Muinín Catalyst STEAM Education for Sustainable Development and Futures Literacy

Climate Change Engage Game Design

UNIT FOCUS: DESIGNING SERIOUS GAMES FOR CLIMATE CHANGE ADAPTATION AND AWARENESS

Subject AREAS: Design, Environmental Science, Game Design, Geography, Science, Technology

An Roinn Oideachais
Department of Education

SFI Discover
Science Foundation Ireland

IRISH RESEARCH COUNCIL
An Chomhairle um Thaighde in Éirinn

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Subjects: Science, Design, Game Design, Geography, Environment, Technology, Sustainability

Climate Change Engage introduces learners to the topic of game design within the context of climate adaptation. It introduces them to the concept and process of Design Thinking; the cognitive, strategic, and practical processes for creative problem-solving. The module enables learners to develop a fundamental understanding of serious game design, world-building, character development, presenting, planning and time management.

The module encourages learners to engage with their local context to enable them to explore real-world problems in meaningful and tangible ways that are manageable. The module encourages the development of 21st Century skills, supporting them to keep up with the lightning pace of a constantly changing technologised world.

Design Thinking helps the learners to understand that they can create their own future by enabling them to design their own experiences and participation. Using linked learning and systemic thinking with practical methods of learning, including inquiry and project-based methods, the activities support teachers and learners to undertake a serious game design project.

In this module, the learner will...

- gain knowledge about climate change adaptation, mitigation, nature based solutions, and environmentally sensitive design
- develop awareness of the basics of Design-Thinking for problem-solving
- practice problem solving and critical thinking skills as individuals and as part of a group
- be introduced to aspects of serious game design and tools such as Lean Canvas, vision boards and a Pecha Kucha presentation
- develop skills of planning, division of workload and time management

This module includes:

- Lesson plans
- Accompanying resources
- Project-specific worksheets related to specific goals and other project modules
- Optional assessments
- Skill support resources

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Lesson 1: What is Design Thinking?
Design Thinking is the cognitive, strategic and practical process for creative problem-solving. This lesson will introduce students to the 5 stages of Design Thinking to build a foundational understanding of the process.

Resources include: Worksheet: Introduction to Design Thinking, Flipped Classroom: Learning about Complexity

Lesson 2: What is Climate Change?
In this lesson, learners are introduced to the foundational concepts of climate change including the difference between weather and climate. This enables learners to understand more about climate change, its impacts and gain knowledge that they can include within their game design.

Resources include: Video: What is climate change part 1 and 2, Worksheet: Discussion Questions and Infographic: Impact of 2C vs 1.5C Support: Teachers Guide

Lesson 3: The Cause of Current Climate Change
In this lesson, learners are introduced to the current causes of climate change. Through an exploration of the process of energy transport (radiation), the relationship between greenhouse gases and how heat is trapped, learners develop awareness on the causes of global warming and how this contributes to contemporary climate change.

Resources include: Video: The Cause of Current Climate Change, Infographic: Infographic: Impact of 2C vs 1.5C

Lesson 4: Climate Change Engage
In this lesson, learners are introduced to the concepts of mitigation and adaptation, and identifying opportunities for learners to take climate action by looking at their own behaviour and how they might reduce their impact.

Resources include: Video: Climate action- part 1-mitigation, Video: Climate action- part 2-adaptation, Support: Climate Mitigation Chart, Support: Climate Game Themes

Lesson 5: Design Thinking 1 - Empathy
Stanford Design School’s five-chairs exercise is adapted to encourage learners to learn how to develop design principles for a gamer profile. Learners will consider the gamers' needs and develop ideas on paper and create 3D prototypes of their designs.

Resources include: Worksheet: Gamer's profiles

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Lesson 6: Design Thinking 2 - Defining the Problem 1
In this lesson, learners will begin to understand how to define a problem. Learners are asked to begin to identify the problem they want to address within their game design using the driving question and SDGs as a starting theme. They also have an opportunity to develop an awareness of the problem on a local scale.

Resources include: Flipped Classroom Task: Define the Problem, Video: Defining the Problem, Worksheet: Problem Tree

Lesson 7: Design Thinking 2 - Defining the Problem 2, Deconstructing Parts of a Game
Through deconstructing games, learners will develop their understanding and knowledge of different kinds of games and game construction. This lesson enables learners to gain insight into game design; their mechanics and purpose, which provides a foundation for them to construct inclusive games.

Resources include: Worksheet: Deconstructing Games, Worksheet: Game Evaluation, Worksheet: Game Review Sheet

Lesson 8: Design Thinking 3 - Ideate 1, Worst Game ever
This lesson enables learners to develop an understanding of the importance of developing ideas and looking for opportunities to iterate and improve on existing ideas. Learners are also introduced to Open Source concepts e.g. iteration and collaboration.

Resources include: Teacher Support Sheet: Worst Game Ever

Lesson 9: Working with Nature: Nature-Based Solutions & Green Infrastructure
This lesson introduces learners to the closely associated concepts of ‘nature-based solutions’ and ‘green infrastructure’. The lesson challenges them to rethink how and why the places they are familiar with could and should be redesigned.

Resources include: Video: ‘Nature-Based Solutions & Green Infrastructure’, Flipped Classroom: Vocabulary & Case Studies

Lesson 10: Working with Nature: Nature-Based Solutions & Green Infrastructure
This lesson builds on Lesson 9 and involves rethinking how we design the places where we live, work, and play. The lesson deepens the learners' understanding of key concepts and terminology presented in lesson 9.

Resources include: None required

Lesson 11: What are Serious Games?
This lesson introduces learners to what serious games are and their purposes, describing the characteristics of games relevant to integrating nature in cities.

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Resources include: Video: What are Serious Games? Worksheet: Active Listening, Support Sheet: Serious Games Directory (Istrate and Hamel, 2022)

Lesson 12: Climate Change and the Built Environment (Part 1)

In this lesson, learners will learn why we need to adapt the way we plan and build our cities and towns in the future. Learners will consider the challenges of existing low-density settlements, how we can adapt and increase density in built-up area of cities and towns through repurposing buildings.

Resources include: Video: Climate Change and the Built Environment, Worksheet: Active Listening Task, Worksheet / Guide: Using AIRO Maps and Activity worksheet

Lesson 13: Settlement Pattern and Sustainability

In this lesson, learners will reflect on the different settlement patterns in their locality and consider if they are positive or negative for the environment. Firstly, they review some of the key vocabulary / terms from the previous lesson and secondly, look at what these terms mean on the ground in the built environment that they are familiar with.

Resources include: Worksheet: Reviewing Vocabulary, Worksheet: Exploring Settlement Patterns, Reference: Appendix 1 and 2

Lesson 14: Housing Types, Density and Climate Change.

In this lesson, learners will think about different types of housing, their varying densities and how sustainable these are. They will think about the various types of housing they are aware of and reflect on the positive and negative elements of these from a climate change perspective. This lesson focuses on different building types rather than overall settlement.

Resources include: None required

Lesson 15: Defining the challenge (driving question) & forming teams

In this lesson, learners will begin to consider the key aims of the project and forming teams. In order to come up with a well-rounded pitch, it is important to answer the driving question in full. By breaking down and analysing each part of the question, learners have a more focused approach to their research, ideas and solutions.

Resources include: None required

Lesson 16: Mapping the User

This lesson facilitates learners to develop further insight into specific users and develop an understanding of their needs and interests. From this lesson, learners working within their design teams will begin to identify and focus on the users of their game and the design principles, necessary to design their game.

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Resources include: Worksheet: Stakeholder Mapping, Worksheet: Gamer Journey Map, Worksheet: ~ Understanding the User

Lesson 17: Ideate 2 : Generating and Remixing Ideas
This lesson builds on Lesson 8, enabling learners to develop an understanding of the process of generating ideas using the fundamental components of a game. They will work in teams to identify 4 components of 3 games building on their understanding of games from Lesson 7 and how to use random variables to create useful building blocks for design ideas.

Resources include: Worksheet: Ideate Remix, Worksheet: Remix SWOT

Lesson 18 - 20: Developing Designs on Paper and Building Prototyping Skills
In this lesson, learners will begin to consider their ideas for their prototype, develop a concept statement and look at ways to prototype their ideas depending on their gamers / audience. They will also develop their designs on paper using their user profiles and selected game theme. They will also begin to prepare materials and ideas for their vision board.

Resources include: Video; Design Thinking - Prototyping, Worksheet: Concept Statement. Worksheet: Rapid Response prototyping (incl. Rapid Response Ready, Set, Design

Lessons 21- 22: Design Thinking - Test 1 Creating and Using Vision Boards
This lesson prepares learners to present their work in a structured way and prepares them for organising documentation (images, details) of their idea development and process. This lesson will begin to help them test their ideas by developing their vision boards using the Vision Board support worksheets and prepare them for their final pitch - their Pecha Kucha presentation.

Resources include: Worksheet: Vision board, Support: Creating a Game Vision board

Lessons 23 - 26: Creating your 3D prototype - Self-directed Making
In these sessions, learners build on lessons 14 - 21, to develop their initial paper prototyping ideas, receive feedback from testing their ideas to create their final game prototype and complete their vision boards in preparation for their pitch presentation.

Lesson 27: Peer Assessment - Developing Pitch Criteria
In this lesson, learners will define their peer assessment criteria. Peer assessment enables those directly involved in the task or project to appraise their own learning. Learners are encouraged to consider what is most important, valuable and successful from what has been learned and the process of learning; taking responsibility, learning to evaluate, increasing motivation and practicing giving and receiving feedback.

Resources include: None required

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Lesson 28: Design Thinking Test 2 Preparing to Pitch - Pecha Kucha 1
In this lesson, learners will be introduced to the Pecha Kucha format and begin to analyse what makes a good presentation so they can prepare to create their own Pecha Kucha presentation.

Resources include: Video: A Pecha Kucha About Pecha Kucha, Video: Bad Presentation 1, Video: Bad vs Good Presentation, Worksheet: Pecha Kucha Analysis

Lesson 29 - 30: Design Thinking Test 2 Creating a Pecha Kucha
In this lesson learners will continue how to plan, create and present their Pecha Kucha. The lesson and its resources support students to create their outline and begin to develop their presentation step-by-step. They can continue to work on this in lesson 30.

Resources include: Worksheet: Pecha Kucha Planning Guide, Worksheet: Pecha Kucha Outline, Worksheet: Pecha Kucha Checklist

Lessons 31 - 32 Design Thinking Test 2 Peer Review and Pitching Your Ideas
This lesson builds on Lessons 27 - 30 by enabling learners to develop their presentation skills, learn to give peer feedback and constructive criticism. Each team will present their game ideas to the other teams and using the supporting resources assess their peers.

Resources include: Support Resource: Peer Review table

Lesson 33: Facilitating a World Café
In this lesson, the learner will experience the World Café methodology as a reflective tool. A World Café is a series of conversations around a question or issue. It was developed in 1995 and is a simple, flexible and effective way to host large group dialogue. By facilitating a World Café as a reflective exercise for your learners, it will enable them to process their thoughts on the game design process and feedback further on each others' game ideas.

Resources include: Support resource: Facilitating a World Café

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Setting up an online learning environment for the lessons on this module:

Our lessons integrate the use of virtual learning environments. To ensure seamless use of our lessons, a module should be setup on your school's virtual learning environment such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers. If your virtual learning environment does not support document sharing, we recommend OneDrive or Google Drive.

