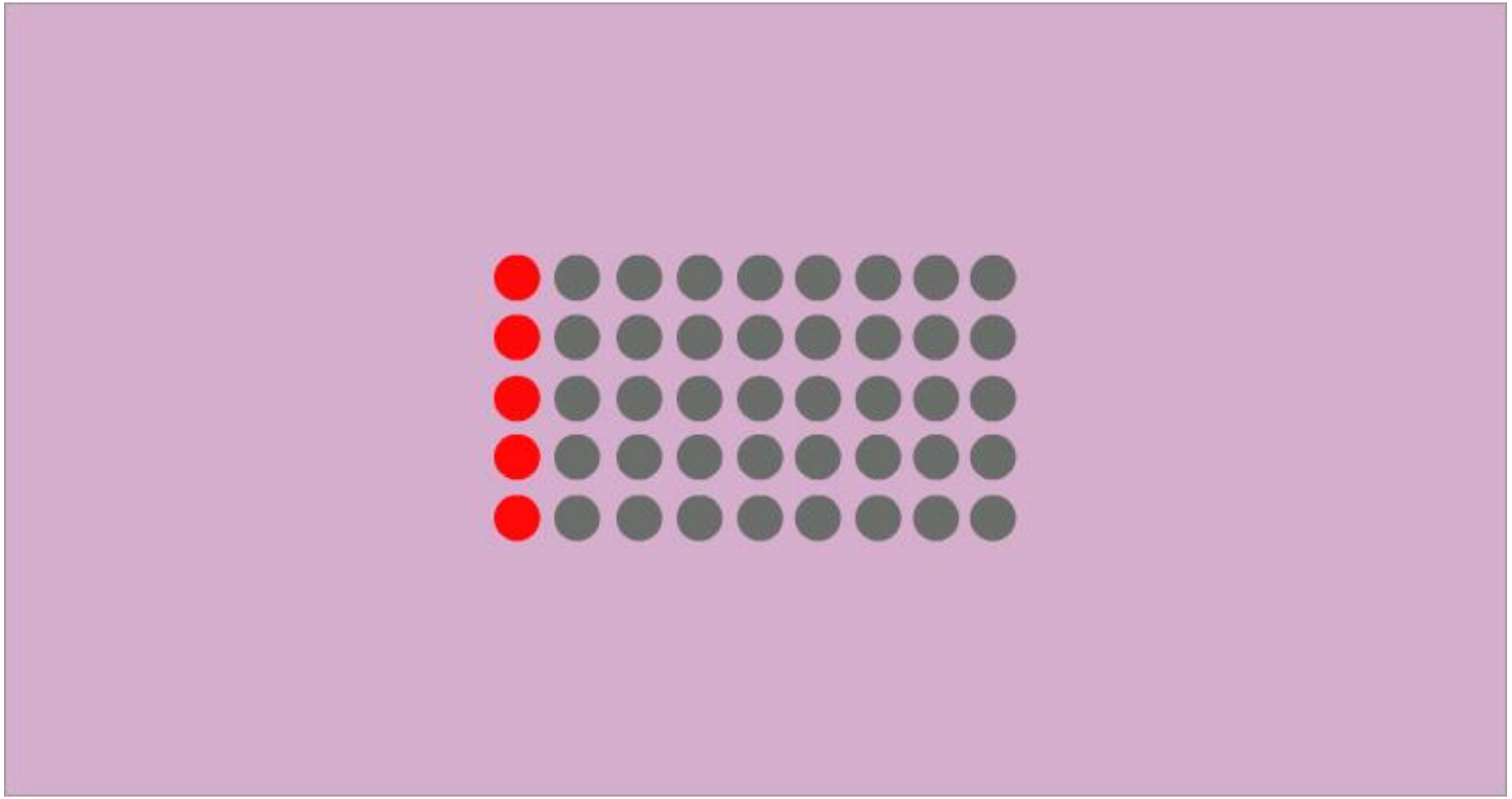
