KS3 Science

Energy Transfer

Mark Scheme

Time available: 30 minutes
Marks available: 41 marks

Mark schemes

1. (a) (i) (the type of) material

accept 'fabric'

1 (L5)

(ii) the temperature after 20 minutes

accept 'temperature'
'temperature at start' is insufficient
accept 'temperature change'
accept 'how hot the water is'
'heat' is insufficient

1 (L5)

(b) (i) B ✓

if more than one box is ticked, award no mark

1 (L5)

(ii) beaker B was warmer (at the end than the others)

accept the converse
accept 'the temperature was higher'
accept 'it dropped the least'
accept 'it lost the least heat'
'B was 40°C at the end' is insufficient

1 (L5)

(c) any **two** from

• temperature in cold room

'temperature' is insufficient
'the person' or 'the time' is insufficient
accept 'his temperature before he went in'

• style or size of coat

accept 'amount of material'

• the clothes he wears for each test

accept '(same) underclothes'

• level of activity

accept 'he had eaten the same food before each test'

2 (L5)

(d) • do not let the volunteer's body temperature go down too far

accept 'do not let him or the room get too cold'
accept 'have a doctor nearby'
accept 'monitor or check him'
accept 'measure his heart rate or breathing rate'
accept 'wear gloves' or 'keep his head warm'
accept 'make sure the volunteer is healthy'
or 'is not allergic to the material'

1 (L5)

www.accesstuition.com

(e)   any **one** from

- monitor the temperature from outside the room

    accept 'remote sensing'
    accept 'you have to open the coat to read the thermometer'

- it gives you a continuous record (of the temperature)

    accept 'you do not have to write down the results'

- it is more accurate or precise

    accept 'it eliminates human error'
    'accurate' is insufficient

    accept 'the experiment is more reliable'
    'more reliable' is insufficient

1 (L5)

[8]

2.   (a)   walls

1 (L3)

(b)   (i)   roof

1 (L3)

(ii)   any **one** from

- it now loses 700 (J)

    accept 'it is only 700'
    'it is 700' is insufficient

- the energy is less (than before)

    accept 'it was 3 400 (J)'

- the energy or heat is different

    accept 'it has gone down'

- all the others do not change

    accept 'insulation reduces heat loss'
    'insulation keeps heat in' is insufficient

1 (L4)

(c)   (i)   coal

    'solid' is insufficient
    '25 000 J' is insufficient

1 (L4)

(ii)   it is a gas

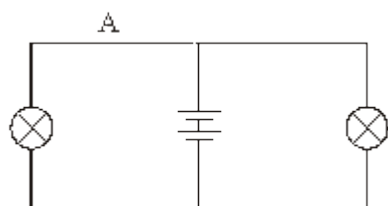   *accept 'physical state'*

1 (L4)

www.accesstuition.com

(iii) no sulphur dioxide (is given off)

accept 'it says no in the sulphur dioxide column'

*do **not** accept 'it has no sulphur dioxide in it'*
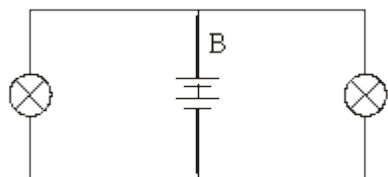
accept 'there is no sulphur in it'

1 (L4)

[6]

3. (a) (i) •

accept a switch drawn and labelled A marked on any part of the circuit highlighted

*do **not** accept a switch at either function*

the switch must be labelled for the mark

1 (L5)

(ii) •

accept a switch drawn and labelled B marked on any part of the circuit highlighted

*do **not** accept a switch at either junction*

the switch must be labelled for the mark

1 (L5)

(b) • they are absorbed

*accept 'they are blocked **or** filtered out'*

'they are filtered' is insufficient

1 (L6)

(c) • chemical

answers must be in the correct order

1 (L6)

• electrical

1 (L5)

• light

1 (L5)

• thermal

'heat' is insufficient as the question asks for a word from the box

1 (L5)

[7]

4. (a) •

2	20
3	45 **or** 46
4	80

all three *answers are required for the mark*

1 (L5)

(b) any **one** from

• the height for 4 cm is 4 times the height for 2 cm

accept 'for 2 cm it went 20 cm but for 4 cm it went 80 cm'
a mark may be awarded for other correct figures
accept 'if I double the distance it goes four times as high'
'when she doubled the distance it did not double the height' is insufficient

• the graph is a curve

accept 'the graph is not a straight line'

• the height for 2 cm is not twice the height for 1 cm

accept 'if it goes from 2 to 3 cm, the height more than doubles'

• the height should have been 40 cm when he pressed it down 4 cm

accept appropriate arguments for other values

1 (L6)

(c) (i) • some
some

both answers are required for the mark

1 (L6)

(ii) • most
    least

    both answers are required for the mark

    answers must be in the correct order

          1 (L6)

(iii) • least
    least

    both answers are required for the mark

          1 (L6)

          [5]

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

- the effect of adding no extra insulation to the windows and roof

    accept 'effect of not adding insulation'

- it provides a baseline measure

- the temperature without any effort to reduce the heat loss

    *accept 'as a comparison **or** control'*
    accept 'how much energy is normally lost'
    accept 'how much heat single glazing keeps in'
    accept 'what would happen if we did nothing'

          1 (L7)

(ii) double glazing *and* roof without insulation **and** a roof with insulation *and* single glazing

    answers may be in either order

    both *answers are required for the mark*

          1 (L7)

(b) any **one** from

- a longer time (roof insulation) to fall between two temperatures

    accept 'slower heat loss for insulation'
    accept 'faster heat loss for double glazing'

- smaller temperature fall (roof insulation) in a given time

    accept 'more heat loss for double glazing'
    accept 'roof insulation stays warmer than double glazing'

    accept 'if it is quicker for the house to reach a given temperature'

          1 (L7)

(c) • both lines **or** curves starting from the same temperature, descending
and approaching (not crossing) the room temperature line

1 (L7)

• the solid line **or** curve descending more steeply than the other

allow a difference of 5 small squares at the start
accept correctly labelled curves which do not use
solid and dotted lines as required by the question

1 (L7)

[5]

6. (a) (i) electrical to chemical ✓

if more than one box is ticked, award no mark

1 (L5)

(ii) chemical to electrical to sound ✓

if more than one box is ticked, award no mark

1 (L5)

(b) Q

1 (L6)

R

1 (L6)

P

1 (L6)

[5]

7. (a) as kinetic energy ✓

if more than one box is ticked, award no mark

1 (L6)

(b) (i) **both the place and the method by which energy is lost are
required for each mark**

answers may be in either order

• from the axle **or** bearings by heat **or** sound

accept 'from the bearing by friction'
or *'the bearings get hot*
or *'from the axle when it squeaks'*

1 (L7)

• from the wires by heat

accept 'the wires get hot'

*accept 'from the dynamo as heat **or** sound'*
or *'from the dynamo when it gets hot **or** squeaks'*
*do **not** accept 'goes into the air as heat **or** sound'*

1 (L7)

(ii)   it slows down more quickly

        accept 'it rotates for a shorter time'

        *do **not** accept 'it slows down'*

1 (L7)

because it transfers energy to the bulb more quickly

        accept 'because it transfers more energy to the bulb'
        *do **not** accept 'because it transfers energy to the bulb'*

1 (L7)

[5]