

Write your name here

Surname

Other names

**Edexcel Primary and
Lower Secondary
Curriculum**

Centre Number

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Candidate Number

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Science

Year 9

Achievement Test

Wednesday 13 June 2012 – Afternoon

Time: 1 hour 20 minutes

Paper Reference

LSC01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Candidates may use a calculator.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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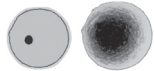
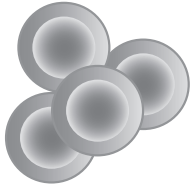
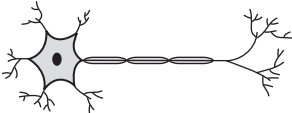
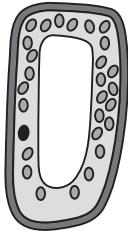
PEARSON

SECTION A

Answer ALL questions.

For questions 1 – 10 put a cross in one box to indicate your answer.
If you change your mind, put a line through the box and then put a cross in another box .
Each question is worth one mark.

1 Which of these cells is a nerve cell?

<input type="checkbox"/> A	
<input type="checkbox"/> B	
<input type="checkbox"/> C	
<input type="checkbox"/> D	

(Total for Question 1 = 1 mark)



2 Organisms have special characteristics to survive in their habitat.

What is this called?

- A adaptation
- B migration
- C survival
- D variation

(Total for Question 2 = 1 mark)

3 We can see cells with the help of a microscope.



eyepiece lens

objective lens

The total magnification is

- A the eyepiece lens magnification + the objective lens magnification
- B the eyepiece lens magnification \times the objective lens magnification
- C the objective lens magnification \div the eyepiece lens magnification
- D the eyepiece lens magnification \div the objective lens magnification

(Total for Question 3 = 1 mark)



P 4 1 3 2 7 A 0 3 3 2

4 Which of these are ecosystems?

1. desert



2. grassland



3. town



4. tree



- A 1 and 2
- B 2 and 4
- C 1, 2 and 3
- D 1, 2 and 4

(Total for Question 4 = 1 mark)

5 A woman has a 28-day menstrual cycle. If her menstruation starts on the 3rd July, on which of these dates should ovulation (egg release) take place?

- A 10th July
- B 17th July
- C 24th July
- D 31st July

(Total for Question 5 = 1 mark)

6 Which of the following are found in **both** animal cells and plant cells?

1. cytoplasm

2. chloroplasts

3. cell wall

4. cell membrane

- A 1 and 2
- B 1 and 4
- C 2 and 3
- D 3 and 4

(Total for Question 6 = 1 mark)



7 Which of these biological processes would produce clones?

- A asexual reproduction in plants
- B selective breeding in mammals
- C sexual reproduction in plants
- D sexual reproduction in mammals

(Total for Question 7 = 1 mark)

8 Read the following statements about micro-organisms.

1. Some micro-organisms cause disease.
2. Antibiotics are effective against all micro-organisms.
3. All bacteria are classified as micro-organisms.
4. All fungi are classified as micro-organisms.

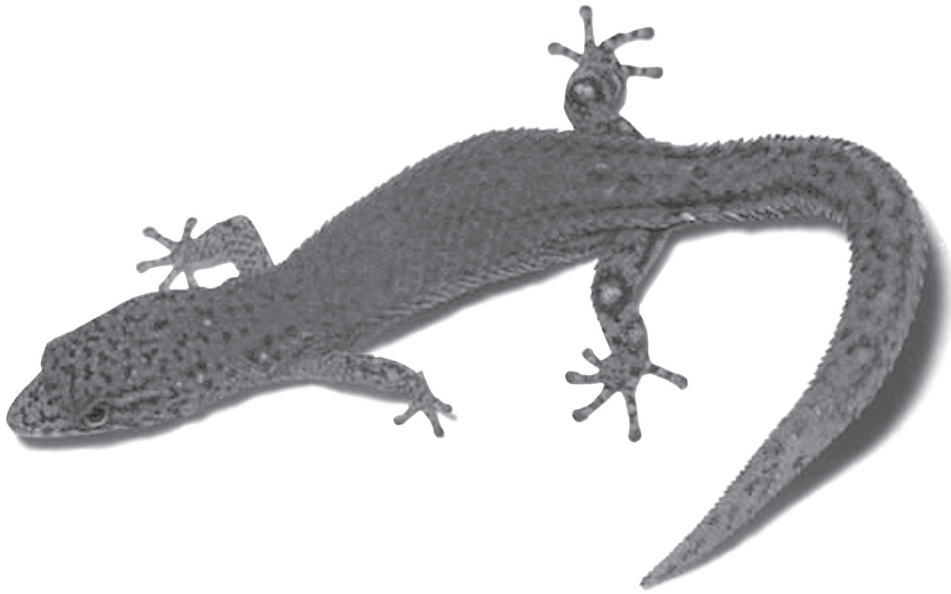
Which of these statements are correct?