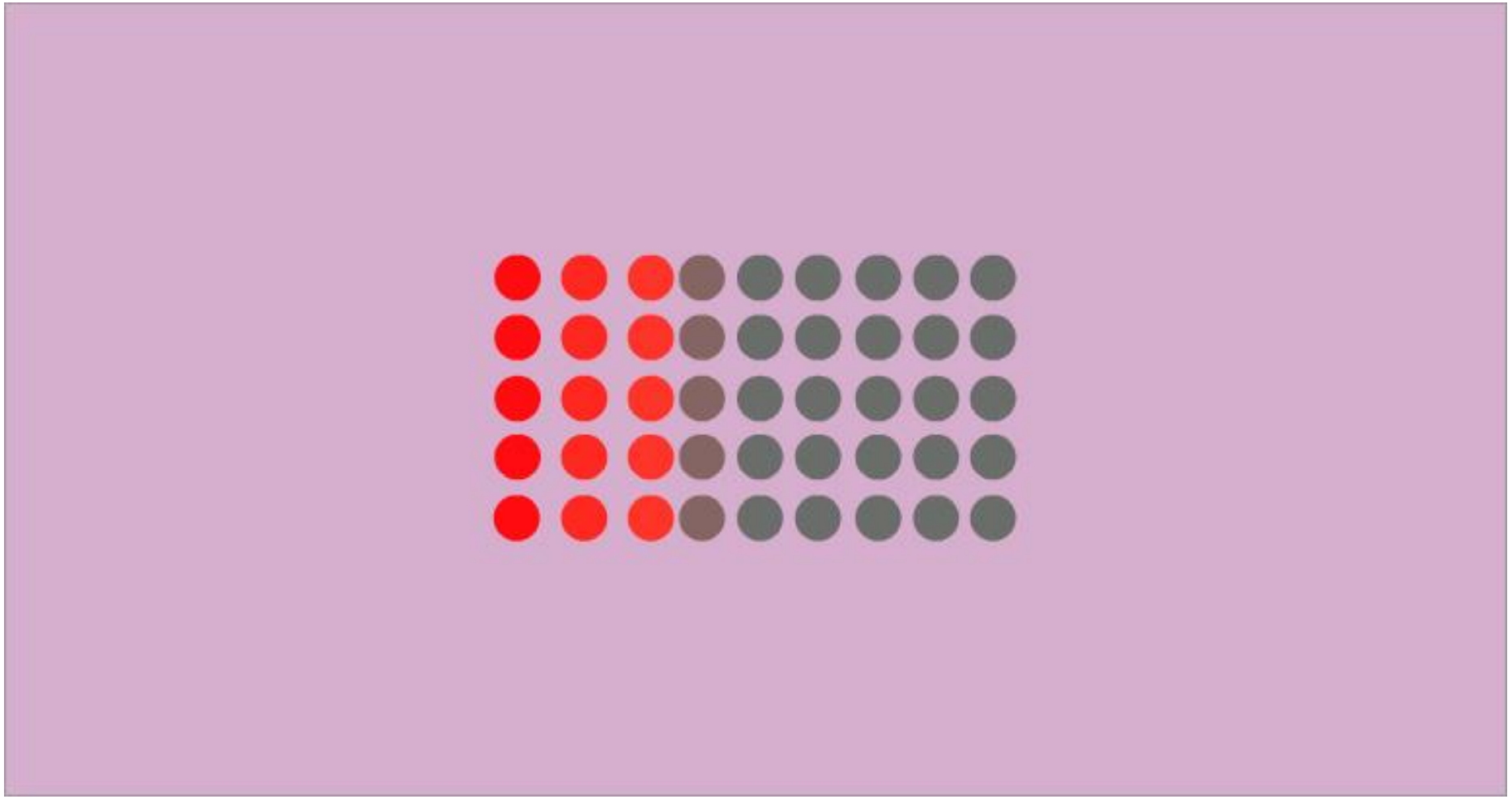
