



9J Gravity and space...mark scheme

Assessment for learning...year 9 (level 3-6)

Question 1:

- (a) larger force on more massive pieces 1
accept 'bigger force on bigger pieces'
or smaller force on less massive pieces
or 'smaller force on little pieces'
- (b) it increased 1
accept 'pulled more' or 'got stronger'
or 'got bigger' or 'got greater'
- (c) there was an attractive force ✓ 1
if more than one box is ticked award no mark
- (d) all parts of the comet were pulled towards Jupiter, but the side facing
towards the planet was pulled more strongly ✓ 1
ie a ✓ in the second box down;
if more than one box is ticked award no mark
an attractive force ✓ 1
if more than one box is ticked award no mark

[5]

Question 2:

- (a) they reflect or scatter light 1
accept 'light reflects off it' or 'light reflects on it'
do not accept 'light reflects onto it' or
'light shines on them'

- from the Sun 1
- (b) it goes into the shadow of the Earth 1
accept 'it is eclipsed' or 'it is not in the sunlight'
or
'it is no longer reflecting the sunlight'
accept 'it goes into the shadow of the Moon' or
'it goes in front of the Moon'
do not accept 'it goes behind the Moon'
or *'the Moon gets in the way'*
or *'the satellite tumbles'*
- (c) any **one** from 1
- weather forecasting
 - navigation **or** position finding
 - communications
accept 'satellite TV' or 'TV' or 'telephone' or
'radio'
 - astronomy **or** looking at the stars
 - to take pictures of the Earth
accept 'spying' or 'surveillance' or 'to see
changes in the environment or in land-use'
accept 'for defence' or 'as weapons'

[4]

Question 3:

- (a) dot in line with Jupiter and the Sun on the 3rd circle out, between the Sun and Jupiter 1
both the correct circle and the correct position of the dot on the circle are required for the mark the label E is not required
- (b) because the Earth is travelling faster than Jupiter 1
accept 'because the Earth is travelling faster' or 'the Earth is overtaking'
accept 'because Jupiter takes longer to orbit'
do not accept 'because the stars are very far away'
- (c) ratio of distances = 6.3 : 1.5 1
 35 minutes
 minutes
accept 6.2 – 6.4 and 1.4 – 1.6
accept a time between 30 and 40
 1

accept $\frac{8.3 \times 6.3}{1.5}$ for one
 mark 1.5 the unit is required
 for the mark
 accept the correct time for
 both marks even if no
 working is shown

[4]

Question 4:

- (a) **Both the correct ball and the correct reason are required for the mark.**

the bowling ball because it has the greatest mass **or** it is the heaviest 1
 do **not** accept 'because it is
 bigger'
 'the bowling ball because it is
 bigger' insufficient

- (b) any **one** from 1
 • they are the same diameter accept 'they are the same size'
 • they produce the same air resistance **or** friction

- (c) (i) they would both reach the ground at the same time 1
 (ii) air resistance accept 'friction' 1
 (iii) **either**
 • the feather and the hammer landed at the same time 1
 there is no atmosphere **or** air resistance **or** air on the moon 1
or
 • they would take longer to fall on the moon 1
 because there is lower gravity than on the Earth 1
 do **not** accept 'there is no
 gravity on the moon'

[6]

Question 5:

- (a) any **three** from 3
 • the forces at points A and C are the same
 • at point B Pluto is nearest so experiences the greatest force
 • at point D Pluto is furthest so experiences the least force
 • the direction of the force is always towards the Sun
 accept 'the gravitational force of the Sun is
 greatest when Pluto is nearest'
 accept 'the gravitational force of the Sun is least
 when Pluto is furthest away'

- (b) (i) D, because it is furthest from the Sun 1
*both the letter and the explanation are required
for the mark*
- (ii) any **one** from 1
*both the letter and the explanation are required
for the mark*
- B, because the most potential energy has been converted to kinetic energy
 - B, because it has the least potential energy
 - B, because it is moving fastest
- accept 'B, because it is closest to the Sun'*

[5]