Is our school a Bioeconomy?

KS4 Pack 2

THYME Project
Teesside, Hull and York - Mobilising Bioeconomy Knowledge Exchange

UNIVERSITY OF HULL

KS4

Contents

KS4

Introduction

Human overconsumption of Earth's natural resources is putting the planet under rapidly increasing stress. Our reliance on fossil fuels for energy, heating, the powering of vehicles and factories, and the production of many household materials such as plastic, is significantly contributing towards the depletion of the planet's resources, as well as exacerbating climate change. By 2050, nearly 10 billion humans will live on Earth. They will consume 40% more energy, 50% more food and demand more consumer goods than ever before. If we are to prevent such things from running out, and if we are to put a halt to climate change, it is imperative we reduce both consumption and waste, and find alternatives to these resources.

Fortunately, there are many things that scientists, businesses, schools, communities, children and the general public as a whole can do to mitigate the bleak predictions often seen in news headlines. Many of these solutions are a part of the Bioeconomy. Pack 1 introduced you and your students to the concept of the Bioeconomy; Pack 2 encourages you to apply these concepts to your institutional environment.

Recap: What is the Bioeconomy?

To break it down, the term **bio** refers to any living thing; while **economy** means the making and usage of goods and services by those within a country or region. So, the **Bioeconomy** is an economy based on renewable biological resources. By using living things instead of those that are non-renewable, humans can grow more to replace diminishing reserves.

This might be as simple as replacing single-use plastic coffee cups with the increasingly popular reusable bamboo ones, that can be reused over and over before composting back into the environment. It could be repurposing food waste to heat homes, or growing algae to create shoes! By making these switches, we not only lessen our reliance on fossil fuels and other finite resources, but we can reduce overall waste and CO_2 emissions. However, the answer doesn't lie in just one of these options; instead it takes a concerted and collective effort, with sustainability at the forefront.

KS4

What is in the packs?

Pack 1 introduced these concepts, making direct links to the National Curriculum and UN Sustainable Development Goals (SDGs), and can be downloaded from the University of Hull's THYME Education Resources webpage*. If not already used, we recommend consulting Pack 1 before using Pack 2, in order to provide the foregrounding required for Pack 2.

In this pack, we have supplied information and activities to encourage students to critically assess the sustainability of their school/home/youth group/etc. Drawing upon many geographical skills, children will identify both barriers and opportunities to employing the principles of the Bioeconomy in such a location.

After this, students will take part in a debate about the role of the Bioeconomy in creating a sustainable future for the planet and society. Working in groups and using case studies from Pack 1, they will plan and deliver presentations to the rest of the class, before critically evaluating both their own and their peers' contributions. Finally, students will investigate Youth Activism and Youth-led Legislation and its potential to make a difference.

Objectives: What will students learn?

By the end of the two packs, students will have a critical and informed knowledge base from which they can make sustainable consumer choices: considering economic, environmental and societal impacts to various decisions. They will have developed their skills in formulating coherent and balanced arguments and will have applied their knowledge to improve their own surroundings. They will have gained an understanding of the types of jobs that exist within the Bioeconomy, and how it maps to their futures. By engaging in outdoor activities that require teamwork and engagement with nature, their social and emotional development will be enhanced, and hopefully, their care and love for the environment increased!

In this pack, students will be getting outside. There is strong scientific evidence that suggests children who spend time outdoors are more likely to make environmentally conscious decisions, and their overall wellbeing is improved. We want to foster a love of the outdoors and natural environment in this pack, so we suggest adults make it as fun and as student-led as possible. By engaging in outdoor activities that require teamwork and engagement with nature, their social and emotional development will be enhanced, and hopefully, their care and love for the environment increased!

