

Lesson 5

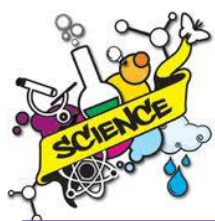
Resources	Context
<p>Beakers (square shaped tube one if have), source of heat, potassium permanganate crystal, glass tube, tweezers .</p> <p>Station 1: Thermometers or temperature probes</p> <p>Radiator or heater (not fan heater)</p> <p>Station 2: Two hot drinks, one with lid, one without.</p> <p>Station 3: Clamp and stand, Foil snake, night lights.</p> <p>One copy of Station Instruction to go next to each station.</p> <p>One per student of Assessment Sheet.</p>	<p>Demonstrations.</p> <p>Circus class visit.</p> <p>Used in class.</p>

Starter – Spelling Quiz

Quickly take your seat and spend these few minutes to review the keywords for a quick spelling quiz!



Lesson Focus: Develop curiosity about differences



Title: Convection

Homework:

Level	Learning Objectives	Key Words	SPAG
All	State the directions cold and hot air move.	Convection Density Current	<ul style="list-style-type: none">To use accurate terminology when explaining ideas.
Most	Describe heat transfer in terms of convection.		
Some	Explain convection through density.		



Main Activity – Modelling

Watch the demonstration of potassium permanganate in water and corner of the beaker being heated.

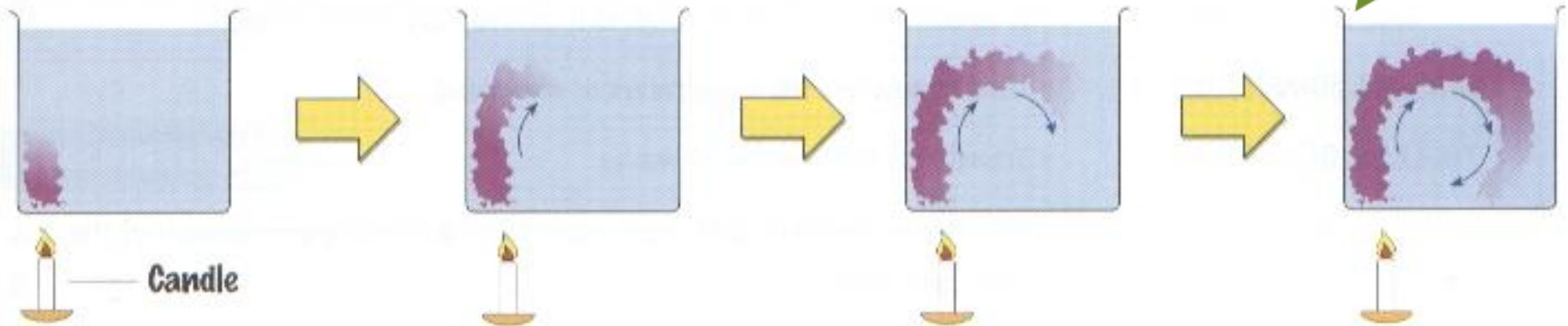
Think	Why do you think the potassium permanganate moved as it did.
Pair	Discuss your ideas and how you can tell with your partner.
Share	Share your ideas with the class.



Main Activity – Modelling

Convection is when a gas or liquid (“fluid”) transfers heat. When the fluid is heated it expands. This means that it will become less dense than the colder fluid around it. A warm fluid will always rise over a cold fluid. This is called a convection current.

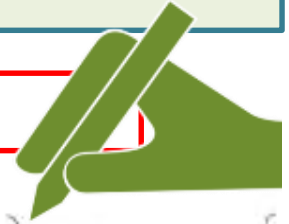
Words to use: expands, dense, current, rise



Main Activity – Modelling

Convection is when a gas or liquid (“fluid”) transfers heat. When the fluid is heated it expands. This means that it will become less dense than the colder fluid around it. A warm fluid will always rise over a cold fluid. This is called a convection current.

Words to use: expands, dense, current, rise



If something expands, its mass will stay the same but its volume will increase, this means it must be less dense.

Fluids will always naturally order themselves to have the most dense at the bottom and least dense at the top. This is why the warm air rises.



