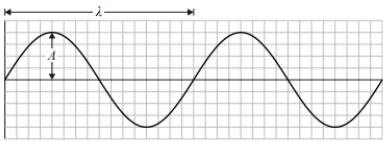
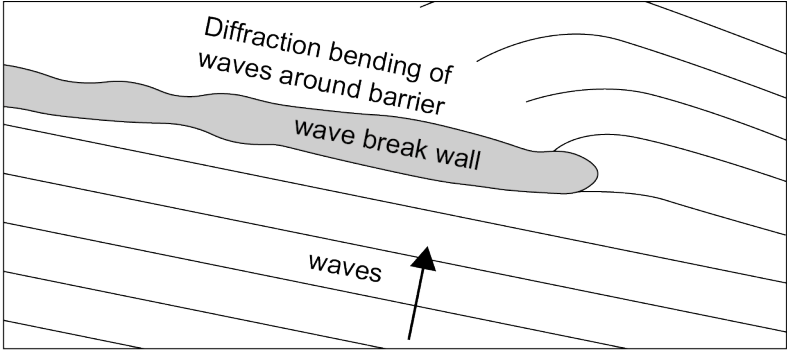
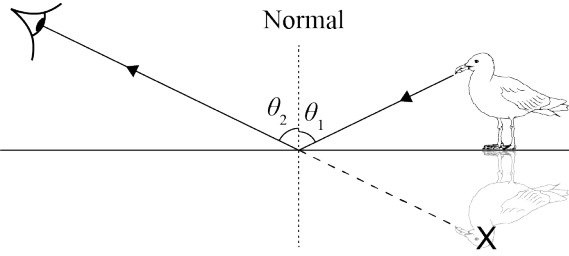


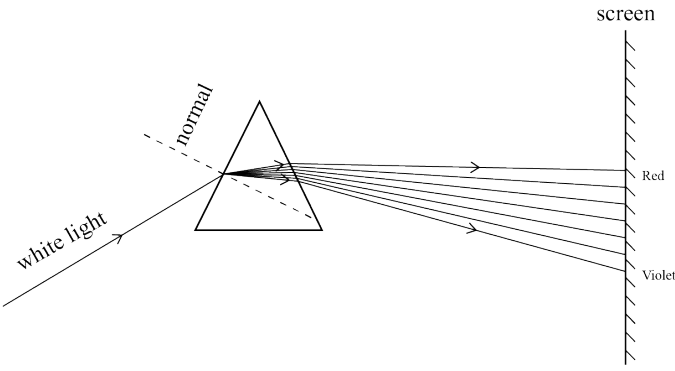
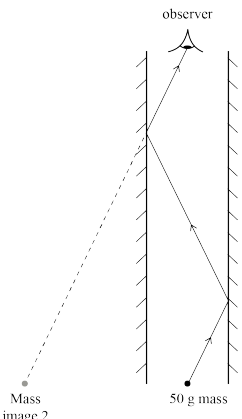
Assessment Schedule – 2018

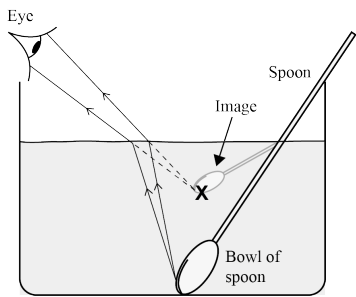
Physics: Demonstrate understanding of aspects of wave behaviour (90938)

Evidence Statement

Q	Evidence	Achievement	Merit	Excellence
ONE (a)(i) (ii)	<p>They propagate perpendicular to the direction of movement / oscillation.</p> 	<p>Correct statement OR Wavelength labelled and amplitude labelled</p>	<p>Correct statement and labels</p>	
(b)	<p>The reflected laser beam travels through a vacuum so travels faster than the transmitted laser beam which travels through glass. This is because the vacuum has a lower optical density than the glass of the beam splitter.</p>	<p>Light is faster in vacuum / slower in glass. OR Vacuum has lower optical density than glass (or vice versa).</p>	<p>Light is faster in vacuum / slower in glass because a vacuum has a lower optical density than glass (or vice versa).</p>	
(c)	$\lambda = \frac{v}{f} = \frac{3.00 \times 10^8}{3.7 \times 10^{14}}$ $\lambda = 8.1 \times 10^{-7} \text{ m (810 nm)}$	<p>Correct answer.</p>		
(d)	$d = 280 \times 4 \times 2 = 2240 \text{ km} = 2240000 \text{ m}$ $t = \frac{d}{v} = \frac{2240000}{3.00 \times 10^8} = 0.0075 \text{ s} = 7.5 \text{ ms}$	<p>Calculate correct distance. OR Solves $t = \frac{d}{v}$ correctly but uses wrong determined distance.</p>	<p>Correct answer in s.</p>	<p>Correct answer in ms.</p>