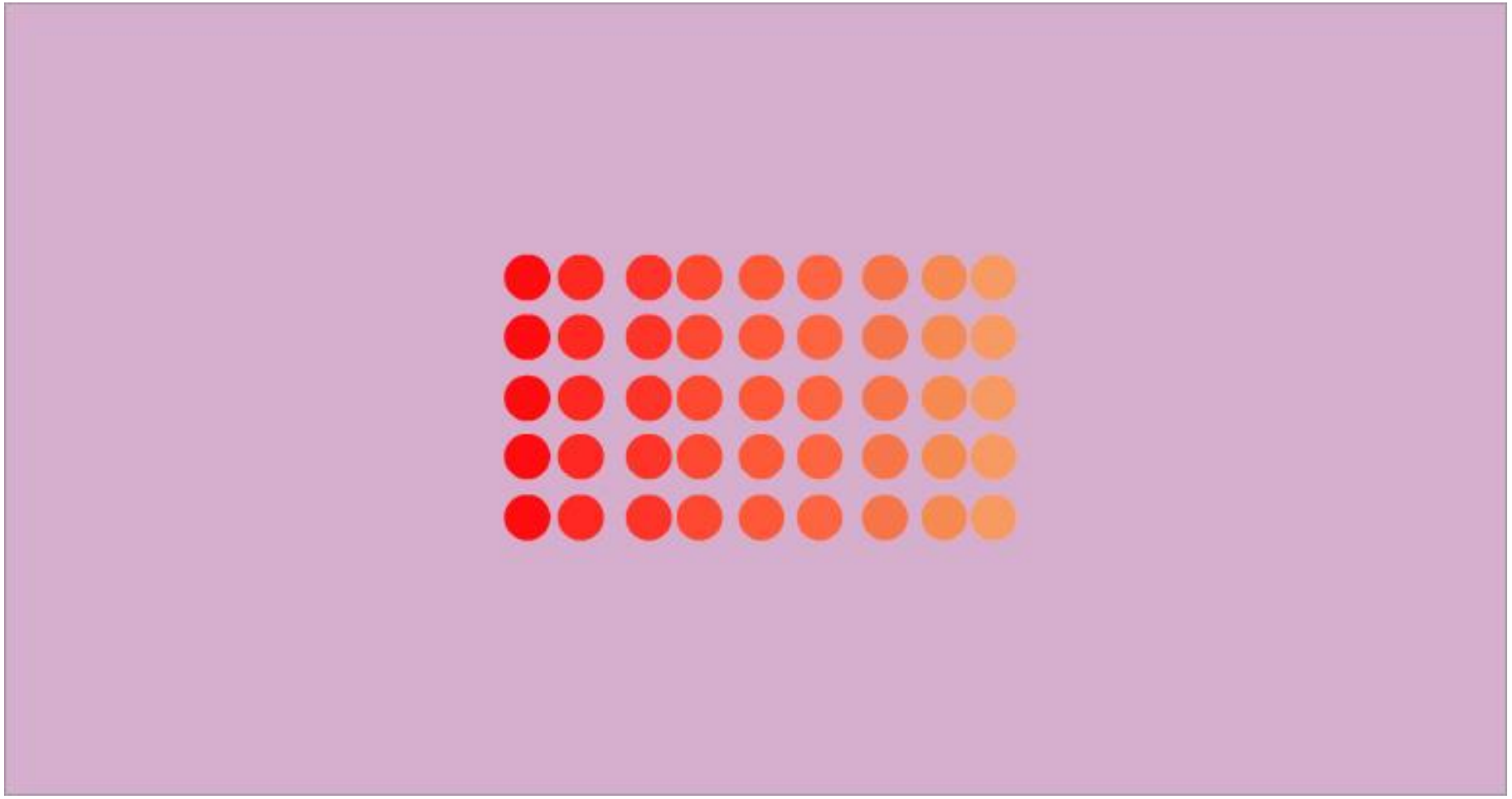


