Knowledge Organiser
8B Classification and Adaptation

KPI 1: Describe the factors effecting the abundance and distribution of organisms

Adaptation

- An animal must be able to find food, breed and navigate its way around its habitat if it is to survive.
- Every animal has evolved gradually over millions of years to become well suited, or adapted, to its habitat.
- These adaptations are specific to the environment of the animal and are essential for survival.
- Here are some examples:

Snow Leopard

- Big paws to evenly spread weight and help with walking through snow
- Thick fur for insulation

Siamang Gibbon

- Long arms and fingers for swinging through trees and gripping branches
- Forward facing eyes for judging distances

Bactrian Camel

- Fat stored in humps to convert to water
- Wide feet to even spread weight and prevent sinking into the sand

Humboldt Penguin

- Streamlined bodies to help with swimming
- Serrated beaks to help with catching and swallowing slippery fish

Key Terms	Definitions
Adaptation	Something which helps an organism to survive in their environment, e.g, humps for storing water
Habitat	The environment that an organism lives in
Competition	When animals or plants compete for limited resources
Intraspecific competition	Competition between individuals of the same species
Interspecific competition	Competition between individuals of different species

Competition

- Animals and plants have to compete for the limited resources available to them
- The animals that are best adapted will win and survive
- There are two types of competition
  - Interspecific – between individuals of different species
  - Intraspecific – between individuals of the same species

Competition in animals

- Animals compete for:

Food

Water

Space

Mates

Knowledge Organiser
8B Classification and Adaptation

KPI 1: Describe the factors effecting the abundance and distribution of organisms

Competition in plants

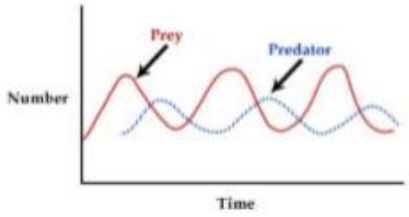
- Plants compete for:

Nutrients Water

Space Sunlight

Predator-prey relationships

- Numbers of predators and prey are interdependent on each other
- If the numbers of prey drop then the numbers of predators will also drop after a while



Key Terms	Definitions
Interdependent species	If the number of one species changes it will affect the numbers of the other species
Variation	Differences between living organisms of the same species
Continuous variation	Differences that can take any value, e.g. height
Discontinuous variation	Differences that can only take set values, e.g. blood groups
Inherited variation	Variation in an individual that is caused by genetics
Environmental variation	Variation in an individual that is caused by the environment

KPI 2: Explain how characteristics can be inherited by individuals

Causes of variation

- The differences between living things of the same species is known as variation.
- Variation can be caused by differences in genes (inherited variation) e.g. eye colour, or differences in the environment e.g. language.
- Some variation is caused by a mixture of both genes and environment (e.g. weight and height).

Types of variation

- Continuous variation is variation that can take any value (e.g. height or weight)
- Continuous variation should always be shown on a line graph
- Discontinuous variation is variation that can only take set values (e.g. shoe size or blood group)
- Discontinuous variation should always be shown on a bar chart

Exmouth Community College
Academy Trust

Knowledge Organiser: 8I Heat Transfers

Section 1: Key Words

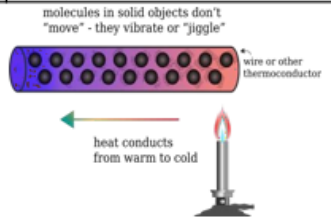
Thermal conductor	A material that will let heat flow through it
Thermal insulator	A material that will not let met flow through it
Conduction	The movement of heat (or electricity) through a substance. Heat is conducted due to particles vibrating and hitting each other
Convection	The transfer of heat through a liquid or gas (fluid) Convection occurs when particles with a lot of heat energy in a liquid or gas move and take the place of particles with less heat energy
Radiation	Heat can be transferred by infrared radiation, this is an electromagnetic wave and doesn't use particles
Temperature	Temperature is a measure of how hot something is
Heat	Heat is a measure of the thermal energy contained in an object
Thermal energy	Energy that is due to particles moving and results in an object having a temperature. It is transferred as heat

Section 2: Transferring Thermal Energy

	Temperature change	Direction of energy flow
Object hotter than surroundings	Temperature of object decrease until it is the same as the surroundings	Energy flows out of the object to the surroundings
Object colder than surroundings	Temperature of object increases until it is the same as the surroundings	Energy flows into the object to the surroundings
Object the same temperature of the surrounds	The object's temperature stays the same	The is no net flow of energy

