Scheme of Work 2020-2021
Subject: Biology

Year Group: 12 Autumn term 2
Specification: AQA

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary	Planned Assessment	Homework or flipped learning resources DODDLE resources	Lit Num SMSC Codes
1	**3.2.3 Transport across cell membranes** The fluid mosaic model of cell membranes, including the arrangement of phospholipids, proteins, glycoproteins and glycolipids. The role of cholesterol	• Describe the arrangement of proteins, glycoproteins, glycolipids, phospholipids and cholesterol in the fluid mosaic model of membrane. • Explain the roles/importance of the constituent parts of the membrane. Relate the structure of the membrane to its role around/inside cells.	**Learning activities:** • questioning to recap the structure and properties of phospholipids (from section 3.1.3) • rainstorm the roles played by the plasma membrane eg selectively permeable, cell signalling etc • teacher led explanation of the role of the plasma membrane, including cholesterol and the role of extrinsic and intrinsic proteins. A 3D model or animation can be used here • reinforce concept by modelling the fluid and 3-D nature of membranes by half filling a tray with water, adding in marshmallows (representing phosphate heads of phospholipids) and coloured polystyrene chunks (representing the other components, eg proteins and glycoproteins, which float) • exam questions. **Skills developed by learning activities:**	**Specimen assessment material:** AS Paper 1 (set 1) – Q7.5–7.7 **Exampro:** BYB1 – June 2006 Q2 BYB1 – Jan 2006 Q7a BYB1 – Jan 2005 Q4a–b BYB1 – June 2004 Q3a BYB9 – Jan 2004 Q2a	**Flipped learning opportunities** Transport across cell membrane checklist glencoe.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::550::400::/sites/dl/free/0078802849/383931/Plasma_Membrane_The_Fluid_Mosaic_Model.swf::The%20Fluid%20Mosaic%20Model teach.genetics.utah.edu/content/begin/cells/print/BuildAMembrane.pdf **Rich questions:** Explain how the structure of the membrane relates to its role as being partially permeable.	C1,C3,Sp2

			• PS 1.2 – apply knowledge about the role of cholesterol to practical data about membrane fluidity AO1/AO2 – application of knowledge and understanding from Section 3.1.3 to understand the structure and function of plasma membranes.		**<u>Flipped learning opportunity</u>** PiXL Independence: Biology – Student Booklet KS5 – Exchange and Transport	
2	**Required practical 4:** Investigation into the effect of a named variable on the permeability of cell-surface membranes.	• Identify key variables which affect membrane permeability. • Represent raw and processed data clearly using tables and graphs. • Apply knowledge of the fluid mosaic model to suggest how temperature/ alcohol affects membrane permeability. • Evaluate the quality of results and reliability of conclusions.	**Learning activities:** students design an experiment to investigate the effect of a named variable eg temperature or alcohol concentration on membrane permeability. This could include: • working through key aspects of experimental design eg key variables • carrying out (subject to teacher approval) • processing and presentation of data. **Skills developed by learning activities:** • AT b – use a colorimeter to record quantitative measurements • PS 1.1 – design an experiment, based on research, to test a hypothesis • PS 1.2 – apply scientific knowledge to practical contexts • PS 2.4 – identify key variables which affect membrane permeability • PS 2.2/PS 3.1/MS 3.2/MS 1.3 – plot the experimental data in an appropriate format • PS 2.3 – evaluate data for errors and uncertainties • PS 4.1 – understand how a colorimeter works and how to interpret results from colorimetry	Students could undertake the BIO3T ISA Q from 2010	cleapss.org.uk nuffieldfoundation.org/practical-biology/investigating-effect-temperature-plant-cell-membranes	Sp7,Sp2