You can also use Google Sites or Microsoft Sway to encourage learners to present their work over the year - this can easily be set up to reflect the aims of TY and provide a showcase for their work as well as assessment tool.

Setting up a Canva Education account:

As our lessons integrate design, our lessons also refer to Canva. Educators and schools are able to open a free Canva for Education account by registering here: https://www.canva.com/education/ Canva for Education provides primary and secondary school teachers and students with premium features and templates. You can then also set up lessons and invite your learners to the class.

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SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 1: Introduction to Design Thinking

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Introduction to Design Thinking

Design Thinking is the cognitive, strategic and practical processes for creative problem-solving. This lesson will introduce students to the 5 stages of Design Thinking to build a foundational understanding of the process.

Vocabulary: Context, Culture, Empathy, Qualitative, Stakeholders, Users

In this lesson, the learner will:

- be introduced to Design Thinking
- explore the 5 stages of Design Thinking
- create their own understanding of the stages through quick practical tasks
- work as pairs and individuals to begin to understand the iterative processes
- practice time management

Materials

- Worksheet: Introduction to Design Thinking
- Flipped Classroom: Learning about Complexity
- A4 paper
- Internet access
- Stakeholder mapping activity

SDG13 Climate Change Engage Game Design
L1: Introduction to Design Thinking

Activity Instructions

Activity 1 Introduction to Design Thinking (20 mins)

1. Using Worksheet: 'Introduction to Design Thinking', watch the short video and refer to the 'Define' section of the worksheet.
2. Working in pairs, ask learners (using dictionaries or the internet) to find out the definitions of the keywords listed and paraphrase in their own words.
3. Share paraphrased definitions with another pair. Make any necessary amendments.
4. Review definitions as a whole class and examine the 5 stages of Design Thinking image.

Activity 2 Ideate: Worst Idea / Good Idea (30 mins)

Working in the same pairs, learners should work through the rest of the worksheet asks. Remind learners they will have to manage their time to complete all tasks in 30 minutes. Ask them to read through all of the tasks and discuss in their pairs how long they should spend on each one.

1. Move learners on to Ideate, complete the task
2. Complete the Prototype task.
3. Complete the 'Test' stage task - using the questions to consider their prototype

The aim of the prototype is not to create masterpieces, but to work quickly and experimentally – it should be made clear that given the time limitations, the aim is to quickly show the idea in 3D.

Ask learners to complete Flipped Classroom: 'Learning about Complexity' before the next lesson.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L1: Introduction to Design Thinking

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, skip Activity 2 and spend more time in building the collective vocabulary list – have learners type up their words and definitions and add to a shared document (either on the wall or as a digital repository).

Extension: For a longer class, allow more time and materials for the Ideate – Prototype stages of the Introduction to Design Thinking worksheet.

If students have game themes in mind they could also begin to research their stakeholders and local organisations through the stakeholder mapping worksheets – see Media Box.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Design thinking Mindsets

Design Thinking For Schools poster
https://www.makersempire.com/design-thinking-for-schools-poster/

How to apply Design Thinking in the Classroom -
https://creativedesigncycle.com/how-to-apply-design-thinking-in-the-classroom/

dSchool starter kit https://dschool.stanford.edu/resources/dschool-starter-kit

SDG Focus: See Introduction to Sustainable Development Goals lessons

Introduction to SDGs for Young People https://www.un.org/sustainabledevelopment/youth/
Explore the SDGs https://sdgs.un.org/

Local Trip / Expertise / Additional Work and Assessments

Teachers are encouraged to work with other teachers to develop the project through multiple outcomes such as video, poster, Pecha Kucha, interviews or podcasts.
SDG 8 Media Communication - supports support the development of the 4Cs skills – Creativity, Communication, Critical Thinking and Collaboration -
https://www.codesres.ie/_files/ugd/92a067_a8f108ce0a6448e9851a5b03dd2e8d40.pdf

SDG 4 Supporting Skills - https://www.codesres.ie/sdg-4-supporting-resources

CCE L1FC: LEARNING ABOUT COMPLEX SYSTEMS

13 CLIMATE ACTION

Learning about Complex Systems

Why are systems complex. https://www.youtube.com/watch?v=FW6MXqzeg7M&ab_channel=SustainabilityScienceEducation

What is a Wicked Problem (Rittel, 1973)?

What is a Wicked Problem? https://www.youtube.com/watch?v=lOKpB4KtUZ8

Watch the video and give 4 qualities of a Wicked Problem.

1.
2.
3.
4.

Climate Change is a Wicked Problem

https://www.youtube.com/watch?v=XRoCxS6n53U

How can Design Thinking help with Wicked Problems?

https://www.youtube.com/watch?v=WrdSkqRypsg

Watch both the videos above and list 3 areas you could use Design Thinking to work on an aspect of climate change.

1.
2.
3.

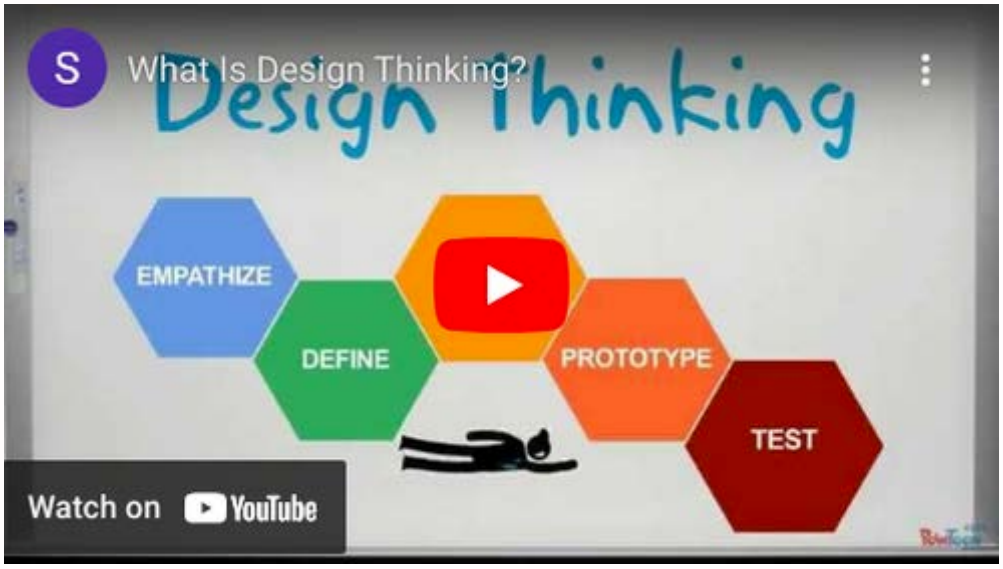
If you are interested in complexity and systems thinking here's a few more videos you might find interesting.

- Jamming on complexity https://www.youtube.com/watch?v=WT_zUxRTEjA
- Boundaries define complex systems https://www.youtube.com/watch?v=9o21WKsM4U8

CCE L1WS: DESIGN THINKING INTRODUCTION

13 CLIMATE ACTION

WHAT IS DESIGN THINKING?



Working in pairs google these words (or use a dictionary) to find out what they mean and re-write the definitions in your own words

1. Ergonomic -

2. Context -

3. Culture -

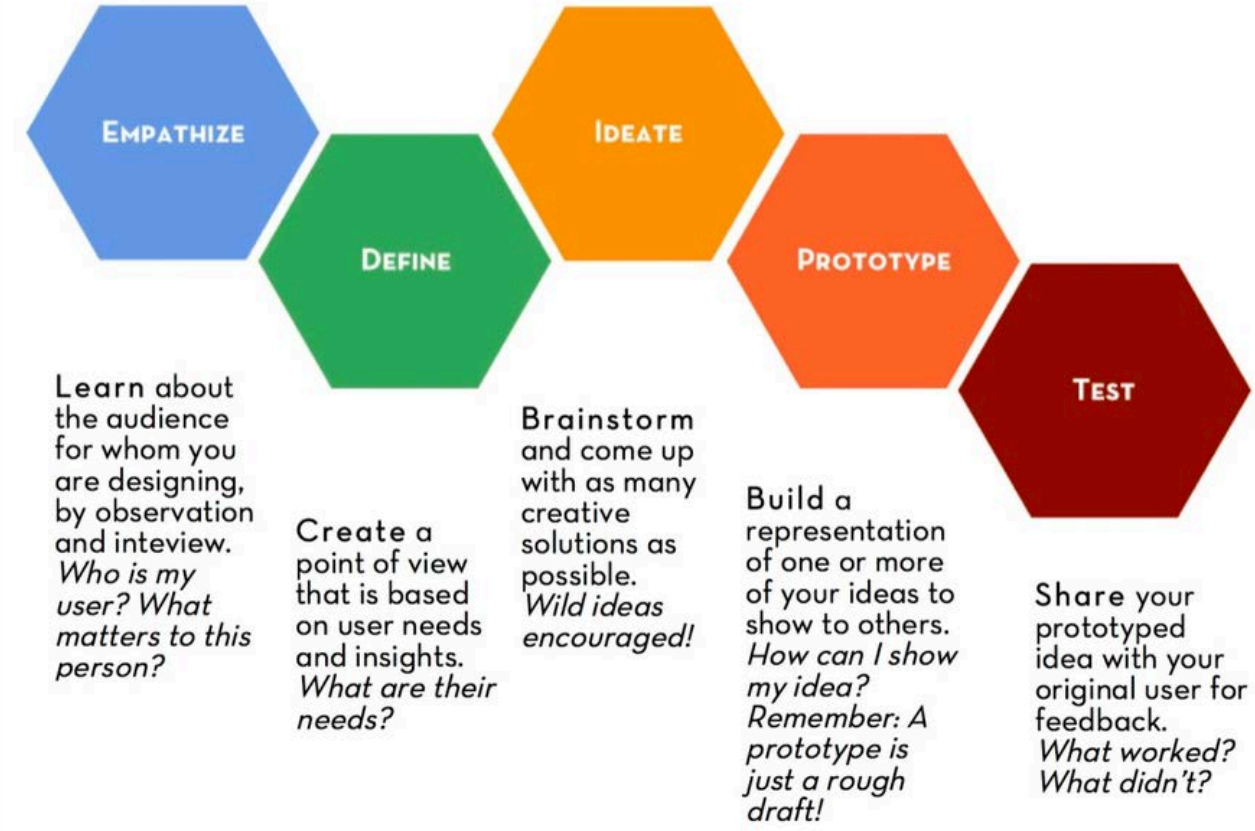
4. Stakeholders -

Your answers will be shared with the other teams to build a vocabulary list and definitions - this is called a glossary

CCE L1WS: DESIGN THINKING INTRODUCTION

13 CLIMATE ACTION

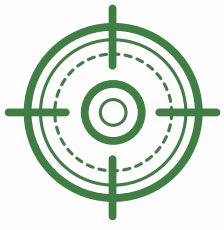
The 5 stages of Design Thinking:



Before you start to work on your problem or project have a look at each stage and see what you need to think about in any project. You will also have to manage your time as the last three tasks will take more time.

Empathise - Most projects will involve people at some point. What might you need to think about - Discuss with your partner and write down 3 things that might matter to a user / audience member.

1.
2.
3.



Define - What's your problem? `Often we deal with symptoms - a runny nose, a sore throat but we need to deal with our immune system. In defining your problem you will look at the whole system. Write down 3 problems you know of in your community or the world.

