

Convection by Gareth Jones

Heat is transferred through liquids and gases by convection.

1. Convection Rectangle



When the bottom left corner of the convection rectangle is heated the potassium permanganate moves round to the right. It does this because the water that is heated near the bottom left corner moves up, to the top left which is less dense than the water above it, so moves up and takes the heat energy with it. This means that the water which has been heated and has risen needs to be replaced, so the water moves round in a convection current.

2. Mine



Here a fire would be lit at the bottom of the mine and the air around the fire heated. This heat then moves up the vent of the mine as the air expands as it is heated. The heated air which is lighter than the surrounding air moves up to the top of the mine, this then drags the cooler air to the left towards the fire to replace the air that has already been lost. The air from above moves down the left vent to help replace the air. This gives a continual flow of air around the mine.

3. Room



Here the air moves around the room, from the radiator up to the top of the room as the air expands it becomes lighter and moves up towards the ceiling. Due to the construction of the room the radiator pushes hot air up, this however means that there is too much air being pushed up, so it moves along the room to the right. The air is then further away from the radiator and so begins to cool. As it cools it falls toward the floor. The air is then sucked back to the left to replace the air which is heated and pushed up. This convection current pushes the air about the room.

4. Sea Breeze



The land heats quicker than the sea and so the air around it expands. The air then rises and moves away from the land as it is pushed by more hot air rising from the beach. As the air moves across the sea it falls down as the sea cools it. The air is then drawn back to the land to replace that which rises up from the land. At night the land cools more quickly but the sea retains the heat which it absorbed during the day. This means that the breeze reverses and moves to the land from the sea.

5. Greenhouse

A greenhouse stays warm because the glass it is made of allows the light which heats the greenhouse to enter, but the heated air cannot escape, and the heat cannot conduct through the glass because glass is a poor conductor of heat.