*https://www.hull.ac.uk/work-with-us/research/institutes/energy-and-environment-institute/our-work/thyme-education-resources

National Curriculum and SDG Links

Geography

Understand:

- A natural resource is any feature or part of the environment that can be used to meet human needs.
- The UK economy and society are increasingly linked and shaped by the wider world.
- Managing climate change involves both mitigation (reducing causes) and adaptation (responding to change).
- Strategies aimed at making urban living more sustainable and improving quality of life in the city (recycling, employment, green spaces, transport, affordable and energy-efficient housing).
- The range of techniques and methods used in fieldwork, including observation and different kinds of measurement.

Practise:

- Selecting appropriate ways of processing and presenting fieldwork data.
- Analysing and explaining data collected in the field.
- Reaching evidenced conclusions and summaries from fieldwork data.
- Reflecting critically on fieldwork data, methods used, conclusions drawn and knowledge gained.

Science

The development of scientific thinking:

- Appreciating the power and limitations of science and considering ethical issues which may arise.
- Explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments.

Analysis and evaluation

- Applying the cycle of collecting, presenting and analysing data, including:
- Presenting observations and other data using appropriate methods.
- Translating data from one form to another.
- Carrying out and representing mathematical and statistical analysis.
- Representing distributions of results and making estimations of uncertainty.
- Interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions.
- Presenting reasoned explanations, including relating data to hypotheses.

Citizenship/PSHCE

- Understand ways in which citizens work together to improve their communities, including opportunities to participate in school-based activities.
- Recognise responsibilities in the community.
- Build and support the ethos and value system of the school.
- Skills and knowledge to explore political and social issues critically, to weigh evidence, debate and make reasoned arguments.
- Prepared to take their place in society as responsible citizens
- Equipped with the skills to think critically.

KS4

English

Speak confidently, audibly and effectively, including through:

- Using Standard English when the context and audience require it.
- Working effectively in groups of different sizes and taking on required roles, including leading and managing discussions, involving others productively, reviewing and summarising, and contributing to meeting goals/deadlines.
- Listening to and building on the contributions of others, asking questions to clarify and inform, and challenging courteously when necessary.
- Planning for different purposes and audiences, including selecting and organising information and ideas effectively and persuasively for formal spoken presentations and debates.

How do I use them?

These packs are all flexible, and have purposely been created on editable templates for teachers/educators to adapt to local contexts and the needs/abilities of students. We recommend delivering the packs in numerical order.

Where possible we have provided a time estimate for activities, however we suggest teachers use their own initiative to chop, change, shorten or lengthen activities based on their students. We know students and educators alike are interested in how their education links to careers in the future. For that reason, we highlight some Bioeconomy Careers resources on page 20, including some case study videos from individuals in the early stages of their Bioeconomy career.

The pack is multimedia, and uses PowerPoints, print-outs, activity guides and video to encourage meaningful learning. Some activities require outdoor space or access to ICT equipment.

Recommended Reading/Resources

The Bioeconomy is a multifaceted topic that enables the exploration of multiple points of view, and many societal, environmental and economic issues. In order for students to get the maximum benefit from these packs, we offer teacher guidance throughout. However, there exist many brilliant external resources we recommend teachers explore, to increase their own knowledge and understanding before conducting the activities.
We recommend further reading contained in the links below:

https://sdgs.un.org/goals
http://www.fao.org/3/ca4352en/ca4352en.pdf

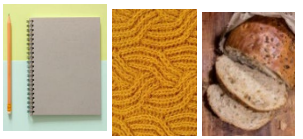
KS4

The Bioeconomy Knowledge Organiser

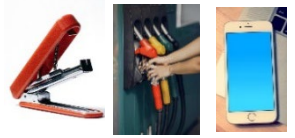
The Bioeconomy can help achieve many of the above **SDGs**. Equally, for the Bioeconomy to work, it must be **sustainable**. Sustainability means **'to meet the needs of the present without compromising the ability of future generations to meet their own needs'**. Sustainability **requires society,** the **environment** and the **economy** to work together.

Concept Digram: How are Earth's resources made?

