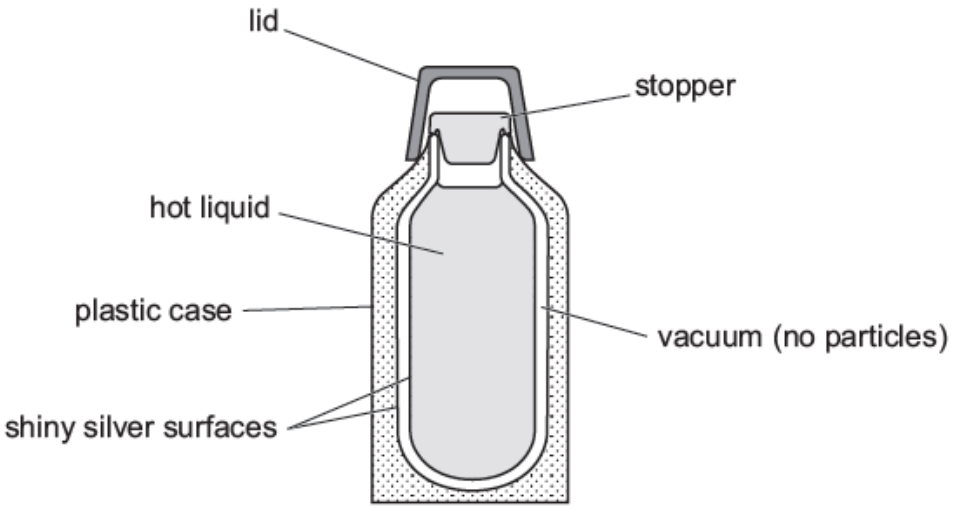
Energy transfer – Checkpoint Sec 1 Physics

1. No.3

Look at the diagram of a vacuum flask.

Gabriella puts a hot liquid into the vacuum flask.

The flask keeps the hot liquid warm.



(a) Which material is most suitable to make the stopper?

Circle the correct answer.

copper **gold** **iron** **plastic**

[1]

(b) **(i)** Suggest how the shiny silver surfaces help to keep the liquid warm.

..... [1]

(ii) The vacuum does **not** contain any particles.

Explain why the vacuum reduces the transfer of thermal energy.

.....

.....

..... [2]

(c) Gabriella removes the lid and the stopper from the vacuum flask.

Some of the hot liquid evaporates.

What happens to the temperature of the liquid that remains in the vacuum flask?

Explain why.

Use ideas about particles.

.....

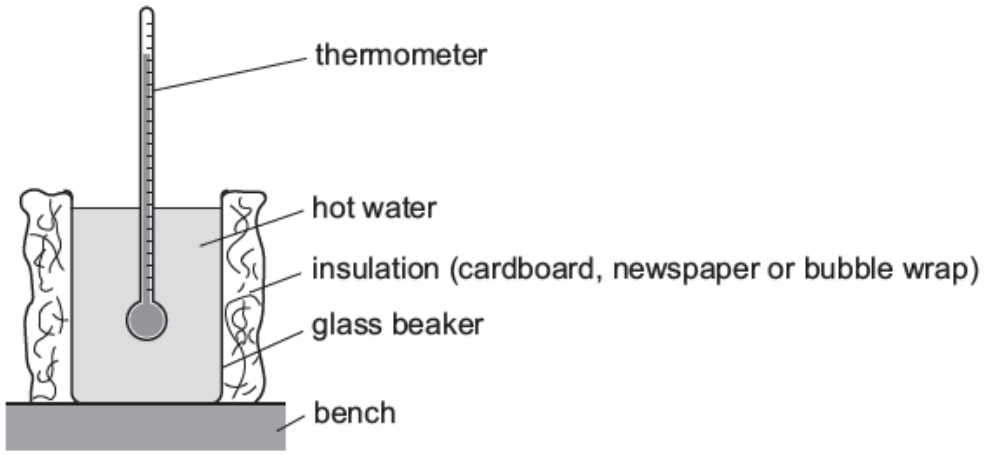
.....

..... [3]

2. No.11

Lily investigates which type of insulation is best at reducing the transfer of thermal energy from hot water.

Look at the diagram of Lily's experiment.