1.
2.
3.

CCE L1WS: DESIGN THINKING INTRODUCTION

The 5 stages of Design Thinking:

Ideate - This is the stage in the process to think about as many ideas as possible. For now, write down the 2 worst ideas you can think of - swap them with your partner and try to create three good ideas from each others bad ideas.

Bad Ideas.	Good Ideas
1	1.
2.	2.

Prototype- using only one piece of paper, build or make one of the good ideas above. You will have to be creative, how will you make the shapes; folding, tearing? If you are to fix it together, how might you do this - links, cutting, what other ways of joining things together can you experiment with?

Remember: There is no right answer this is about experimentation - have fun!

Test - The final stage is testing. In this stage you learn about the product, service or idea you have created . Share your 'good idea' prototype with your partner and they will share with you.

Things to discuss / consider:

Test - The final stage is testing. In this stage you learn about the product, service or idea you have created . Share your 'good idea' prototype with your partner and they will share with you.

Things to discuss / consider and questions to ask:

1. Who might the user be?
2. Look at how it is made - remember there were limits to materials so you are looking at their problem solving and creativity.
3. Is there anything they could try to make it better or improve it using the materials they had?
4. How might you explore the idea further if time and materials were not a limit?

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 2: What is Climate Change?

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: What is Climate Change?

In this lesson, learners are introduced to the foundational concepts of Climate Change. This will enable them to understand more about Climate Change and its impacts and gain knowledge that they can include within their game design.

Learners will be introduced to the difference between weather and climate, begin to understand the changes in patterns and recognise the impacts that this can have.

Vocabulary: Average Conditions; Climate Change; Extreme Weather Events; Weather

In this lesson, the learner will:

- learn foundational concepts of climate change
- understand the difference between weather and climate
- gain insight into changing weather patterns over time
- understand the scale of the problem of climate change
- understand the importance of keeping climate warming at 1.5 degrees C
- understand the impact of 2 degrees C warming

Materials

- Video: What is climate change? Part 1 and 2
- Worksheet: Activity Question
- Worksheet: Discussion Questions and Infographic: Impact of 2C vs 1.5C
- Lesson 2-4 Teachers' Guide
- Internet access
- Pens, pencils
- paper
- Blackboard / Whiteboard

SDG13 Climate Change Engage Game Design
L2: What is Climate Change?

Activity Instructions

Activity 1 Understanding Climate Change (20 mins)

1. Ask learners if they can describe the difference between weather and climate. They can share ideas with a partner before a whole class share.
2. Put the following questions on the board and read through as a whole class.
    - How would you describe climate?
    - How would you describe climate change?
    - How do you think climate has changed in Ireland?
    - How would you describe weather?
    - What is an extreme weather event?
    - How are extreme weather events related to climate change, what are the impacts?
    - Have you recently experienced an extreme weather event? What were the impacts on houses, streets, agriculture, etc.? How was human health affected?
3. Play the Video: What is climate change? (Part 1), asking learners add to their answers.
4. Divide learners into pairs to share answers before discussing as a whole class.

Activity 2 How hot is the new climate? (20 mins)

1. Watch Video: What is climate change? (Part 2) and make notes under the following headings:
    - Global climate changes
    - Changes in nature (melting ice - species migration - species disruption)
    - Paris Agreement
2. Working in the same groups, compare notes and use the Infographic to discuss the worksheet questions.

Activity 3 What are you willing to do? (10 mins)

1. In pairs, discuss what you would be willing to do to keep the temperature from reaching 2 degrees Celsius). Would you eat less meat? Would you not fly for vacation? Would you buy less clothing/ second-hand clothing? Would you turn down the heat in your home?

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L2: What is Climate Change?

EXTENSION / REDUCTION ACTIVITIES

Reduction: for a shorter lesson, only complete Activity 1 & 3.

Extension: For a longer lesson, ask learners to reflect on how a changing climate makes them feel. Discuss what someone can do to handle fear of something that seems out of one's control. Refer to the Force of Nature discussion guide on eco-anxiety- see Media Box.

Option B: Brainstorming for game design - In small groups, brainstorm things that will be more difficult to access as it gets warmer - how might this inform their game design?Share ideas as a whole class.

Option C: Mini research task, research the effects of climate change on local flora and fauna.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Activity 1 Video: What is Climate Change? Part 1 https://youtu.be/t4csCQuzDf0

Activity 1 Video: What is Climate Change? Part 2 https://youtu.be/0NbmJOhKpMY

Infographic: Comparing 2C to 1.5C https://www.climatecouncil.org.au/resources/infographic-the-difference-between-1-5-and-2-degrees-warming/

Force of Nature Discussion Guide https://www.forceofnature.xyz/discussion-guide

Walsh, S. (2012). A summary of climate averages for Ireland, 1981-2010. Climatological note no. 14. Met Éireann. Retrieved from http://hdl.handle.net/2262/70490

Met Éireann's role in climate change https://www.met.ie/climate/climate-change

Before the Flood Documentary (95:00min) https://www.youtube.com/watch?v=zbEnOYtsXHA

Local Trip / Expertise / Additional Work and Assessments

Ask learners to calculate the average temperature/ rainfall from their nearest weather station. You could also discuss extreme weather events that recently have happened locally/ elsewhereL Weather Observation Website: https://wow.met.ie/

Find out and organise a visit and talk to your local weather station, or invite them to link with the learners.

CCE L2 - 4: TEACHERS' GUIDE

LESSONS 2 - 4 ARE THREE INTERLINKED LESSONS AROUND THE FUNDAMENTAL CONCEPTS OF CLIMATE CHANGE :

- **WHAT IS CLIMATE CHANGE?**
- **THE CAUSE OF CURRENT CLIMATE CHANGE**
- **CLIMATE ACTION: ADAPTATION AND MITIGATION**

LESSON 2 - WHAT IS CLIMATE CHANGE?

Climate is the long-term average weather conditions over time and their variation. When we change the climate, we are changing this average weather pattern. With current climate change, the earth is getting rapidly warmer.

We are experiencing sea level rise, higher, more intense rainfall, and more extreme weather events like heat waves, droughts, flooding, wildfires and storms with high winds. These events make it more difficult to farm, which may impact food supplies.

Changing the climate displaces plants and animals from places that they used to live in and may expose them to novel disease. The adverse effects of climate change can make us anxious as we are not sure what is to come and how we will deal with these changes. Talking about these feelings and finding community in living through and adapting to the change is very important.

The media box resources also contains a link to the film 'Before the Flood' which is a useful background summary. This is available for renting so maybe something that is integrated into TY as a general all pupil activity it looks at the sources, techniques, media and impact with a mostly American perspective but does include China, India, Indonesia, and the Pacific islands.

LESSON 3 - WHAT IS THE CAUSE OF CURRENT CLIMATE CHANGE?

The climate is driven by the amount of energy that drives the climate system. Energy is transported from the sun mainly in the form of visible light, whereas once this energy is absorbed at the Earth's surface it is transported from object to object in the form of infrared radiation.

The climate can be changed for two reasons; either there is more solar radiation received on Earth and/or there are more greenhouse gases in the atmosphere that keep infrared radiation in the atmosphere.

Changes in greenhouse gas concentrations in the atmosphere are due to human activities such as burning of fossil fuels, but also land use changes such as deforestation, soil degradation, draining of peatlands, and livestock agriculture as well as natural processes such as volcanic eruptions and meteorite impacts.

Changes in solar radiation are mostly due to changes in the distance of the earth to the sun, which happens on a geologic time scale. However, some variation is due to changes in solar activity and now the melting of snow and ice on Earth, as this decreases the amount of sunlight reflected.

CCE L2 - 4: TEACHERS' GUIDE

LESSON 4 - CLIMATE ACTION- MITIGATION AND ADAPTATION?

Climate action is twofold, we have to reduce greenhouse gas emissions but we also have to adapt to the new climate that we have created by our greenhouse gas emissions. Our greenhouse gas emissions per person are higher in Ireland than elsewhere in the EU and much higher than elsewhere in the world. We are emitting more than our fair share. We are emitting more than our fair share. To cut our greenhouse gas emissions we need to measure our carbon footprint, so we know what activities emit them.

Generally, everybody can help reduce greenhouse gas emissions by organising for climate action, choosing green transport, saving energy consuming less, helping nature and eating less meat and dairy products. This lesson introduces learners to the concepts of mitigation and adaptation, as well as encouraging climate action.

Mitigation: Mitigation: In order to reduce greenhouse gas emissions, we need to become aware as to where these emissions come from. The most abundant greenhouse gas that is contributing the most to global heating is carbon dioxide (CO2). CO2 is a gas we breathe out after we produce metabolic energy in our bodies. It is produced when we burn wood or fossil fuels, like oil, coal and gas, so it is produced when heating our homes and in transport and energy systems. Drained (and harvested) peatlands also emit large amounts of CO2. Methane (CH4) is the second most abundant greenhouse gas. It is an important contributor to greenhouse gas emissions in Ireland as livestock agriculture produces a lot of methane (CH4) through digestion (cows burping it out of their stomach) and from manure.

Adaptation: we need to live with higher sea levels and more extreme weather events, so we need to prepare for this. Ideally, we would do so by helping nature to help us, e.g. giving more space for nature in coastal ecosystems or flood plains.

Lesson 4 Case Study support:

Case study 1: Seagrass: restoring seagrass in Kilmore Quay, County Wexford (interview with a 7-year old boy and other participants in seagrass restoration project by Coastwatch (the Irish Coastal Environmental Group): https://fb.watch/eb---r3uy7/ (RTE news, September 2021).

In this project, volunteers removed the invasive seaweed Sargassum muticum from seagrass meadows to allow light onto the seagrass). Coastwatch relies on volunteers to survey the coasts for seagrass presence, for seagrass restoration and for picking up litter around the coast. Benefits in terms of climate mitigation: seagrass is very efficient at capturing CO2 from the atmosphere. Benefits in terms of climate adaptation: seagrass slows the action of waves and reduces coastal erosion.

Case study 2: Coastal dune: the Inchydoney Dune Conservation Project, Cork is educating the public about the impact of walking in the dunes can lead to erosion of the dunes. They are taking measures to recover eroded dunes and protect existing dunes from further erosion and organising beach clean ups. Benefits in terms of climate mitigation: some

carbon capture by dune grass. Benefits in terms of climate adaptation: dunes provide a natural barrier against coastal flooding and erosion.

- https://www.southernstar.ie/news/our-dunes-are-dying-but-if-we-move-quickly-we-can-save-them-4218106
- https://www.facebook.com/Inchydoney-Dunes-Conservation-Group-101291461965770/

References:

Blondel, J. (2019). How do birds adapt to a changing climate? Encyclopedia of the Environment. Institute de France, Académie des Sciences, University Grenoble Alpes. This webpage https://www.encyclopedie-environnement.org/en/life/how-birds-adapt-changing-climate/ explains in detail how birds will be affected by climate change. Last accessed: June 2022.

Climate change post (2022). Ireland. https://www.climatechangepost.com/ireland/
The Ireland page contains links to footages of floods in Ireland on YouTube. There is also a specific write-up of coastal flood risks: https://www.climatechangepost.com/ireland/coastal-floods/

Devictor, V., Van Swaay, C., Brereton, T., Brotons, L. s., Chamberlain, D., Heliölä, J., . . . Jiguet, F. (2012). Differences in the climatic debts of birds and butterflies at a continental scale. Nature Climate Change, 2(2), 121-124. doi:10.1038/nclimate1347

Friedlander, B. (2021). Seven years of agricultural productivity growth lost due to climate change. Stanford Woods Institute for the Environment adapted from Cornell Chronicle. This website https://woods.stanford.edu/news/seven-years-agricultural-productivity-growth-lost-due-climate-change summarises the agriculture losses observed over the period 1961-2020 Last accessed: June 2022.