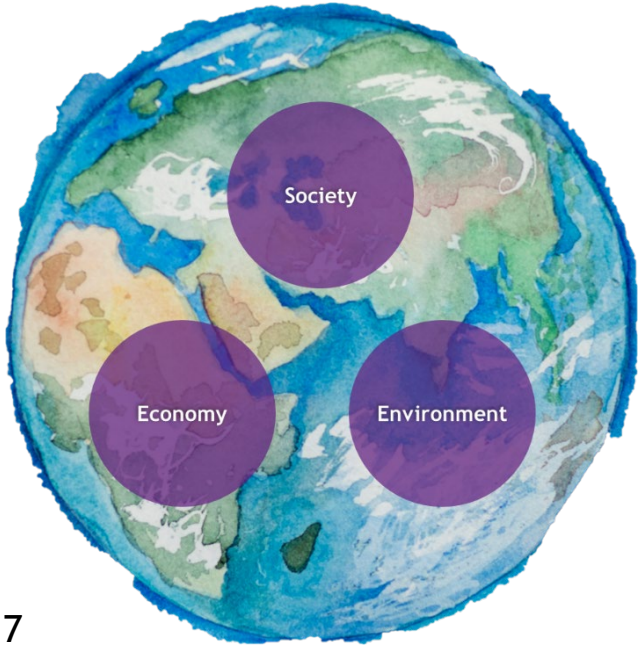
Earth's natural resources are either **grown** or **mined**. Whilst those mined (such as fossil fuels), originally come from dead plants and animals from millions of years ago, these are considered **inorganic**, or **non-bio**. Those that are grown, are known as **organic,** or **bio-based** resources, like plants, animals and microbes, and are created much faster than non-bio resources. This means that if grown **sustainably**, they can be **renewable resources.** We need to reduce our useage of mined resources (especially fossil fuels) as they are running out, and contribute to climate change!

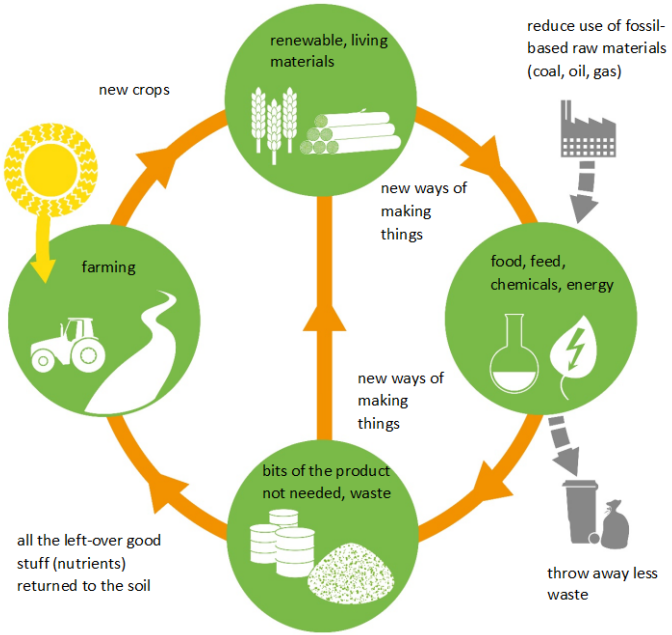


Grown bio-based resources



Mined non bio-based resources





What is the Bioeconomy?

The term **bio** refers to any living thing, while **economy** means the making and usage of goods and services by those within a country or region. So, the **Bioeconomy** is an **economy based on renewable biological resources**. These resources may be converted into food, feed (the food we give animals), bio-based products (like biodegradable bags, coffee cups, chairs, clothes) or bioenergy.

Examples of the Bioeconomy

Electricity from bio-waste (like poop and food!)

Everyday products from bamboo, seaweed and coffee beans!