Look at her results.

cardboard		**newspaper**		**bubble wrap**	
time in seconds	temperature	time in seconds	temperature	time in seconds	temperature
0	83	0	85	0	85
60	67	60	81	60	81
120	75	120	79	120	79
180	71	180	76	180	77
240	68	240	72	240	75
300	65	300	68	300	73

(a) The unit of temperature is missing from the tables.

Write down the unit of temperature.

..... [1]

(b) Calculate the decrease in temperature in the 300 seconds for each beaker.

cardboard .....

newspaper .....

bubble wrap .....

[1]

(c) Before the investigation, Lily predicts,

'Bubble wrap is the best insulator.'

Is her prediction correct? .....

Explain your answer.

.....

[1]

(d) In one of Lily's results tables, there is an anomalous result.

Circle the anomalous result in the table.

Give a reason for your answer.

.....

..... [2]

(e) Lily improves her investigation.

Suggest **two** improvements Lily makes to her investigation.

1 .....

.....

2 .....

.....

[2]

3. No.3

Heat and temperature are different.

(a) Tick (✓) **all** the correct statements that describe heat.

a measure of how cold something is	☐
a measure of how hot something is	☐
a measure of the thermal energy of a substance	☐
measured in MJ	☐
transferred by conduction	☐

[2]

(b) Measurements of temperature in °C can be positive, negative or zero.

Describe how the temperature measurements of water can be positive, negative or zero.

Use ideas about the three states of matter in your answer.

.....

.....

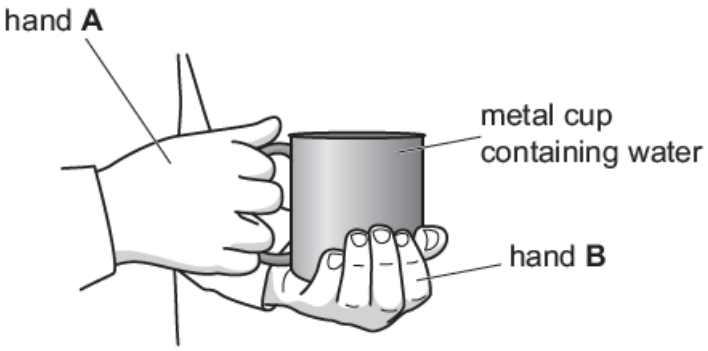
.....

.....

..... [2]

4. No.3

Mike holds a metal cup containing water.



(a) The water in the metal cup is at a higher temperature than both of his hands.

Describe what happens to the thermal energy in the water.

.....

..... [1]

(b) Mike pours the water out of the metal cup.

He adds ice and water to the metal cup.

Describe what Mike feels with hand **B** compared to hand **A**.

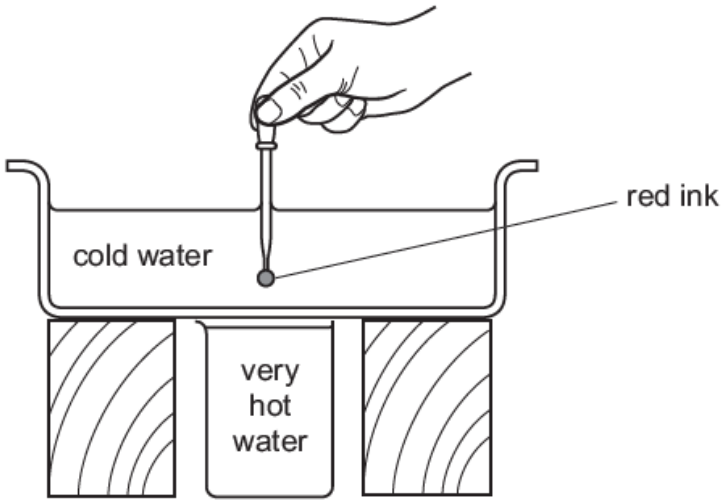
.....

..... [1]

5. No.13

Yuri investigates convection.

He adds a drop of red ink to the cold water as shown in the diagram.



(a) Complete the sentence to suggest a testable hypothesis for **this** investigation.

I predict that the red ink will move .....

because ..... .

[1]

(b) Complete the table about **safety risks** and the **control of risks** in this investigation.

safety risk	control of risk
very hot water may burn skin	....
red ink may irritate skin	....
....	use plastic beaker instead of glass beaker

[3]