

BIOWELSH WORKSHEET FOR WJEC GCE A LEVEL BIOLOGY
UNIT 4 – VARIATION, INHERITANCE AND OPTIONS
OPTION A IMMUNOLOGY AND DISEASE: WORKSHEET 1 (BW-A2-OptionA-W1) MARK SCHEME

GENERAL INSTRUCTIONS

Recording of marks

Mark in red ink. One tick equals one mark, except in the extended response question, where a level of response scheme is used.

Write each question total in the box at the end of the question, and copy the totals onto the grid on the front cover of the worksheet. Add them to give the worksheet total out of 160.

Marking rules

Look at all of the work. Where the scheme says working is needed, the working must be seen. Mark crossed-out work if it has not been replaced. Give credit for correct, relevant answers that are not listed in the scheme.

Extended response question

Read the whole answer first. Decide which level descriptor fits the answer best, judging the overall quality. Then choose the mark within the level: the top mark when the answer matches both the content and the communication statements well, the middle mark when most of the content is there and the communication statement is partly met, and the bottom mark when only the content statements are matched.

Marking abbreviations

cao = correct answer only
ecf = error carried forward
bod = benefit of doubt
ORA = or reverse argument
owtte = or words to that effect

Notation: / separates alternatives; { } groups alternatives within a point; words in () are not needed for the mark; underlined words are essential; (1) is one mark.

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)			(Long-term) host of a pathogen that is a (constant) source of infection / in which the pathogen lives (and multiplies) without causing disease in it (1)	1			1		
	(b)			They are infected / contain the bacteria and can pass them on, but show no symptoms (1)		1		1		
	(c)			Endemic: always present at a steady / predictable level of about 20 cases a month (1) Epidemic: a large, rapid increase above the usual number, to 310 cases in July (1)		1	1	2		
	(d)			1309 (%) (2) Award 1 mark for $(310 - 22) \div 22 \times 100$		2		2	2	
	(e)			The bacteria live and reproduce in / on the human body / the body provides them with nutrients and shelter (1)	1			1		
	(f)			Any two ($\times 1$) from: - Wear boots / waterproof clothing / gloves when in flood water (1) - Cover cuts / wounds (1) - Control rats / keep food and rubbish away from rats (1) - Provide clean drinking water / boil or treat water (1) - Early antibiotic treatment / preventive antibiotics for people exposed (1) - Public health warnings / education (1)			2	2		
				Question 1 total	2	4	3	9	2	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)			Curved rods / comma-shaped (1) Accept vibrio; reject spherical / coccus	1			1		
	(b)			2.1 μm (2) Accept 1.9 to 2.3 μm Award 1 mark for measured length of C $\div$ measured length of the scale bar ($\times$ 1 μm)		2		2	2	
	(c)			The toxin causes chloride ions to be secreted / move out of the epithelial cells into the lumen (of the small intestine) (1) This lowers the water potential of the contents of the lumen (1) Water moves out of the cells / tissues into the lumen by osmosis, so large volumes of water are lost in faeces (1)	2	1		3		
	(d)			Sodium and chloride ions / salts lost in the diarrhoea are replaced (1) Glucose is absorbed with sodium ions (by co-transport), and water follows by osmosis, so more water is absorbed (1) Accept glucose provides energy for 1 mark only if no other creditworthy point		2		2		
	(e)			Cholera is spread by the faecal-oral route / in water or food contaminated with faeces (1) Shared / overcrowded latrines and taps mean sewage easily contaminates the water supply / hands, so many people drink it (1) Accept carriers without symptoms spread it		1	1	2		
				Question 2 total	3	6	1	10	2	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)			They have a thick waxy / lipid(-rich) cell wall that retains the red stain / is not decolourised (1)		1		1		
	(b)	(i)		Positive correlation / as the percentage of overcrowded households increases, the number of TB cases increases (1)			1	1		
		(ii)		TB is spread by airborne droplets when infected people cough / sneeze (1) Overcrowding means more close contact with / more people breathing the air of infected people, so more are infected (1)		2		2		
	(c)			Some bacteria may have a mutation giving resistance to one antibiotic (1) It is very unlikely to be resistant to all of them, so it is still killed and resistant strains are not selected (1)		2		2		
	(d)			1.5 (%) (1)		1		1	1	
	(e)			Not all the bacteria are killed / the more resistant bacteria survive (1) They multiply and can be passed on to others, so a larger proportion of TB bacteria are resistant (1)			2	2		
	(f)			BCG (1)	1			1		
				Question 3 total	1	6	3	10	1	0