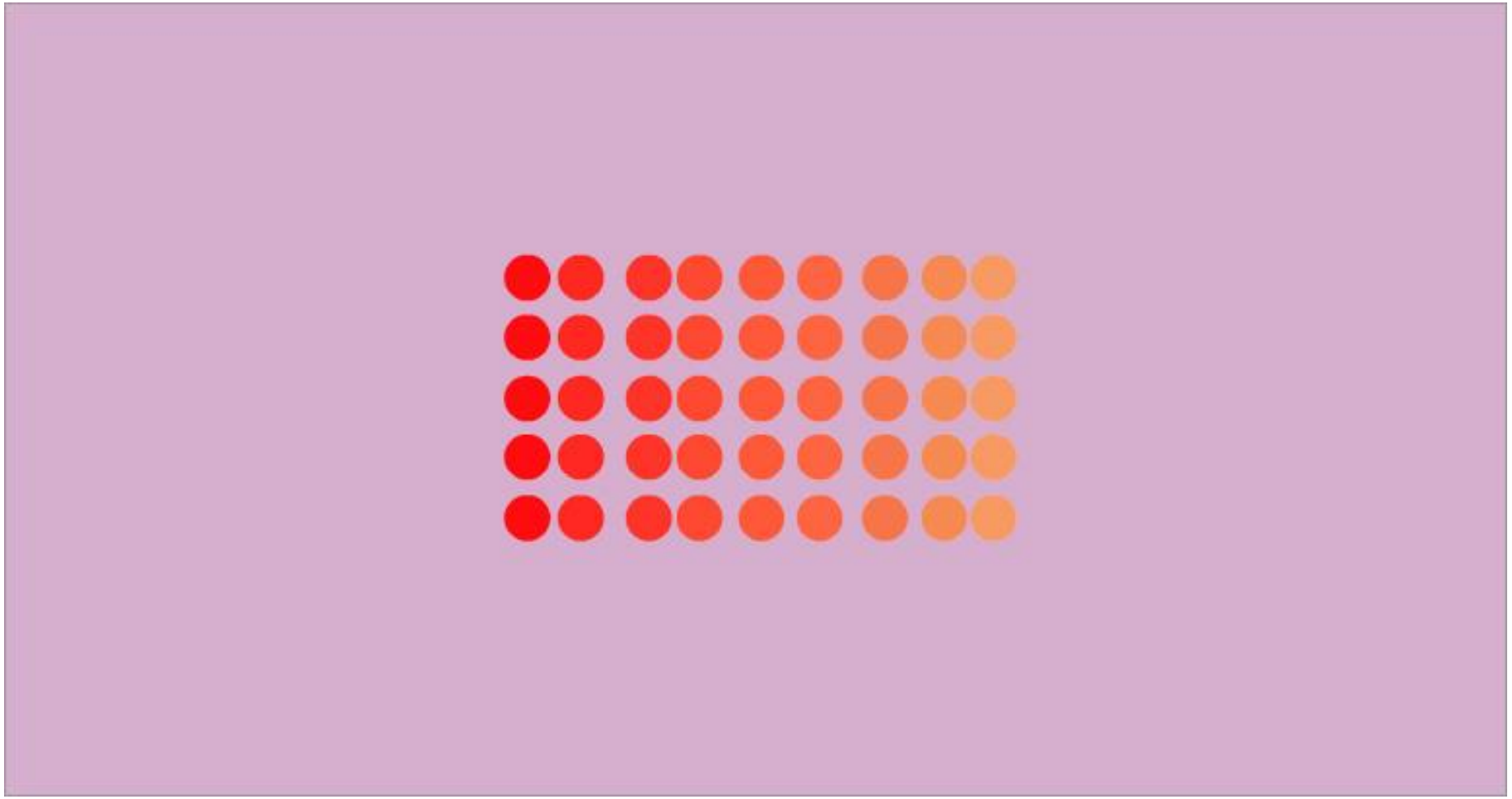
To understand conduction, we need to look at the particles inside the metal.