Maynooth University (2022). Press release: https://www.maynoothuniversity.ie/news-events/maynooth-university-research-confirms-elevated-rates-sea-level-rise-dublin

NOAA (2021). How does climate change affect coral reefs? National Ocean Service website, This website https://oceanservice.noaa.gov/facts/coralreef-climate.html contains an infographic that explains the impact of climate change and other human activities on coral reefs. Last accessed: June 2022.

Ortiz-Bobea, A., Ault, T. R., Carrillo, C. M., Chambers, R. G., & Lobell, D. B. (2021). Anthropogenic climate change has slowed global agricultural productivity growth. Nature Climate Change, 11(4), 306-312. There is also a short video where Ariel Ortiz-Bobea explains his research https://news.cornell.edu/stories/2021/04/climate-change-has-cost-7-years-ag-productivity-growth

Walsh, S. (2012). A summary of climate averages for Ireland, 1981-2010. Climatological note no. 14. Met Éireann. Retrieved from http://hdl.handle.net/2262/70490

CCE L2WS: ACTIVITY 2 DISCUSSION QUESTIONS

As you watch the video: 'What is Climate Change?' (Part 2), make notes here or in your notebooks under the following headings:

- **Global climate changes**

- **Changes in nature**
  - **melting ice**
  - **species migration**
  - **species disruption**

- **Paris Agreement**

Use the Infographic on the next page to discuss and answer the following questions below:

- **What does it mean to lose more plant and insect species?**
- **What happens to these species?**
- **Why are coral reefs so badly affected by climate change?**
- **Why is it a problem to lose more ice?**

CCE L2WS: ACTIVITY 2 DISCUSSION QUESTIONS

https://www.climatecouncil.org.au/resources/infographic-the-difference-between-1-5-and-2-degrees-warming/

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 4: Climate Action

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Climate Action

In this lesson, learners are introduced to the concepts of mitigation and adaptation, as well as encouraging them to take climate action, by looking at their own behaviour and how they might reduce their impact.

Learners will explore local and global impacts and actions around greenhouse gas and energy reduction, expanding their knowledge for potential themes in their game design.

Vocabulary: Climate Action; Climate Change Adaptation; Climate Change Mitigation; Carbon Dioxide (CO_2); Methane (CH_4)

In this lesson, the learner will:

- Understand the difference between climate change mitigation and adaptation
- Understand what they can do to cut greenhouse gas emissions
- Understand how we can live in a changed climate and adapt to it
- Be empowered to take positive action for the climate

Materials

- Video: 'Climate action- part 1-mitigation'
- Video: 'Climate action- part 2-adaptation'
- Support: Lesson 2-4 Teachers' Guide
- Support: Climate Mitigation Chart
- Internet access
- Pens, pencils
- paper
- Blackboard / Whiteboard

SDG13 Climate Change Engage Game Design
L4: Climate Action

Activity Instructions

Activity 1 Climate mitigation: how can we cut greenhouse gas emissions? (25 mins).

1. Elicit possible definitions of climate change mitigation. Allow learners to refer to dictionaries to gather 2 - 3 definitions and share ideas with a partner.
2. Elicit ideas as a whole class to create a definition together.
3. Reintroduce the concept of Greenhouse Gases, Carbon Dioxide (CO_2) / Methane (CH_4) emissions and the areas where CO_2 / CH_4 are produced:

    - burning wood or fossil fuels, like oil, coal and gas
    - heating our homes
    - transport and energy systems
    - livestock agriculture's digestion producing methane

   and discuss - refer to support: 'Lesson 2-4 Teachers' Guide' for additional support if required.

5. Watch video 'Climate action- part 1- mitigation' (4:46 mins): ask learners to list the activities mentioned that use energy.
6. Divide learners into pairs, ask them to write a list describing the activities that they carry out during the day e.g. taking a shower, washing clothes, eating breakfast, going to school, etc.
7. Ask them to compare their list with the list they made from the video and discuss how less energy could be used by them personally, the local community, and the country.
8. Use the Climate Mitigation Chart to consider what they already do and what are the obstacles to things they don't do. Compare with another pair.

Activity 2: Adaptation (25 mins)

1. Elicit possible definitions of climate change adaptation. Allow learners to refer to dictionaries to gather 2 - 3 definitions and share ideas with a partner.
2. Elicit ideas as a whole class to create a definition together. Introduce the concept of climate change adaptation - see support: 'Lesson 2-4 Teacher's Notes'.
3. Working in the same pairs as Activity 1, look up how much the sea level has already risen (in Ireland/ in the world) - see Media Box.
4. Discuss the following questions as a whole class or in small groups:

    - Have you seen any coastal erosion?
    - Have you seen any flooding?
    - Are you aware of any houses or roads that were built close to the coast/ in flood plains?

SDG13 Climate Change Engage Game Design
L4: Climate Action

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, reduce the amount of time spent on Activity 1.

Extension: For a longer lesson, share the case studies on seagrass or salt marsh / dune system with the learners and discuss if they would rather have a sea wall to prevent coastal erosion or plant seagrass / create a salt marsh/dune system?

Option B: Consider the adaptations outlined in the support: 'Climate Game Themes' for their potential for integration into their game design

Option C: Calculate their carbon footprint: https://www.carbonfootprint.com/calculator.aspx

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Activity 1 Video: 'Climate action- part 1-mitigation' (4:46 mins) https://youtu.be/ptV2xXiDXAc

Activity 2 Video: 'Climate action- part 2-adaptation' (2:37 mins) https://youtu.be/eoY7N7QKI_o

Climate Change Post (2022) https://www.climatechangepost.com/ireland/

Coastal Floods in Ireland https://www.climatechangepost.com/ireland/coastal-floods/

Coastal Risk Screening Tool https://coastal.climatecentral.org/

History of CO2 concentration animation https://gml.noaa.gov/ccgg/trends/history.html

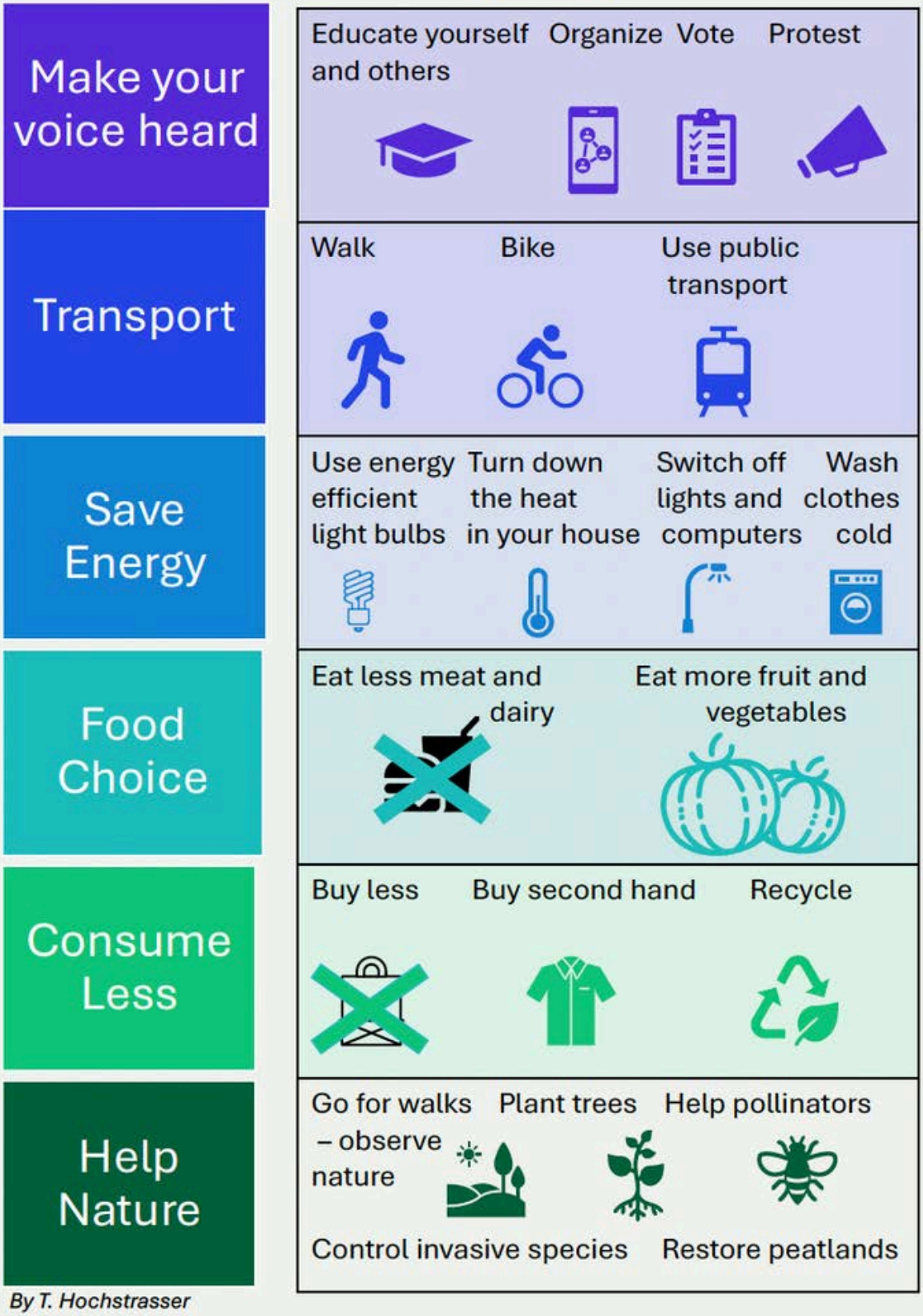
Local Trip / Expertise / Additional Work and Assessments

Contact a planner from the local or information on their climate change mitigation and adaptation projects.
Contact any local engineering companies to find out more about any climate change mitigation and adaptation projects.

CCE L4WS: CLIMATE MITIGATION CHART SUPPORT

13 CLIMATE ACTION

How to cut greenhouse gas emissions?
Climate change mitigation



By T. Hochstrasser

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 5: Building Empathy

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Building Empathy

In this lesson, Stanford Design School's 'Five Chairs' exercise is adapted to use Bartles's taxonomy of types of gamers and their play type. This encourages students to learn how to develop design principles for a gamer profile.

Students will consider 5 types of gamers and their gaming 'needs', develop ideas on paper, then create 3D prototypes of their designs. This activity encourages students to iterate on their designs and practice using different materials and will scaffold Lesson 16 - Mapping the User.

