Energy transfer – Checkpoint Sec 1 Physics

1. No.13

Priya finds some information about the energy transferred by four machines.

machine	energy put into machine in J	useful energy out of the machine in J	other energy out of the machine in J
A	100	64	36
B	240	60	180
C	24	12	12
D	782	382	400

Priya says,

'Energy is always conserved.'

Tick (✓) to show if Priya is correct.

Yes ☐ No ☐

Explain your answer.

Use the numbers in the table.

.....

.....

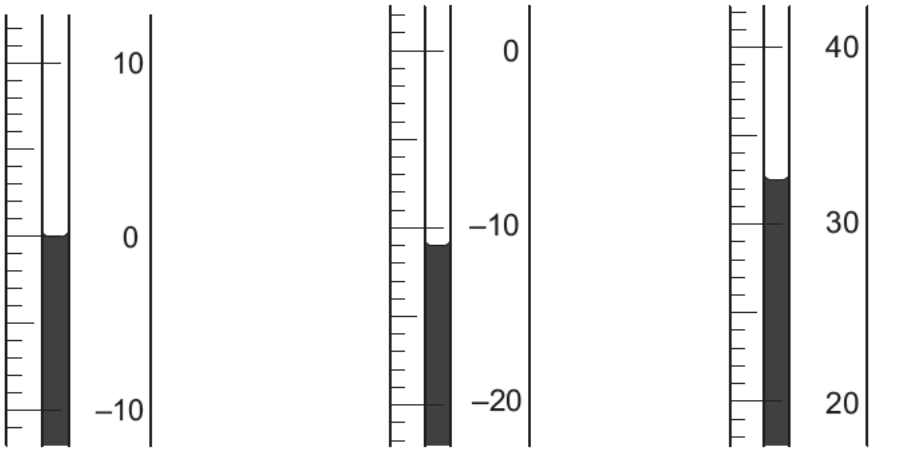
.....

[2]

2. No.16

Angelique measures the temperature of three samples of water.

The diagrams show her results.



thermometer **A** thermometer **B** thermometer **C**

Record the temperature of each thermometer in the table.

thermometer	temperature in °C
A	.....
B	.....
C	.....

[2]

3. No.3

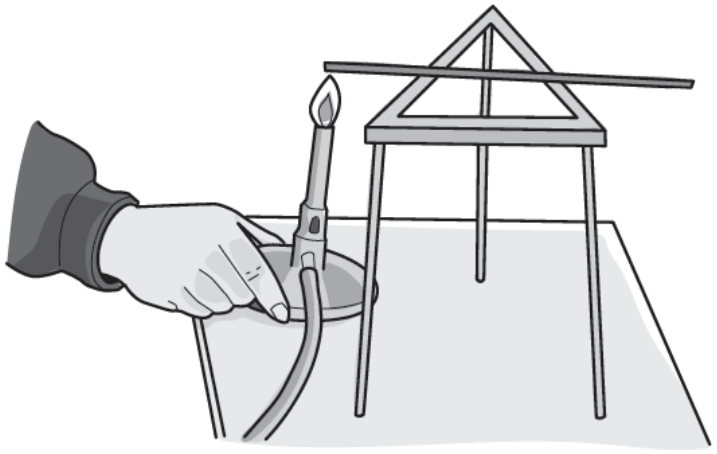
This question is about energy transfer processes.

(a) Draw a line from each **method of energy transfer** to its **example**.

method of energy transfer	example
	The way the air above a heater becomes warm.
radiation	
	The way energy from the Sun reaches the Earth.
convection	
	The way the metal handle of a cooking pot gets hot.

[1]

(b) The diagram shows a copper rod being heated.



Explain how heat is transferred through the copper rod.

Use ideas about particles in your answer.

.....

.....

.....

..... [3]

4. No.3

Complete the sentences about thermal (heat) energy transfer.

Choose words from the list.

conduction **convection** **radiation**

Thermal (heat) energy can be transferred from one place to another place.

When particles are involved, the processes are ..... and ..... .

When electromagnetic waves are involved, the process is ..... .

[2]

5. No.9

Lily investigates the boiling points of some liquids.

(a) She uses a Bunsen burner to heat 20 cm^3 of each liquid in a beaker.

