SUPPORT MATERIALS

IS ANGLESEY A GREEN ISLAND?

In this task learners will explore how to survive if they were shipwrecked on an island. They consider what order to carry out tasks in order to survive and how to make use of items they have found. They discuss how to clean sea water and carry out an experiment to try out their ideas. Learners consider basic human requirements for survival, how we source these and how these requirements all rely on energy transfers. They find out about the concepts of energy conservation and energy 'waste' and explore photosynthesis, animal respiration and the water cycle. Learners explore how we generate energy from different sources to keep warm in colder months and whether these sources are 'dirty' or 'clean'. They look at energy usage and whether the energy is clean, green or renewable. Learners explore the Anglesey Energy Island™ Programme and produce a digital poster showing how Anglesey generates green energy. Finally, learners explore the use of solar farms on Anglesey and design a solar farm that meets a specific set of criteria.

CURRICULUM FOR WALES

Areas of Learning and Experience explored:

- Expressive Arts
- Health and Well-being
- Humanities
- Languages, Literacy and Communication
- Mathematics and Numeracy
- Science and Technology

Activity also incorporates aspects of cross-curricular skills outlined in the LNF and DCF.

RESOURCES

Internet enabled device and internet access.
Apparatus to make drinking water from seawater: mirror, large plastic transparent sheet, two plastic bowls, two long ropes, ball of string, a knife, a flip-flop, two plastic bottles and a plastic bag.

DOING THE ACTIVITY

- Most tasks require learners to work in pairs or groups.
- Encourage learners to share their ideas, and through open questioning, explain and justify their ideas when possible. Focus questions have been suggested to guide learners through the tasks.
- Some tasks might be more effective if pairs or groups of learners have access to an internet enabled device.
- When taking learners outdoors, it is essential that the Countryside Code is adhered to and any relevant risk assessments have been carried out with risks mitigated.

TASK 1

HOW DO WE SURVIVE?

Explain to learners that in this task they will explore how to survive if they were shipwrecked on an island.

Screen 3

Ask learners to consider what it might be like to be shipwrecked on a tropical island and to discuss the question posed.

Focus question

- What do you need to do to survive? Make a list.

Screen 4

Invite them to look at their list and discuss the questions posed.

Focus questions

- Which is the most important thing to do? Should this be the first thing to do? Why?
- Which things will take you longer to do than others? Why? Should you start these first or leave them to later?
- Which things need to be done daily? Why?

Ask learners to prioritise the things on their list in order of importance for survival.

Screen 5

Explain to learners that they are going to make a timetable showing how they will spend the first week using their prioritised list. Ask them to discuss the questions posed.

Focus questions

- Which things need to be done on Day 1? Why?
- Which things can you start to do later in the week? Why?
- Which things need to be done multiple times? When will you do these?
- Which things will take more than one day to do? Why?

Ask learners to complete the timetable on screen to show their thoughts.

Screen 6

Explain to learners that on Day 2, they find these items of litter on the beach: mirror, large plastic transparent sheet, two plastic bowls, two long ropes, ball of string, a knife, a flip-flop, two plastic bottles and a plastic bag.

Ask them to consider the list and to discuss the questions posed.

Focus questions

- Where do you think each of these items has come from? Why?
- What could you use each item for? Which is the most important use? Why?

Screen 7

Tell learners that they have been unable to find any drinking water on the island. By Day 3, they are feeling quite unwell and know they must try to make drinking water from seawater.

Ask learners to look again at the list of litter items and discuss the questions posed.

Focus questions

- What do you know about seawater?
- What can you do to make drinking water?
- Which items of litter can you use to do this?

Screen 8

Ask learners to draw a diagram of their apparatus to remove salt from seawater, labelling it to show how it works.

Invite them to build their apparatus to make drinking water from seawater.

Screen 9

Take the learners outside to test their apparatus to check that it works.

Screen 10

Ask learners to review their apparatus and how well it worked, discussing the questions posed.

Focus questions

- How well did the apparatus work? How do you know?
- The apparatus you have been trying to make is called a solar still. Research online to find different types of solar stills. What improvements could you make to your apparatus? Why would these ideas improve the apparatus?

Invite learners to amend their solar still and to test it.

Screen 11

Invite learners to reflect on making their solar still by completing two or more of the sentence starters and share these in class. The sentence starters are:

The key knowledge and skills we used were...; I used to think... Now I think...; The next time we could...; I learned about...; We solved problems when...; The thing we found most difficult was...; We had to think creatively to reframe and solve problems when...; I could also use the things I learnt when...; Something I still don't understand is...

TASK 2

HOW DO WE SURVIVE ON THE ISLAND OF ANGLESEY?

Explain to learners that they will consider the basic human requirements for survival, how we source these and how these requirements all rely on energy transfers. They will find out about the concepts of energy conservation and energy 'waste' and explore photosynthesis, animal respiration and the water cycle. Learners will explore how we generate energy from different sources to keep warm in colder months and whether these sources are 'dirty' or 'clean'.

Screen 3

Ask learners to look at the map of Anglesey and to discuss the questions posed.

Focus questions

- What do you need to survive in your everyday life? Make a list.
- How do you get each of these things?
- Where does each of these things come from? How do you know?
- Do some of these things come from multiple sources? Why?

Screen 4

Explain to learners that humans need food, water and oxygen for survival and that we also need to keep warm when it is cold outside. All of these survival factors rely on energy being transferred from one form to another. Invite them to discuss the questions posed.