Vocabulary: Assumptions; (Biases, Judgement) Design Principles; Empathy; Identify; Immersion

In this lesson, the learner will:

- Understand empathy in design
- Develop critical thinking through the practical tasks of asking students to analyse their user's profile to find their needs
- Build, test and iterate design ideas grounded in a user's needs
- Practice group work and develop the ability to work through design challenges collaboratively

Materials

- Worksheet: Gamer Profiles
- Video: 'Design Thinking Empathise'
- Pens, pencils
- Paper
- Scissors
- Craft materials
  - Corrugated Cardboard
  - Pipe Cleaners,Match sticks or toothpicks
  - Modelling Clay
  - Tape

SDG13 Climate Change Engage Game Design
L5: Building Empathy

Activity Instructions

Activity 1 Developing design principles from user profiles (10 mins)

1 Organise learners into groups of 2 or 4.
2. Elicit learners' understanding of 'empathy'. What does it mean? Why is it important? Use the video 'Design Thinking - Empathise' if preferred.
3. Using Worksheet: Gamer Profiles, explain the task to the learners and read through the gamer profiles as a whole class. Learners will develop the design principles (rules / needs) for the users' games based on the needs of the gamer for each profile.

Activity 2 Developing paper designs (20 mins)

1. Ask each learner to select a gamer profile they want to work with and identify two needs they see in the description. These will form the initial design principles.
2. Begin to develop design ideas on paper for their chosen gamer that integrates the needs they have identified.
3. After 15 minutes, conduct a check-in by asking learners to discuss the following questions with 1-2 of their peers. Check in for main ideas and opinions as a whole class.

Empathy Questions Checklist

- *Did you identify the design principles required for your user?*
- *Did you make any assumptions about your user?*
- *Did you discover any biases / judgments about your user that you might have?*

Activity 3 Develop a rapid 3D prototype (20 mins)

1. Using the prototyping materials (see Materials list), invite learners to build a 3D prototype of their paper design. Their prototype needs to build in two of their identified user needs (design principles). Encourage them to include one more design principle of their choice- to reflect their own style as a designer; something unique for their user.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L5: Building Empathy

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class select one user and profile and complete activities 1 and 2 only for that gamer. Follow up with 3D designs and discussion in secondary class.

Extension: For a longer class do both activities with more additional user profiles. Use Discussion Questions in the Media Box as part of Activity 3.

In Lesson 16, learners will begin to develop their gamer profiles based on the Stakeholder Mapping and the Empathy Map – see Local Trip / Expertise / Additional Work and Assessments

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

- 'Design Thinking - Empathise' (4:18 mins) https://www.youtube.com/watch?v=q654-kmF3Pc
- 'The Importance of Empathy' (1:07min) https://www.youtube.com/watch?v=UzPMMSKfKZQ
- 'Empathy Mapping' (5:36min) https://www.youtube.com/watch?v=QwF9a56WFWA
- 'Empathy not Sympathy' (2:32min) https://www.youtube.com/watch?v=HznVuCVQd10
- Worksheet: Gamers' profiles

Activity 3 Design Discussion Questions

- *What was it like to design and build your ideas using the user needs (design principles) you identified?*
- *What was it like to create different iterations of your design? Paper vs 3D?*
- *What did you change along the way? What did you learn from your prototypes?*
- *Did anyone get stuck at any point? What was that like? What did you do to get unstuck?*
- *Which material did you enjoy working with the most? Why?*
- *Which material did you like the least? Why?*

Local Trip / Expertise / Additional Work and Assessments

Lesson 16: The stakeholder mapping worksheet supports learners to focus in on their gamer, their interests and focus their game design.

Teachers are encouraged to work with other teachers to develop the project through multiple outcomes. SDG 8 Media Communication (video, poster, Pecha Kucha, interviews or podcasts) supports support the development of the 4Cs skills – Creativity, Communication, Critical Thinking and Collaboration - sign up for these resources using your school email. https://www.codesres.ie/_files/ugd/92a067_a8f108ce0a6448e9851a5b03dd2e8d40.pdf

SDG 4 Supporting Skills - https://www.codesres.ie/sdg-4-supporting-resources

CCE L5WS: GAMER PROFILES

Lisa Simpson loves exploring and will spend hours hunting for clues. She loves mysteries and being the first to discover something. She likes to use her new-found information to make a difference, she's a vegetarian and concerned about climate change . She's not really a team player and likes to go at her own pace. She will spend hours finding out all she can about a place or a topic. For Lisa, it's the journey rather than winning, that she enjoys best.

Janey Powell is Lisa Simpson's best friend - Lisa doesn't spend a lot of time with many people except Janey. Janey is really social so she uses social media a lot to make more friends and loves to get to know people. She's always joining groups and using chat boxes or getting involved in discussion forums. Janey likes social interactive games. She cares about people and being part of a community, and wants everyone to be able to join in and will often look for ways to engage others.

Most adults struggle with Bart Simpson, who's considered a troublemaker and disruptive as he's not that interested in rules. He may not get high grades but he's smart, a quick thinker and good problem solver. He's also funny, so he's very popular and has a number of friends. He likes to do things in groups that require skill and likes both physical and video games, but they must be action orientated.

Milhouse van Outen is Bart's best friend, He has very poor eyesight and this can make him feel vulnerable. He's pretty smart and knows a lot about things that interest him. He is interested in animals and their unique abilities as well as being obsessed with science fiction / fantasy, science, and technology and systems. He notices patterns and connections and wants to understand how things work, so he can invent or create and developed new ideas particularly technical and scientific solutions for climate change.

Ralph is very conscientious in all that he does. He likes to demonstrate his skills and knowledge, particularly about climate change. He's very keen to complete tasks and activities and loves getting badges, trophies, and being recognised for his knowledge and is determined to gain high scores. He can be hard to play with as he likes to be indoors and is focused on completing a task perfectly.

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 6: Defining the Problem

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Defining the Problem

In this lesson, learners will begin to understand how to define a problem. Learners will be using game design to engage 15 - 17-year-olds with awareness about climate change and methods of adaptation. The process of developing a game for other learners will provide them with an opportunity to develop an awareness of climate change, causes and impacts and concepts of mitigation and adaptation.

Vocabulary: Assumptions; Analyse; Conflicts; Define; Source

In this lesson, the learner will:

- understand the importance of getting to the source of a problem
- become more aware of climate change
- develop an awareness of how to adapt to climate change
- develop an understanding of the connection of local and global issues
- complete a problem tree
- understand the complexity of wicked problems in their location
- develop critical thinking about problem-solving
- begin to think about how to apply their awareness of climate change and adaptation within their game design
- begin to reflect on and communicate issues concerning climate change to teenagers of similar ages

Materials

- Flipped Classroom Task: Define the Problem
- Video: 'Defining the Problem'
- Worksheet: Problem Tree
- Pens, pencils
- Paper

SDG13 Climate Change Engage Game Design
L6: Defining the Problem

Activity Instructions

Activity 1 Finding and defining your problem, issue or concern (15 mins)

Before the lesson, ask learners to read Flipped Classroom Task: Define the Problem and underline key words and main ideas.

1. In pairs, ask learners to discuss the following questions:
    - *What is a problem?*
    - *Why is it important to define a problem before you begin to find solutions?*
    - *What kind of difficulties can people have when they are trying to solve a problem?*
    - Share ideas as a whole class and note down ideas on the board.
2. Watch video: 'Defining the Problem' (see Media Box).
   Make notes on the questions in Step 1 based on the video.
   Add additional ideas (after watching the video) to the board.
3. In pairs, ask learners to discuss 'why is climate change a problem?'
   Share ideas as a whole group.

Activity 2 Aligning your problem area to the Sustainable Development Goals (15mins)

1. Visit the Sustainable Development Goals (SDGs) knowledge platform - see Media Box.
2. Ask learners to use the SDGs knowledge platform to select the SDGs that align with climate change.
3. In their groups, ask them to look at the targets and indicators of one of the selected SDGs.
4. Brainstorm possible solutions for the issues of that SDG.

Activity 3 Use a Problem Tree (20 mins)

1. Remind learners about the importance of defining a problem (refer to notes on the board from Activity 1).
2. Using worksheet: 'Problem Tree' and their notes from Activity 1 & 2 ask learners to write their selected problem on the problem tree trunk (Step 3 Activity 1).
3. In pairs, discuss the causes of this problem and write them underneath the problem, as the “roots” of the tree.
3. Discuss the effects or consequences of this problem and write them above the problem, on the “branches” of the tree.
4. For each cause, ask what causes it. For each effect, ask what the consequences are. Continue this process until no further causes and effects are mentioned. You may not have all the answers at this point, so make notes of any assumptions, questions, conflicts, or gaps in knowledge.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L6: Defining the Problem

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 and 2 only with extended discussion time.
Extension: For a longer class, watch video: 'Identifying the focal issue' and begin to try to develop a problem statement / driving question. In addition, ask students to refer to their answers on the worksheet: Define the Problem
Students can begin to consider what areas they might like to focus on for their game design research.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Defining the Problem' (1:25min) https://www.youtube.com/watch?v=2rJRVv-NOaA\

Article: 'Creative Strategies: Problem-finding' https://creativiteach.me/creative-thinking-strategies/problem-finding/

Article: 6 'Steps to identifying the real problem' https://executiveeducation.wharton.upenn.edu/thought-leadership/wharton-at-work/2015/06/identify-the-real-problem/

'Identifying the focal issue - using a problem tree' (1:57 min)
https://www.youtube.com/watch?v=-j-_Y7D35H4

UN SDGs Knowledge Platform https://sdgs.un.org/goals

Lesson 15: Supports learners to define their driving question for the game design challenge

Lesson 16: The stakeholder mapping worksheet supports learners to focus on their gamer, their interests and focus their game design.

Local Trip / Expertise / Additional Work and Assessments

Contact the local librarian to collect back issues of the local newspaper for students to look at for local problems related or potentially related to climate change and adaptations.

Visit local area organisations and ask them if they are working on climate change or adaptation.

Interview local organisations to find out more about any climate concerns through primary source research.

CCE L6WS: P2P DEFINE YOUR PROBLEM

Problem Solving

First Step in problem-solving: Understand the Problem

While it may seem obvious, identifying the problem is not always as simple as it sounds. The biggest issue can be identifying the wrong source of a problem. This could mean your attempts to solve it are inefficient or even useless. Remember: Once the correct source of the problem has been identified you need to fully define it before it can be solved effectively.

Things to think about:

- What do I know already about the problem? – Make a list.
- Can a picture or diagram help you? Try to visually draw or map the problem.
- Who's telling me about this problem? What is their perspective?
- What do I need to find out?
- Do I need to speak with anyone else about this problem?
- Try rewriting the problem in your own words?
- What do you think the problem is?

Step Two: Brainstorm

In this phase, you will need to think, talk, sketch, doodle, contemplate, or journal, in order to start allowing ideas to formulate. Then, set aside some daydreaming time and get started. Think big and let all the ideas you have hit the page without editing them.

Step Three: Research: How are you going to turn the idea into a reality?

Brainstorming, researching and refining your problem go hand in hand. You will be going back and forth between the three until you come up with a plan. Once you brainstorm some great ideas for your game, you will need to research to learn more about the problem and possible solutions. In turn, that leads to more brainstorming and refining your problem.

In the next Design Thinking phase - Ideate and Prototype you will think of how to begin to turn your idea into a reality. Start to make a make a list of any questions or concerns that come to mind. Its never too early!