Which equipment should Lily use to measure the boiling point of the liquid?

..... [1]

(b) Write down **one** safety precaution that Lily should take.

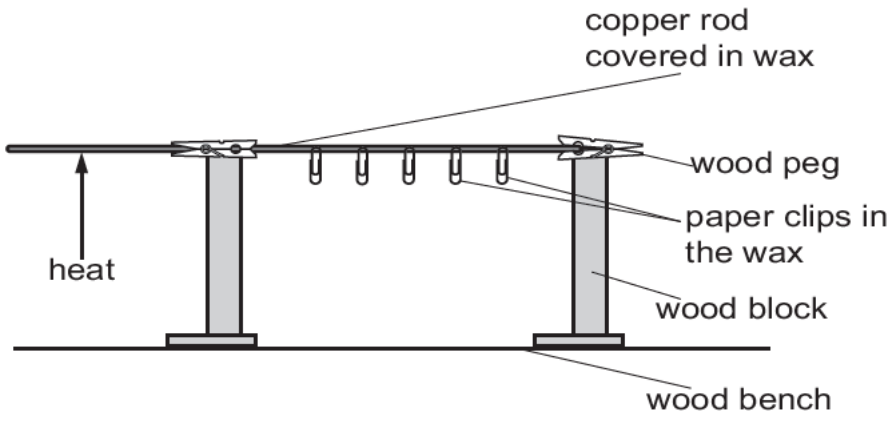
..... [1]

6. No.16

Aiko and Oliver investigate thermal (heat) energy.

They heat a copper rod covered in wax.

Here is the apparatus they use.



When the copper rod is hot, the wax melts and the paper clips fall onto the bench.

(a) Aiko removes the copper rod. Oliver tells her to be careful.

Complete the sentences.

Aiko must be careful because .....

When she removes the copper rod, she uses .....

[1]

(b) Here are the results.

distance of paper clip from heat in cm	time for paper clip to fall in seconds
6	3.2
7	4.3
8	5.4
9	6.6
10	7.9

Aiko says it is a good idea to repeat the experiment.

Explain why this is a good idea.

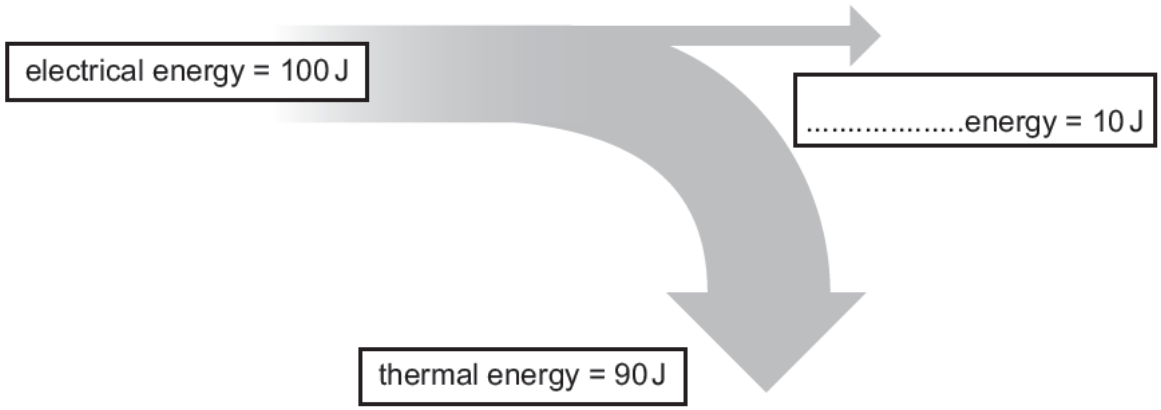
.....

..... [1]

7. No.13

Diagrams are used to show how energy is transferred.

Lamps transfer energy.



Complete the diagram to show the type of energy that is 10 J. [1]

8. No.6

A class of 20 students measure their body temperatures.

The thermometer shows the body temperature of student number 20.

(a) The table shows the results for 19 of the students.

The result for student 20 is missing.

What is the body temperature of this student?

