Name:
Science Class:
Teacher:
Hand in day:

Y8 Science

Term 1: Homework Booklet

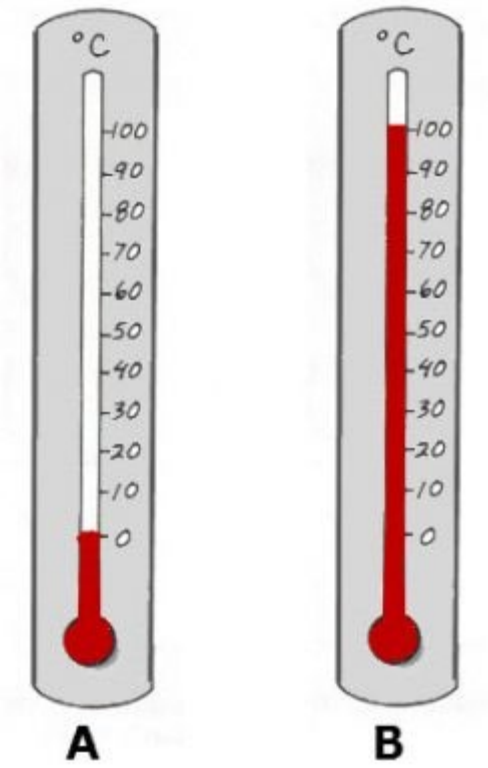
Physics

	Hand in Date	Parents Signature
Heat Transfer		
Homework 1		
Homework 2		
Homework 3		
Homework 4		

Heat transfer Homework 1:

Read the following information and answer the questions that follow.

Heat and temperature are related but not the same. We can measure temperature with a thermometer but we cannot measure the amount of heat energy something contains using one.



Temperature describes how hot or cold an object is and it is measured in degrees Celcius (°C).

Heat is a form of energy and, like all energy, is measured in joules (J). Another name for heat energy is thermal energy.

The amount of thermal energy stored in an object depends on

- It temperature
- Its material
- Its mass

Thermal energy always transfers from a hot object to a cold one. The bigger the difference in temperature, the faster the thermal energy is transferred. The cold object becomes hotter and the hot object becomes cooler until they are both the same temperature.

Thermal energy can be transferred from a hot object to a cooler one by:

- conduction
- convection
- radiation

Questions

1. **What do we use to measure the temperature of an object?**

2. **What is temperature measured in?**

3. **What is heat measured in?**

4. **What three things affect the amount of thermal energy stored in an object?**

5. **What temperature is shown on thermometer A?**

6. **What temperature is shown on thermometer B?**

7. **What happens to the temperature of a drink when you add ice cubes to it?**

8. **What happens to the temperature of the ice cubes when they are added to the drink?**

9. **What will happen to the temperature of the drink if you left it standing in the room all day?**

10. **What three ways can thermal energy be transferred from a hot object to a cooler one?**

Heat transfer Homework 2:

Learn the spellings of the following key words/ phrases and their meanings…

Temperature: measure of the average kinetic energy of particles in a substance in ^{o}C

Kelvin: Another unit for temperature starting with 0K at absolute zero.

Absolute zero: the lowest possible temperature where there will be no movement of particles.

Conduction: method of heat energy transfer found mostly in solids based on vibrations being passed from one particle to the next.

Convection: method of heat transfer found in fluids where the movement depends on the changing densities of the fluid.

Infrared radiation: method of heat transfer which does not require particles to transmit.

Absorb: to take in energy into a material.

Transmit: to allow energy to pass through a material.

Latent energy: 'hidden' energy used for bond making resulting in no change in temperature when recording a cooling curve of a substance.

Vacuum: an area lacking any particles including gases e.g. space

Test :

1.

2.

3.

4.

5.

6.

7.

8.

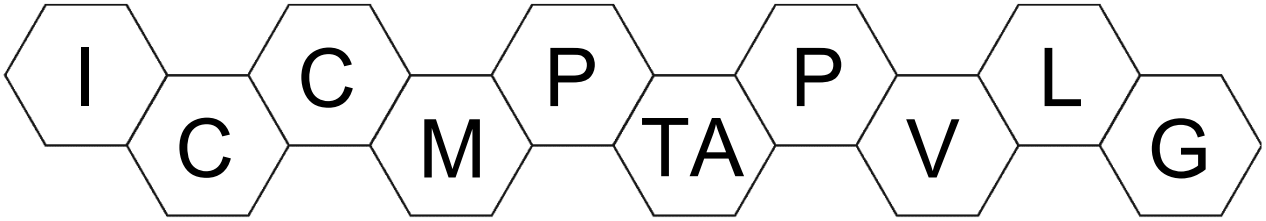
9.