Question				Marking details	Marks available																				
					AO1	AO2	AO3	Total	Maths	Prac															
4	(a)			A: core containing the (viral) DNA / nucleic acid (1) B: (outer) membrane / envelope / protein coat / capsid (1)	2			2																	
	(b)			Smallpox antigenic types: one / only one (1) Influenza animal reservoir: birds / pigs / ducks (1) Smallpox symptomless infection: none / no (1) Example of a full-mark answer<table><tr><td>Feature</td><td>Smallpox</td><td>Influenza</td></tr><tr><td>Nucleic acid</td><td>DNA</td><td>RNA</td></tr><tr><td>Number of antigenic types</td><td>one</td><td>many</td></tr><tr><td>Animal reservoir</td><td>none</td><td>birds and pigs</td></tr><tr><td>People infected but without symptoms</td><td>none</td><td>yes</td></tr></table>	Feature	Smallpox	Influenza	Nucleic acid	DNA	RNA	Number of antigenic types	one	many	Animal reservoir	none	birds and pigs	People infected but without symptoms	none	yes	3			3		
Feature	Smallpox	Influenza																							
Nucleic acid	DNA	RNA																							
Number of antigenic types	one	many																							
Animal reservoir	none	birds and pigs																							
People infected but without symptoms	none	yes																							
	(c)			Smallpox had one (stable) antigenic type, so one vaccine gave lasting protection against all cases / memory cells always recognised it (1) No animal reservoir / no carriers, so once every human case was stopped the virus could not survive / every case was visible and could be isolated (1) Influenza has many antigenic types that change / mutate, and survives in birds and pigs, so it keeps returning (1)		2	1	3																	
	(d)			The contacts are the people most likely to have been / be infected next (1) Once they are immune, the virus has no one else to infect / the chain of transmission is broken (1)		2		2																	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(e)			Vaccinia has the same / very similar antigens to variola (1) So the memory cells / antibodies produced are complementary to variola antigens too, giving a fast secondary response (1)		1	1	2		
				Question 4 total	5	5	2	12	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			P: haemagglutinin (spike) / H antigen; Q: neuraminidase (spike) / N antigen; R: RNA (segment); S: (lipid) envelope / membrane All four correct = 2 marks Two or three correct = 1 mark	2			2		
	(b)	(i)		39.6 (%) (1) Accept 40		1		1	1	
		(ii)		Antigenic drift / mutations changed the H or N antigens of the circulating virus (1) After the vaccine strains had been chosen, so the vaccine did not match the circulating strain (1) So antibodies / memory cells from the vaccine were not complementary to / did not recognise the new antigens (1)		2	1	3		
	(c)			Two different subtypes infect the same (host) cell, for example in a pig (1) Their RNA segments are mixed / recombine, producing a virus with a new combination of H and N antigens (1) No one has memory cells / immunity to the new antigens, so it spreads rapidly across many countries (1)	2	1		3		
	(d)			Mucus traps viruses / particles in inhaled air (1) Cilia beat / waft the mucus up to the throat, where it is swallowed / removed (1)	2			2		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(e)			Any two ($\times 1$) from: • These groups are most likely to become seriously ill / die from influenza (1) • Limited money / vaccine, so it is given where it prevents most harm / is most cost-effective (1) • Vaccinating pregnant women also protects the baby (by antibodies crossing the placenta) (1) • Healthy adults usually recover, so vaccinating them has less benefit for the cost (1)			2	2		
				Question 5 total	6	4	3	13	1	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			W: sporozoites; X: merozoites; Y: gametocytes; Z: salivary glands All four correct = 2 marks Two or three correct = 1 mark	2			2		
	(b)			In the gut of the mosquito (1)	1			1		
	(c)	(i)		Cell R contains (several) ring-shaped parasites / purple rings or dots; cell U contains none (1)		1		1		
		(ii)		The parasites reproduce inside red blood cells in a (48-hour) cycle (1) The infected red cells burst at the same time, releasing merozoites / waste / toxins into the blood, which cause the fever (1)		1	1	2		
		(iii)		3.1×10^5 / 3.12×10^5 (2) Award 1 mark for $0.065 \times 4.8 \times 10^6$ / 312 000 not in standard form		2		2	2	
	(d)			Any three (×1) from: - There are several species / many antigenic types / strains of <i>Plasmodium</i> (1) - The antigens change / are different at each stage of the life cycle (1) - High mutation rate / antigenic variation (1) - The parasite spends much of its time inside liver cells / red blood cells, hidden from antibodies / the immune system (1) - A vaccine would need antigens from every stage / strain (1)		3		3		
				Question 6 total	3	7	1	11	2	0