Exposure Vocabulary Grid

Word	The word in context	My understanding/Class Definition
Bioeconomy (n)	The main reason the Bioeconomy is gaining attention, is because existing production practices contribute to serious environmental and climate problems.	
Renewable	There are an increasing number of renewable options nowadays, for both energy and products.	
Fossil Fuel	Governments are now realising that we can't keep relying on fossil fuels to keep our economy going.	
Sustainable	Humans' current transport practices are not sustainable.	
Biomass	An anaerobic digester uses biomass to create energy.	
Biogas	We can make biogas from all kinds of things, like animal manure, food, and sewage!	
Biodegrade	Whilst plastic does break down over time, it does not biodegrade or decay.	
Organic/bio-based	You can improve soil quality by adding organic/bio-based matter.	
Products	Seagrown have launched a new range of products made from seaweed.	
Services	Some of the biggest energy providers have reduced their reliance on coal to provide heating and electricity services.	
Greenwashing	Many high-profile fashion brands have been criticised for greenwashing.	
Carbon Footprint	Many people are now considering the carbon footprint and air-miles that come with their food as they make their consumer choices.	

Lesson 1:

Is our School a Bioeconomy?

THYME Project

Teesside, Hull and York - Mobilising Bioeconomy Knowledge Exchange

UNIVERSITY OF HULL

KS4

Resources Required:

- PowerPoint Slides for "Is your school a Bioeconomy?",
- Bioeconomy Fieldwork Booklet,
- Clipboards, pencils/pens,
- Outdoor space,
- Suitable outdoor clothing

Lesson 1:

Is our School a Bioeconomy?

Lesson Objectives

- Develop and apply geographical fieldwork techniques.
- Develop capabilities in presenting and interpreting geographical data.
- Understand how societies can become more sustainable and move towards a Bioeconomy.
- Interpret data to reach conclusions in relation to complex issues such as sustainability.
- Evaluate the limitations of the enquiry.

Lesson Outcomes

1. Discuss various examples of the Bioeconomy in the context of their own environment.
2. Be able to critically analyse observations and seek out practical opportunities for the Bioeconomy.
3. Be able to apply geographical fieldwork techniques to collect data.
4. Be able to analyse and present data in a meaningful and targeted way and use this to make coherent arguments.

AQA Geography

Geographical fieldwork:

- Selecting, measuring and recording data appropriate to the chosen enquiry.
- Selecting appropriate ways of processing and presenting fieldwork data.
- Describing, analysing and explaining fieldwork data.
- Reaching conclusions.
- Evaluation of geographical enquiry.

Numerical skills to:

- Demonstrate an understanding of number, area and scales, and the quantitative relationships between units
- Design fieldwork data collection sheets and collect data with an understanding of accuracy, sample size and procedures, control groups and reliability
- Understand and correctly use proportion and ratio, magnitude and frequency
- Draw informed conclusions from numerical data.

Edexcel Geography

- Understanding of the range of techniques and methods used in fieldwork, including observation and different kinds of measurement.
- Processing and presenting fieldwork data in various ways, including maps, GIS, graphs and diagrams (hand-drawn and computer-generated).
- Analysing and explaining data collected in the field, using knowledge of relevant geographical case studies and theories.
- Drawing evidenced conclusions and summaries from fieldwork transcripts and data.
- Reflecting critically on fieldwork data, methods used, conclusions drawn and knowledge gained.

KS4

Preparation

As this is an activity that takes outside of the classroom, it would be prudent to check your school's policy and risk assessment for onsite fieldwork. Carrying out an interview is a suggested fieldwork activity; arrange any interviews in advance, the site manager is most obvious person, or the network manager who arranges the disposal of electronic waste. Brief any staff who may work with a group as they carry out the transect of the site.

Previous Learning

Pack 1 introduces students to the Bioeconomy. Pack 2 builds upon this knowledge and encourages students to critically evaluate aspects and attitudes associated with the development of the Bioeconomy in our society. We would therefore recommend covering Pack 1 first, to ensure an understanding of the Bioeconomy. This lesson requires some knowledge of the purpose of fieldwork and observation skills; it is likely that students will have covered map and other skills that are covered in this lesson, however, this can be dovetailed by the educator to the teaching of this lesson if required.

