Hawarden High School
Ysgol Uwchradd Penarlâg

Subject Learning Program 2019-2020

Subject / Pwnc:	Year/ Blwyddyn:	Topic/ Topig:
Science	7	Energy

Skills, Knowledge and Understanding to be developed:

Skills =

- ✓ Communication - Develop their communication skills
- ✓ Enquiring – Predictions, identifying independent and dependent variables, identifying the number of observations / measurements to be recorded
- ✓ Developing – Using prior knowledge to explain links, considering other's views to inform opinions / decisions
- ✓ Reflecting – Evaluating outcomes against success criteria, justifying improvements made to methods, linking learning to other situations
- ✓ Develop your communication skills.
- ✓ Develop your research skills and ability to work with others.

Knowledge =

- ✓ Conservation of energy and ways in which energy can be stored
- ✓ How devices work by energy transfers
- ✓ How renewable and non-renewable energy resources can be used to generate electricity
- ✓ How food is used as a fuel by the body.
- ✓ The interdependence of organisms and use of food chains to show this

Understanding =

- ✓ Learn about the conservation of energy and ways in which energy can be stored.
- ✓ Learn how familiar devices/machines work by using electricity, light, sound and other energy transfers.
- ✓ how food is used by the body as a fuel during respiration.

Key Terms/ words:

Energy, Light, Energy change, Potential, Sound, kinetic, light, heat, nuclear, electrical,, chemical, elastic, gravitational, fuel, Fossil fuels, Non-renewable, renewable, electricity, mean results, energy transfer, aim, variables, independent variable, dependent variable, control variables, method, safety, results, analysis, evaluation.

Learning outcomes and success criteria:	Assessment / Assesu	Gwaith Cartref/ Homework

Lesson 1 – What is Energy? <u>Learning outcome:</u> • There are "types" or "forms" of energy • The presence of energy is revealed only when <u>change</u> takes place.	<u>Numeracy: 7NS</u> Use appropriate strategies for multiplication and division, including application of known facts	Homework – Revise 9 types of energy. Produce a poster with diagrams and examples of each energy type. **Energy educake quiz** ☐%
Lesson 2 – Energy in Fuels <u>Learning outcome:</u> • Fuels are substances which burn to release ENERGY. • Investigate the effect of changing the Bunsen burner flame on the temperature of fixed volume of water for a fixed time	Numeracy: 7M8 Use of number lines and scales on the thermometer. Assessment planning/concluding of experiment **NC level** ☐	Hwk: Ask the pupils to write a prediction of what would happen if we used two Bunsen burners to heat up the water instead of one to the temperature rise observed in the water and explain why.
Lesson 3 – What are fossil fuels? <u>Learning outcome:</u> • That coal, oil and gas are examples of fossil fuels, which are formed from organic and non-renewable materials over millions of years • Know what is meant by non-renewable and fossil fuels • know how fossil fuels were formed and understand that they are limited (non-renewable).		Hwk: Produce a poster explaining why fossil fuels are limited/Focus the poster on how pupils could conserve energy by changing lifestyles, etc.
Lesson 4 – Generating electricity and renewable energy resources <u>Learning outcome:</u> • Pupils will know how electricity is generated in real life (using fossil fuels). • Understand what is meant by a renewable fuel (The fuel will not run out). • Know of the different renewable energy resources that are available: wind, running water, sunlight, biomass, geothermal. • We can search for information using ICT • We need to consider bias when reading scientific reports, as well as considering others' views to	Literacy **Explain ideas fully, showing implications and consequences.** **Use impersonal language to convey ideas and information.**	• Research task – Electricity History Internet Task. To be completed in the back of their book. Please collect in the sheets afterwards and place back into the filing cabinet. To create a spider diagram (poster style if you wish or page in their books) answering the question "what is energy?" This will allow you to formatively assess the pupils understanding of the topic to date.

inform our opinions.		
Lesson 5 – Generating electricity and renewable energy resources Learning outcome: Same as lesson 4		
Lesson 6 - How do living things use energy? Learning outcome: • That we (and living things) need energy for every activity • That food is the energy source of animals • That energy is measured in joules.	**Numeracy: 7N2** Use of energy amounts on food labels to use number skills and compare number sizes	**Educake quiz** ☐ %
Lesson 7 – Investigating energy in foods Learning outcome: • Investigate and compare the different amount of energy in a Shreddies and Wotsits (OR investigate sweeteners SL8 21d) • Identify independent and dependent variables in their plan • Link these variables into a results table and select the number of results to take.	**Numeracy: 7D4a, 7D3a, 7D3** Construct a wide range of graphs and diagrams to represent the data. Use mode, mean, median and range. Interpret diagrams and graphs. Produce a bar chart of their results and make conclusions on their results. **NC level** ☐	Hwk: Write a paragraph to show what they found in the experiment.