Question				Marking details	Marks available																					
					AO1	AO2	AO3	Total	Maths	Prac																
7	(a)			Axes correct way round and labelled: x = year; y = malaria cases per 1000 people (1) Suitable linear scales using more than half of the grid (1) All points plotted correctly $\pm$ half a small square (1) Points joined with ruled straight lines (1) Example of a full-mark answer <table><caption>Data points for the malaria cases graph</caption><thead><tr><th>Year</th><th>Malaria cases per 1000 people</th></tr></thead><tbody><tr><td>2010</td><td>410</td></tr><tr><td>2012</td><td>400</td></tr><tr><td>2014</td><td>410</td></tr><tr><td>2016</td><td>270</td></tr><tr><td>2018</td><td>190</td></tr><tr><td>2020</td><td>175</td></tr><tr><td>2022</td><td>215</td></tr></tbody></table>	Year	Malaria cases per 1000 people	2010	410	2012	400	2014	410	2016	270	2018	190	2020	175	2022	215		2	2	4	4	2
Year	Malaria cases per 1000 people																									
2010	410																									
2012	400																									
2014	410																									
2016	270																									
2018	190																									
2020	175																									
2022	215																									
	(b)			Fell from 405 (in 2014) to 176 (in 2020) / fell by about 57 % (1) Then rose to 214 in 2022 (1)			2	2																		
	(c)			<i>Anopheles</i> mosquitoes feed / bite at night, and the net stops them biting sleeping people (1) The insecticide kills mosquitoes that land on the net, so fewer mosquitoes / vectors carry <i>Plasmodium</i> between people (1)		2		2																		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(d)			Any two (×1) from: - Mosquitoes became resistant to the insecticide (1) - Nets became damaged / worn / were not replaced / the insecticide wore off (1) - Mosquitoes began to bite earlier in the evening / outdoors (1) <i>Plasmodium</i> became resistant to antimalarial drugs (1) - More rainfall / standing water, so more mosquitoes (1)			2	2		
				Question 7 total	0	4	6	10	4	2