- A 1, 2 and 3
- B 1 and 3
- C 1 and 4
- D 1, 3 and 4

(Total for Question 8 = 1 mark)



9



A lizard can live in a hot dry desert because

- A it is warm blooded.
- B it has thick, scaly skin.
- C it has thin, moist skin.
- D it can survive without water.

(Total for Question 9 = 1 mark)

10 Which is the correct energy change that takes place during photosynthesis?

- A heat energy → light energy
- B light energy → heat energy
- C chemical energy → light energy
- D light energy → chemical energy

(Total for Question 10 = 1 mark)



11 Complete the table by naming the part of the cell that carries out the function described.

(3)

Part of cell	Function
(a)	controls all cell processes
(b)	controls the movement of substances in and out of the cell
(c)	provides an area in the cell where most of the chemical reactions take place

(Total for Question 11 = 3 marks)



12 Complete the table by adding the number of the cloud that finishes each sentence correctly. Each cloud can only be used once.

(3)

	Sentence	Number of cloud
(a)	You can smell perfume from a distance because...	
(b)	A block of wood has a regular shape because...	
(c)	Solids expand when they are heated because...	
(d)	Hydrogen will spread out more quickly than carbon dioxide because...	

(1) their particles vibrate more and move further apart

(2) particles in a gas move around rapidly and spread out

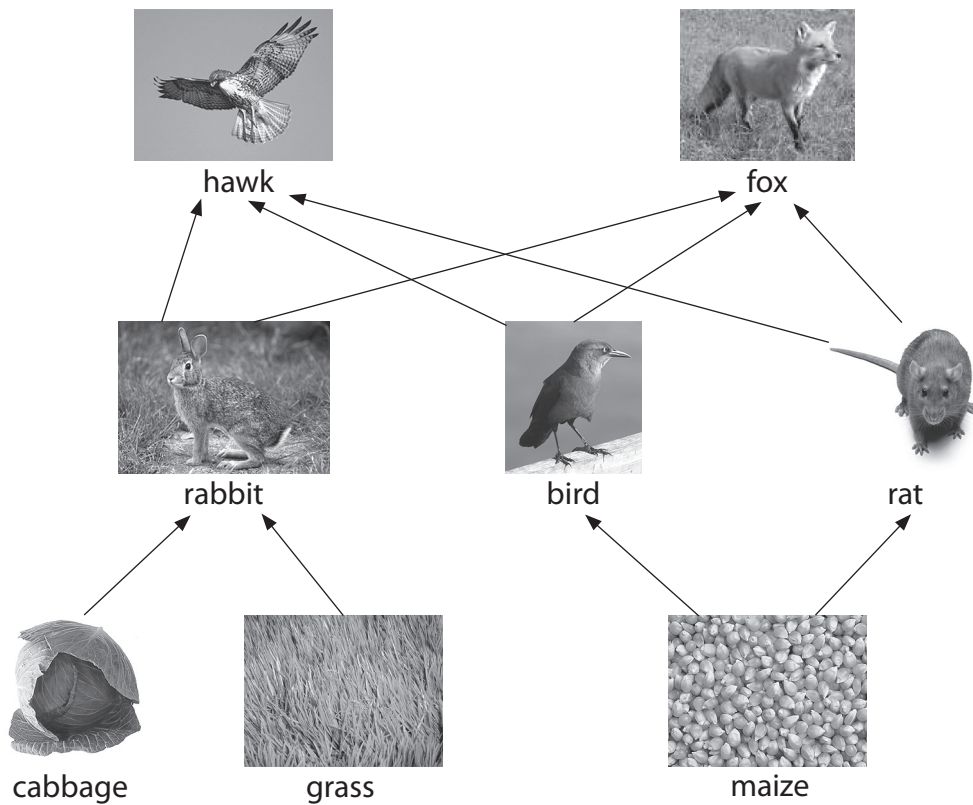
(3) it is made of smaller molecules

(4) its particles are closely packed and tightly held together

(Total for Question 12 = 3 marks)