			• MS 0.1/MS 0.2 – use and convert units for concentration • MS 1.9 – select (and use) an appropriate statistical test. • 8.4.2.1, 8.4.2.2, 8.4.2.3 and 8.4.2.4 • AO1/AO2 – application of knowledge to explain trends and to understand the technique of colorimetry AO3 – develop and refine practical design.			
3	The movement of water across partially permeable membranes by osmosis. The concept of water potential.	• Define osmosis in terms of water potential. • Explain the movement of water due to osmosis into or out of cells. • Explain the effect of osmosis on plant and animal cells.	**Learning activities:** • teacher explanation of osmosis and water potential to arrive at an A-level definition • jigsaw learning: working in teams of three, one student goes to each information station to discover about the effect of placing plant and animal cells in solutions with different water potentials (the terms hypotonic, hypertonic and isotonic are not specification terms) • students feedback to one another • teacher assessment and explanation to address areas of weakness • exam questions. **Skills developed by learning activities:** • AT d/AT e – use an optical microscope to examine and draw onion cells • AO1 – development of knowledge of osmosis and water potential • AO2 – application of knowledge and understanding of osmosis 8.4.2.2 and 8.4.2.4	**Past exam paper material:** HBI3T 2014 EMPA Students could undertake the BIO3T ISA P from 2012 Microscopy to observe and draw plasmolysis and turgor (terms no required) in onion cells. Red onion or rhubarb petiole give clear results. Ask students to explain using GCSE knowledge.	nuffieldfoundation.org/practical-biology/observing-osmosis-plasmolysis-and-turgor-plant-cells cleapss.org.uk highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__how_osmosis_works.html **Rich question:** Present diagrammatic representation of cells with numerical water potentials and ask students to represent the net movement of water with arrows between cells.	C1,C3,Sp 2

4	**Required practical 3** Production of a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue.	• Explain what a dilution series is and produce one from stock solutions. • Apply knowledge to explain how the water potential of a plant tissue can be experimentally determined. • Represent raw and processed data clearly using tables and graphs. • Process data to calculate percentage gain/loss. • Apply knowledge to explain trends in graphs in relation to osmosis, water potential and mass change. • Explain the usefulness of calibration curves or standards. Evaluate the results and conclusions.	**Learning activities:** Students conduct an experiment to identify the water potential of plant tissue. This should include: • research into methods • carrying out • processing and presentation of data • evaluation and explanation findings • a past ISA paper (relevant to practical). **Skills developed by learning activities:** • AT c – use glassware to produce serial dilutions • MS 0.1/0.2 – use and convert concentrations between standard and ordinary form • MS 0.3 – calculate percentage change in mass • PS 1.1 – design an experiment, based on research, to test a hypothesis • PS 2.2/MS 3.1/MS 3.2/MS 1.3 – plot the experimental data in an appropriate format (tables and graphs) • PS 4.1 – use calibration curves • MS 1.9 – select (and use) an appropriate statistical test • MS 3.4 – determine the water potential of plant tissues using the intercept of a graph of water potential of solution against gain/loss of mass • 8.4.2.1, 8.4.2.2. 8.4.2.3 and 8.4.2.4 • AO1/AO2 – application of knowledge to explain trends and to understand serial dilutions AO3 – develop and refine practical design and analyse data to draw conclusions.	Students could undertake the investigations/ questions from the following ISAs: BIO3T P14 BIO3T Q09 HBI3T P10 HBI3T P12 **Specimen assessment material:** AS Paper 1 (set 1) – Q8 **Past exam paper material:** BIOL1 Jan 2009 – Q3 BIOL1 Jan 2011 – Q5 BIOL1 Jan 2010 – Q5	cleapss.org.uk nuffieldfoundation.org/practical-biology/investigating-effect-concentration-blackcurrant-squash-osmosis-chipped-potatoes	Sp7,Sp2

