

## Mark schemes

1

(a) any **one** from

- the forces are balanced  
*ignore references to gravity if the answer is in terms of balanced forces*
- the forces are equal **or** the same  
*'the sides are equal' is insufficient*
- the forces are both 1000 N  
*accept 'the forces are both 1000'*  
*accept 'the newtons are even'*  
*do **not** accept 'both teams weigh 1000 N'*
- they pull with the same force **or** equally hard  
*accept 'both teams have the same strength'*

1 (L4)

(b) an arrow drawn to the right

*accept an arrow drawn to the right anywhere on the drawing*

1 (L3)

(c) any **one** from

- team A pulled harder than team B  
*accept 'team A pulled harder' **or** 'team A pulled more'*  
***or** 'they pulled harder'*  
*accept the converse*
- team A was stronger  
*accept 'they used more strength'*
- team A was pulling with more than 1000
- team B was pulling with less than 1000
- there was more force to the left  
*accept 'there are more newtons to the left'*

1 (L4)

(d) 1200 N ✓

*if more than one box is ticked, award no mark*

1 (L4)

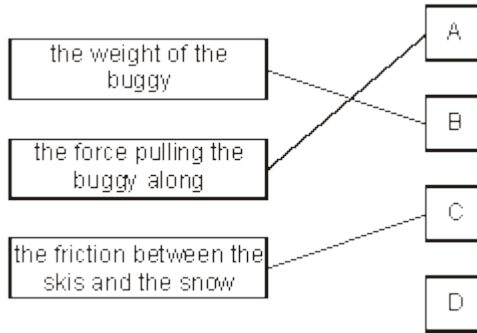
(e) friction

1 (L4)

[5]

2

(a)



*if more than one line is drawn from any one force award no mark for that force*

3 (L3)

(b) 800

*accept '80 x 10'*

1 (L4)

(c) any **one** from

- it weighed more
- the mass was greater  
*accept 'it was heavier'*
- it weighed less at the end  
*accept 'it only weighed 130 at the end'*  
*accept 'there was more food or fuel or supplies'*  
*accept 'more pressure'*

1 (L4)

(d) any **one** from

- they spread out the weight  
*accept 'they do not sink into the snow'; 'wheels sink'*
- they have a bigger surface **or** area
- they can slide easily  
*accept 'they reduce the pressure'; 'less friction'*  
*'they are bigger'; 'it can slide' is insufficient*

1 (L4)

(e) any **one** from

- there is a bigger surface **or** area
- there is a bigger force
- it catches more air **or** wind

*do **not** accept 'there is more air resistance'*

1 (L4)

[7]

3

(a) • it decreases

*accept 'there are fewer swings'*

*accept 'there are less'*

*'the ball swings slower **or** more slowly' is insufficient*

1 (L3)

(b) (i) *vertical axis:*

- number of swings in 10 seconds

*accept 'number of swings' **or** 'how many swings' **or** 'swings'*

*'number' is insufficient*

1 (L4)

*horizontal axis:*

- length of string in cm

*accept 'length of string' **or** 'length' **or** 'cm'*

*'string' is insufficient*

1 (L4)

(ii) • 13

*accept any number from 12.5 to 13.0 (inclusive)*

*accept '11' if the axes are labelled in reverse for part (bi)*

1 (L4)

(iii) • 6 ✓

*if more than one box is ticked, award no mark*

1 (L4)

(c) any **one** from

- friction
- air resistance

*accept 'drag'*

*do **not** accept 'tension'*

1 (L4)

[6]

- 4** (a) B 1 (L5)
- (b) (i) A and C 1 (L5)  
*accept 'lift and weight'*  
*answers may be in either order*  
**both** letters are required for the mark
- (ii) D and B 1 (L5)  
*accept A and C*  
*answers may be in either order*  
**both** letters are required for the mark
- (c) (i) • Force D is greater than force B. ✓ 1 (L6)  
*if more than one box is ticked, award no mark*
- (ii) • Force A is greater than force C. ✓ 1 (L6)  
*if more than one box is ticked, award no mark*

[5]

- 5** (a) (i) any **two** from 2 (L6)
- gravity **or** weight
  - friction
  - reaction  
*accept 'upthrust'*
  - air resistance  
*accept 'drag'*  
*do **not** accept 'centrifugal force'*  
***or** 'centripetal force' **or** 'g- force'*
- (ii) any **one** from 1 (L6)
- constant speed
  - steady speed
  - it stays the same  
*accept 'it is the same' **or** 'it does not change'*
- (b) friction is less 1 (L5)  
*'it is smoother' **or** 'it is slippery' are insufficient*

(c) it increases

*accept 'he goes more quickly'*

1 (L6)

because there is less air resistance **or** friction

*accept 'he is streamlined **or** aerodynamic'*

1 (L6)

[6]

6

(a) (i) 12.5 m/s

*accept ' $\frac{400}{32}$ ', m/s'*

*accept 'metres per second' **or** 'ms<sup>-1</sup> for m/s*

*the unit is required for the mark*

*do **not** accept 'mps'*

1 (L7)

(ii) they are equal **or** the same

*accept 'they are balanced'*

1 (L7)

(b) the forward force is greater than the backward force

*accept the converse*

*accept 'the forward force is greater'*

***or** 'the backward force is smaller'*

*do **not** accept 'the forward force becomes greater*

***or** increases'*

1 (L7)

any **one** from

- because air resistance **or** drag is smaller **or** reduced

*accept 'less friction'*

- because there is a smaller surface area

*'she is more streamlined' is insufficient*

*as it is given in the question*

1 (L7)

[4]