13 The food web below shows some feeding relationships found in a field.



(a) What do the arrows in a food web indicate? (1)

(b) Using this food web give **one** example of each of the following: (2)

producer

secondary consumer

(c) How many food chains end with the hawk? (1)



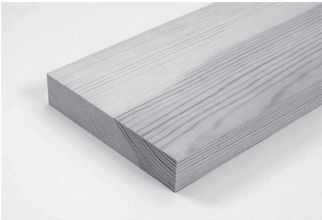

(d) Sketch and label a pyramid of numbers for the food chain grass → rabbit → hawk. (2)

(Total for Question 13 = 6 marks)



For questions 14 – 23 put a cross in one box to indicate your answer.
If you change your mind, put a line through the box and then put a cross in another box .
Each question is worth one mark.

14 Which of the following is made up of only one type of atom?

<input type="checkbox"/> A	 a crystal of sugar
<input type="checkbox"/> B	 a piece of aluminium foil
<input type="checkbox"/> C	 a piece of wood
<input type="checkbox"/> D	 a drop of water

(Total for Question 14 = 1 mark)

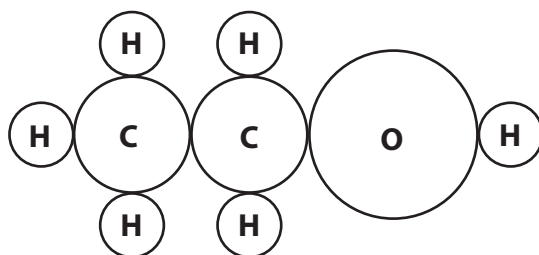


15 Which of these statements about a chemical reaction is always true?

- A Heat and light are always produced.
- B Mass is never created or lost.
- C The substance always changes state.
- D There is always a colour change.

(Total for Question 15 = 1 mark)

16 The diagram shows the atoms present in a molecule of ethanol.



Which number of elements and number of atoms is correct for a molecule of ethanol?

	Number of elements	Number of atoms
<input type="checkbox"/> A	1	1
<input type="checkbox"/> B	3	9
<input type="checkbox"/> C	9	3
<input type="checkbox"/> D	9	9

(Total for Question 16 = 1 mark)

17 Which of these substances would give off carbon dioxide when added to calcium carbonate?

Substance	pH value
<input type="checkbox"/> A	7
<input type="checkbox"/> B	3
<input type="checkbox"/> C	14
<input type="checkbox"/> D	11

(Total for Question 17 = 1 mark)



18 Which of the following processes happens when the forces between particles become weaker?

- A condensation
- B crystallisation
- C evaporation
- D freezing

(Total for Question 18 = 1 mark)

19 Which of the following molecules have the same number of atoms as a water molecule?

1. CaO

2. CO₂

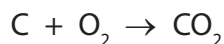
3. CaCl₂

4. FeO

- A 1 and 2
- B 1, 2 and 3
- C 2 and 3
- D All of these

(Total for Question 19 = 1 mark)

20 The chemical equation for burning carbon in oxygen is:



The equation shows one atom of carbon reacting with:

- A one molecule of oxygen to form one molecule of carbon dioxide.
- B one atom of oxygen to form one molecule of carbon dioxide.
- C one atom of oxygen to form one atom of carbon dioxide.
- D two molecules of oxygen to form one molecule of carbon dioxide.

(Total for Question 20 = 1 mark)



21 Which **two** of these statements about rocks are true?

1. Igneous rock can be changed to metamorphic rock in the rock cycle.
2. Fossils are found in igneous rock.
3. Marble is a metamorphic rock form of limestone rock.
4. Fast cooling molten rock produces larger crystals than slow cooling molten rock.