5	Movement of molecules and ions down concentration gradients by simple diffusion or facilitated diffusion.	• Define what is meant by diffusion and facilitated diffusion. • Explain the process of facilitated diffusion. • Identify which substances rely on facilitated diffusion and why they cannot enter/leave cells by diffusion. • Interpret data to identify when a substance is moving by facilitated diffusion or diffusion.	**Learning activities:** • students observe diffusion using agar cubes containing phenolphthalein. Place in dilute NaOH solution for 5–10 minutes and cut the cubes open to show where NaOH has diffused to. This could be conducted with different concentrations to highlight diffusion gradients • teacher explanation of factors which affect the rate of diffusion • teacher explanation of why water-soluble molecules cannot pass across the phospholipid bilayer by diffusion. Introduce facilitated diffusion and the role of channel and carrier proteins. Use animations and video clips to support • discuss some data showing data on facilitated diffusion and ask students to explain trends. Model an answer. **Skills developed by learning activities:** • AO1 – development of knowledge and understanding of facilitated diffusion • MS 1.3/AO3 – interpret data from a variety of tables and graphs AO2/AO3/PS 1.2 – apply knowledge of diffusion to explain trends in experimentally derived data on the movement of molecules and ions.	**Exampro:** BYA1 – Jan 2005 Q5 BYA1 – June 2004 Q6	highered.mheducation.com/sites/9834092339/student_view0/chapter5/how_facilitated_diffusion_works.html cleapss.org.uk **Rich question:** Show students a list of substances and ask them to categorise those which can diffuse by simple diffusion and those that cannot.	C1,C3,Sp2
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7	Movement of molecules and ions against concentration gradients by active transport.	• Define what is meant by active transport. • Explain the process of active transport. • Compare and contrast active transport and facilitated diffusion. • Interpret data to identify when a substance is being actively transported.	**Learning activities:** • teacher explanation of active transport, using animations and video clips to support • discuss some data showing data on active transport and ask students to explain trends. Model an answer. • exam questions. **Skills developed by learning activities:** • AO1 – development of knowledge and understanding of facilitated diffusion • AO3/MS 1.3 – interpret data about active transport from a variety of tables and graphs • AO2/PS 1.2 – apply knowledge of active transport to explain trends in experimentally derived data on the movement of molecules and ions.	**Specimen assessment material:** A-level Paper 1 (set 1) – Q5 AS Paper 2 (set 1) – Q2 **Past exam paper material:** BIOL1 June 2013 – Q5 BIOL1 June 2012 – Q4 BIOL1 June 2011 – Q5 **Exampro:** BYB1 – Jan 2006 Q7b	nuffieldfoundation.org/practical-biology/tracking-active-uptake-minerals-plant-roots highered.mheducation.com/sites/9834092339/student_view0/chapter5/primary_active_transport.html cleapss.org.uk **Rich questions:** • Why do poisons that inhibit respiration, result in active transport stopping? Suggest why overwatering of plants can kill the plants.	C1,C3,Sp2
8	The adaptations of cells for rapid transport across internal and external membranes The roles played by proteins.	• Explain the adaptations of specialised cells maximising the rate of transport across their internal and external membranes (could be linked to Fick's law). Explain how surface area, number of channel or carrier proteins and differences in gradients	**Learning activities:** • questioning to assess understanding of adaptations to increase rate of diffusion • calculate surface area: volume ratio of cells with folds, when supplied with appropriate data. (Could address with section 3.3.1) • exam questions. **Skills developed by learning activities:**	**Past exam paper material:** BIOL1 June 2011 Q8b	**Rich questions:** • what does Fick's law state? • what common adaptations do cells of exchange surfaces have?	Sp7,Sp2

	The biuret test for proteins.	of concentration or water potential affect the rate of movement across cell membrane	• AT d – use optical microscopes to observe cells that are adapted for rapid exchange eg root hair cells, epithelial cells of the small intestine • MS 0.3/MS 4.1 – calculate surface area: volume ratios of cells • extended exam answers. • Microscopy of cells that have adaptations for exchange. Ask pupils to identify and explain these adaptations. • Teacher led explanation based on feedback.			
9	Movement of molecules and ions against concentration gradients by co-transport.	• Describe the adaptations of small intestine epithelial cells for absorption. • Define what is meant by co-transport. Explain the process of co-transport in the context of absorption of glucose (and amino acids).	**Learning activities:** • DARTS task – students convert comprehension on co-transport into a diagrammatic representation of the process and then present to group • peer evaluation of presentation • teacher explanation to address weak areas of presentations • provide data showing a range of different transport processes and ask pupils to identify the transport process from the data to summarise this section of the specification exam questions. **Skills developed by learning activities:** • AO1 – development of knowledge and understanding of co-transport • AO2/PS 1.2 – apply knowledge of transport processes to explain data and identify the transport process being used • extended exam answers.	Questions from Section B of the 2014 BIO3T Q14 ISA **Past exam paper material:** BIOL1 Jan 2013 – Q9a BIOL1 June 2010 – Q7a BIOL1 Jan 2010 – Q4	**Rich questions:** • describe the process of co-transport. • how does co-transport differ from direct active transport?	C1,C3,Sp 2

