



KS3 Science

Sound

Mark Scheme

Time available: 42 minutes

Marks available: 50 marks

www.accesstuition.com

Mark schemes

1.

- (a) (i) • A and C

letters may be in either order

both the letter and the correct explanation
are required for the mark

their amplitudes are the same

accept 'the waves are the same height'

'the height of the waves' is insufficient

accept 'they are equally tall'

'they are big or tall' is insufficient

'taller waves are louder' is insufficient

do not accept 'they are equally long'

1 (L6)

- (ii) • B and C

letters may be in either order

both the letter and the correct explanation
are required for the mark

their frequencies are the same

accept 'the waves are the same distance apart'

'the distance apart of the waves' is insufficient

'the less spaced out the waves,

the higher the pitch' is insufficient

accept 'the wave lengths are the same'

'they are the same length or thickness or width' is insufficient

accept 'there are the same number of waves'

1 (L6)

- (iii) • its pitch becomes higher

accept 'the frequency gets higher'

'it gets higher' is insufficient

'it becomes high' is insufficient

1 (L6)

- (b) • any number between 4.5 and 7.5 hours (inclusive)

1 (L5)

(c) any **one** from

- it vibrates with a greater amplitude
accept 'it moves more'
- it has larger vibrations
accept 'burst ear drum'
'it vibrates harder' and 'it vibrates more'
are insufficient responses
*do **not** accept 'it vibrates faster'*

1 (L5)

[5]

2.

(a) bar for material A drawn to 40 decibels

allow a tolerance of one small square for the drawn line,
*either above **or** below 40 decibels*

1 (L3)

(b) 4

1 (L3)

(c) D

accept '35'

1 (L4)

(d) • Use the same box each time. ✓

1 (L4)

- Keep the distance between the sound sensor and the bell the same each time. ✓

if more than two boxes are ticked, deduct one mark for
each incorrect tick minimum mark zero

1 (L4)

[5]

3.

(a) pluck them harder

*'make the strings vibrate more **or** move more*
*do **not** accept 'make the strings vibrate more quickly'*

1 (L5)

(b) The sound has a higher pitch ✓

if more than one box is ticked, award no mark

1 (L5)

(c) the sound from the thicker string has a lower pitch **or** a lower frequency

*accept 'it has a lower pitch **or** a lower frequency'*
accept 'the sound from the thicker string is louder
***or** 'it is louder'*

answers must include a comparison
'it is lower' is insufficient

1 (L5)

(d) (i) the sound in A has a higher pitch **or** a higher frequency
*accept 'it has a higher pitch **or** higher frequency'*
answers must show a comparison
'the vibrations are quicker' is insufficient
'it is higher' is insufficient

1 (L6)

(ii) the sound in A is louder
accept 'it is louder'
accept 'the sound in C is quieter'
accept 'it has a greater amplitude'
'the vibrations are stronger
***or** of greater amplitude' is insufficient*
*do **not** accept 'it is higher'*

1 (L6)

[5]

4.

(a) (i) five circles not touching and randomly arranged
accept at least three circles
accept pairs of similar atoms

1 (L6)

(ii) they are closer
*do **not** accept 'they move faster'; 'they are close'*

1 (L6)

(b) greater than
accept 'greater'

1 (L6)

(c) (i) the amplitude gets smaller
accept 'the height of the waves gets less'
*accept 'the waves get shorter **or** smaller'*
*do **not** accept 'it vibrates less'*

1 (L6)

(ii) any **one** from

- the peaks **or** troughs are equally spaced
accept 'the waves are the same distance apart'
*accept 'there are four peaks **or** waves*
***or** troughs between the lines'*
accept 'the width of each wave is the same'
accept 'the lines are equally spaced'
- the frequency is constant **or** does not change
accept 'the wavelength is the same'

1 (L6)

[5]

5.

(a) (i) Paul, James, Sylvia

accept 'light'; 'vibration'; 'sound'

answers must be in the correct order

all three answers in the correct order are required for the mark

1 (L7)

(ii) 3

accept $\frac{1020}{340}$

1 (L7)

(b) (i) the energy **or** the sound is more spread out

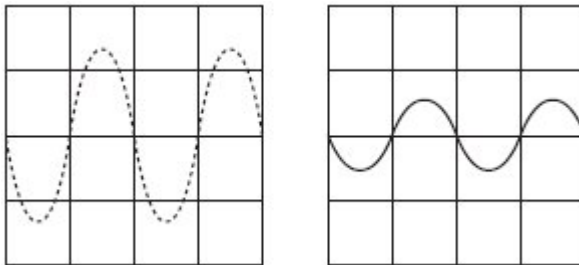
accept 'some of the sound is absorbed by the air'

accept 'the amplitude decreases'

'vibrations decrease' is insufficient

1 (L7)

(ii)



award one mark for a wave with a smaller amplitude

award one mark for a wave with the same frequency

award the marks for a wave with the correct amplitude and frequency but which is not centred

*on the middle line of the grid **or** which is not in phase with the drawn wave*

the marks may be awarded for a wave drawn on Sylvia's grid

2 (L7)

[5]

6. (a) (i) vibrate
accept 'move in and out'
'move' is insufficient 1 (L4)
- (ii) any **one** from
- it stops the sound waves **or** vibrations reaching our eardrums
accept 'it stops sound reaching our eardrum'
accept 'it absorbs sound'
accept 'it blocks the ear'
 - it stops the eardrum vibrating
accept 'it stops the eardrum moving in and out'
 - the eardrum vibrates less
accept 'soundwaves are reflected by the wax' 1 (L3)
- (b) (i) human *and* sparrow *and* rabbit
accept 'bird' for sparrow
answers may be in any order
all three answers are required for the mark 1 (L4)
- (ii) cat 1 (L4)

[4]

7. (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]

8. (a) makes it vibrate with a higher frequency
accept 'it has a higher frequency'
or *'it vibrates more quickly'*
do not accept 'it vibrates more' 1 (L7)

(b) the ear drum vibrates with a greater amplitude
accept 'it has a greater amplitude'
or 'larger vibrations'
do not accept 'it vibrates more'

1 (L7)

(c) can burst the ear drum
accept 'they damage the nerve endings'
or cochlea or the bones in the ear or ear drum'
do not accept 'they damage the ear'

1 (L7)

[3]

9.

(a) vibrate
allow move more (vigorously) but not just move

1

dirt / muck / grit / rust / dust etc.
do not accept bacteria

1

(b) any **one** medical use eg
ignore incorrect biological detail

- scanning unborn babies
- destroying (kidney) stones

1

(c) (i) 2

1

(ii) C

1

[5]

10.

(a) (i) porpoise
apply list principle

1

(ii) chicken
apply list principle

1

(b) (i) 20–20,000
allow (15–20) – (18 000–20 000)

1

(ii) busy road traffic

normal talking

whisper

any 2 or 3 correct for 2 marks, 1 correct for 1 mark

ignore vacuum cleaner

otherwise deduct 1 mark for each incorrect answer

2

(c) (i) each 5 dB increase halves time limit (for exposure)

for 1 mark accept as the loudness increases the time limit decreases

2

(ii) 1 hour

1

[8]