The Lesson

This lesson follows KS4 Pack 2 PowerPoint presentation 1. More detailed guidance is provided in the notes section within it.

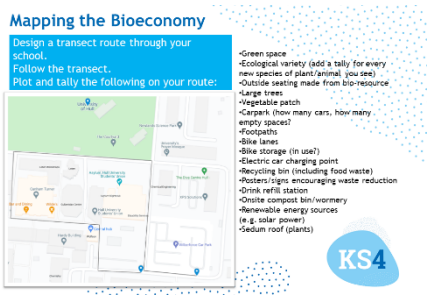
Starter activity: Slide 4 After introducing the aims and objectives, start by showing the students the image on the slide, asking them to consider how this image is supporting the Bioeconomy. This will allow you to gauge if/how students apply their previous learning to real world scenarios. After a few minutes, encourage students to share their answers with each other and record their answers in the student fieldwork booklet (**Slide 5**) Students should be encouraged to complete the challenge activity, sharing answers with the whole class.

Slide 6: This is an opportunity to introduce or remind students of some fieldwork equipment, name the equipment, describe how it is used and suggest a range of uses for these pieces of equipment. The PowerPoint notes provide further guidance.

Slide 7: This is an opportunity to introduce or remind students of the types of data that geographers collect: primary and secondary data. Students define these two types of data and give examples of what this looks like in a fieldwork situation. Students can record this in their fieldwork booklet.

Slide 8: Students are asked to generate a series of questions that they will ask a member of the school team to gain further insight to some aspects of the daily running of the school, for example disposal of waste, aspects of recycling, energy providers, energy saving strategies, water or waste reduction strategies.

This can be done in pairs or groups, as a class decide on a set of questions to ask and record them in their booklets.

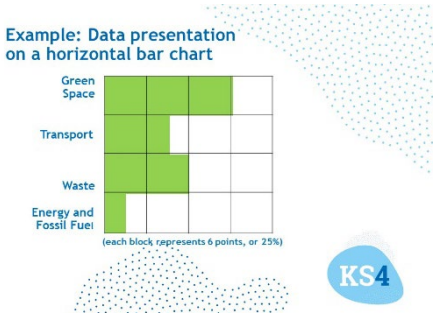


Slide 9: The line transect should aim to represent elements of the school grounds, with students carrying out a tally at four stations on the route. As an educator you may decide the route to be taken or students may decide their own route. This should be plotted on the map of the school site. In the field students should tally the elements of the Bioeconomy they observe.

Slide 12 - 15: Students use their observations to calculate their ratings of the four areas of the school site; green space, transport, reducing waste and energy rating. The bipolar scale asks students to make their ratings between two opposite end points, each element if scored out of 20, then converted to a percentage to be used in the data analysis section of the fieldwork.

Slide 16: Students add their percentages together to create their overall Bioeconomy rating of the school site. This is recorded in the student fieldwork booklet.

Slides 17-19: Presenting student research findings, slide 17 asks students to think about appropriate data presentation techniques, the questions provide an opportunity to discuss strengths and weaknesses of data presentation methods and justify choice of data presentation techniques. Slide 18 & 19 provide examples of data presentation methods; students may select an alternative data presentation method.



Slides 20-21: Students are given guidance on writing a conclusion to their fieldwork. Students are encouraged to link appropriate SDGs to their findings, examining "how is your school supporting the SDGs"? Slide 21 asks students to evaluate their fieldwork method, more guidance is given in the notes section of the PowerPoint. You may find it helpful to pose questions such as:

- Which area of your school supports the Bioeconomy the most?
- Which area of your school has the fewest elements of the Bioeconomy?
- Describe the element that supports the Bioeconomy the most.
- Explain how this element supports the Bioeconomy the most.
- **Remember the SDGs? Can you link them to any of your findings?**

Slide 22: Finally, students are asked to reflect on how the fieldwork has supported their understanding of the Bioeconomy in a real-life setting, using the questions on the slide. This requires students to synthesise findings and their knowledge of the Bioeconomy. Further guidance is in the PowerPoint notes.