10	**3.2.4 Cell recognition and the immune system** The definition of an antigen. These molecules allow the immune system to identify pathogens, cells from other individuals, abnormal body cells and toxins.	• Explain what is meant by an antigen and the types of molecules which can act as antigens. • Explain why antigen recognition is important for the immune system. • Identify cells which the immune system would launch an immune response against.	**Learning activities:** • assess GCSE recall and understanding • define an antigen and explain which types of molecules usually act as antigens • explain importance of antigens in identification by the immune system • discuss with students that abnormal cells of the body can produce antigens which would initiate an immune response eg cancer cells • exam question. **Skills developed by learning activities:** AO1 – Development of knowledge and understanding of antigens and their importance.	**Specimen assessment material:** A-level Paper 3 (set 1) – Q4 **Exampro:** BYA3 – June 2006 Q1a	**Rich questions:** • efine what an antigen is. xplain why the surface molecules of some cells act as antigens. **Flipped learning opportunity** PiXL Independence: Biology – Student Booklet KS5 – Health and disease	C1,C3,Sp 2
11	Phagocytosis of pathogens. The subsequent destruction of ingested pathogens by lysozymes.	• Describe the process of phagocytosis. • Explain the role of lysozymes in the destruction of pathogens. • Explain the role of antigen presentation following destruction.	**Learning activities:** • teacher introduction to the concept of non-specific and specific immune responses and phagocytosis • exam questions. **Skills developed by learning activities:** • AO1 – development of knowledge and understanding of phagocytosis extended exam answers	**Past exam paper material:** BIOL1 June 2011 Q8a BIOL1 June 2012 Q5a and 5b; BIOL1 Jan 2009 Q5a	dnatube.com/video/116/Neutrophil-attacts-on-bacteria highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__phagocytosis.html **Rich questions:**	C1,C3,Sp 2

					• Describe the process of phagocytosis from start to finish.	
12	The response of T lymphocytes to a foreign antigen (the cellular response). The role of antigen-presenting cells in the cellular response. **B** The role of helper T cells (T_H cells) in stimulating cytotoxic T cells (T_C cells), B cells and phagocytes.	• Explain what is meant by the specific immune response. • Explain the cell-mediated (cellular) immune response. • Explain the roles played by helper T cells.	**Learning activities:** • define the circumstances under which the cell mediated immune response is used • teacher explanation of the cell mediated immune response in detail (linked to antigen presentation and the role of TH and TC cells), use videos and animations to support • get students to write an essay on the cell mediated response. **Skills developed by learning activities:** AO1 – development of knowledge and understanding of the cell mediated response.		highered.mheducation.com/sites/0072507470/student_view0/chapter22/animation__the_immune_response.html sbs.utexas.edu/psaxena/MicrobiologyAnimations/Animations/Cell-MediatedImmunity/micro_cell-mediated.swf highered.mheducation.com/sites/0072495855/student_view0/chapter24/animation__the_immune_response.html **Rich questions:** Why is the cell-mediated response able to destroy body cells that have turned cancerous?	So5,Sp2 M2
13	The definition of an antibody. The structure of an antibody. The formation of	• Relating previous knowledge of protein structure, describe the structure of antibodies. • Explain the specificity of an antibody to a particular antigen.	**Learning activities:** • questioning about protein structure and the roles of proteins • teacher definition of an antibody • highlighting exercise about how antibodies bind to and lead to the destruction of pathogens that have complementary antigens (specification only requires	**Past exam paper material:** BIOL1 Jan 2012 – Q6 HBIO1 – June 12 Q4a **Exampro:**	**Rich questions:** • Define what an antibody is. • Explain the importance of the variable region of antibodies.	So5,Sp2 M2