Write your answer in the table.

student	1	2	3	4	5	6	7	8	9	10
temperature in °C	36.9	37.1	37.0	37.1	36.9	37.0	37.1	37.0	37.2	37.1

student	11	12	13	14	15	16	17	18	19	20
temperature in °C	37.0	36.9	37.0	37.2	36.9	37.0	37.1	37.3	37.0	.....

[1]

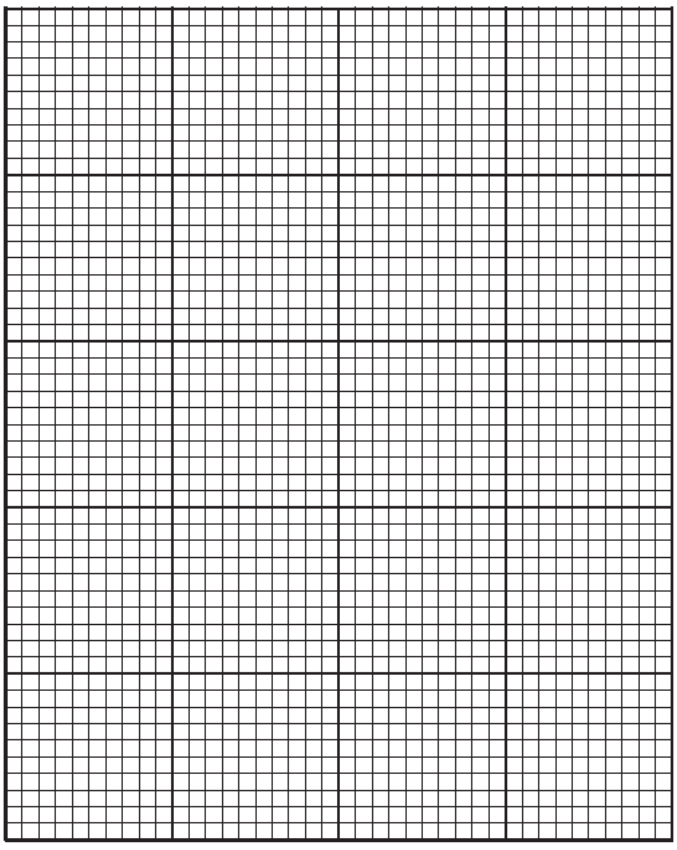
(b) Complete the tally box for all 20 students by counting the number of students at each temperature.

Some of the rows have been done for you.

temperature in °C	tally	number of students at this temperature
36.6		
36.7		
36.8		
36.9		
37.0	𝍸 II	7
37.1	𝍸	5
37.2	II	2
37.3	I	1

[2]

(c) Use the grid to present the results from the completed tally box in part **(b)**.

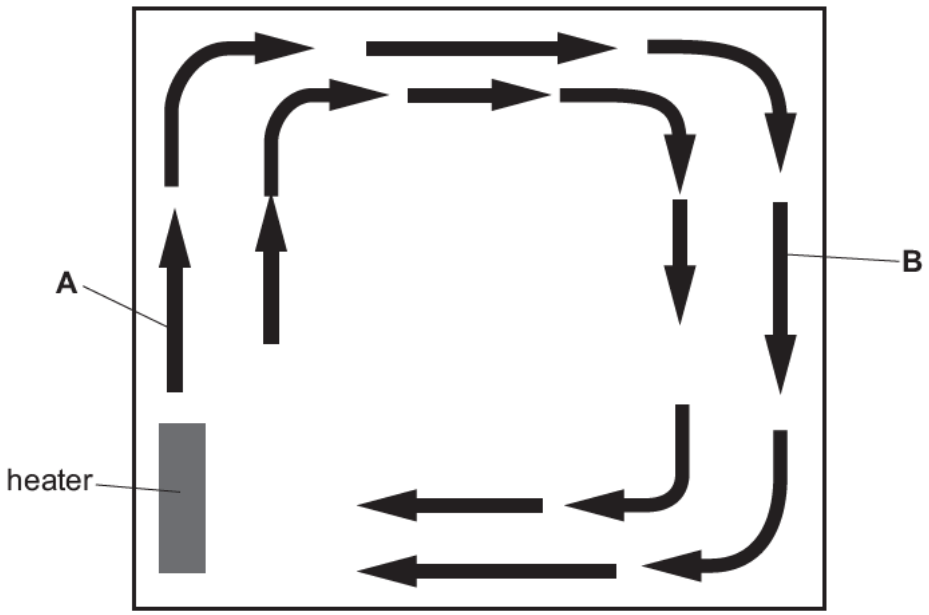


[3]

9. No.11

The diagram shows how a room can be heated.