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8	(a)			L, M, N, K (1)		1		1		
	(b)			Host enzymes are copying / replicating the viral nucleic acid (1) Host ribosomes are making viral (capsid) proteins / the viral genes are being transcribed and translated (1)	1	1		2		
	(c)	(i)		The virus was inside the host cells, being replicated / assembled (1) No cells had burst / lysed yet, so no new particles had been released (1)		2		2		
		(ii)		200 (2) Accept 180 to 220 Award 1 mark for $10^{5.3}$ and $10^{3.0}$ / 2.0×10^5 and 1×10^3 read from the graph		2		2	2	
	(d)			The viral DNA stays inactive / latent in host (nerve) cells / is inserted into the host DNA without causing symptoms (lysogenic) (1) Later a trigger such as stress / illness / sunlight activates it, so it enters the lytic cycle and lyses cells, causing a sore (1)		1	1	2		
	(e)			They bind to (complementary) viral antigens displayed on the surface of infected cells (1) They release perforin / cause lysis of the infected cell before new virus particles are made / released (1)	2			2		
				Question 8 total	3	7	1	11	2	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
9	(a)			S (1) The number of living bacteria falls, so bacteria are being killed (whereas with R the number stays constant) (1)			2	2		1
	(b)			Penicillin inhibits the enzyme (transpeptidase) that forms cross-links between peptidoglycan chains in the cell wall (1) The wall is weakened as it continues to be broken down in growing bacteria (1) Water enters by osmosis and the cell bursts / lyses (1)	3			3		
	(c)			It blocks the A site so tRNA cannot bind / amino acids cannot be added, so protein synthesis stops (1) It binds reversibly / the bacteria are not damaged or lysed, so they stay alive but cannot grow (1)	1	1		2		
	(d)			Gram-negative bacteria have an outer membrane (of lipid / lipopolysaccharide) (1) That stops penicillin reaching the (thin) peptidoglycan / transpeptidase (1)		2		2		
	(e)			Influenza is caused by a virus, which has no cell wall / ribosomes / metabolism of its own for the antibiotics to act on (1)		1		1		
				Question 9 total	4	4	2	10	0	1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
10	(a)			Rose from 3 % in 1995 to a peak of 42 % in 2004 (1) Then fell to 6 % by 2020 (1)			2	2		
	(b)			Some bacteria had a (random) mutation giving resistance (1) Heavy use of antibiotics killed susceptible bacteria, so resistant bacteria had a selective advantage / survived (1) They reproduced, passing on the resistance allele, and spread between patients (1)		3		3		
	(c)			Plasmids can be passed between bacteria, including different species, not only to offspring (1)			1	1		
	(d)			It breaks down / hydrolyses penicillin (1) Before it can bind to / inhibit transpeptidase, so cell wall cross-links still form (1)		2		2		
	(e)			Any two (×1) from: • Better hand washing / alcohol gel / hygiene (1) • Screening patients for MRSA on admission (1) • Isolating infected patients (1) • Fewer / more careful antibiotic prescriptions (1) • Better cleaning of wards / equipment (1)			2	2		
				Question 10 total	0	5	5	10	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
11	(a)			Any three (×1) from: - Wash hands / disinfect the bench before and after (1) - Flame the neck of the culture bottle (1) - Sterilise the spreader in alcohol then flame it / use a sterile spreader (1) - Lift the lid of the dish only slightly / open it for as short a time as possible (1) - Work near a Bunsen flame / upward air current (1) - Tape the lid on (with two pieces of tape, not sealed all round) (1)	3			3		3
	(b)			It is a control, to show that the paper disc / water alone does not stop growth, so any clear zone is due to the antibiotic (1)		1		1		1
	(c)			452 mm ² (2) Award 1 mark for $3.14 \times 12^2 / r = 12$ mm Answer not to 3 significant figures = 1 mark		2		2	2	
	(d)			Antibiotic C is the most effective against <i>B. subtilis</i> / has the largest zone (1) All four antibiotics B to E inhibit growth / the bacteria are not resistant to any of them (1) Accept D is least effective			2	2		1
	(e)			Any two (×1) from: - Concentration / mass of antibiotic on each disc (1) - Size of disc / volume of solution soaked up (1) - Volume / density of bacterial culture spread (1) - Type / depth / volume of agar (1) - Time the discs were soaked (1)			2	2		2
	(f)			37 °C is close to human body temperature, so it could encourage the growth of (contaminating) human pathogens (1)	1			1		1
				Question 11 total	4	3	4	11	2	8