Q	Evidence	Achievement	Merit	Excellence
TWO (a)		Drawing of diffraction curving around the edge of barrier.		
(b)(i) (ii)	Diffraction. The frequency, velocity and wavelength stay the same.	States diffraction. OR The frequency, velocity and wavelength stay the same.	Full correct answer.	
(c)(i) (ii)	Frequency is the number of times a crest of a wave passes a given point / oscillations / cycles (etc) per second $f = \frac{8.00}{60.0} = 0.133333 \text{ Hz}$ $\lambda = \frac{v}{f} = \frac{10.0}{0.133333}$ $= 75.0 \text{ m (3 s.f.)}$	Correct definition of frequency. OR Correct frequency. OR Uses incorrect calculated frequency to find wavelength.	Correct wavelength. (Unit and s.f not important.)	Correct definition of frequency. AND Correct wavelength with correct unit.
(d)		Ray from bird reflecting off surface to observer shown. OR Line backtracked	Ray from bird reflecting off surface to observer and extended back to show location of image shown (angles approx. same).	

Q	Evidence	Achievement	Merit	Excellence
<p>THREE (a)</p>		<p>Rays bend in correct direction OR Red and violet labelled correctly.</p>	<p>Rays bend in correct direction AND Red and violet labelled correctly.</p>	
<p>(b)(i) (ii)</p>	<p>Angle of incidence = angle of reflection</p> 	<p>Law of reflection correct. OR Path correct.</p>	<p>Law of reflection correct. AND Ray path correct</p>	
<p>(c)(i) (ii)</p>	<p>Conditions of T.I.R.</p> <ul style="list-style-type: none"> • Light must travel from an optically denser medium to an optically less dense medium. • The angle of incidence must be greater than the critical angle. <p>The light reflects off the mirror from any angle of incidence / there is no critical angle / travelling from less optically dense to more / not all light transmitted.</p>	<p>One condition of T.I.R. correct.</p>	<p>Both conditions of T.I.R. correct. AND Correct reasoning why it does not use T.I.R.</p>	

<p>(d)(i)</p>	 <p>(ii)</p> <p>Refraction makes the spoon appear to bend. This is due to the different optical densities of water and air. Light travelling from water into air speeds up, so it bends away from the normal. We see two images of the spoon, as one refraction is coming from the top of the water to the observer, and the other image is caused by refraction from the side of the glass to the observer.</p>	<p>Refracted correctly shown OR Light bends away from the normal. OR One image from top, one from the side.</p>	<p>Drawing correct including arrows for (i). OR Light bends away from the normal AND one image from top, one from the side.</p>	<p>Drawing correct with arrows and position of 'x' for (i). AND One image from top, one from the side.</p>
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Judgement Statement

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No relevant evidence.	Very little evidence at the Achievement level. Most evidence is at the Not Achieved level.	Some evidence at the Achievement level; partial explanations.	Most evidence provided is at the Achievement level, while some is at the Not Achieved level.	Nearly all evidence provided is at the Achievement level.	Some evidence is at the Merit level with some at the Achievement level.	Most evidence is at the Merit level, with some at the Achievement level.	Evidence is provided for most tasks, with evidence at the Excellence level weak or with minor errors / omissions.	Evidence provided for all tasks. Evidence at the Excellence level accurate and full.
No evidence	1 × A	2 × A OR 1 × M OR	3 × A OR 1 × A + 1 × M 1 × E	4 × A OR 2 or 3 × A + 1 × M OR 2 × M OR 1A (or more) + 1E	1 × A + 2 × M OR 1 × M + 1 × E	2 × A + 2 × M OR 3 × M	1 × A + 1 × M + 1 × E	2 × M + 1 × E

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 13	14 – 19	20 – 24