10.

Heat transfer Homework 2:

Task 1

Answer the questions below. The first letter for the answer is given in each question.



1 What I is the name for anything that does not let heat energy flow through it?

_____

2 What C is the name for anything that does let heat energy flow through it?

_____

3 What C is the name for heat flowing through solids? _____

4 What M is a type of material that lets heat flow through it easily?

_____

5 What P is a material that does not let heat flow through it easily?

_____

6 What TA makes something a good insulator?

_____

7 What P is everything made of? _____

8 What V describes the way these things move in solids? _____

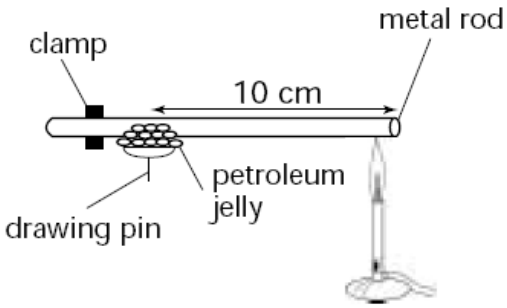
9 What L do not conduct heat very well? _____

10 What G hardly conduct heat at all? _____

Task 2

Joel set up an experiment like the one shown in the diagram.

He used five different rods, all the same length. He heated the rods and timed how long it took for the drawing pin to drop off. He recorded his results in the table shown below.



Rod	Copper	Iron	Glass	Aluminium	Graphite
Time for pin to drop off (s)	23	79	650	26	207

a Which material is the best conductor of heat?

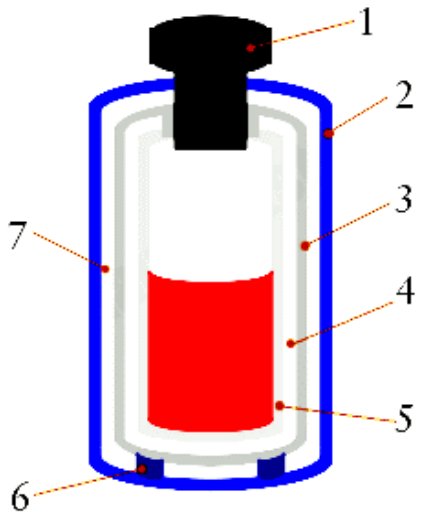
b Which material is the worst conductor of heat?

c The experiment shows that some solids conduct heat much better than others. Using a particle model, explain why all solids conduct heat better than gases.

Heat transfer Homework 3:

Explain how a thermos flask keeps the contents warm or cold….

Your answer should include a reason for the choice of each ***part listed*** in the table below, any definitions of scientific words used and an explanation of the relevant heat transfer processes.



Parts:

1. ***Insulating stopper***
2. Double wall
3. ***Vacuum***
4. ***Silvered inner wall***
5. ***Insulated supports***
6. ***Air/ insulation***

Heat transfer Homework 4:

Task 1

Describe the properties which each material in these objects have in terms of heat transfer….

Item:	Material:	Property and reason for choice:
Handle of a pan	Plastic	
Quilt	Feathers and down	
carpet	Wool and polyester	
Radiator	Iron and water inside	
Cooking spoon	Wood	
Poker for the fire	Iron	

Task 2

Q1.

(a) In an iron rod the particles vibrate. If one end of an iron rod is heated, the vibrating particles transfer energy to neighbouring particles which are **not** vibrating so violently.
What is this process called?

……..……

1 mark

(b) An electric immersion heater is put at the bottom of a large tank of water.

The water next to the heater becomes warm.

(i) What will happen to the warmed water next to the heater?
Give a reason for your answer.

……

……

……

2 marks

(ii) Why can heat **not** be transferred in this way in an iron rod?

……

……

1 mark

(c) In a liquid, some of the particles have enough kinetic energy to escape from the surface.
This process happens even when the liquid is well below its boiling point.

(i) What is this process called?
…….

1 mark

(ii) How will this affect the temperature of the liquid left in the container?

……

1 mark

Maximum 6 marks