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
12	(a)			Mix 5 cm ³ of the tube 1 solution (64 µg cm ⁻³) with 5 cm ³ of sterile broth (1) This is a 1 in 2 / doubling dilution, which halves the concentration to 32 µg cm ⁻³ (1)		2		2		2
	(b)			4 µg cm ⁻³ (1)		1		1		
	(c)			Broth and bacteria with no antibiotic (1) To show that the bacteria are alive / can grow in the broth, so clear tubes are due to the antibiotic (1)			2	2		2
	(d)			110 mg (2) Award 1 mark for 15 × 22 = 330 mg per day		2		2	2	
	(e)			4.4 cm ³ (1) ecf from (d)		1		1	1	
	(f)			Any two (×1) from: - It reaches the blood / infected tissue faster (1) - A higher concentration in the blood is reached / above the MIC (1) - It is not broken down by stomach acid / enzymes (1) - It is not lost by vomiting / diarrhoea / poor absorption from the gut (1)		1	1	2		
				Question 12 total	0	7	3	10	3	4

Question				Marking details	Marks available															
					AO1	AO2	AO3	Total	Maths	Prac										
13	(a)			Tears contain lysozyme, which breaks down (peptidoglycan in) bacterial cell walls (1) Mucus traps microorganisms and cilia move it up to the throat / away from the lungs (1) Acid / low pH kills (most) microorganisms in food / denatures their enzymes (1) Example of a full-mark answer <table><tr><th>Barrier</th><th>How it reduces the risk of infection</th></tr><tr><td>Skin</td><td>a tough layer of dead cells containing keratin that microorganisms cannot pass through</td></tr><tr><td>Tears</td><td>contain lysozyme, which breaks down bacterial cell walls</td></tr><tr><td>Mucus and cilia in the trachea</td><td>mucus traps microorganisms and cilia sweep it up to the throat</td></tr><tr><td>Hydrochloric acid in the stomach</td><td>the low pH kills most microorganisms swallowed with food</td></tr></table>	Barrier	How it reduces the risk of infection	Skin	a tough layer of dead cells containing keratin that microorganisms cannot pass through	Tears	contain lysozyme, which breaks down bacterial cell walls	Mucus and cilia in the trachea	mucus traps microorganisms and cilia sweep it up to the throat	Hydrochloric acid in the stomach	the low pH kills most microorganisms swallowed with food	3			3		
Barrier	How it reduces the risk of infection																			
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	(b)			Damaged cells release histamine (1) Arterioles dilate, so more blood reaches the area (redness, warmth) (1) Capillaries become more permeable / leaky, so fluid and phagocytes / white blood cells move into the tissue (swelling) (1) Accept higher temperature slows bacterial growth for 1 mark	2	1		3												
	(c)	(i)		T: phagosome / (phagocytic) vacuole / vesicle; V: lysosome; N: (lobed) nucleus All three correct = 2 marks Two correct = 1 mark	2			2												

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		It fuses with the phagosome / T (1) Releasing (hydrolytic) enzymes / lysozyme that digest / hydrolyse the bacterium (1)	2			2		
		(d)		It allows T helper cells with complementary receptors to bind / recognise the antigen (1) They are activated and release cytokines that stimulate B cells / T killer cells (clonal selection) (1)		2		2		
				Question 13 total	9	3	0	12	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
14	(a)			E: antigen binding site; F: variable region (of light chain); G: disulphide bridge / bond; H: constant region (of heavy chain) All four correct = 2 marks Two or three correct = 1 mark	2			2		
	(b)			The variable region has a specific amino acid sequence / tertiary structure (1) So the antigen binding site has a shape complementary to the (toxoid / toxin) antigen only (1)	2			2		
	(c)			Any three (×1) from: • Macrophages engulf the toxoid and present the antigen (1) • T helper cells with complementary receptors bind and release cytokines (1) • The B cell with a complementary receptor / antibody is selected / activated (clonal selection) (1) • It divides by mitosis (clonal expansion) (1) • Forming plasma cells that secrete antibodies, and memory cells (1)	3			3		
	(d)			After the second dose antibody appears more quickly / shorter latent period (1) It reaches a much higher concentration and stays high for longer (1) Because memory cells made after the first dose recognise the antigen and divide rapidly into plasma cells (1)		2	1	3		
	(e)			The antibodies give immediate (passive) protection / neutralise the toxin at once, during the latent period of the (primary) response (1) The vaccine gives long-term (active) immunity because memory cells are made, whereas injected antibodies are soon broken down (1)		2		2		
				Question 14 total	7	4	1	12	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
15				Indicative content	3	3	3	9		
				A How MMR gives long-lasting protection A1 The vaccine contains live, attenuated (weakened) viruses with the antigens of measles and rubella, so it causes an immune response without the disease A2 Antigens are presented by macrophages; T helper cells release cytokines, activating B cells with complementary receptors (clonal selection) A3 Clonal expansion produces plasma cells that secrete antibodies, and memory cells A4 Memory cells remain for years; on infection they give a fast, large secondary response, so the virus is destroyed before symptoms develop A5 The second dose acts as a booster, producing a secondary response and more memory cells, and protects children who did not respond to the first dose A6 Measles and rubella each have one (stable) antigenic type, so the protection lasts A7 The first dose is not given before 12 months because antibodies from the mother (passive immunity) could destroy the vaccine viruses						