Main Activity – Modelling

Convection is when a gas or liquid (“fluid”) transfers heat. When the fluid is heated it expands. This means that it will become less dense than the colder fluid around it. A warm fluid will always rise over a cold fluid. This is called a convection current.

All

State the directions cold and hot air move.



Most

Describe heat transfer in terms of convection.



Some

Explain convection through density.



00:00:00



Main Activity - Task

Go to the three stations around the room and investigate what you find.

Station 1: Radiator.

Station 2: Comparing drink containers.

Station 3: Foil snakes.



Most:

Describe what your observations prove and show.



Some:

Explain, referring to density, the radiator and the foil snakes.

All:

Record the **observations** you make at each station.

Main Activity - Task

All:

The air directly above the radiator was warmest.

The can without the lid cooled down faster.

The foil snakes span round when above the night light.

Most:

The radiator and foil snake show that warm air rises upwards.

The can shows that the air can take the heat from the can.

Some:

The air directly above the heat source heats up. This means that it expands. Therefore, it becomes less dense. So it rises upwards as the air above it is more dense.



at each station.

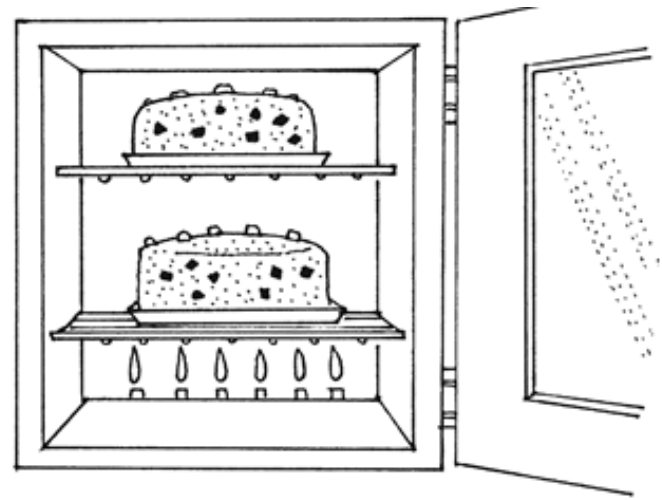
Place these Statements in order.

In Convection:

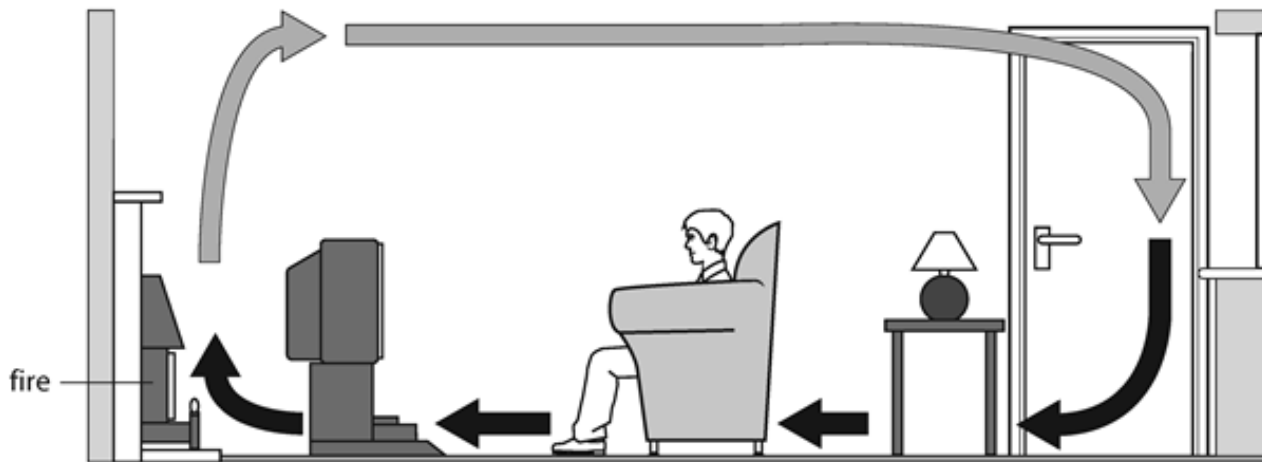
- 3 1. The less dense fluid rises.
- 1 2. When a substance is heated it expands.
- 2 3. The warm fluid is therefore less dense.
- 4 4. When it reaches the top it cools and contracts.
- 5 5. The more dense fluid sinks.
- 6 6. The cycle of rising and falling is the convection current.