	antigen-antibody complexes and the subsequent destruction of pathogens.	Explain how antibodies lead to the destruction of pathogens	agglutination and destruction by phagocytosis). Students can also generate their own questions that they would like answered • show students antibody structure and explain variable and constant regions and how the antigen binding site means specificity for one antigen • exam questions. **Skills developed by learning activities:** AO1 – development of knowledge and understanding of the antibody structure and how antibodies lead to the destruction of pathogens	Specimen paper Unit 1 Q2	Explain the structure of antibodies in terms of the hierarchy of protein structure	
14	The response of B lymphocytes to a foreign antigen, clonal selection and the release of monoclonal antibodies (the humoral response). The roles of plasma cells and of memory cells in producing primary and secondary	• Explain the humoral (antibody-mediated) immune response. • Explain what is meant by a monoclonal antibody. Explain the roles of plasma cells in producing a primary response and memory cells in producing a secondary response	**Learning activities:** • teacher explanation of the humoral immune response in detail (linked to antigen presentation and the roles of B lymphocytes and of TH cells), Use videos and animations to support • card sort – provide statements which students categorise as humoral, cell mediated or both • provide data on the antibody concentrations in the blood after a primary and secondary response. Ask students to explain and ask for improvements to statements such as "the body knows how to fight it off in the secondary response" • exam questions. **Skills developed by learning activities:**	**Past exam paper material:** HBIO1 – June 2012 Q4b	highered.mheducation.com/sites/0072507470/student_view0/chapter22/animation__the_immune_response.html sbs.utexas.edu/psaxena/MicrobiologyAnimations/Animations/HumoralImmunity/micro_humoral.swf **Rich questions:** • Would the humoral response be used during a viral infection? Explain your answer.	So5,Sp2 M2

	immune responses		• AO1 – development of knowledge and understanding of the humoral response AO2 – application of knowledge on the humoral response to explain data on antibody concentrations during the primary and secondary immune responses.		• Why does the secondary immune response mean that pathogens are destroyed before they are able to make you ill?	
15	The effect of antigen variability on disease and disease prevention.	• Explain that antigen variability can lead to some diseases being caught more than once. • Explain how mutations can cause antigen variability and how this can cause new strains of pathogen. Explain the consequences of antigen variability on the incidence of disease and the development of therapies against that disease.	**Learning activities:** • teacher led introduction to antigenic variability through gene mutation • students examine information about past epidemics/ pandemics eg influenza outbreaks over the last century and why periodically some are so serious • students could research the modern focus on disease prevention using internet materials and why recent outbreaks eg avian and swine flu, have attracted such media focus • teacher summary could bring together their findings and discuss the consequences of antigen variability of disease prevention and treatments. **Skills developed by learning activities:** • MS 0.3 – calculate and understand the use of percentages or values per 100 000 when looking at data within populations • AO1 – development of knowledge and understanding of antigen variability and its consequences	**Exampro:** BYB7 June 2004 Q6 HBIO1 – June 2012 Q2	newscientist.com/topic/bird-flu bigpictureeducation.com/epidemics bigpictureeducation.com/influenza-special-issue **Rich questions:** • Suggest why we can suffer from some diseases multiple times, but we get others only once and are then immune. • Why is it so difficult to develop a vaccine against the common cold or HIV? • Why have many animal flu viruses eg bird flu, made the news so often in recent years? During recent flu outbreaks, the	So5,Sp2 M2

			AO2 – application of knowledge of antigen variability to the context of recent outbreaks of influenza (and other diseases).		government invested in Tamiflu drugs to protect the population in the event of a pandemic. Was this a wise decision?	
16	The differences between active and passive immunity. The use of vaccines to provide protection for individuals and populations against disease. The concept of herd immunity. Ethical issues associated with the use of vaccines.	• Compare and contrast active and passive immunity and apply knowledge to given examples. • Describe how antigens can be used to produce a vaccine. • Explain why vaccination is able to protect against diseases caused by particular pathogens. • Explain what is meant by herd immunity and why it is able to protect unvaccinated individuals in a population • Discuss ethical issues associated with the use of vaccines Evaluate methodology, evidence and data relating to the use of vaccines.	**Learning activities:** • teacher introduction to active and passive immunity. Get students to categorise rich question statements • teacher explanation of concept of vaccination and the types of vaccines which are used/in development • debate the ethical issues of the use of vaccines with students given different viewpoints to discuss • provide structured questions for students to analyse the data against. **Skills developed by learning activities:** • MS 0.3 – understand the use of, percentages or values per 100,000 when looking at disease data • AO1 – development of knowledge of vaccines AO3 – evaluate scientific evidence.	**Specimen assessment material:** AS Paper 2 (set 1) – Q10.1 and 10.2 **Past exam paper material:** BIOL1 June 2013 – Q7 BIOL1 Jan 2012 – Q8a BIOL1 Jan 2011 – Q6 BIOL1 June 2009 – Q4 BIOL1 June 2010 – Q4	bigpictureeducation.com/herd-mentality **Rich questions:** Provide statements and ask students to identify them as relating to active immunity, passive immunity or both, eg: • antibodies rapidly produced on re-infection by same pathogen • an antibody reacts with an antigen • antibodies received in breast milk • attenuated microorganisms in a vaccine.	So5,Sp2 M2
17	Structure of the human immunodeficiency virus (HIV) and its replication in helper T cells.	• Describe the structure of ATP. • Explain the role of enzymes in hydrolysing and synthesising ATP. Explain the significance of ATP in numerous	**Learning activities:** • teacher explanation of the structure and significance of ATP and the enzymes required to hydrolyse/synthesis ATP • exam questions. **Skills developed by learning activities:**	**Past exam paper material:** BIOL4 Jan 2012 – Q8a BIOL4 June 2011 – Q1b–1c	**Rich questions:** • explain why ATP is such an important molecule evaluate the statement "when ATP is hydrolysed, it	So5,Sp2 M2