KS4

Lesson 2:
The Great Debate

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KS4

Lesson 2:
The Great Debate

Resources Required:
- PowerPoint Slides for Lesson 2 - The Great Debate,
- Case studies from Pack 1, Lesson 2
- Flipchart pad,
- Sticky notes,
- Pencils/pens

Lesson Objectives

- Apply knowledge and case study information to critically argue various points of view in relation to the Bioeconomy.
- Make a judge Bioeconomy can support a sustainable planet.
- Understand the difference between fact and opinion.
- Make a prediction for the future of the planet based on a balanced judgement.

Lesson Outcomes

- Prepare an argument using facts and opinion.
- Make links between different. viewpoints to build a more robust argument.
- Form a balanced opinion and predict the success of the Bioeconomy now and in the future.

Curriculum Links

EdExcel Geography

- A natural resource is any feature or part of the environment that can be used to meet human needs. Natural resources can be defined and classified in different ways (biotic, abiotic, renewable and non-renewable).
- The UK economy and society are increasingly linked and shaped by the wider world.
- Strategies aimed at making urban living more sustainable and improving quality of life in the city (recycling, employment, green spaces, transport, affordable and energy-efficient housing).

AQA Geography

- Features of sustainable urban living: water and energy conservation waste recycling creating green space.
- Major changes in the economy of the UK have affected, and will continue to affect, employment patterns and regional growth.
  Moving towards a post-industrial economy: development of information technology, service industries, finance, research, science and business parks
- Impacts of industry on the physical environment. An example of how modern industrial development can be more environmentally sustainable.

KS4

Preparation

Students would benefit from completing Pack 1 before completing this lesson as they will have researched specific case studies, which will provide specific details that inform the activity.
The activity takes place in groups, six roles (including Chair) are identified in the lesson materials but can be adapted to group size of the educator's choosing from four students upwards.

Previous Learning

Students will be linking the issues of modern living to the solutions provided by the Bioeconomy therefore a previous knowledge of the elements of the Bioeconomy is essential for the success of this activity. Students will answer the key question 'The world we live in is currently unsustainable. The Bioeconomy will solve this?' linking this to the sustainable development goals.

The Lesson

This lesson follows KS4 Pack 2 PowerPoint Presentation 2. The purpose of this lesson is to encourage students to consider multiple points of view towards the statement: **"The world we live in is currently unsustainable. The Bioeconomy will solve this"**.

The slides are self-explanatory, and will support the educator in devising a healthy, meaningful, and considered debate within their classroom. The role of the teacher throughout this lesson is to prompt students to think about the global, local, social, economic and environmental impacts of the Bioeconomy. You might wish draw attention back to the previous case studies explored in Pack 1. Encourage healthy challenges, and enable students to formulate coherent arguments as part of a team.

Slide 4 acts as an introduction to what the class will be doing, allowing students to recall prior learning across packs 1 and 2. Here, students will consider the statement **"The world we live in is currently unsustainable. The Bioeconomy will solve this"**. Students may wish to do this initial thinking individually, in pairs, or as a whole class.

Slide 5 These slides guide students through the thinking exercise. Allocate, or allow students to select, a group of people to represent (e.g. Youth, Resident of low-lying coastal area, Doctor, Inventor, Politician, etc). You could use the case studies from Pack 1, Lesson 2 to support this, but we recommend making these as relevant as possible to your class).

Slide 6 introduces the main activity, and gives an overview of the following slides.

Slide 7 is the first of four that will guide students through the initial steps of formulating an argument for debate. Ensure each group has sticky notes, markers, pens, paper, etc. Depending on your students' previous experience of debating, your support, and the necessity of these slides will vary. Children will start to populate the sticky notes with their various arguments for their group. Encourage them to consider the benefits and drawbacks that the Bioeconomy might have for their roles – taking into account social, economic and environmental impacts and the SDGs.