The arrows show the direction of air movement.



Use the diagram to complete the sentences.

At **A** warm air rises because it is ..... .

At **B** cool air sinks because it is ..... .

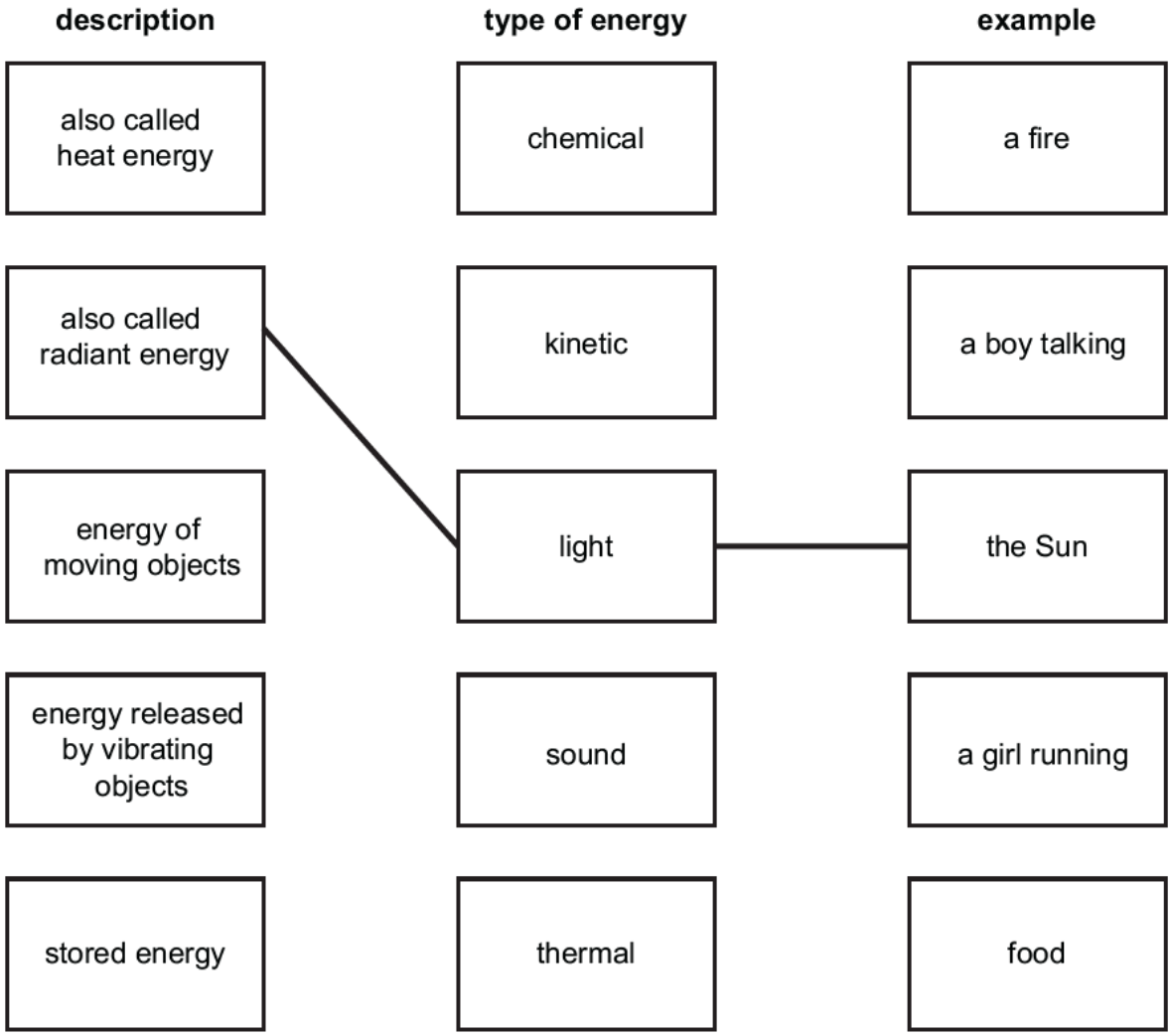
This process is called ..... .