		processes within organisms, as a supplier of energy or phosphate	• AO1 – development of knowledge and understanding of scientific ideas and processes extended exam answers. • Students circulate round information posters containing simplified descriptions of ATP driven processes within Biology (that they will come across later in the course) eg active transport, muscle contraction. Provide question sheets for students to find the answers to • Collate findings Produce a concept map grouped around whether the ATP is providing energy and/or phosphorylating compounds to increase reactivity.		makes energy for cellular processes to occur".	
18	How HIV causes the symptoms of AIDS.	• Describe the structure of a HIV particle • Explain how the structure of a HIV particle enables it to infect and replicate within a helper T cell • Explain the distinction between being HIV positive and developing AIDS • Explain how HIV causes the symptoms of AIDS Explain why antibiotics are ineffective against viruses (link to cell structure).	**Learning activities:** • show data about HIV infection rates and AIDS sufferers in different countries and ask students to explain the trends and the difference between HIV and AIDS based on the knowledge they have • show HIV structure • video on HIV lifecycle • teacher explanation to reinforce replication cycle and explain that antibiotics are ineffective against viruses. This could be extended to look at the low number of antiviral drugs compared with those that work against bacteria • revisit earlier graphs and refine ideas • exam questions. **Skills developed by learning activities:**	**Past exam paper material:** BIOL1 Jan 2013 – Q8 HBIO1 – June 2014 Q6 HBIO1 – Jun 2009 Q8	wellcome.ac.uk/Education-resources/Education-and-learning/Resources/Animation/WTDV026676.htm hhmi.org/biointeractive/hiv-life-cycle dnadarwin.org/casestudies/7/ highered.mheducation.com/sites/0072495855/student_view0/chapter24/animation__hiv_replication.html **Rich questions:** • Why are so few anti-viral drugs licensed	So5,Sp2 M2

			• MS 0.3 – calculate and understand the use of percentages or values per 100 000 when looking at data within populations • AO1 – development of knowledge of HIV and AIDS and the replication of HIV AO2/AO3 – interpret scientific data (graphs) and apply knowledge to explain them		for human use compared with the number against other types of pathogen? What is the difference between being HIV positive and having AIDS?	
19	The use of monoclonal antibodies in: targeting medication at particular cell types, medical diagnosis and ELISA. Ethical issues associated with the use of monoclonal antibodies.	• Explain how the specificity of monoclonal antibodies can be used in medical diagnosis and targeting of medication at particular cell types. • Explain the use of monoclonal antibodies in the ELISA technique. Interpret information to explain the	**Learning activities:** • introduce what is meant by monoclonal antibodies and the usefulness of their specificity for a particular antigen • teacher explanation of ELISA using animations • exam questions showing monoclonal antibody uses in different contexts. **Skills developed by learning activities:** • AO1 – development of knowledge of monoclonal antibodies and their uses • AO2 – application of knowledge of monoclonal antibodies to the contexts given in exam questions.	**Specimen assessment material:** A-level Paper 1 (set 1) – Q7 AS Paper 2 (set 1) – Q8 **Past exam paper material:** BIOL1 June 2009 – Q5 BIOL1 Jan 2010 – Q6	sumanasinc.com/webcontent/animations/content/ELISA.html **Rich question:** What property of monoclonal antibodies makes them so useful in diagnostic testing?	So5,Sp2 M2