All: Which cake will cook the fastest in this oven? Explain your answer.



Most: Convection can help heat energy from a fire to spread around a room.



Write the following letters on the diagram:

A where air is being heated

D where air is contracting and becoming more dense

B where air is cooling

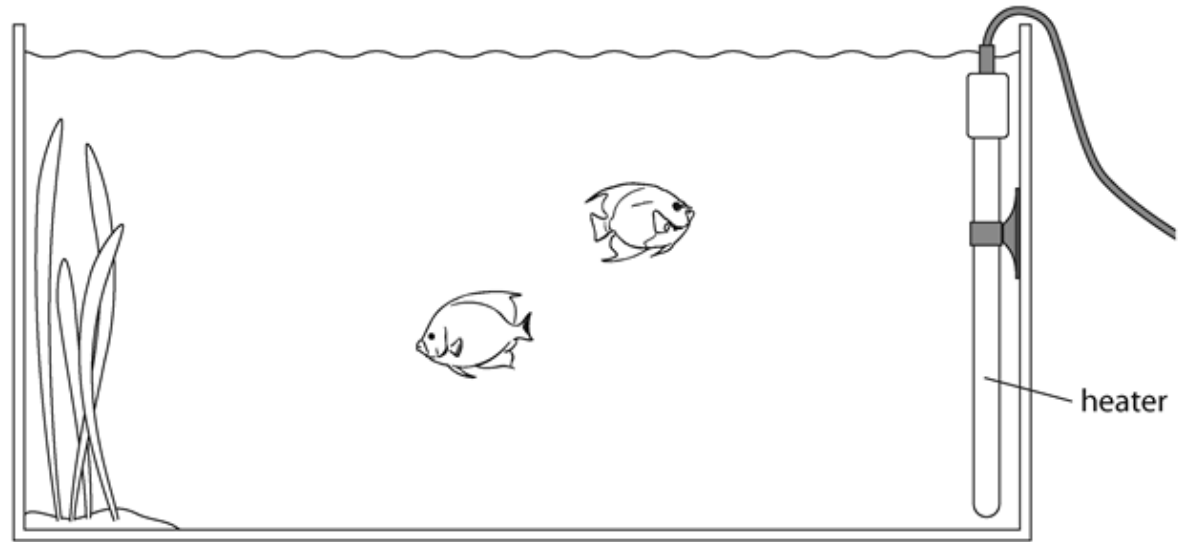
E where air is rising

C where air is expanding and becoming less dense

F where air is moving in to replace rising air

G where air particles are moving the fastest.

Some: Many people keep tropical fish as pets. The water in the tank must be kept at just the right temperature or the fish will die. The diagram shows a fish tank and heater.



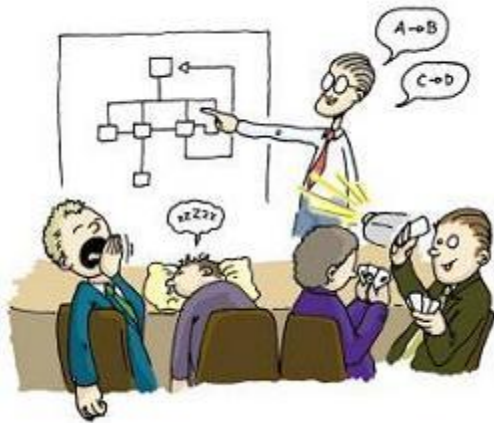
a Write an H on the diagram where the water is being heated.

b How and why will this heated water move? (3 key word are needed) _____

c Draw arrows on the diagram to show how the water will move around the tank.

d What is this movement of water called? _____

Student Role Play



Create with your group a role play to demonstrate the differences between conduction and convection, try to make it creative and humorous!!