As the particles start to move more, they pass some of their energy to their neighbours.

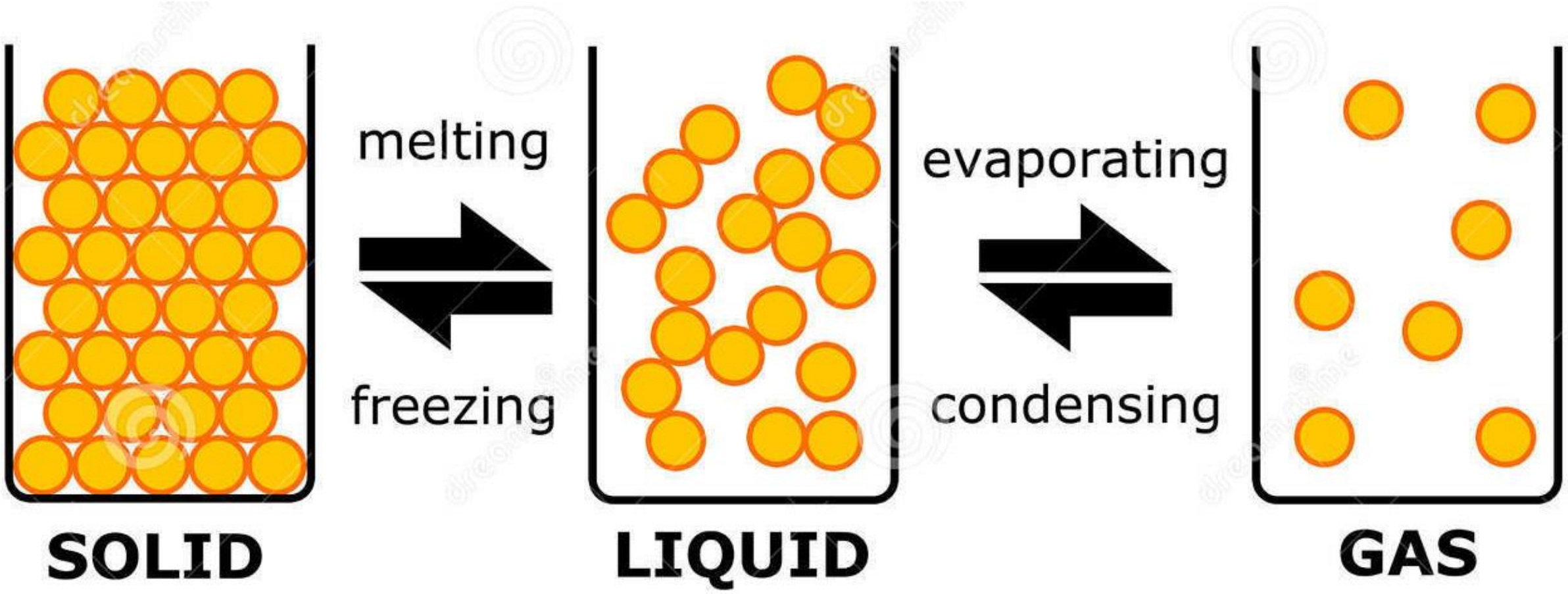


The spreading of the energy as it is shared between neighbouring particles...



... is the flow of heat energy through the metal.

Predict: Which conducts thermal energy better?



The good, the bad and the poor conductor

- Some materials are better conductors than others
- What materials make good conductors?

- Materials which are very poor conductors are called 'thermal insulators'
- What materials make good insulators?

Good conductors in the home

Stainless steel (mostly Iron) is a very good conductor of heat and is used to make cooking pots.

Can you think of any other items in your home that are good conductors?