- A** 1 and 3
- B** 2 and 3
- C** 2 and 4
- D** 3 and 4

(Total for Question 21 = 1 mark)

22 A liquid has a pH of 7. So it

- A** must contain water
- B** has a boiling point of 100°C
- C** must be neutral
- D** must be colourless

(Total for Question 22 = 1 mark)

23 If a lake is polluted by acid rain which is the best substance to sprinkle on its surface?

- A** marble chips
- B** sodium hydroxide pellets
- C** powdered chalk
- D** fine pieces of charcoal

(Total for Question 23 = 1 mark)



24



inflated balloon



glass



match

A burning match is put into a glass.

An inflated balloon is then placed on top of the glass.

When the balloon is lifted, the glass sticks to the balloon and lifts up with it.

Explain why this happens.

(3)

.....

.....

.....

.....

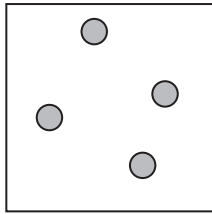
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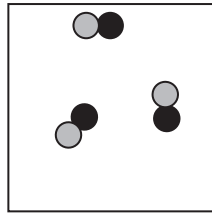
(Total for Question 24 = 3 marks)



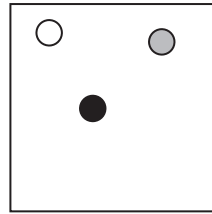
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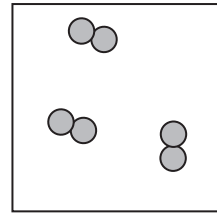
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Q



R



S

In the diagrams ● and ○ represent different atoms.

Which diagram shows

(a) a mixture?

(1)

(b) an element which is made up of molecules?

(1)

(c) a compound?

(1)

(Total for Question 25 = 3 marks)



26 The table shows how the solubility of potassium chloride in water changes with temperature.

Temperature (°C)	10	30	50	70	90
Solubility (g/100 cm³)	31	37	43	50	60

(a) Use these values to plot a graph to show how the solubility of potassium chloride changes with temperature. Remember to:

- decide a scale for each axis
- plot the points
- draw a line of best fit

(4)

solubility



temperature

(b) Use the graph to determine how much potassium chloride would crystallise out from 100 cm³ of saturated solution if it was cooled from 40 °C to 10 °C.

(2)

.....

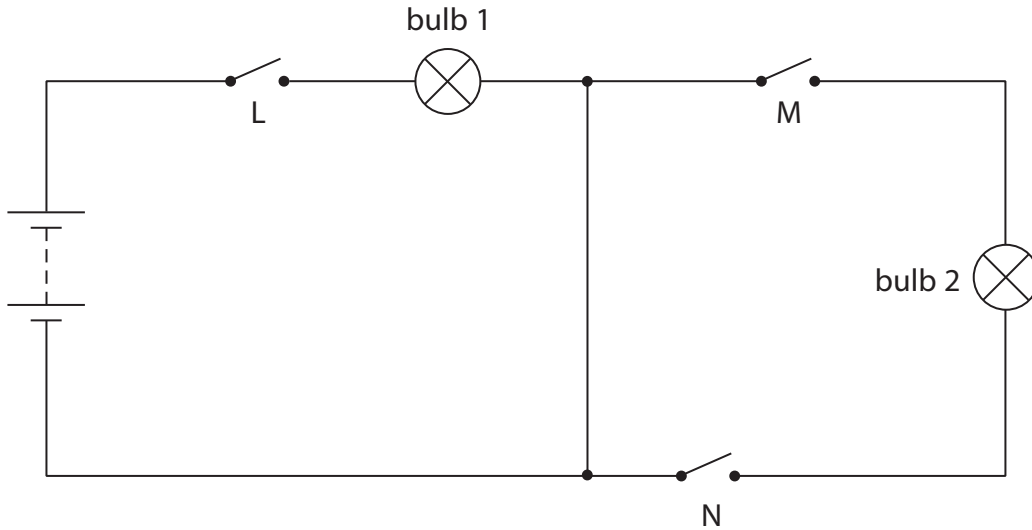
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(Total for Question 26 = 6 marks)



For questions 27 – 36 put a cross in one box to indicate your answer.
 If you change your mind, put a line through the box and then put a cross in another box .
 Each question is worth one mark.

