

Learning Plan 2		Subject/Pwnc: Science – Double Applied (Unit 2)	Year/Blwyddyn: 10
<p><u>The Four Purposes in Science and Technology:</u></p> <p>Ambitious, capable learners, who: set themselves high standards; seek and enjoy challenge; are increasingly knowledgeable and skilful; ask questions; enjoy solving problems; can explain ideas and concepts; can use number effectively in different contexts; interpret data and apply mathematical concepts; use digital technologies creatively to communicate, find and analyse information; research and evaluate critically what they find.</p> <p>Enterprising, creative contributors, who: take measured risks.</p> <p>Ethical, informed citizens, who: find, evaluate and use evidence in forming views; consider the impact of their actions when making choices and acting; are committed to sustainability.</p> <p>Healthy, confident individuals, who: are establishing their ethical beliefs; face and overcome challenge.</p>			
<p>Knowledge focus/what matters: Understand that human health is affected by several factors, understand what genes are and how genetic information should be used. Understand the effect of lifestyle choices. Understand what techniques are available to image human tissue and diagnose ongoing diseases. Explain what vaccinations are and understand the importance of the treatment of diseases.</p>			
Learning objective/key question	What will I know and be able to do? I can...	How will I develop my skills? (Success Criteria)	Homework/Gwaith cartref to support progress
Week 1 2.3.1 Factors affecting human health	<ul style="list-style-type: none"> Understand the effects of alcohol consumption in both the long and short term and explain the consequence of addiction. Calculate daily energy requirements and BMI as well as explaining that BMI has limitations and describe the long-term effects of anorexia, bulimia. Understand how lifestyle factors affect health through epidemiological studies, and explain why large, matched samples are more reliable than individual cases. 	<ul style="list-style-type: none"> I can describe how alcohol, diet, and lifestyle choices affect health, and explain key terms like addiction, BMI, GDA and RDA. I can apply my knowledge to calculate energy needs and BMI, interpret food labels, and use health guidelines to make informed choices. I can analyse the impact of eating disorders, obesity, and salt intake, and evaluate the reliability of health studies using matched samples. I can create a personal health plan, develop resources to raise awareness, and reflect on how individual choices affect public health and healthcare systems. 	Wk 1 Homework: Set: Due:



	<ul style="list-style-type: none"> • Interpret food labels and explain the role of GDA and RDA in managing diet and energy intake and describe the health effects of too little or too much salt, including risks like cramps or high blood pressure. • Understand the impact of obesity on health (e.g. heart disease, diabetes) and explain its strain on healthcare systems. 			
<p>Week 2 2.3.1 Factors affecting human health</p>	<ul style="list-style-type: none"> • Understand the role of insulin in regulating blood glucose levels and explain how diabetes disrupts this balance. • Describe the differences between type 1 and type 2 diabetes and explain how each can be controlled and understand how diabetes is diagnosed, including the detection of glucose in urine. • Explain the impact of pollutants (e.g. air pollution, heavy metals) on human health, including links to conditions like asthma. • Investigate the energy content in foods. 	<ul style="list-style-type: none"> • I can describe how insulin regulates blood glucose and explain how diabetes affects this balance, including how it is diagnosed. • I can apply my understanding to compare type 1 and type 2 diabetes and identify how each can be managed. • I can analyse how pollutants like air pollution and heavy metals impact human health and evaluate links to conditions such as asthma. • I can investigate the energy content in foods and draw conclusions about how diet affects health and wellbeing. 	Wk 2	<p>Homework:</p> <p>Set:</p> <p>Due:</p>
<p>Week 3 2.3.2 Diagnosis and Treatment</p>	<ul style="list-style-type: none"> • Understand how different parts of the electromagnetic spectrum are used to diagnose disease and injury. • Explain the benefits and side effects of drug treatments, 	<ul style="list-style-type: none"> • I can describe how different parts of the electromagnetic spectrum are used in medical diagnosis and explain how drug treatments like aspirin benefit patients. • I can apply my understanding to identify side effects of treatments and outline the stages of drug testing, including animal and clinical trials. 	Wk 3	<p>Homework:</p> <p>Set:</p> <p>Due:</p>