[3]

10. No.2

Draw a line from the **type of energy** to its **description** and **example**.

One has been done for you.



[4]

11. No.12

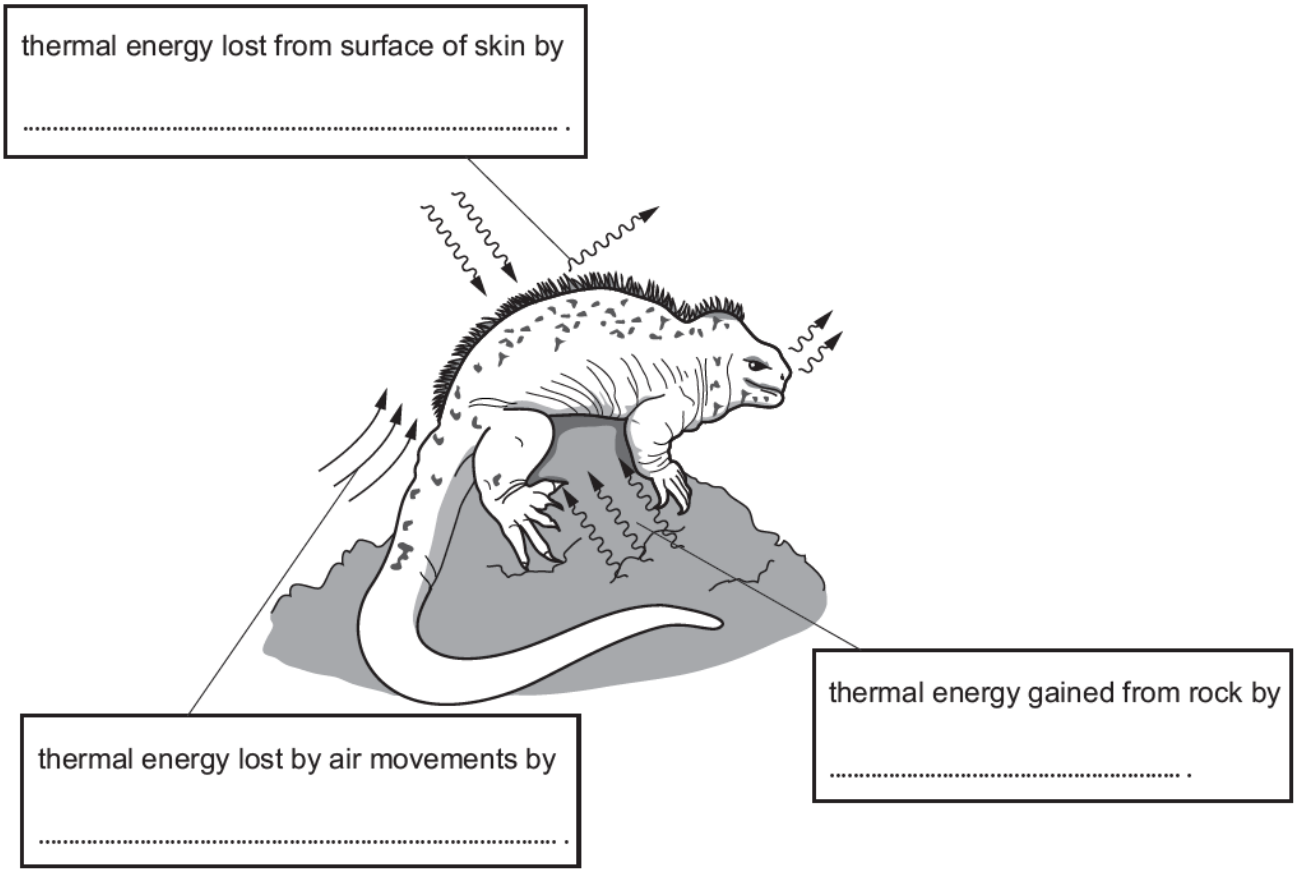
The lizard loses thermal (heat) energy and gains thermal (heat) energy.

Complete the labels to show the energy transfers taking place.