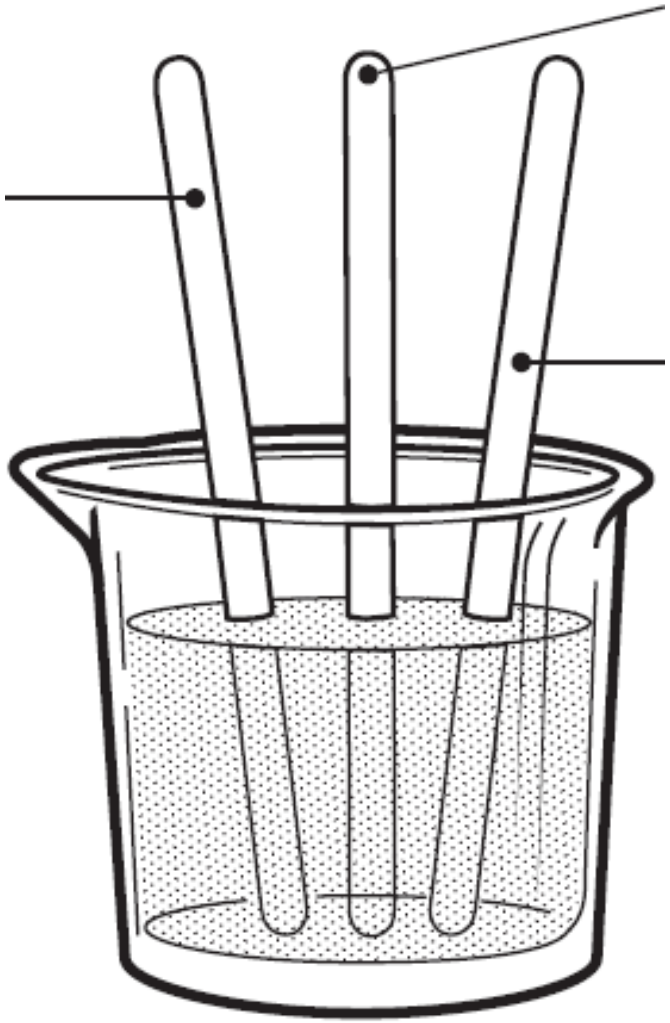
HEAT ENERGY INSULATORS

- Wood is a poor conductor of heat.

We tend to use wooden spoons in cooking since they won't pass the heat through them onto your hand.

- We call Wood a good INSULATOR.

What is the best insulator?