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				B Uptake, cases and herd immunity B1 Uptake was always below the 95 % target, rising to 92.5 % in 2012 to 2013 and then falling to about 87 % by 2023 B2 Cases were lowest (fewer than 150) in 2014 to 2015, when uptake was highest, and rose again (about 1000 in 2018) as uptake fell B3 Cases were very high in 2012 to 2013 even though uptake of young children was high, suggesting infection of older children and young adults who missed vaccination in the early 2000s B4 Herd immunity: when a high enough proportion is immune, an infected person is unlikely to meet anyone susceptible, so the chain of transmission is broken and unvaccinated people are protected B5 Measles is so infectious that about 95 % must be immune; below this, outbreaks can spread among unvaccinated people B6 Very low cases in 2020 to 2022 may reflect fewer contacts / less travel, not higher uptake; the data show a correlation, and other factors affect cases						
				C Ethical issues of compulsory vaccination C1 Individual rights / autonomy: people, or parents on behalf of children, have the right to choose medical treatment C2 The vaccine is very safe, but rare side effects occur, and a government would be forcing a small risk on healthy children C3 Some people cannot be vaccinated, for example those with weakened immune systems or severe allergies, so exemptions would be needed C4 Religious or personal beliefs, and mistrust caused by misinformation, may be increased by compulsion C5 Unvaccinated people put others at risk, including babies, people who cannot be vaccinated and the fetuses of pregnant women (rubella) C6 Alternatives such as education, reminders or requiring vaccination for school entry may raise uptake without compulsion; cost and fair access must be considered						

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				7-9 marks Indicative content of this level is detailed information from all three lists. The candidate constructs an articulate, integrated account, correctly linking relevant points in a logical sequence. The answer fully addresses the question with no irrelevant inclusions or significant omissions. Scientific conventions and vocabulary are used appropriately and accurately.						
				4-6 marks Indicative content of this level is detailed information from two of the lists, or less detail from all three. The candidate constructs an account correctly linking some relevant points, showing some reasoning. The answer addresses the question with some omissions. Scientific conventions and vocabulary are usually used appropriately and accurately.						
				1-3 marks Indicative content of this level is some information from at least one of the lists, or a little information from more than one. The candidate makes some relevant points, showing limited reasoning. The answer addresses the question with significant omissions. Use of scientific conventions and vocabulary is limited.						
				0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.						
				Question 15 total	3	3	3	9	0	0

UNIT 4: VARIATION, INHERITANCE AND OPTIONS, OPTION A
SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	2	4	3	9	2	0
2	3	6	1	10	2	0
3	1	6	3	10	1	0
4	5	5	2	12	0	0
5	6	4	3	13	1	0
6	3	7	1	11	2	0
7	0	4	6	10	4	2
8	3	7	1	11	2	0
9	4	4	2	10	0	1
10	0	5	5	10	0	0
11	4	3	4	11	2	8
12	0	7	3	10	3	4
13	9	3	0	12	0	0
14	7	4	1	12	0	0
15	3	3	3	9	0	0
TOTAL	50	72	38	160	19	15



A Tutor Meets Tutee project

BioWelsh mark scheme BW-A2-OptionA-W1 (MS). Not an official WJEC mark scheme.

