

Date:

ENERGY TRANSFERS

Heat vs Temperature

LO: To understand the difference between heat and temperature

Recall the units for temperature and energy
Describe what temperature and heat are
Explain why things maybe hotter but contain less heat energy

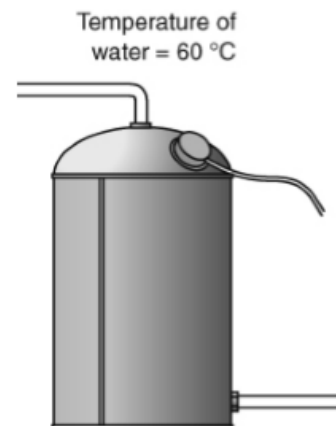
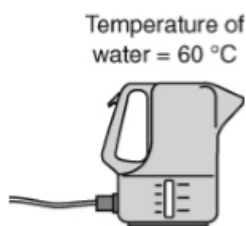
Keyword: **The amount of thermal energy an object has**

Match the words to their meanings.

joules (J)	how hot or cold something is
degrees Celsius ($^{\circ}\text{C}$)	the units for measuring energy
temperature	another name for thermal energy
internal energy	the units for measuring temperature

- a What units are used to measure energy? _____
- b What units are used for temperature? _____
- c What instrument do we use for measuring temperature? _____

The drawings show a kettle and a hot water tank.

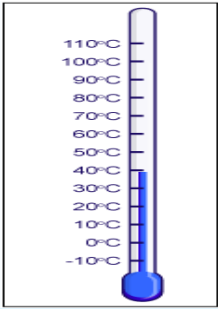


- a Which one contains the greatest mass of water when it is full?

- b Which will heat up the quickest?

- c Which is storing the most energy?

Heat vs Temperature



Heat and temperature are not the same!

Temperature is a measure of how _____ or _____ something is. It is measured in degrees _____ (°C). For example: the temperature of _____ water is 100°C and the temperature that water _____ at is 0°C.

Heat is the amount of _____ energy something has. It is measured in _____ (J). The amount of thermal energy depends on the _____ energy of its particles. The faster the _____ move the more thermal energy it has.

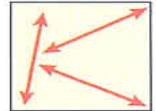


Heat vs Temperature of a sparkler

- The tiny sparks are at a very high t _____
- Each particle in the spark is v _____ a lot because it is very

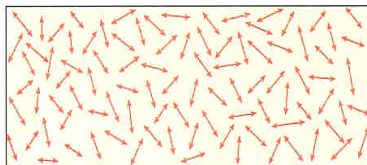
hot

• But as there are not many p _____, the total amount of heat energy is s _____



Heat vs temperature of a warm bath

• The water is at a l _____ temperature than the sparkler but it contains more e _____. This is because it contains more p _____. Each particle is vibrating l _____ as it is at a lower temperature BUT because there are so m _____ - there is more t _____ energy.



WORD BANK:

Celsius

lower

thermal

joules

many

particles

kinetic

less

cold

smaller

energy

vibrating

temperature

hot

freezes

boiling

Extension

Look at the diagrams below and tick (✓) the *one* of each pair that has the most thermal energy stored in it. Explain your answers.

a

large bowl of porridge at 30 °C



small bowl of porridge at 30 °C



b

small pan of soup at 80 °C



the same size pan of soup at 50 °C



Look at these two bowls of food.

300 g soup 80 °C



air temperature 20 °C

300 g ice cream 2 °C



a Will energy flow into the soup or out of it? _____

Explain your answer. _____

b Will energy flow into the ice cream or out of it? _____

Explain your answer. _____
