KS3 Science

Forces

Mark Scheme

Time available: 28 minutes
Marks available: 38 marks

Mark schemes

1. (a) (i) • ↓ ✔

 if more than one box is ticked, award no mark

1 (L3)

(ii) • ↑ ✔

 if more than one box is ticked, award no mark

1 (L3)

(b) • B

 accept 'the middle or second one'

1 (L3)

any **one** from

- it hangs down the most
 accept 'the spring is wider apart'

- it stretches the spring most
 accept 'it stretches more'

- the spring is longer
 accept 'it stretched the longest'
 this mark cannot be awarded if the response conflicts with the first part of (b)
 a comparative answer is required for the mark
 non-comparative answers such as 'it is long' are insufficient

1 (L3)

(c) • T

 accept 'the last one'

1 (L3)

any **one** from

- the spring was pushed down the most amount
 accept 'it squashes more'

- the cube pushed it down the most
 accept 'the spring is the tightest'

- the spring is shorter
 accept 'it is shortest'
 this mark cannot be awarded if the response conflicts with the first part of (c)
 a comparative answer is required for the mark
 non-comparative answers such as 'it is short' are insufficient

1 (L4)

[6]

2. (a) **either**

- *pan X:* 1N and 1N
  pan Y: 2N

  or

- *pan X:* 4N and 1N
  pan Y: 5N

  1 (L3)

  three *weights are required for the mark*
  units are not required for the mark
  the weights in pan X can be in either order

(b) • up

  accept '↑'
  'X will go down' is insufficient

  1 (L3)

(c) • 3 *N*

  1 (L3)

(d) (i) • 8 *N*

  1 (L3)

  (ii) • 5 *N*

  accept the answer to (di) minus the answer to (c)
  accept '8-3'

  1 (L4)

  [5]

3. (a)

	moves to the left ←	moves to the right →	stays still
(i)	☐	✔	☐
(ii)	☐	☐	✔
(iii)	✔	☐	☐
(iv)	☐	☐	✔

1 (L3)

1 (L3)

1 (L3)

1 (L3)

if more than one box is ticked in a row, award no mark for that row

(b) (i)

if more than one box is ticked, award no mark

1 (L3)

(ii) any **one** from

- newton meter
  accept 'spring balance'

- forcemeter
  'balance' is insufficient
  'newtons' or 'N' is insufficient
  'meter' is insufficient
  'weighing scales' is insufficient

1 (L4)

[6]

4. (a) (i) • 240

accept '0.8 × 300'

1 (L7)

• Nm

accept '24 000 Ncm' for two marks
*do **not** accept 'mN'*
*do **not** accept 'n' for 'N'*

1 (L7)

(ii) any **one** from

• 150

accept '$\dfrac{300}{2}$' or '$\dfrac{240}{1.6}$'

consequential marking applies

• half the force needed at 0.8 m
*accept the numerical answer to **(a) (i)** ÷ 1.6*
'half' is insufficient

1 (L7)

(b) • 600

accept '$\dfrac{120}{0.2}$'

1 (L7)

• N/m^2 **or** Pa

accept '0.06 N/cm^2' for two marks

1 (L7)

[5]

5. (a) Mars

accept '6 kg'
*do **not** accept '24 N'*

1 (L5)

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(b)   any **one** from

- 4 kg weighs more on Earth

    accept the converse
    'different weights' is insufficient

- the weight of the object is greater on Earth

    accept the converse
    accept 'Earth is 40 N and Venus is 36 N'
    accept 'Earth is 40 and Venus is 36'
    *accept 'more newtons on Earth'   **or** 'less newtons on Venus'*
    accept 'there is a greater force on Earth'
    *do **not** accept 'it has more mass on the Earth'*

    1 (L5)

(c)

    answers must be in the correct order

- less (than) **or** smaller (than) **or** lower (than)

    1 (L6)

- the same (as) **or** equal (to)

    1 (L6)

(d)   (i)   • the greater the distance
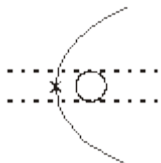
    accept 'it increases' the greater the time for one orbit

    1 (L5)

(ii)   • an answer from 1.6 to 6 inclusive

    1 (L6)

(e)

    award a mark for X marked on the orbit within the
    tolerances shown

    1 (L6)

                                                                            [7]

6.   (a)   B

    1 (L5)

(b)   (i)   A and C

    accept 'lift and weight'

    answers may be in either order
    ***both** letters are required for the mark*

    1 (L5)

(ii)   D *and* B

   accept A and C

   answers may be in either order
   both letters are required for the mark

<div align="right">1 (L5)</div>

(c)   (i)   • Force D is greater than force B.   ✓

   if more than one box is ticked, award no mark

<div align="right">1 (L6)</div>

(ii)   • Force A is greater than force C.   ✓

   if more than one box is ticked, award no mark

<div align="right">1 (L6)</div>

<div align="right">**[5]**</div>

7.   (a)   (i)   C

<div align="right">1 (L3)</div>

(ii)   B

<div align="right">1 (L3)</div>

(b)   20

<div align="right">1 (L3)</div>

(c)   any **one** from

• friction

• air resistance **or** drag

• reaction

   accept 'upthrust'
   *do **not** accept 'gravity'*

<div align="right">1 (L4)</div>

<div align="right">**[4]**</div>