AQA GCSE Science Combined Foundation

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	force = spring constant x extension		1	AO1 6.5.3
01.2	2 = spring constant x 0.01 spring constant = $\frac{2}{0.01}$ = 200 (N/m)		1 1 1	AO2 6.5.3
01.3	work done = 0.5 x 200 x $(0.01)^2$ = 0.01 J		1 1	AO2 6.5.3
01.4	correct suggestion e.g., use a newtonmeter/weights to measure the extension for different forces repeat several times and find the average extension plot a graph of force against extension if the graph is a straight line then the relationship is linear		1 1 1 1	AO1 6.5.3
02.1	a vector has magnitude and direction		1	AO1 6.5.1.1
02.2	weight magnetism		1 1	AO1 6.5.1.2
02.3	e.g., water resistance/drag, upthrust/buoyancy, tension		1	AO1 6.5.1.2
03.1	←		1	AO1
03.2	no the desk is pushing up (so there are two forces)		1 1	AO3 6.5.3

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03.3	three		1	AO3 6.5.3
03.4	elastic deformation		1	AO1
04.1	newtons		1	AO2 6.5.1.3
04.2	$\frac{20+21+23}{3} = 21.3$ 21	answer given to two significant figures	1 1	AO2 6.5.1.3
04.3	one mark for correctly plotted point one mark for line of best fit		2	AO2 AO3 6.5.1.3
04.4	the weight is proportional to the mass/there is a linear relationship		1	AO3 6.5.1.3
05.1	non-contact – weight/force of the Earth on the wood		1	AO1 AO2 4.5.1.2
05.2	contact force – upthrust/upwards force of the water on the wood		1	AO1 AO2 4.5.1.2
05.3	equal opposite	do not accept 'they are balanced' or 'they cancel out'	1 1	

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05.4	water resistance contact force		1 1	AO1 AO2 4.5.1.2
06.1	mass — a measure of the amount of material in an object weight — is a measure of the force of gravity on an object	one mark for one line correct two marks for both lines correct	2	AO1 6.5.1.3
06.2	a region where the force of gravity acts		1	AO1 6.5.1.3
06.3	mass N/kg mass weight		1 1 1 1	AO1 6.5.1.3
07.1	the resultant force is the single force that has the same effect as all the forces acting together		1	AO1 6.5.1.4
07.2	zero		1	AO2 6.5.1.4
07.3	2000 N to the left		1 1	AO2 6.5.1.4
08.1	the force of the hand on the bag		1	AO2 4.5.3
08.2	inelastic deformation is deformation where the object does not return to its original shape when the force is removed		1	AO1 4.5.3

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<table>
<tr><th>Question</th><th>Answers</th><th>Extra information</th><th>Mark</th><th>AO / Specification reference</th></tr>
<tr><td>08.3</td><td><table><tr><th>Statement</th><th>Correct</th></tr><tr><td>the graph for the plastic bag shows a non-linear relationship between force and extension</td><td>✓</td></tr><tr><td>the graph for the plastic bag shows that is proportional to extension</td><td></td></tr><tr><td>a graph that is a straight line is likely to be for a spring</td><td>✓</td></tr><tr><td>the material that produced a linear graph has been inelastically deformed</td><td></td></tr></table></td><td>one mark for each correct row</td><td>2</td><td>AO3
4.5.3</td></tr>
<tr><td>09.1</td><td>2 cm = 0.02 m
elastic potential energy = $0.5 \times 2000 \times 0.02^2$
= 0.4
J (joules)</td><td></td><td>1
1
1
1</td><td>AO1
AO2
6.5.3</td></tr>
<tr><td>09.2</td><td>bigger
the elastic potential energy stored/work done is proportional to the spring constant: elastic potential energy stored = 0.5 × spring constant × extension^2; if the compression is the same but the work done is bigger, then the spring constant must be bigger</td><td></td><td>1
1</td><td>AO3
6.5.3</td></tr>
<tr><td>09.3</td><td>yes
the elastic potential energy stored in a spring is the same when it is extended by 1 cm as when compressed by 1 cm. The elastic potential energy stored is equal to the work done, so the same amount of work will be done (if the average force applied is the same).</td><td></td><td>1
1</td><td>AO2
6.5.3</td></tr>
<tr><td>10.1</td><td>work done = force × distance</td><td>accept W = Fs</td><td>1</td><td>AO1
4.5.2</td></tr>
</table>

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Question	Answers	Extra information	Mark	AO / Specification reference
10.2	work done = 20 × 30 = 600 (Nm or J)	accept 600 (Nm or J) with no working for the two calculation marks	1 1	AO2 4.5.2
10.3	friction		1	AO1 4.5.2
10.4	energy is transferred from the chemical energy store (food/oxygen) to the thermal energy store (of the surroundings)	do not accept answers involving kinetic energy	1 1	AO2 4.5.2