

Physics - Key Stage 3 - Energy

# Lesson 9: Mid Topic Review

Mrs Evans



# Independent practice: answer the questions

1. When the catapult is pushed down...
  - a. Which energy store of the person has decreased?
  - b. Which energy store of the catapult has increased?
  - c. Which pathway was used?
  
2. When the catapult is released and the ball flies...
  - a. Which energy store of the catapult has decreased?
  - b. Which energy stores of the ball has increased?
  - c. Which of these stores are wasted?



# Support

## - choose the correct answer

1. When the catapult is pushed down...
  - a. Which energy store of the person has decreased? **Nuclear or Chemical**
  - b. Which energy store of the catapult has increased? **Elastic potential or Electrostatic**
  - c. Which pathway was used? **Mechanical or Radiation**
  
2. When the catapult is released and the ball flies...
  - a. Which energy store of the catapult has decreased? **Chemical or Elastic potential**
  - b. Which energy stores of the ball has increased?  
**Kinetic or Chemical or Gravitational Potential or Thermal or Magnetic**
  - c. Which of these stores are wasted?  
**Kinetic or Chemical or Gravitational Potential or Thermal or Magnetic**



# Independent practice: fill your comparison table

Conduction	Convection	Radiation



# Support

## - use these to fill your table

Mainly occurs in solids

Requires particles

Hot fluids rise

Requires particles

Involves changes in density

Creates currents

Example: hot air balloon

Involves waves

Does not require particles

Particles vibrate more and collide with the particles next to them

Example: hot rod

Black surfaces are the best absorbers and emitters

Can occur in a vacuum

Example: sun heating the Earth

Occurs in fluids (liquids and gases)



# Independent practice: change the incorrect word to make the statement correct

1. Black objects get hotter because they attract radiation
2. Insulators stop energy transfers
3. The 8 energy types are kinetic, chemical, thermal, nuclear, electrostatic, magnetic, gravitational potential, elastic potential
4. The 4 energy pathways are radiators, electricity, mechanical and heating
5. The law of conversation of energy says total energy before transfer is equal to total energy after transfer



# Support

- **the bold words are incorrect and need to be changed**

1. Black objects get hotter because they **attract** radiation
2. Insulators **stop** energy transfers
3. The 8 energy **types** are kinetic, chemical, thermal, nuclear, electrostatic, magnetic, gravitational potential, elastic potential
4. The 4 energy pathways are radiation, **electricity**, mechanical and heating
5. The law of **conversation** of energy says total energy before transfer is equal to total energy after transfer



# Independent practice: identify the different variables

**Investigation: which beaker wrap is the best insulator?**

**Independent** variable - the one you change

**Dependent** variable - the one you observe

**Control** variable - the one you keep the same





# Support

## - use the method to help identify the variables

1. Cover each beaker with a 1 cm thick beaker wrap  
(1. Cotton wool, 2. Paper, 3. polystyrene)
2. Boil the kettle, so the water is at 100°C
3. Pour 200ml of water into each beaker
4. Start the timer, for 10 minutes
5. Record the temperature of each beaker



# Analysing our results: calculating a mean

Beaker wrap type	Temperature of water after 10 minutes (°C )			
	Attempt 1	Attempt 2	Attempt 3	Average (mean)
<b>Cotton wool</b>	56	52	51	
<b>Paper</b>	25	27	26	
<b>Polystyrene</b>	64	61	58	

To find a mean: add up all your values and divide by the number of values you added



# Independent practice: write a conclusion

The beaker wrap that provides the best insulation is...

I know this because...

Beaker wrap type	Average (mean) temperature of water after 10 minutes (°C )
<b>Cotton wool</b>	53
<b>Paper</b>	26
<b>Polystyrene</b>	61



# Support

## - use this scaffold to help structure your conclusion

The beaker wrap that provides the best insulation is \_\_\_\_\_?\_\_\_\_\_.

I know this because it had the \_\_\_\_\_?\_\_\_\_\_ temperature decrease after 10 minutes, which means the it \_\_\_\_\_?\_\_\_\_\_ the energy transfers from the water to the surroundings the most.

The water in the beaker with this beaker wrap had a temperature of \_\_\_\_?\_\_\_ after 10 minutes, which means the temperature dropped \_\_\_\_?\_\_\_ from the 100°C starting temperature. Whereas the water in the beaker with the \_\_\_\_\_?\_\_\_\_\_ beaker wrap had a temperature of \_\_\_\_\_?\_\_\_\_\_ after 10 minutes, which means the temperature dropped \_\_\_\_?\_\_\_ and the beaker with the \_\_\_\_\_?\_\_\_\_\_ beaker wrap had a temperature of \_\_\_\_\_?\_\_\_\_\_ after 10 minutes, which means the temperature dropped \_\_\_\_?\_\_\_ from the 100°C starting temperature.