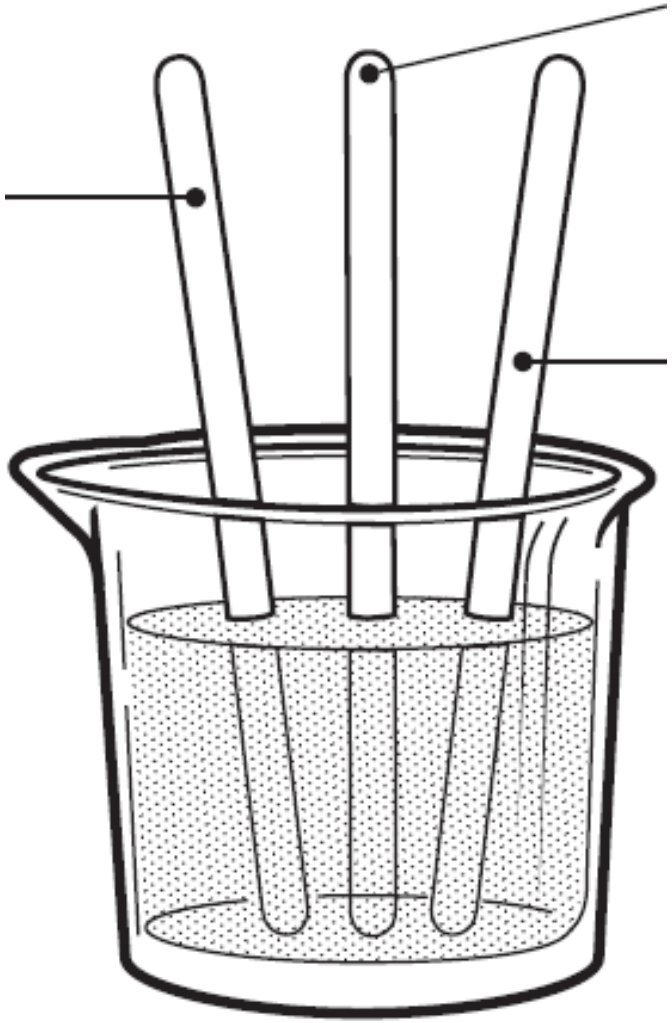


1. Place different rods (metal, plastic, glass and wood) into a beaker containing freshly boiled water.

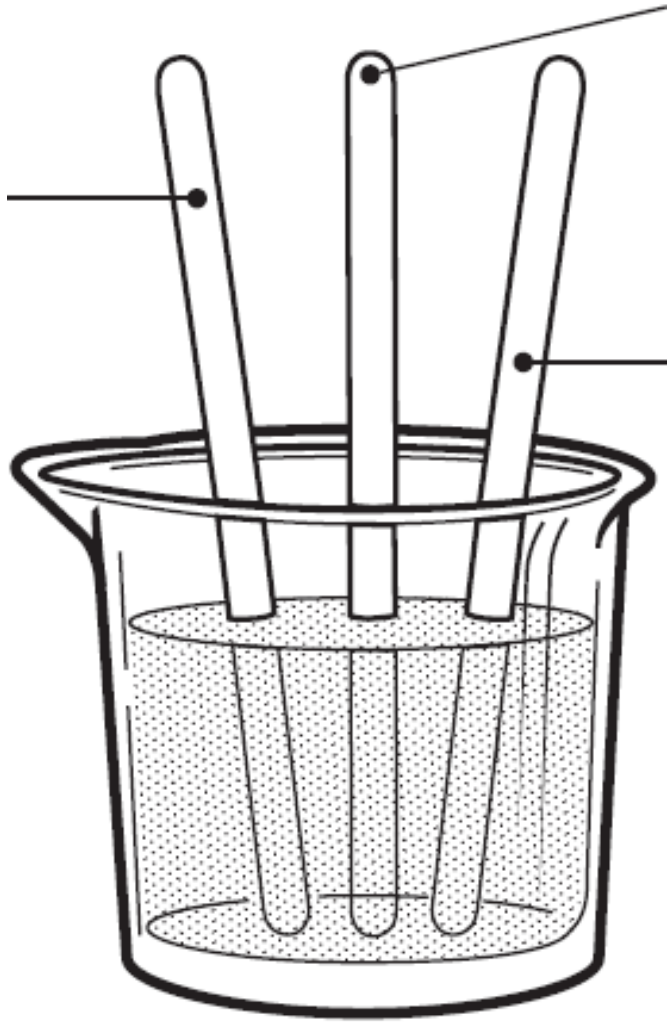
2. After 5 minutes GENTLY touch the end of each rod and find out which ones are hot or cold.

What is the best insulator?

TYPE OF METAL ROD	HOT OR COLD AFTER 5 MINUTES



What is the best insulator?



The heat from the bunsen burner has NOT travelled along some of the rods.

Can you explain what happened to the particles in the INSULATORS that didn't allow the heat to move through them?

Just Checking

1. What is temperature a measure of?

How hot or cold something is.

2. How can you make the temperature rise?

Add heat energy

3. What is the difference between "heat" and "temperature"?

Heat is the energy, temperature is how hot or cold something is.

Just Checking

Put these statements in order

1. the neighbouring particles also move. 3
2. Heat makes the particles vibrate. 1
3. Particles in a solid are tightly packed together, so 2
4. The heat can therefore travel along the solid. 5
5. This movement means they have a higher temperature. 4

Fill in with "well" or "badly"

- A conductor lets heat travel _____.
- An insulator lets heat travel _____.
- Air lets heat travel _____ by conduction.