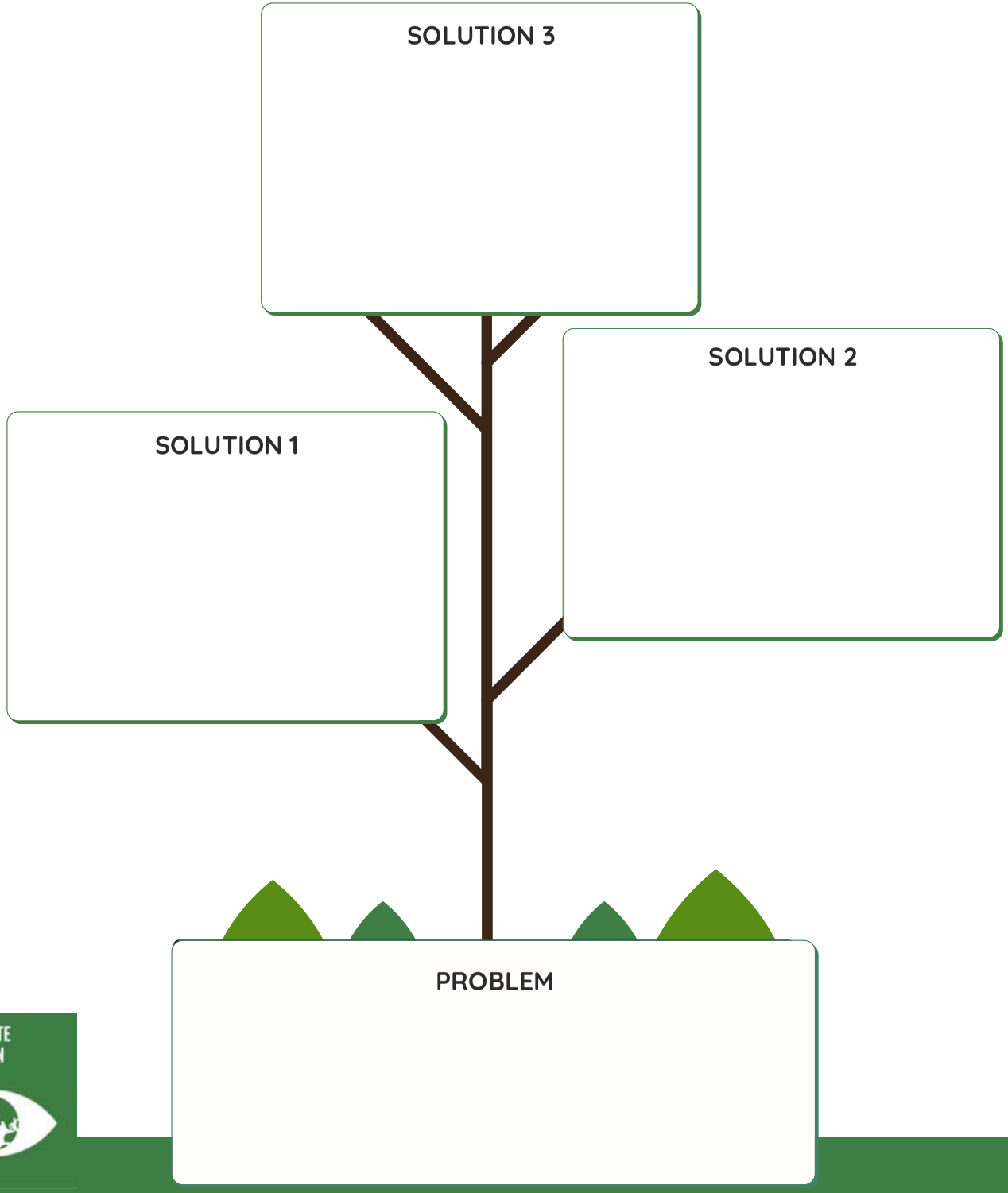
- What materials do you need?
- What will it cost?
- Can you build it yourself or will you need help?
- If you will need to collaborate on this piece, decide who that will be and make plans to work together?

PROBLEM SOLVING TREE

Find out different ways to solve a problem.
Pick the best one.

I choose solution number _____
because _____

_____



SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 7: Deconstructing Games

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Deconstructing Games

Through deconstructing games, learners will develop their understanding and knowledge of different kinds of games and game construction.

This lesson enables learners to gain insight into game mechanics, design and purpose, which provides a foundation for learners to construct inclusive games.

Vocabulary: Conflict, Challenge; Deconstruct; Findings; Gameplay; Industry Influence; Interaction; Objective; Participant / player; Research; Revenue; Rule/instruction

In this lesson, the learner will:

- explore their understanding and knowledge of different kinds of games
- identify elements that make a game successful.
- research a well-known game to deconstruct and report findings
- work collaboratively and engage in critical and analytical/evaluative research in groups

Materials

- Worksheet: Deconstructing Games
- Worksheet: Game Evaluation
- Worksheet: Game Review Sheet see also lesson 11
- Internet access
- Paper / whiteboard
- Markers / chalk
- Pens, pencils

SDG13 Climate Change Engage Game Design
L7: Deconstructing Games

Activity Instructions

Activity 1 Goals, Components & Core Mechanics of Games (25 mins)

1.Using Worksheet: Deconstructing Games, ask learners to brainstorm responses to the following questions (in pairs):

- *What are the three possible goals or objectives of a game? - the Goal.*
- *What is necessary for the game to function? - the Components*
- *What kinds of actions or moves do players do to power the play of a game? - the Core Mechanics.*

It may help them to focus on two or three specific games to complete the task.
These could be selected in advance and gathered through discussion with the class.

2. Bring the pairs together to make groups of four. Invite pairs to share their ideas.

Encourage pairs to feedback - what do they like about the ideas the other pair present?
And feed-forward - how might they add to what the pair have presented to improve the idea?

Activity 2 What's Out There? (25 mins)

1. Working in pairs, ask learners to undertake a Pinterest search to find 5 games that are linked to climate change, climate adaptation, or environmental action.
2. Ask learners to use the game evaluation worksheet and the game review sheet: complete the questions, review and analyse 5 games,
3. Bring the pairs together to make groups of four and invite pairs to share their ideas.

NB: Encourage pairs to feedback - what do they like about the ideas presented by the other pair present? And feed-forward - how might they add to what the pair have presented to improve the idea?

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L7: Deconstructing Games

EXTENSION / REDUCTION ACTIVITIES

Reduction: for a shorter lesson, elicit briefly different types of games and complete activity 1.

Extension: for a longer lesson, share the games the learners found with the whole class and create a directory of all the games. Create a shared spreadsheet and ask students to complete this by adding the information they found to be completed over the course of the Game Design project.

Option 2: Include an exploration of the game, 'Climania' (see Media Box). Encourage a group discussion on aspects of the game, using the game evaluation sheet.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Breaking down games (video) - part of a course with free enrolment

- https://www.coursera.org/lecture/gamification/4-1-breaking-games-down-BvorV

Game deconstruction information for online games

- https://departmentofplay.net/guide-how-to-deconstruct/
- http://www.leagueofgamemakers.com/breaking-down-games/

Activity idea source:

- https://gamesforchange.org/studentchallenge/teachers-resources/
- https://climaniathegame.com/about-climania/

Local Trip / Expertise / Additional Work and Assessments

Link learners to Ireland's gaming industry

- https://www.thinkbusiness.ie/articles/the-irish-people-dominating-the-gaming-industry/

Learners can then research Ireland's University's for Gaming Undergraduate programmes

- https://www.courses.ie/course-category/game-design-animation/

Career pathways learners can begin to explore career options in the film and games industry
https://www.cgspectrum.com/career-pathways

CCE L7WS: GAME EVALUATION

13 CLIMATE ACTION

USE THE 'GAMES FOR CHANGE' CRITERIA TO ASSESS THE GAME DESIGNS

GAMEPLAY:

- Is the game playable?
- Is the gameplay smooth and glitch-free?
- Is it well-balanced (not too easy/hard)?
- Do players have meaningful choices in the process of achieving the game's goal?

ORIGINALITY:

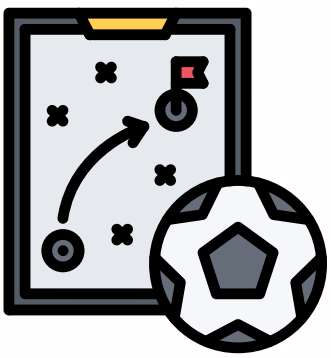
- Is the game new and innovative?
- How unique is the design and concept of the game?
- Does it bear any resemblance to other games?

USE OF THEME:

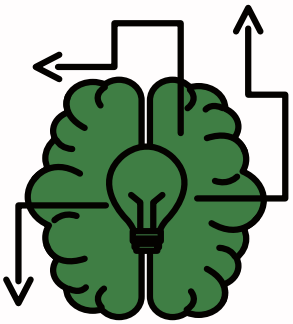
- Does the game address its theme in a meaningful way?
- Is the theme information presented clearly and accurately?
- Is there an engaging storyline or backstory?
- Is there a sense of a 'complete world' for players to engage in?

OVERALL FUN FACTOR:

- How engaging and fun is the game?
- Would you recommend it to someone else?



CCE L7: DECONSTRUCTING GAMES



WORKING IN PAIRS YOU WILL CHOOSE AND EXAMINE PARTS OF A GAME FROM THE LIST PROVIDED.

RECORD THE NAME OF YOUR CHOSEN GAME HERE

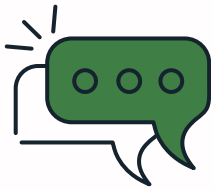
Use this space to mind map your ideas.

1. What are the three possible aims, goals or objectives of the game?

2. What is necessary for the game to function? - the Components of the game, which includes players.

3. What kinds of actions or moves do players do to power the play of the game? - the Core Mechanics.

CCE L7: DECONSTRUCTING GAMES



Using the question prompt to discuss the questions and note ideas in the space below: goal, challenge, core mechanics, rules components, space:

Goal -

- What does a player or team have to do to win?
- How might this be enjoyable and engage the players?

Challenge -

- What obstacles are in the player's way to make reaching the goal fun and interesting?
- How is the player being kept from reaching a goal?
- How might these obstacles engage the player?

Core Mechanics -

- What core actions or moves does the player do to power the play of the game?
- How might these actions or moves encouage engagement?
- How might these affect engagement?

Components -

- What parts make up the materials of play, including players?
- How might these components affect the goal of the game?

Rules -

- What relationships define what a player can and cannot do in the game?
- How might these determine the goal of the game?
- How might these encourage engagement?

Space -

- Where does the game take place and how does that space affect the game?
- To what extent is the space important in the goal of the game?

CCE L7WSC: GAME REVIEW SHEET

13 CLIMATE ACTION

USE THE TABLE TO GATHER INFORMATION ABOUT THE VARIOUS GAMES YOU ARE FINDING

GAME'S NAME	GAME TYPE	# PLAYERS	GAME AIM.	COMMENTS / OPINION

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 8: Generating and Remixing Ideas: Worst Game Ever

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Generating and Remixing Ideas: Worst Game Ever

This lesson builds on lesson 4, and enables students to develop an understanding of the importance of developing ideas and looking for opportunities to iterate and improve on existing ideas.

Learners are also introduced to open source concepts such as iteration and collaboration and expand on the concept of ideation.