Choose from the following words.

conduction **convection** **radiation**

[2]

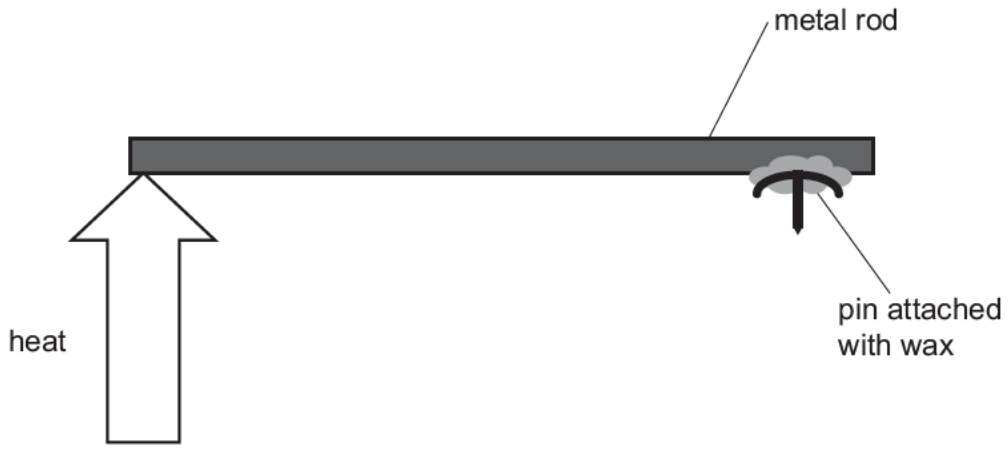


12. No.9

Blessy investigates conduction of thermal (heat) energy.

She heats a metal rod.

The metal rod has a pin attached with wax.



When the end of the metal rod is hot, the wax melts and the pin falls.

Blessy must think about the safety hazards of this investigation.

Describe two of these **safety hazards**.

1 .....

.....

2 .....

.....

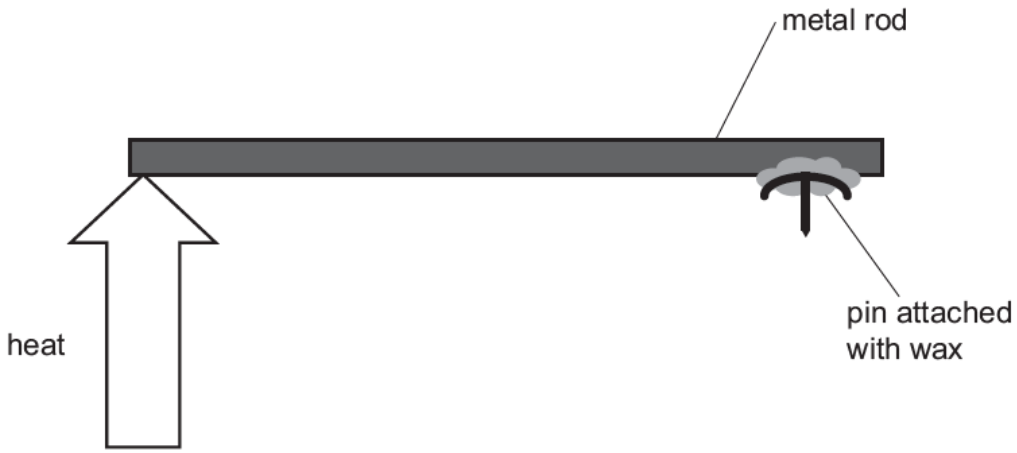
[2]

13. No.6

Angelique investigates heat transfer.

She heats a metal rod.

The metal rod has a pin attached with wax.



When the end of the metal rod is hot, the wax melts and the pin falls.

(a) What type of heat transfer is Angelique investigating?

..... [1]

(b) Angelique repeats the investigation with rods made of different metals.