	<p>using aspirin as an example for cardiovascular disease.</p> <ul style="list-style-type: none"> Describe the stages of drug testing, including animal trials and clinical trials, and evaluate ethical considerations. 	<ul style="list-style-type: none"> I can analyse how diagnostic tools and drug treatments affect patient outcomes and evaluate the ethical issues involved in drug development. I can reflect on the role of science in healthcare and create informed arguments about the use of technology and testing in medicine. 		
<p>Week 4 2.3.2 Diagnosis and Treatment</p>	<ul style="list-style-type: none"> Understand ionising radiation and identify sources such as radioisotopes and short-wavelength EM radiation (UV, X-ray, gamma). Explain how gamma cameras detect gamma rays to form diagnostic images and how radioisotopes target specific organs. Describe the differences between alpha, beta, and gamma radiation, including their penetrating and ionising powers. 	<ul style="list-style-type: none"> I can describe what ionising radiation is and identify sources such as radioisotopes, UV, X-rays, and gamma rays. I can explain how gamma cameras work and outline how radioisotopes are used to target specific organs in medical imaging. I can compare alpha, beta, and gamma radiation, including their penetrating and ionising powers, and analyse their uses and risks. I can evaluate the role of radiation in diagnosis and reflect on its impact in healthcare and scientific research. 	Wk 4	<p>Homework:</p> <p>Set:</p> <p>Due:</p>
<p>Week 5 2.3.2 Diagnosis and Treatment</p>	<ul style="list-style-type: none"> Explain how ionising radiation damages DNA, affecting cancer cells more than healthy ones. Understand radiotherapy methods: external (X-rays) and internal (radioisotopes like iodine-131) and define the concept of half-life. Use data to select appropriate radioisotopes for medical applications based on emission type and half-life. 	<ul style="list-style-type: none"> I can describe how ionising radiation damages DNA and explain why cancer cells are more affected than healthy ones. I can outline how radiotherapy works, including external and internal methods, and define the concept of half-life. I can analyse data on emission types and half-lives to select suitable radioisotopes for medical use. I can evaluate the effectiveness of different radiotherapy approaches and justify choices using scientific evidence. 	Wk 5	<p>Homework:</p> <p>Set:</p> <p>Due:</p>

<p>Week 6 2.3.2 Diagnosis and Treatment</p>	<ul style="list-style-type: none"> Describe chemotherapy as a cancer treatment and explain how it works alongside radiotherapy. Explain how medical imaging techniques (X-rays, CAT scans, MRI, ultrasound) help diagnose and monitor disease. Describe how ultrasound and X-ray technologies produce images and compare 2D X-rays with 3D CAT scans and MRI. Determine the half-life of a model radioactive source as a practical. 	<ul style="list-style-type: none"> I can describe how cancer treatments and medical imaging techniques work, including X-rays, CAT scans, MRI, and ultrasound. I can explain how different technologies produce images and compare 2D X-rays with 3D scans. I can analyse how imaging supports diagnosis and treatment and use data to determine half-life in a practical. I can evaluate the role of radiotherapy and imaging in healthcare and justify choices based on evidence. 	<p>Wk 6</p>	<p>Homework:</p> <p>Set:</p> <p>Due:</p>
<p>Week 7 2.3.3 Fighting Disease</p>	<ul style="list-style-type: none"> Understand that some microorganisms are harmless and perform vital functions, while others (pathogens) cause disease. Describe how the body defends itself against microorganisms using skin as a barrier, blood clots, and white blood cells. Explain how white blood cells ingest pathogens and produce antibodies and antitoxins to fight infection. Understand how natural microorganisms compete with pathogens to protect the body. 	<ul style="list-style-type: none"> I can recall the roles of different microorganisms and describe how the body defends itself against harmful pathogens. I can explain how white blood cells fight infection by ingesting pathogens and producing antibodies and antitoxins. I can analyse how natural microorganisms help protect the body by competing with pathogens. I can evaluate the effectiveness of the body's defence systems and justify how they help maintain health. 	<p>Wk 7</p>	<p>Homework:</p> <p>Set:</p> <p>Due:</p>