Vocabulary: Collaboration; Idea Generation; Ideation, Iteration; Remix

In this lesson, the learner will:

- explore how to evolve ideas
- consider opportunities to improve ideas
- feel comfortable with exploring experimental approaches
- develop skills around idea generation
- learn to transfer and apply skills

Materials

- Teacher's Guide: Worst Game
- Ever Pens, pencils
- Large pieces of paper
- White board

SDG13 Climate Change Engage Game Design
L8: Generating and Remixing Ideas: Worst Game Ever

Activity Instructions

Activity 1 Worst Game Idea Ever – Rapid Response (20 mins)

1. Explain the activity (see Support: Worst Game Ever) learners will work in their groups to come up with 6- 8 examples of the worst game ideas ever. These will then be swapped amongst the groups to be transformed in activity 2.
2. Tutor to give some real-world starting ideas – see media box
3. After 15 minutes ask students to share one or two of their worst ideas ever

Activity 2 Transforming Ideas – Rapid Response (20 mins)

1. Gather up the sheets from the groups and begin to swap them with other groups
2. Give some examples of a transformation of the worst game idea into a good game idea
3. Give students 15 mins to transform the examples on the sheets into good game ideas

Activity 3 Generating and Remixing Ideas – Rapid Response (15 mins)

1. Discuss some of the ideas that have been generated as a whole class.

    - *How easy/difficult was it to generate bad ideas? Why?*
    - *How easy/difficult was it to remix the ideas into good ones? Why?*
    - *How could this process be used in different ways (not just about products)?*

2. Use the activity to introduce key ideas of open source:

    - Watch the Open Source As Explained by Lego video - see Media Box
    - Give each learner one of the other open source video links (see Media Box) to watch at home. They can bullet point the main ideas in the video and share it in class during the following lesson.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L8: Generating and Remixing Ideas: Worst Game Ever

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 and 2 with less examples (i.e. 3-5 ideas).

Extension: For a longer class, extend discussion time and spend more time examining open source projects (Activity 3). With more time, ask learners to select 1-2 of the remixed good ideas and complete the user Empathy Map from Lesson 16 or the Remix SWOT Analysis worksheet.

Extend the discussion and include some examples of open source projects for students to research as a Flipped Classroom with discussion in next class – see Media Box

- Open Source Ventilator
- Crispr Editing
- Aquaponic Greenhouse

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

What is open source? Explained by Lego (4 min 40) https://www.youtube.com/watch?v=a8fHgx9mE5U

Open-source culture (1:10min) https://www.youtube.com/watch?v=gobBQwtFeyk

Crispr Gene Editing (4:22min) https://www.youtube.com/watch?v=1VaG3DpFXjs

Open Source Aquaponic Greenhouse (3:45min) https://vimeo.com/141252002

Open Source Ventilator https://www.siliconrepublic.com/start-ups/open-source-ventilator-project-coronavirus

Local Trip / Expertise / Additional Work and Assessments

Link learners to Ireland's gaming industry
https://www.thinkbusiness.ie/articles/the-irish-people-dominating-the-gaming-industry/

Learners can then research Ireland's university's for Gaming undergraduate programmes
https://www.courses.ie/course-category/game-design-animation/

Career pathways learners can begin to explore career options in the film and games industry
https://www.cgspectrum.com/career-pathways

Top Funding for Game Design in Ireland https://shizune.co/investors/gaming-vc-funds-ireland

CCE L8TG WORST GAME EVER SUPPORT SHEET

The session is an iteration of the 'Worst Possible Idea' a term coined by author, president and co-founder, Bryan Mattimore, The Growth Engine Company LLC.

As a facilitation tool for ideation, the 'Worst Possible Idea' (WPI) turns the process of developing ideas upside down. Rather than having the pressure of coming up with novel or innovative ideas, WPI facilitates agile creative thinking in a relaxed, fun, collaborative atmosphere. The process is used by professionals, design studios, within hackathons and start-up weekends, and has been shown to boost confidence, challenge assumptions and offers a more inclusive approach to ideation. No one fears stating the worst possible ideas, a process loaded with fun and laughter and maybe a few groans.

This session introduces learners' to this concept focused around the worst game idea ever and a playful process of transforming how they can be formed into the foundation for possible good game ideas.

To start, explain the activity using the following examples of bad to good ideas:

- a sealed metal tube for a boat / as transport - add an engine / design and pressurise it (submarine), add windows and wings (aeroplane), different wheels and slick design (bullet train)
- a chocolate teapot - why is it a bad idea? It would melt. However, the 'hot chocolate spoon' that retails for about €4-5 uses that quality as a design feature to create a gift / treat product
- windows you can't see out of / opaque windows - this how 'bathroom' or privacy glass started

To facilitate the worst game idea ever, have groups;

1. Come up with as many bad game ideas as they can. 8 -10 is a good number to aim for.
2. Ask them to list why they are bad game ideas, listing all the properties of what makes them bad as this is what forms the foundation of the transformation.
3. List what makes the WORST of these ideas SO terrible.

Here, you can decide whether to do a class activity or just swap the groups work, it is important no group works on their own bad ideas. Then either as a class (you can still swap the groups work and ask each group to offer up ideas to work on collaboratively a class) or within their groups.

1. Begin with searching for the OPPOSITE of the WORST attribute of each idea.
2. Then substitute something else in for the worst attribute.
3. Mix and match various awful ideas to see what happens - all the time considering how to make them good game ideas or how they might become good attributes for a game e.g. penalties or benefits for players, player challenges, player / character, game world or 'backstory' development. These concepts are covered more deeply in other lessons.

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 9: Working with Nature: Nature-Based Solutions & Green Infrastructure

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Working with Nature: Nature-Based Solutions & Green Infrastructure

How and why should we rethink the way we design our villages, towns and cities?

Adapting to climate change involves rethinking how we design the places where we live, work and play. This lesson introduces learners to the closely associated concepts of ‘nature-based solutions’ and ‘green infrastructure’. Key terms related to these concepts are defined. The lesson challenges learners to rethink how and why the places they are familiar with could and should be redesigned.

Vocabulary: Biodiversity; Connectivity; Drainage Management; Green Infrastructure; Green Roof; Green Wall; Habitat; Mutual Benefit; Multi-functionality; Nature-Based Solutions; Resilience.

In this lesson, the learner will:

- develop an awareness of ‘why’ we should design with nature and ‘how’ we can do this
- be introduced to the concepts of nature-based solutions and green infrastructure
- scan for specific information
- summarise and paraphrase
- share opinions
- apply new concepts

Materials

- Flipped Classroom: Vocabulary
- Video: 'Nature-Based Solutions'
- Poster size paper
- Markers, coloured pens

SDG13 Climate Change Engage Game Design
L9: Nature-Based Solutions & Green Infrastructure

Activity Instructions

Activity 1 Defining Key Vocabulary (15 mins)

1. Watch the video recording: 'Nature-Based Solutions & Green Infrastructure'.
2. Divide the learners into small groups of 4-5. Ask the learners for any words from video they don't understand. Write these words on the board. Allow 5 minutes for each group to complete Steps 1-3 below. Allow an additional 5 minutes for Step 4.

    - Step 1: Allocate each group a word from the board (or a word from the vocabulary list) to become an expert in.
    - Step 2: Each group brainstorms what the word means (own ideas).
    - Step 3: Using dictionaries and/or online resources, each group researches the meaning of the word.
    - Step 4: Nominate a person from each group to explain the meaning of their group's word to the class, inclusive of examples.

Activity 2 Applying Concepts (35 mins)

1. The learners stay in their groups from Activity 1. Follow Steps 2-6 below.
2. Each student group draws a map of the neighbourhood in which the school is located, noting the main landmarks, such as roads, shops, churches, housing estates and parks.
3. Instruct each group to use the 'green infrastructure' approach shown in the video [from Activity 1] to suggest and draw on their map three key nature-based solutions they could introduce to enhance the climate change resilience of the neighbourhood.
4. Explain that each suggested solution they come up with should connect with the principles of the green infrastructure approach that is in the video (Activity 1), namely that each solution should: (a) be able to be used for many purposes [multi-functionality], b) provide benefits for people and nature [mutual benefit], and (c) provide opportunities for animals, people and water to move around [connectivity] - see example of a woodland in the video.
5. Encourage learners to use online resources to identify and examine examples of nature-based solutions/green infrastructure ideas that they may find inspiring.
6. Inform the learners that they will have an opportunity to work on their maps in the next lesson. Ask the learners to continue thinking about what they have learnt in class and develop ideas for inclusion on their map in the next lesson.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L9: Nature-Based Solutions & Green Infrastructure

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson,

Option A: reduce the amount of time in Activity 1 by using Lesson 9's flipped classroom worksheet. Divide the learners into groups and have each group complete the Flipped Classroom worksheet on vocabulary and the nature-based solution case studies. In class, learners share what they have learnt, discuss aspects of the case studies and, as a class, identify locations they are familiar with in the locality where they could introduce some of the nature-based solutions they have explored.

Option B: Have learners record their definitions and meanings digitally to create a collectively produced glossary.

Extension: For a longer lesson, each group takes a particular area in the locality and draws a larger, more detailed map of that area, and undertakes Activity 2, Steps 2 - 6. Assemble the maps produced by the different groups on a wall or on the floor. Each group explains what they have proposed regarding nature-based solutions. Discuss with the learners how the different proposals on the different maps now assembled into one giant map could be connected e.g., a connecting woodland, shrub-lined grassy walkway or wildflower-lined drainage channel.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Activity 1 video: 'Nature-Based Solutions & Green Infrastructure' https://youtu.be/0nYJFzPoya0

Additional Resources:

'Nature-based solutions for natural flood management', produced by Earthwatch Europe (1 min 39 secs): https://youtu.be/-F6M3RWsJH0

'Urban Nature-Based Solutions: What are they and why are they so important?' (3 mins 12 secs): https://youtu.be/SRXx0QyxBFo

'Urban Nature-Based Solutions: Buildings and Neighbourhoods' (3 mins 37 secs): https://youtu.be/wlOj2R697GQ

See also flipped classroom worksheet for further links on nature-based solutions

Local Trip / Expertise / Additional Work and Assessments

Visit the offices of the local authority (city or county council) to speak with town planners about the green infrastructure interventions they are making in the locality (or invite a planner from the local authority to speak to the class about this topic; this could be via Zoom).

SDG13 CCE L9FC: VOCABULARY AND CASE STUDIES

Look up the meaning of these words and complete the first part of the worksheet. Using your own words develop definitions to create a glossary.

BIODIVERSITY	**CONNECTIVITY**	**DRAINAGE MANAGEMENT**
GREEN ROOF	**GREEN WALL**	**GREEN INFRASTRUCTURE**
HABITAT	**MUTUAL BENEFIT**	**MULTIFUNCTIONALITY**
NATURE-BASED SOLUTIONS	**RESILIENCE**	

SDG13 CCE L9FC: VOCABULARY AND CASE STUDIES

Explore the websites below and make some notes for in-class discussion about each of the examples

Case Studies:

- Green Infrastructure in Worcestershire (9 mins 6 secs) produced by the Worcestershire GI Partnership conveys the green infrastructure concept in layperson's terms using examples from Worcester City: https://youtu.be/etdPM_mUGK0

- AIPH Green City Guidelines' "Case Study Collection" webpage: https://aiph.org/green-city/guidelines/case-studies/case-studies/

- Green Cities Europe "Best Practice Inspiring Projects" webpage: https://uk.thegreencities.eu/best-practices/page/2/

- EU Repository of Nature Based Solutions "Case Studies" webpage: https://oppla.eu/case-study-finder

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SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 10: Working with Nature-Based Solutions and Green Infrastructure 2

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Working with Nature-based solutions and Green Infrastructure 2

How and why should we rethink the way we design our villages, towns and cities?