27 In the circuit below which switches (L, M or N) must be closed for **only** bulb 1 to light up?



- A switch L only
- B switches L and M
- C switches L and N
- D switches L, M and N

(Total for Question 27 = 1 mark)

28 Which of these are forces?

1. friction 2. mass 3. heat 4. magnetic repulsion

- A 1 and 2
- B 1 and 4
- C 1, 3 and 4
- D 2 and 4

(Total for Question 28 = 1 mark)



29 An electric current consists of moving

- A atoms
- B electrons
- C elements
- D molecules

(Total for Question 29 = 1 mark)

30



When a person sits in front of a fire, heat reaches them by

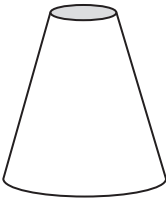

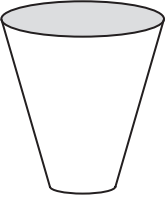
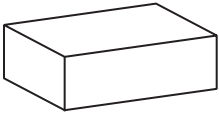
- A radiation only.
- B conduction and convection.
- C convection and radiation.
- D conduction and radiation.

(Total for Question 30 = 1 mark)



31 All of these objects have the same mass.

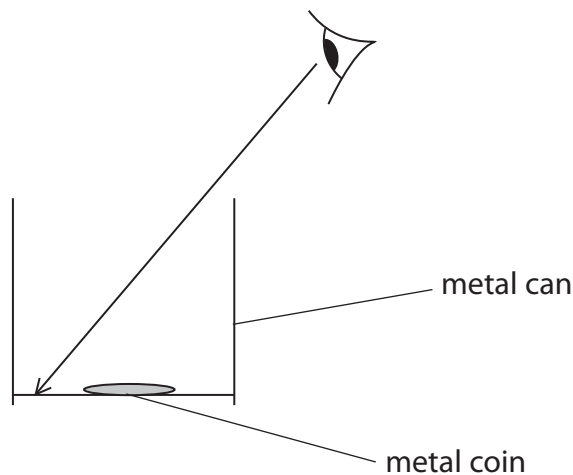
Which one exerts the greatest pressure on the ground?

<input type="checkbox"/> A	
<input type="checkbox"/> B	
<input type="checkbox"/> C	
<input type="checkbox"/> D	

(Total for Question 31 = 1 mark)



32 In the diagram the coin is just out of sight.

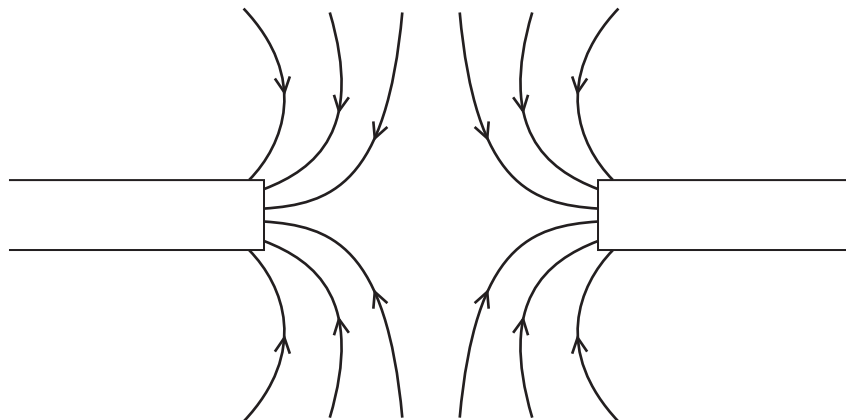


When water is poured into the metal can, the coin can be seen. This is because of

- A diffraction.
- B dispersion.
- C reflection.
- D refraction.

(Total for Question 32 = 1 mark)

33 Two permanent magnets produce a magnetic field pattern as shown below.



This pattern is produced by a

- A S pole and S pole repelling.
- B N pole and S pole repelling.
- C S pole and N pole attracting.
- D N pole and N pole repelling.

