



KS3 Science

Particle Theory

Mark Scheme

Time available: 29 minutes

Marks available: 37 marks

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Mark schemes

1.

(a) (i) any **one** from

- to stop water vapour **or** steam escaping
*accept 'gas **or** vapour **or** particles could escape'*
*'to stop water escaping **or** spilling out' is insufficient*
- to stop lavender oil vapour escaping
accept 'to stop oil escaping'
accept 'to make sure the oil goes down the tube'
*accept 'the oil **or** vapours could not be collected'*
'to stop the smell escaping' is insufficient
- to reduce heat loss
*accept 'to stop heat loss' **or** 'to keep heat in'*
accept 'to stop the heat escaping'
accept 'to maintain the pressure'

1 (L5)

(ii) any **one** from

- it could explode
- it could break
accept 'the lid might come off'
accept 'so the pressure does not break the seal'
'the pressure would be too high' is insufficient
'it would get too hot' is insufficient

1 (L5)

(b) (i) • *from gas to liquid*
both answers are required for the mark
answers must be in the correct order

1 (L5)

(ii) any **one** from

- it sinks
accept 'lavender oil floats'
- it is at the bottom
accept 'the oil is on the top'
'they are not mixed' is insufficient

1 (L6)

(c) • B

if more than one letter is identified, award no mark

1 (L6)

[5]

2.

- (a) (i) • (molecules) are far apart **or** not touching each other
accept 'only gases can be compressed'
'the gas can be compressed' is insufficient
as it is given in the question
accept 'they are randomly arranged'
- 1 (L7)




- (ii) • there is only one type of molecule
or compound **or** substance
accept 'there is one type of particle'
*do **not** accept 'there is only one type of atom **or** element'*
- 1 (L7)

- (b) any **one** from
- the space **or** distance between the molecules **or** particles is smaller
accept 'the volume is less'
accept 'atoms' for 'particles'
 - the particles **or** they are closer together
 - more particles are touching the sides
accept 'particles hit the sides more often'
'the particles are hitting the sides' is insufficient
'if the gas is compressed the pressure rises' is insufficient
- 1 (L7)

- (c) (i) any **one** from
- new **or** different compounds have formed
accept 'they are now joined in threes'
*accept 'new combinations of particles **or** atoms'*
 - there is more than one compound
accept 'the compounds are different'
accept 'there is no longer a pure substance'
- 1 (L7)

- (ii) any **one** from
- the same number of atoms are present
accept 'mass is conserved'
'the mass stays the same' is insufficient
 - nothing has been added to **or** lost
'the same atoms are present' is insufficient
'nothing changed' is insufficient
'the amount of gas stays the same' is insufficient
- 1 (L7)

(iii) •

	NO
	N ₂ O
	NO ₂

accept 'ON'

accept 'ON₂'

accept 'O₂N'

all three answers are required for the mark

1 (L7)

(iv) • nitrogen oxide

accept 'nitrogen monoxide'

accept 'nitric oxide'

1 (L7)

[7]

3.

(a) (i) • oxygen

1 (L6)

• water

1 (L6)

answers may be in either order

'air' is insufficient

'moisture' or 'dampness' or 'wet' are insufficient

(ii) any **one** from

• it prevents contact between the steel **or** the car and oxygen
or water

• it is waterproof **or** water runs off

accept 'it prevents air getting to the car'

accept 'wax fills scratches or chips where paint is damaged'

'it forms a protective layer' is insufficient

1 (L5)

(iii) any **one** from

• paint

• chrome

accept 'they are coated in zinc'

or 'they are galvanised'

accept 'polish'

'rust treatment' is insufficient

'cover it' is insufficient

1 (L5)

- (b) • acid rain

accept 'sulphur dioxide'

accept 'oxides of nitrogen'

accept 'car exhaust fumes'

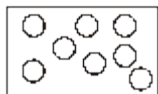
accept 'burning fossil fuels'

accept 'sea air' or 'salty air' or 'salt'

'carbon dioxide' is insufficient

1 (L6)

- (c) (i) • gas: particles randomly arranged and most **not** touching



accept black shaded circles if drawn correctly

accept fewer or more than 8 circles if the arrangement is clear

ignore arrows attached to circle

1 (L6)

- (ii) • solid: particles regularly arranged and all touching



accept white circles if drawn correctly

accept 2 rows of particles with at least 2 particles in the second row

accept fewer or more than 8 circles if a regular arrangement is clear

ignore location of circles in box

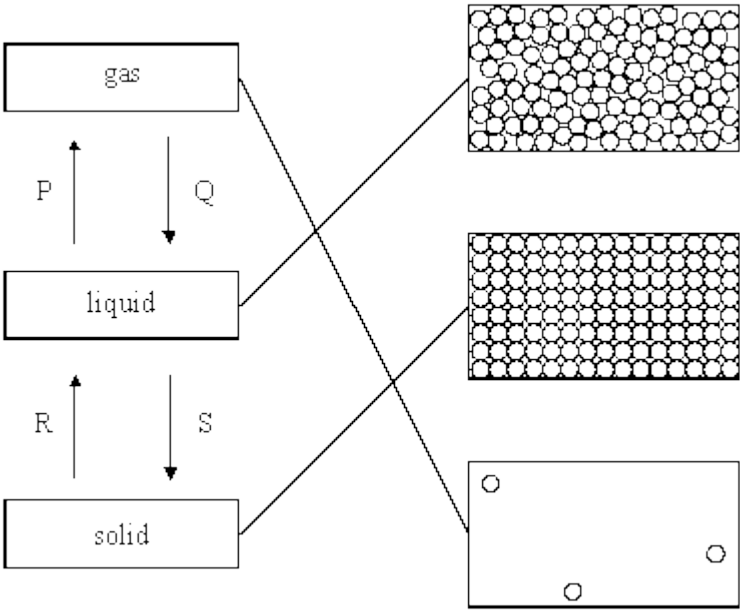
*do **not** accept a single row of circles*

1 (L6)

[7]

4.

(a) (i)



all three lines must be correct for the mark

1 (L6)

(ii) *evaporation: P*

1 (L5)

melting: R

1 (L5)

(b) (i) liquid

1 (L6)

(ii) carbon

1 (L6)

hydrogen

1 (L6)

(iii) carbon dioxide

accept 'CO₂'

accept 'carbon monoxide' or 'CO'

accept 'carbon' or 'soot'

answers must be in the correct order

1 (L6)

[7]

5.	(a) (i) C	1 (L7)	
	(ii) D		1 (L7)
	(iii) A and B		
	<i>answers may be in either order</i>		
	both answers are required for the mark	1 (L7)	
(iv) A and D			
<i>answers may be in either order</i>			
both answers are required for the mark	1 (L7)		
(v) C			
		1 (L7)	
(b) (i) the same			
<i>accept 'seven'</i>			
		1 (L7)	
(ii) a random, mixed arrangement of both types of molecule should be drawn with the molecules not touching each other			
		1 (L7)	[7]

6.	(a) balls are far apart from each other		1
	balls move randomly		1
(b) solid			1
gas			1
			[4]