Section 3: Conduction

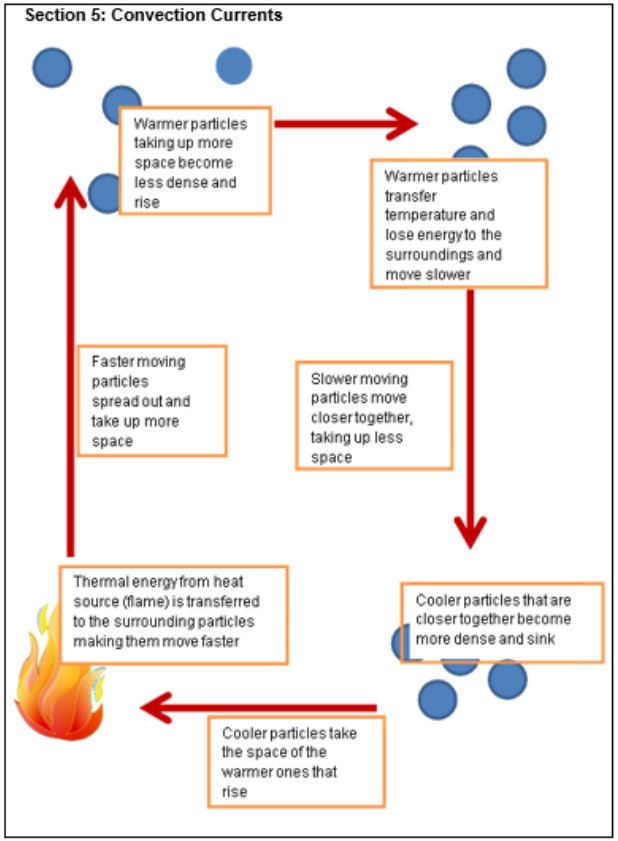
State of matter	Solids
Description	Heat moves from the hotter part of the object to the colder part
Explanation	Particles in the metal are packed closely together. As they are heated the particles gain kinetic energy and vibrate more. The particles that are vibrating collide with other particles and start to make them vibrate. This passes the kinetic energy from the heated particles to the cooler particles causing them to heat up too.



Section 4: Convection

State of matter	Liquids and Gases
Description	Particles with lots of heat energy in a liquid or gas move and take the place of particles with a lot of energy. Heat energy is transferred from hot places to cooler places by convection
Explanation	Liquids and gases expand when they are heated. This happens because the particles in the liquid or gas moves faster when they are heated. This causes the particles to take up more space as the gaps between particles gets bigger. The liquid or gas in hot areas is less dense than the liquid or gas in the cold areas, so it rises into the cold areas. The denser cold liquid or gas falls into the warm areas. In this way, convection currents form that transfer heat from one place to another

Section 5: Convection Currents



Section 6: Radiation

State of matter	n/a
Description	A type of electromagnetic radiation called infrared radiation.
Explanation	Infrared radiation involves waves instead of particles. As such it can travel through a vacuum e.g. space. The hotter an object is, the more infrared radiation it emits.

Section 7: Reflection and absorption of heat by radiation

colour	finish	ability to emit thermal radiation	ability to absorb thermal radiation
dark	dull or matt	good	good
light	shiny	poor	poor

Light, shiny surfaces are also good reflectors of infrared radiation

Section 8: Comparing conduction, convection and radiation

	Conduction	Convection	Radiation
Particles	Y	Y	N
Solids	Y	N	Y
Liquids	N	Y	Y
Gases	N	Y	Y
Particles move far part	N	Y	n/a
Particles vibrate on the spot	Y	N	n/a
Particles rise and fall to transfer energy	N	Y	n/a
Particles hit each other to transfer energy	Y	N	n/a

Section 9: Types of thermal insulation

Appliance/feature	Description
Boiler	This has a large surface area to allow for large amounts of heat energy to be transferred to its surrounding through convection
Radiator	This is specially designed to have a heating element at the bottom. Convection currents heat all the water in it
Double Glazing	Windows and doors with 2 planes of glass with air trapped between them (or a vacuum between them). Air is a poor conductor and there is no convection because the air is trapped and cannot for convection currents
Loft Insulation	A thick layer of the loft floor. It works because it's a poor conduction and traps air, stopping convection
Floor Insulation	An insulation layer under the floor. Prevents heat loss because it is a poor conductor
Draught excluders	Brushes and seals on doors. Prevents warm air escaping from the home
Cavity wall insulation	Insulation place in the cavity of the walls. It works because it traps air which is a poor conductor. However, energy could still be lost due to convection so a insulating material is injected into the gap to create pockets of air and prevent convection currents forming

Year 8– Science / Heat Transfers– HT1