(Total for Question 33 = 1 mark)

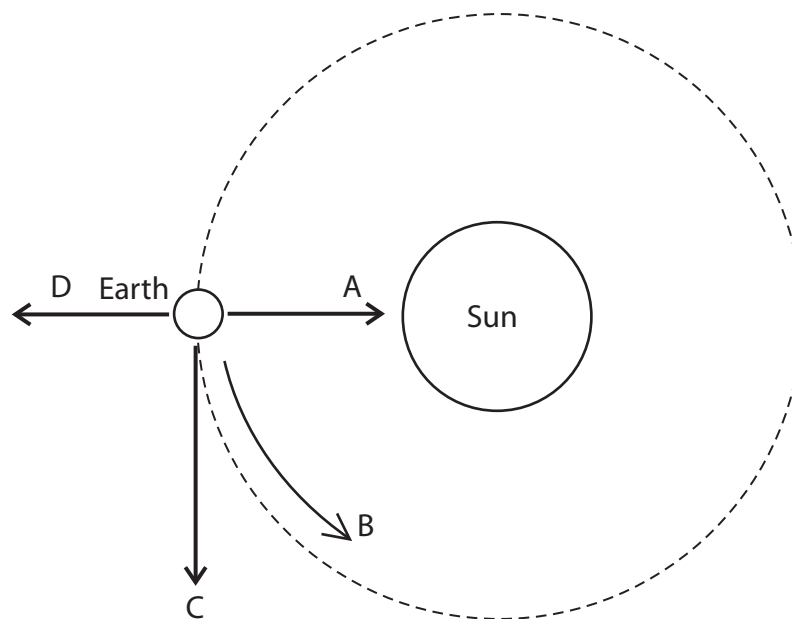


34 United football club are playing an evening match. The team's shirts are blue and white. What colours would the shirts appear under yellow light?

- A black and yellow
- B blue and white
- C blue and yellow
- D black and white

(Total for Question 34 = 1 mark)

35 The diagram shows the Earth orbiting anticlockwise around the Sun.



If the gravitational attraction of the Sun on the Earth suddenly stopped, in which direction would the Earth move?

- A Direction A
- B Direction B
- C Direction C
- D Direction D

(Total for Question 35 = 1 mark)

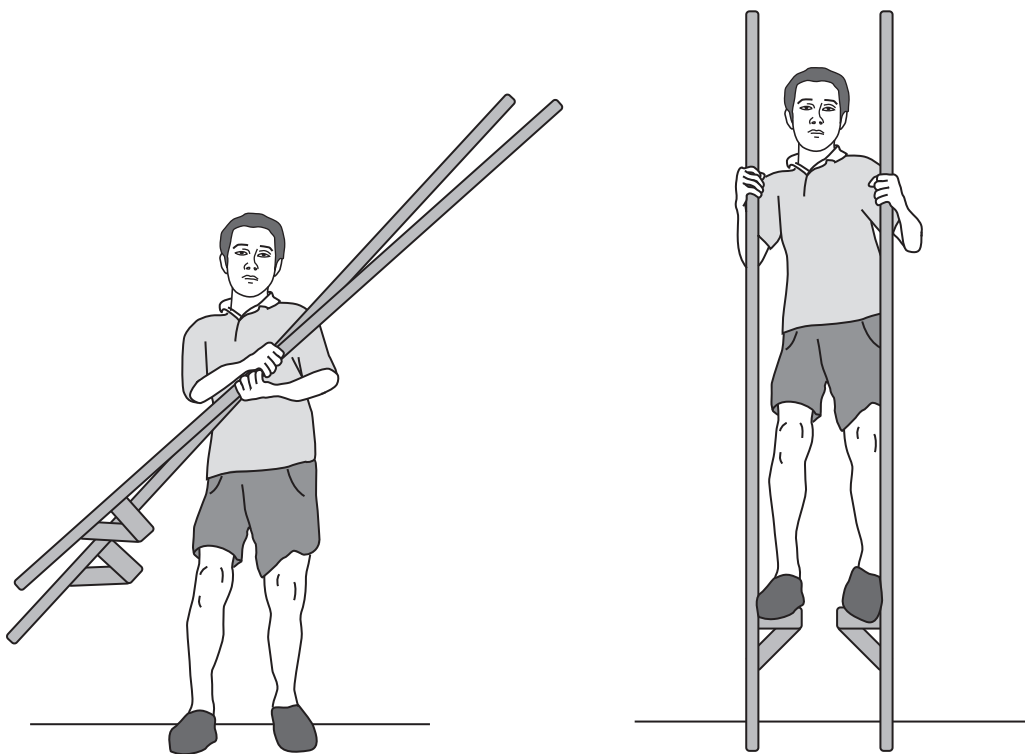


36 Which statement is correct?

- A The gravitational pull of an object is weaker if the object has a greater mass.
- B Astronauts are weightless in space because there is no air.
- C Planets and satellites are kept in their orbits by gravity.
- D The gravitational pull between two objects increases as they become further apart.