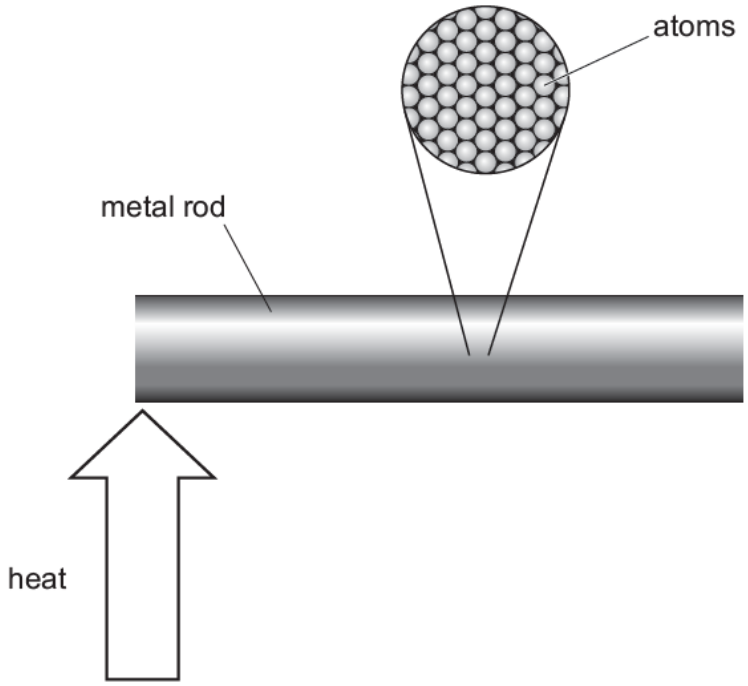
The pins fall after different amounts of time.

Why do the pins fall after different amounts of time?

.....

..... [1]

(c) Angelique draws a picture of the atoms inside one of the metal rods.



Describe how the heat is transferred to the end of the metal rod.

Use Angelique's drawing to help you.

.....

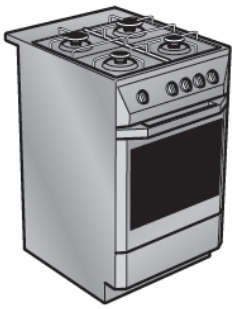
.....

..... [2]

14. No.3

Here are six objects.

Each of these objects transfers energy into useful types of energy.

.....	.....	 .....
.....	.....	.....

Write down the **useful** type of energy released below each object.

Choose the type of energy from

electrical **kinetic** **light** **sound** **thermal**

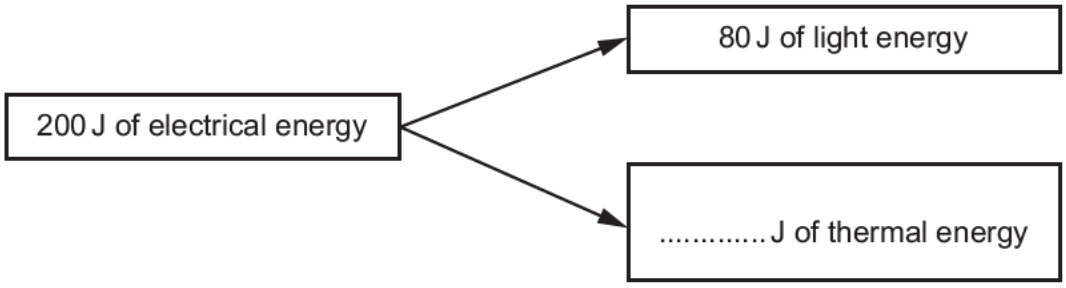
[3]

15. No.5

Energy is always conserved.

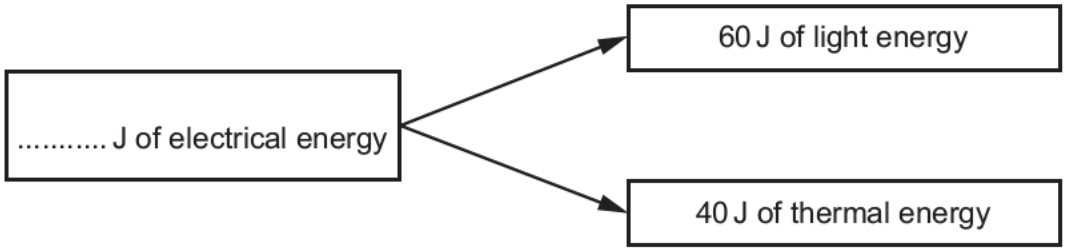
Complete the energy diagrams to show that energy is conserved.

(a)



[1]

(b)



[1]