Focus questions

- What are the energy transfers required for us to have:
  - food
  - water
  - oxygen
  - warmth?

Screen 5

Invite learners to try the quiz about energy and its transfers.

Screen 6

Explain to learners that energy cannot be made or destroyed and that we can only transfer energy from one form to another. When we transfer energy from one form to another, energy is given off as 'waste'. Ask them to discuss the questions posed.

Focus questions

- Which forms of energy are given off when:
  - a plant photosynthesises
  - an animal respires?

Screen 7

Invite learners to discuss the questions posed.

Focus questions

- What do you use water for in your everyday lives? List your ideas.
- Where does the water you use come from? How do you know?
- Why do our bodies need water?
- What would happen if your body didn't have enough water? How do you know?

Screen 8

Ask learners to sketch their ideas about the water cycle and to add words to their diagram to explain what is happening. To help learners develop their ideas, ask them to discuss the questions posed.

Focus questions

- What do you think the water cycle is? Why do you think that?
- What do you think happens to rain after it falls on the Earth? Why do you think that?
- What do the words 'evaporation' and 'condensation' mean? Why do you think that? How do they fit into the water cycle?

Screens 9-10

Invite learners to try to complete the water cycle by putting the text in the correct place. Ask them to look at the completed water cycle on the next screen and to discuss the questions posed.

Focus questions

- Where is energy transferred in the water cycle? List the places.
- What is the main energy transfer (or transfers) at each of these places?

A hint is given here: the forms of energy to think about are potential, kinetic, heat, and sound.

Screen 11

Explain to learners that humans (and most other organisms) need oxygen to respire. Ask learners to look at the equation for respiration discuss the questions posed.

Focus questions

- Where does the oxygen come from?
- What does your body do to take in oxygen and get rid of carbon dioxide and water vapour?
- Where does glucose come from? How do you know?
- What does your body use the energy for? List as many ideas as you can.

Screen 12

Explain to learners that we need heat in colder months to keep warm. We generate energy from a range of sources, e.g. solar, wind, water (hydro), nuclear, burning gas, wood, coal or petrol. Solar energy is seen as 'clean energy'.

Invite learners to sort the types of energy generation into 'dirty' or 'clean'.

TASK 3

HOW DOES ANGLESEY GENERATE CLEAN ENERGY?

In this task, learners will look at energy usage and clean, green and renewable energy. They will explore the Anglesey Energy Island™ Programme, producing a digital poster showing how Anglesey generates green energy before finally exploring the use of solar farms.

Screen 3

Ask learners to discuss the questions posed.

Focus questions

- What types of energy is used in your home and in school?
- Which energy companies supply this energy to your home and school?
- How does the energy company generate energy? What proportion of the energy generated is:
    - clean energy
    - green energy
    - renewable energy?

A definition of each of these terms is provided on a pop-up.

Screen 4

Explain to learners that the Isle of Anglesey County Council has established the Anglesey Energy Island™ Programme.

Invite learners to access the webpage What is Energy Island™? and to read the text on the page. Ask them to discuss the questions posed, recording their ideas in the first column of the table provided.

Focus questions

- What do you understand about Energy Island™?
- What don't you understand about Energy Island™?
- Looking at the words used in the text, which words don't you understand? List them in the first column of the table.

Screens 5-6

Invite learners to complete the second column in the table to show what they think each word means.

Ask them to carry out research to find the actual meaning of the words they listed in the table and to then to complete the table.

Screen 7

Ask learners to access the webpage What is Energy Island™? again and to re-read the text on the page and discuss the questions posed.

Focus questions

- What do you now understand about Energy Island™?
- What don't you still understand about Energy Island™? How can you find out?

Screen 8

Invite learners to explore the webpage Ways Anglesey "the Energy Island" fights climate change and its hyperlinks and to discuss the questions posed.

Focus questions

- How does Anglesey generate:
  - clean energy
  - green energy
  - renewable energy?
- What future projects could help Anglesey generate more green energy?

A definition of each of these terms is provided on a pop-up.

Screen 9

Inform learners that they are going to produce a digital poster about one of the ways that Anglesey generates green energy through wind, solar or marine.

In their groups, invite learners to research one of the methods of generating energy used on Anglesey and to think about the questions posed.

Focus questions

- Which search engine or AI will you use? Why?
- What are the key search terms/prompts to use? What do you want to find out?
- What type of websites will be the best to look at, why?

Screen 10

Ask learners to discuss the questions posed about how to make a good poster and then to create a digital poster, before sharing it with the class.

Focus questions

- What makes a good poster? Why do you think that?
- What words are important to include? Why?
- What images are important to include? Why?
- What are the key messages you want the poster to convey? Why?
- How will you make use of colour in your poster? Why?

Screen 11

Inform learners that there has been much discussion about the use of solar farms on Anglesey. However, solar energy is clean and is seen as a widespread solution to address global energy costs and climate change. Explain that photovoltaic cells are often arranged in arrays and that a large numbers of arrays together makes a ‘solar farm’.

Screen 12

Explain to learners that one challenge to solar farms is the amount of land required to site the arrays. Engineers have to undertake a cost-benefit analysis in their planning, taking into consideration any potential ecosystem impacts.

Inform learners that their task is to design a solar farm using the ‘Designing a solar farm criteria’ sheet provided.