(Total for Question 36 = 1 mark)

37 The diagram shows a boy carrying a pair of stilts and then standing on them. Together the boy and the stilts weigh 500 N.



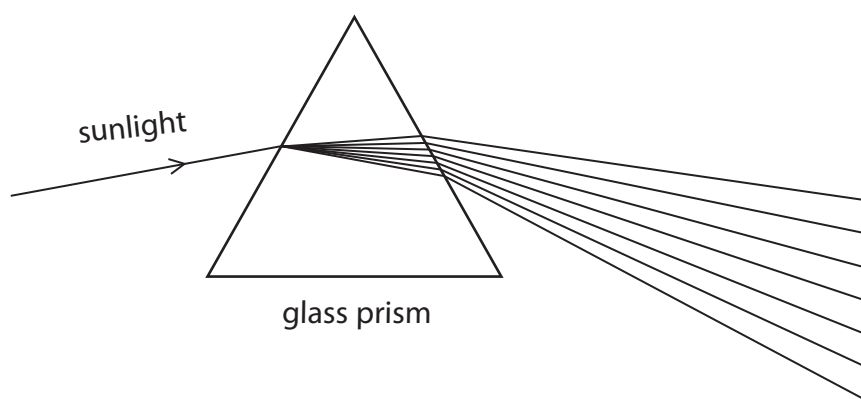
Complete the following table.

Force on ground N	500 N
Area in contact with the ground	125 cm ²	20 cm ²
Pressure on the ground	4 N/cm ² N/cm ²

(Total for Question 37 = 2 marks)



38 The diagram shows a ray of sunlight passing through a prism.



Label the colours of the spectrum that appear from the prism.

(Total for Question 38 = 4 marks)

TOTAL FOR SECTION A = 60 MARKS



SECTION B

Answer ALL questions.

39 Fritz is investigating whether seeds release energy when they begin to grow (germinate).

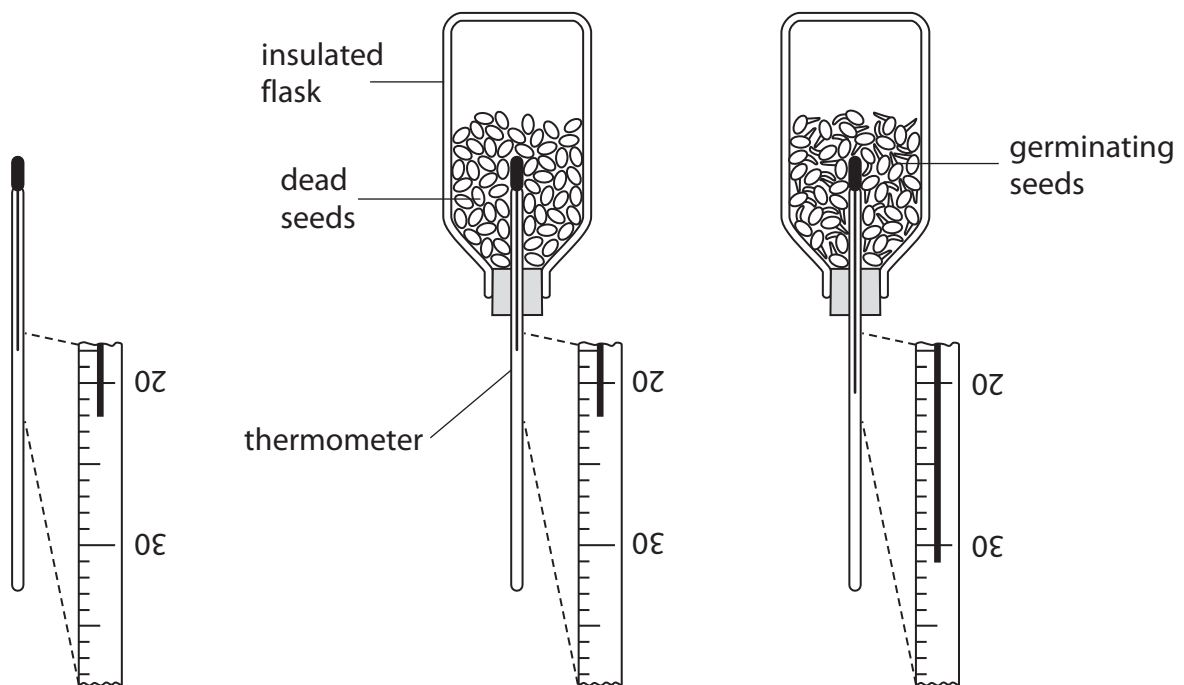
He sets up two insulated flasks of seeds as shown in the diagram below.