well

badly

badly

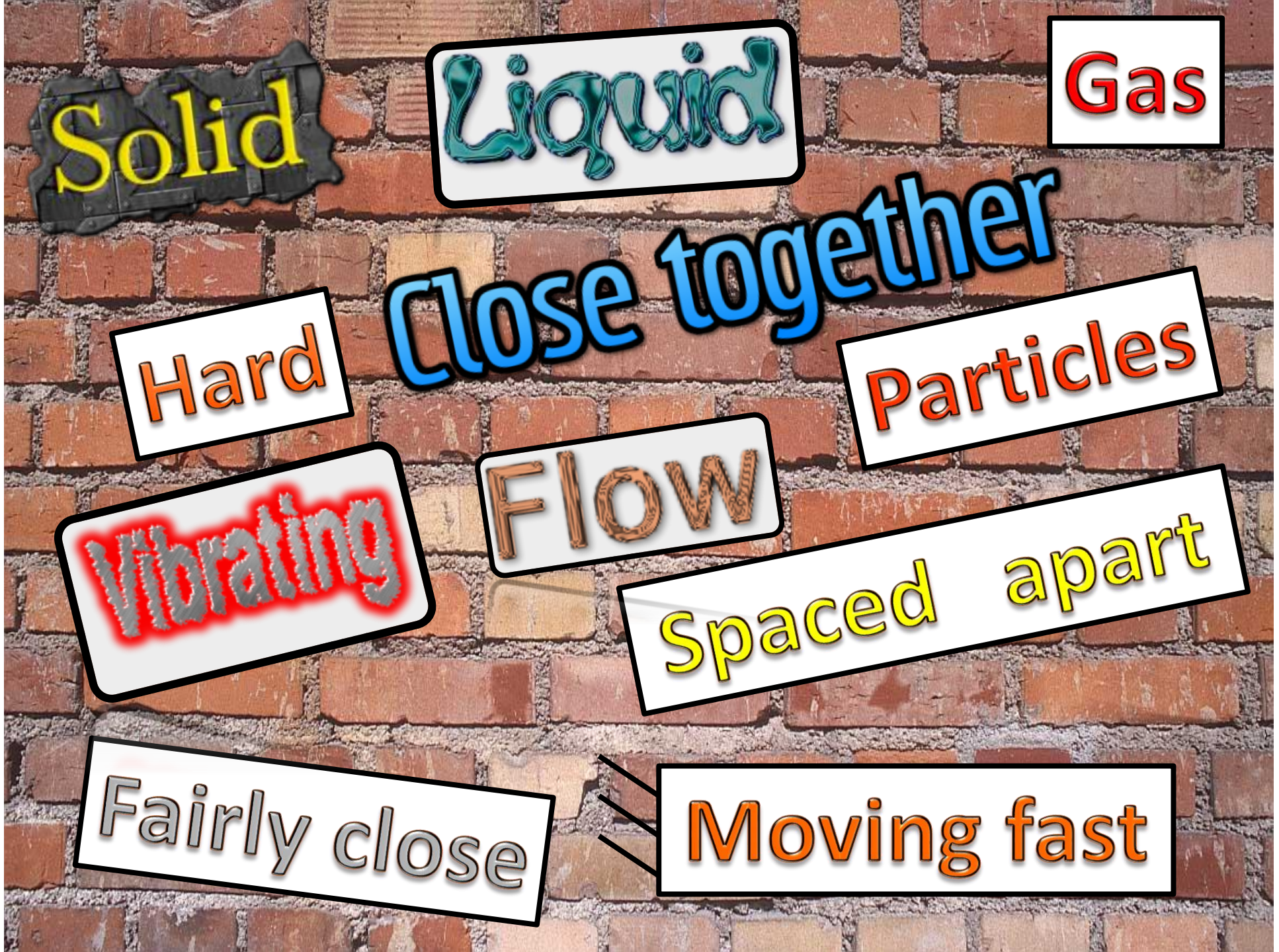
Answer the questions

- Examples of *conductors* in the home are:

Electric Iron, saucepan

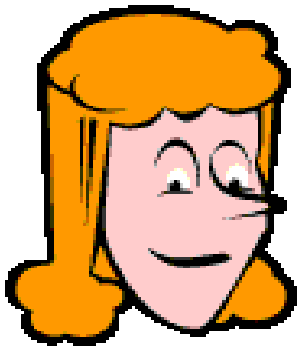
- Examples of *insulators* in the home are:

Pot handles, clothes


Solid
Liquid
Gas
Close together
Hard
Particles
Flow
Vibrating
Spaced apart
Fairly close
Moving fast

Conduction can happen in **liquids** and **gases** but it is **slower**.

Explain this **statement.**




Kahoot!

Starter

Listen to the **BBC KS3 interactive** video on **Temperature** and **Heating.** Then answer the **following questions……**

1. What is **temperature?**
2. How can we **measure it?**
3. What are the **units** that **temperature** is **measured** in?
4. What is **heat?**
5. What are the **units** that **heat** is **measured** in?

6. Which has more the **most energy? YOU MUST EXPLAIN YOUR ANSWER!**