Students then start to cross-reference their thoughts and ideas across the team, with the "Chair" managing such discussions. As an extension, students should suggest which of the SDGs could be addressed and the impact this would have on climate-based issues.

Slide 8 will help students organise their ideas, constructing stronger more coherent arguments.

Slide 9 uses the likely familiar method of PEEL to structure their arguments. You may provide assistance in understanding this structure, where required. Whilst this will draw upon English and Literacy skills, we suggest that note form at this stage is fine, so long as students can coherently discuss and use their notes as prompts.

Slide 10 enables student to put their wider arguments and points into a formal structure. Again, we suggest focussing on content as opposed to English writing skills.

Slide 11 is where the students' hard work comes into practice. The Teacher's role is to manage a classroom debate, organising speakers from each group and negotiating healthy challenges. Encourage students to take notes as others are talking, highlighting strengths and weaknesses to arguments.

Slide 12 Once the debate is over, allow students to democratically and anonymously vote for who they believed gave the most convincing argument. Congratulate the winner.

Slide 13 adds the needed nuance after such a discussion, Remind students that in reality, there is no one clear answer or winner; there are credible arguments both for and against the Bioeconomy. It won't solve everything, but if done in a sustainable manner, it will bring us one step closer to a healthier, happier world.

Slide 14 concludes the lesson, and encourages students to think, based on their arguments and learning, if they were to make one personal change what might it be?

Students can share their pledges via the schools Twitter account using the hashtag **#THYMEtochange.**

Lesson 3:

Taking Action!
Applying what we know to make a positive difference

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Lesson 3:
Taking Action!

Resources Required:
PowerPoint Slides for "Taking Action"

Lesson Objectives

- Identify examples of appropriate environmental Youth Activism.
- Apply examples of Youth Activism to a local situation.
- Justify the importance of a local topic to a target audience.

Lesson Outcomes

- Explore examples of how young people have made their voice heard against major environmental issues.
- Present your arguments to a target audience explaining their importance to the environment.
- Use persuasive language to communicate an emotive issue to a target audience.

Curriculum Links

Citizenship

- Skills to think critically and debate political questions.
- Sound knowledge and understanding of how the United Kingdom is governed, its political system and how citizens participate actively in its democratic systems of government.
- Understand different ways in which a citizen can contribute to the improvement of his or her community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity.

EdExcel Geography

- The UK economy and society are increasingly linked and shaped by the wider world.
- Strategies aimed at making urban living more sustainable and improving quality of life in the city (recycling, employment, green spaces, transport, affordable and energy-efficient housing).

AQA Geography

Managing climate change involves both mitigation (reducing causes) and adaptation (responding to change).

Managing climate change: mitigation – alternative energy production, carbon capture, planting trees, international agreement; adaptation – change in agricultural systems, managing water supply, reducing risk from rising sea levels.

KS4

Preparation

In this final lesson of KS4 Pack 2, we ask students to reflect on the climate change emergency and look to the Bioeconomy as part of the solution. Student understanding of the Bioeconomy is essential to the success of Lesson 2; therefore, we recommend that you cover the content contained in KS4 Packs 1 and 2 prior to starting this lesson.

Previous Learning

Students may have already learned about various climate change agreements, including the Kyoto Protocol and the Paris Agreement. Many governments have pledged to slow down global warming, despite this the globe is still facing devastating consequences.

Students may know what Youth Activism is, if they don't, they probably will have seen or heard of examples of Youth Activism, most likely Greta Thunberg, the climate campaigner. This lesson allows students to think about appropriate youth activism, to make a positive change socially, politically, economically or environmentally.

The Lesson

This lesson follows KS4 Pack 2, PowerPoint Presentation 3. More detailed guidance is provided in the notes section within it.