He places them in a room at a constant temperature for two days.

Flask A contains dead seeds.

Flask B contains germinating seeds.

room temperature



(a) Circle **two** factors which Fritz should keep the same when setting up the two flasks.

colour of seeds **mass of seeds** **shape of seeds** **variety of seeds**

(2)

(b) Why is it important to keep the two flasks in the same room during this investigation?

(1)



(c) (i) What is the temperature of the room?

(1)

.....°C

(ii) How much has the temperature in flask B increased by over the two days?

Show your working.

(2)

.....

.....

.....

.....°C

(d) What conclusion could Fritz draw from this experiment? Give a reason for your answer.

(2)

.....

.....

.....

.....

(Total for Question 39 = 8 marks)



40 Epsom salts (magnesium sulfate) can be used to treat bruises and strained muscles.

Rakhi and Sunil plan to prepare a sample of magnesium sulfate using strips of magnesium ribbon and sulfuric acid.

(a) Identify **one** possible hazard when handling sulfuric acid and describe how Rakhi and Sunil could minimise the risk of injury.

(2)

Hazard

How to minimise the risk of injury

Rakhi and Sunil talk about their plan.

Rakhi



We should add small amounts of magnesium ribbon to the acid a little at a time.

Sunil

I think that we need to keep adding more magnesium until some remains at the end.



(b) Explain why each of these statements is important when making magnesium sulfate.

(2)

Rakhi

Sunil



The magnesium ribbon reacts slowly with the sulfuric acid.

Rakhi and Sunil finally obtain a solution of magnesium sulfate that still contains some magnesium.

(c) Describe two things they would need to do to obtain crystals of pure magnesium sulfate.

(2)

1

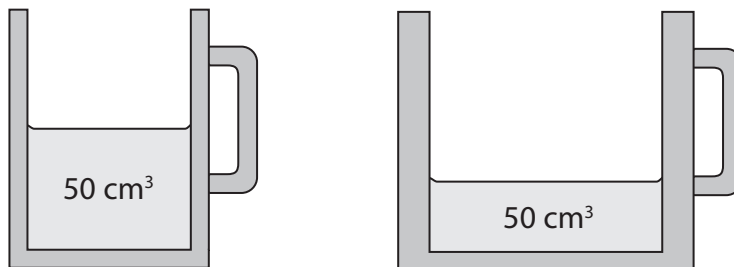
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(Total for Question 40 = 6 marks)



P 4 1 3 2 7 A 0 2 7 3 2

41 Chris investigated what factors affect the rate of cooling. He used two different shaped plastic mugs. One was narrow with thin walls and the other was wider with thick walls. He poured 50 cm³ of boiling water into each of the mugs and recorded the temperature every minute.



Here are his results.

Time (minutes)	Temperature (°C)	
	Narrow mug	Wide mug
0	95	95
1	82	76
2	72	61
3	64	63
4	57	39
5	52	31
6	47	26
7	43	24
8	40	24

- (a) (i) What was room temperature?°C (1)
- (ii) In the table, circle a temperature reading which may have been misread. (1)



(b) Is more heat lost through the sides or from the surface of the mugs?

Explain your choice.

(2)

.....

.....

.....

.....

(c) Suggest **two** ways that Chris could use to reduce heat loss from both mugs.

(2)

1

2

(Total for Question 41 = 6 marks)

TOTAL FOR SECTION B = 20 MARKS
TOTAL FOR PAPER = 80 MARKS



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