Lesson 8 – Investigating energy in foods Learning outcome: • write up the experiment with key sections/headings (aim, independent variable, dependent variable, control variables, safety, method, results, graph, analysis, evaluation) and conclude which cereal had the most energy. • Describe the energy changes that took place in the experiment.	**Numeracy: 7D4a, 7D3a, 7D3** Construct a wide range of graphs. Use mode, mean, median and range. Calculate mean results. Interpret diagrams and graphs.	Hwk - Write a paragraph to show what they found in the experiment.
Lesson 9 - Are we getting enough energy? Learning outcome: • Do the energy chain by using prior knowledge. • Identify the energy needs of different people by interpreting data. • Interpret the data and give a basic explanation of it to highlight it as information. • Link the information to prior learning. • Predict what other people's energy intake may be depending on their lifestyle.	**Numeracy**: 7U4 Interpretation of a numeric set of data	**Educake quiz** ☐ %
Lesson 10 – Investigating energy in foods – feedback session Learning outcome: • Provide feedback to the teacher based on the level / comments provided by the teacher. • Identify ways to improve work.	Literacy Making corrections to spelling/grammar.	Revise for end of topic test.
Assessment week **Lesson 11 – Topic test** Learning outcome: • Answer questions on the Energy.	**Test score** ☐ %	

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Lesson 12 – Test review	**Area that I need to work on:**
Learning outcome: • Review your performance in the test, annotate and correct any errors made. • Give yourself targets and complete MaD tasks assigned by the teacher.	_____ _____ _____ _____

Subject: ***Pwnc:***	***Year:*** ***Blwyddyn:***	***Term:*** ***Tymor:***	***Topic:*** ***Topig:***
Science	7	Autumn	Solids, liquids and gases

Skills, Knowledge and Understanding to be developed:

Skills =

- To use a Bunsen burner, thermometer, measuring cylinder and top pan balance
- Develop communication skills.
- Identify trends and patterns
- Make simple observations

Knowledge =

- The properties of solids, liquids and gases.
- To use the particle model to explain expansion and contraction.
- To use the particle model to explain changes of state.

Understanding =

- Classify materials as solid, liquid or gas.
- The effect of heating and cooling a substance.
- Pure substances have fixed melting and boiling points.
- The rate of diffusion in a liquid and a gas are different.
- Mass is conserved when a solute is added to a solvent.

Key Terms/Words:

Bunsen burner Solids
Thermometer Liquids
Balance Gases
Particles
Soluble
Insoluble
Melting
Boiling
Condensation
Evaporation
Expanding
Contracting
Diffusion

Learning outcomes and success criteria: **Deilliannau dysgu a meini prawf llwyddo:**	**Assessment / Skills** **Asesu/Sgiliau**	**Homework:** **Gwaith Cartref:**

Week 1: Safety in the lab. Learning outcome = • To understand safety rules and why they are necessary. • To recognise unsafe behaviour in the lab. Success Criteria = • To list a set of safety rules for the lab and give reasons.		
Week 2: Lighting and using a Bunsen. Learning outcome = • To name the different parts of a Bunsen burner. • To light a Bunsen Burner safely. • To name the three types of flames. Success Criteria = • To use a Bunsen Burner and to be able to change the type of flame depending on what you are heating.		Bunsen burner homework sheet.
Assessment Week / **Week 3:** Heating solids and liquids. Learning outcome = • To identify which flame to use when heating a liquid and a solid. Success Criteria = • To demonstrate heating a boiling tube of water and a piece of magnesium. • To produce a labelled diagram and detailed method of the practical.		
Week 4: Progress task 1- laboratory skills. Learning outcome = • To investigate the effect opening the air hole has on the temperature of a Bunsen burner flame.	***NC Level***  AP1	To complete investigation write-up.

Success Criteria = • To identify the variables, to choose the correct equipment and to write a detailed method to carry out the investigation.		
Week 5: Making observations. Learning outcome = • To classify materials as solid, liquid or gas. • To analyse a circus of experiments and to make simple observations. Success Criteria = • To summarise a solid, liquid and gas.		
Week 6: Classifying materials. Complete literacy task. Learning outcome = • To explore and classify different materials as a solid, liquid or gas. Success Criteria = • To describe the properties of solids, liquids and gases.	Literacy ☐/6	
Week 7: Expanding and contracting. Learning outcome = • That models can be used to explain phenomena which cannot be observed. • To analyse two experiments and make simple observations. Success Criteria = • To use the particle model to explain expansion and contraction.		

Week 8: Using a thermometer. Complete numeracy task and hwk sheet. Learning outcome = • To accurately use and read a thermometer. Success Criteria = • To successfully carry out the practical and to measure and record the temperature of the water with the appropriate scale. • To use the boiling point and melting point of substances to identify what state they are in at different temperatures.	Numeracy hwk. ☐ 20 Numeracy: 7M8 ☐ 17	Temperature conversion hwk sheet.
Week 9: Changes of state. Learning outcome = • To investigate what happens to the temperature when ice melts and when salt is added. Success Criteria = • To summarise the temperature changes when ice melts. • To explain what happens to the melting point when salt is added.		
Week 10: Boiling and condensing. Learning outcome = • To investigate the changes taking place when boiling water under a conical flask of ice. Success Criteria = • To explain the changes of state taking place inside the beaker and inside/outside of conical flask.		

Week 11: 22/11 Diffusion. Learning outcome = • To analyse different experiments and to make simple observations. Success Criteria = • To explain diffusion in a solid, liquid and gas.		Diffusion worksheet.
Week 12: 29/11 Soluble or insoluble. Learning outcome = • To observe whether a substance is soluble or insoluble. • To compare the mass before the solute is added and after. Success Criteria = • To explain the terms soluble and insoluble. • To explain why mass is conserved.		**Revise for test**
Week 13: **Test.**	% *AP2*	