Slide 4: Students are asked 'What is Youth Activism?'. They will explore this question using a series of questions on the slide. The prompts encourage students to share their knowledge and develop their understanding of the issues young people want to campaign for.

Slide 5: Youth-led legislation engages young people in political policy. Students should read the article referenced in the Powerpoint and answer the questions to investigate an example of appropriate Youth Activism.

Slide 6: Students will work on designing their own legislation addressing how the Bioeconomy can help tackle the climate emergency and think about how they would persuade Members of Parliament to pass this new law. The PowerPoint notes suggest areas that students may want to address. They may wish to take their inspiration from the statistics on the Climate Emergency Factsheet.

Slide 7 & 8: Students use the guidance to write their proposed Bill to take to their local MP. It should include five changes that will address the climate emergency. Students have the opportunity to share their proposed legislation with their class; they may decide to share it with their local MP.

Slide 9: This is the final reflection of the unit, students should remember the size of one person's carbon footprint is mind boggling (particularly in Western developed nations): each person in the USA emitted an average of 13.7 tonnes of greenhouse gases per year compared to the global average of 4.7 tonnes per person!

https://unfccc.int/kyoto_protocol
https://www.un.org/en/climatechange/paris-agreement
https://www.britannica.com/biography/Greta-Thunberg
https://edgar.jrc.ec.europa.eu/report_2021 (EU report on greenhouse gas emissions per country)

Bioeconomy Careers

As an additional resource for students, we have prepared a number of short videos, each introducing a particular role in the Bioeconomy. The videos take the form of a short interview with a young graduate at the beginning of their careers. The videos could be a useful tool for prompting discussion about career options and aspirations. Links may be found at www.hull.ac.uk/thymeemployability

A report on Jobs and Careers in the Bioeconomy from All Things Bio identified 10 key areas for the bioeconomy:

1 Agriculture
2 Forestry
3 Fishing and aquaculture
4 Food, beverages and other agro-manufacturing
5 Bio-based textiles
6 Wood products and furniture
7 Paper
8 Bio-based chemicals including plastics, pharmaceuticals and rubber
9 Liquid biofuels
10 Bioelectricity

The Bioeconomy offers jobs and career opportunities for people with varying levels of educational attainment. While there are undoubtedly highly technical roles, requiring specific scientific training, there are also manual roles and roles directly transferrable with other industries, such as marketing, HR and project management, so try to encourage a wide-ranging discussion. How many can your students identify?

https://www.hull.ac.uk/thymeemployability
https://www.allthings.bio/wp-content/uploads/2021/04/JobsCareers_EN_2104.pdf

KS4

Next steps

This is the end of Pack 2, and thus concludes the resources within this portfolio. Your students have learned about Bioeconomy, and how this applies to real world problems. They have explored the social, economic and environmental scales that need to be balanced to ensure sustainable development, and have applied their debating skills to make a case for particular points of view. They have learned about innovative solutions from within the Bioeconomy, and have heard about a broad range of careers that might inspire them to pursue work within the Bioeconomy sector.

However, that does not mean that their learning is over. From this pack, we hope your students feel empowered to make change themselves – in whatever shape or form that might be. Encourage and support them to achieve this. Is there a business venture they could set up inside or outside of school that might support sustainable development? Could they write a persuasive letter to a local MP asking for local or national changes? Is there rationale for a student led lunchtime eco-group? Whatever it is, the possibilities are endless, and this is just the start.

Acknowledgements

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Project management and content design:
Florence Halstead, Energy and Environment Institute, University of Hull.

Teachers' panel:
Sarah Harris, Linda Taylor, Ashleigh Clarkson, Clare Powell, Annabella Halstead.

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For more information on the THYME Project, including downloadable education resources please visit:

https://www.hull.ac.uk/work-with-us/research/institutes/energy-and-environment-institute/our-work/thyme-education-resources

https://thyme.biovale.org/resources/schools-resources/

KS4