Adapting to climate change involves rethinking how we design the places where we live, work and play. This lesson introduces learners to the closely associated concepts of ‘nature-based solutions’ and ‘green infrastructure’. Key terms related to these concepts are defined. The lesson challenges learners to rethink how and why the places they are familiar with could and should be redesigned.

Vocabulary: Biodiversity; Connectivity; Drainage Management; Green Infrastructure; Green Roof; Green Wall; Habitat; Mutual benefit; Multi-functionality; Nature-Based solutions; Resilience

In this lesson, the learner will:

- develop an awareness of ‘why’ we should design with nature and ‘how’ we can do this
- be introduced to the concepts of nature-based solutions and green infrastructure
- scan for specific information
- summarise and paraphrase
- share opinions
- apply new concepts

Materials

- Poster size paper
- Markers, coloured pens

SDG13 Climate Change Engage Game Design
L10: Working with Nature-Based Solutions & Green Infrastructure 2

Activity Instructions

Activity 1 Applying Concepts (10 mins)

1. The learners stay in their groups from the previous lesson and continue to develop the group's map and ideas for introducing nature-based solutions into the locality.

Activity 2 Elevator Pitch (40 mins)

1. Each of the groups prepare an 'elevator pitch' (a one-minute 'sales pitch') for one of the three key solutions they have developed and detailed on their map.
2. Select one of the solutions from their map.
3. Develop notes under the following headings:

    - What is the solution called?
    - Describe the solution.
    - How will the solution help the locality adapt to climate change?

4. Each group nominates a member to provide this 'elevator pitch' (other group members can assist by holding the map).

5. Elevator pitches are presented to the class.

    Questions can be asked about how and why the proposals advance: (i) multi-functionality; (ii) mutual benefit; and (iii) connectivity.

NB: Allow approximately 8 mins per group, this includes getting the group ready to pitch ('on and off') and questions or feedback from their peers.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, complete Activity 2 only.

Extension: For a longer lesson,

Option A: Each group sources images and ideas online to help communicate their idea(s). These are copied and collated onto a 'vision board'. The students use these images to illustrate their idea(s) in the elevator pitch. The vision board in lesson 20 can be used to support this activity.

Option B: Walk around the school neighbourhood and ask the learners to identify / note specific locations and green infrastructure interventions that could be used to enhance the resilience of the locality to climate change. Integrate these ideas into their map in Activity 1.

Option C: Watch the video Nature-based solutions for natural flood management, and consider how this might be relevant to the learners' neighbourhood.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Additional Resources: World Wildlife Foundation

'Nature-based solutions for natural flood management', produced by Earthwatch Europe (1:39min) https://www.youtube.com/watch?v=-F6M3RWsJH0

'Urban Nature-Based Solutions: What are they and why are they so important?' (3:12min) https://youtu.be/SRXx0QyxBFo

'Urban Nature-Based Solutions: Buildings and Neighbourhoods' (3:37min) https://youtu.be/wlOj2R697GQ

See also Lesson 9 Flipped Classroom for further links on nature-based solution case studies.

Local Trip / Expertise / Additional Work and Assessments

Take a walk around the neighbourhood of the school. Ask the learners to identify specific locations and green infrastructure interventions that could be used to enhance the resilience of the locality to climate change. Working in small teams, each team provides an elevator pitch for their idea(s) at the location where they think their idea(s) should be implemented.

Visit the offices of the local authority (city or county council) to provide the elevator pitch to planners and/or councillors (or invite a planner or councillor from the local authority to the class to hear the elevator pitches; this could be via Zoom).

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 11: What are Serious Games?

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: What are Serious Games?

The gaming industry has been growing fast and the youth are highly attracted to playing (video) games. If more of those games could be 'serious', multiple individual and societal benefits could be unleashed. This lesson introduces learners to what serious games are and their purposes, describing the characteristics of games relevant to better integrating nature in human settlements.

Vocabulary: Games' Purposes (educational, interventional, for research); Serious Games; Sustainability; Wicked Questions

In this lesson, the learner will:

- Develop an understanding of what serious games are, and their purpose
- Begin to understand how serious games can be used for better integrating nature in human settlements
- Assess and reflect on serious games

Materials

- Video: 'What are Serious Games?'
- Worksheet: Active Listening
- Support Sheet Serious Games Directory (Istrate and Hamel, 2022)
- Worksheet: Game Review
- Access to internet
- Paper / Pens

SDG13 Climate Change Engage Game Design
L11: What are Serious Games?

Activity Instructions

Activity 1 What are serious games? (20 mins)

1. Give each learner a copy of Worksheet: Active Listening and ask them to read over the questions, underlining the key words.
2. Play Video: 'What are Serious Games?' and ask learners to complete the activity sheet.
3. Go over answers in pairs, and then as a whole class.

1. *Yes*
2. *Complex; no single solution*
3. *17th*
4. *Compete; cooperate (both)*
5. *Purposeful*
6. *Urban*
7. *GIS - geographic information system gathers, manages, and analyses data*
8. *Sustainable Development*

Activity 2 Playing Serious Games (30 minutes)

1. Either in pairs or individually play digital games (on pads/laptops/computers) with the class by sharing the links from the Media Box.
2. After each game, ask the learners to do a quick analysis of the games and share with the class.
3. Use prompts to facilitate discussion after each game

- *How was the game environment? (Describe in short sentences).*
- *Who is expected to be playing this game (target groups)?*
- *What outcomes would the game designers expect after playing this game?*
- *What interested you in this game?*
- *What do you think should be improved?*

Prompts to facilitate reflective discussion after playing all games:

- Which game elements you liked the most considering all games played? Why?
- What elements would you keep/discard in a new game you would develop? Why?
- What audience would you target in a new game and what do you think would catch their interest?

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L11: What are Serious Games?

EXTENSION / REDUCTION ACTIVITIES

Reduction: for a shorter lesson, select 1 or 2 games including at least one educational game.

Extension: for a longer lesson, pause the Serious Games video from activity 1 at 2:25 mins and ask learners to give examples of games they know (not necessarily 'serious') for each category

- analogue/PC games
- for children/youth/adults;
- single player/multiplayer
- with costs/for free).

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

- Activity 1 video 'Introduction to Serious Games' https://youtu.be/RcymwwgMHDo
- What is GIS, an overview - https://www.esri.com/en-us/what-is-gis/overview
- Educational Game: Urban Climate Architect (choose English): https://www.cen.uni-hamburg.de/press/entdecken/stadtklimaarchitekt.html
- or additional educational game Sustainable Shawn: https://www.shaunthesheep.com/games/sustainable-shaun
- Games4Sustainability (games database searchable by SDGs): https://games4sustainability.org/gamepedia/
- Climania: https://climaniathegame.com/about-climania/
- The Climate Smart game and workshops https://climatesmart.ie/about can also be used for longer-term training.

Local Trip / Expertise / Additional Work and Assessments

- Invite game designers and expert ecologists/nature scientists to speak to the class. Ask the learners to identify what elements could be more suitable to introduce in the games from the knowledge expertise the ecologists shared while considering game development principles indicated by game designers.

Possible contacts:

- UCD computer science – game development module https://hub.ucd.ie/usis/!W_HU_MENU.P_PUBLISH?p_tag=MODULE&MODULE=COMP30540
- TCD - Game Design programme https://www.tudublin.ie/study/undergraduate/courses/game-design-tu984/
- UCD Earth Institute - https://www.ucd.ie/earth/whatwedo/researchthemes/ecosystemsevolution/give some leads

SDG13: CCE L11WS: ACTIVE LISTENING

Video: What are Serious Games?
https://youtu.be/RcymwwgMHDo

Fill in blanks or circle the answers to the questions below.

1. Serious Games are games used for study:

   Yes No

2. Wicked Questions are _____ problems with _____

3. Military games started being played since the _____ century.

4. In Serious Games, the players can

   Compete Cooperate

5. In one word, serious games are _____

6. 'Urban games' address _____ problems.

7. 'Geo games' are often supported by _____ technology.

8. 'Games for sustainability' address societal challenges in the area of _____

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No.	Name	Game's Description	Time to Play	Players	Target Group	Distribution (Digital vs Board Game)	Play mode (Online/ In-person)	Charges Fee vs For Free	Links to the Game's page/ Materials	Developer
1	Sustain	Sustain is a board game about urban sustainability, developed in an European "Erasmus+" project as support in high-level education. Each player represents a different department in a growing city - facing many issues and solving them based on other players' decisions.	<1h	Multiplayer	Youth & Adults	Digital	Online	For Free	Official page: http://sustainerasmus.eu/wp/ Where to play: https://tabletopia.com/games/sustain-erasmus EU project outputs and reports: http://sustainerasmus.eu/wp/intellectual-outputs/	Erasmus University
2	Climate Smart	Players have five years to climate-proof Dublin (starting year is 2045). The core action of the game is defending against floods through adopting different measures (grey, green and blue, or mixed infrastructure; and policy). One round represents one year.	N/A	Single Player	Youth	Digital	Online	For Free	https://climatesmart.ie/game	Trinity College Dublin, Ireland
3	Urban Climate Architect	Urban Climate Architect allows players to create their own environmental-friendly city - building houses, streets and green spaces, employing citizens in offices and industrial plants, while observing the effect on the city's climate. The impact of each element is informed, and the game is evaluated when finished.	<1h	Single Player	Youth & Adults	Digital	Online	For Free	https://www.clisap.de/stadtklimaarchitekt/	Hamburg University Cluster of Excellence CliSAP
4	Amenajeu	Amenajeu is a game structured according to the coupled infrastructure system (CIS) framework that categorizes the entities of a social-ecological system in four main categories (resources, resource users, public and private infrastructures, and public infrastructure providers). Resource systems, resource users, and infrastructures arerepresented as elements of the game board. Players experiement the interplay of socio-ecological interdependencies.	>2h	Multiplayer	Adults	Board Game	In-Person	For free	https://www.researchgate.net/publication/333916660_Analyzing_coastal_coupled_infrastructure_systems_through_multi-scale_serious_games_in_Languedoc_France	Bonte, Therville, Bousquet, Abrami, Dhenain & Mathevet (2019)
5	Block by Block Minecraft	The UN-HABITAT Minecraft is a game that targets community participation, youth participation, use of images, plans, Google Maps and other available material to model public space as a community participation tool. The Minecraft models are then presented to stakeholders.	Varied	Multiplayer	Youth & Adults	Digital	Online & In-Person	For Free & Charges Fee	https://www.blockbyblock.org/resources https://unhabitat.org/manual-using-minecraft-for-community-participation https://unhabitat.org/sites/default/files/download-manager-files/Using%20Minecraft%20for%20Youth%20Participation%20in%20Urban%20Design%20and%20Governance.pdf	Mojang with UN-Habitat & Block by Block
6	Buy, Sell and Trade	Buy, Sell and Trade is a role-playing exercise that demonstrates the multiple benefits of preserving ecosystems for the services that they provide. It functions as support tool for training decision makers and local stakeholders on managing natural resources.	>2h	Single Player & Multiplayer	Adults	Board Game	In-Person	Charges Fee	https://www.iucn.org/lo/node/3188	WBCSD and IUCN (2008); Gissi & Garramone (2018)

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7	Eco-GAME (BONUS MARES)	Eco-GAME is a game that is an interface between science, policy and society. It is a participatory and evidence-based appraisal of existing (scientific) knowledge, methods or combinations, providing a matrix to assesses the adequacy of scientific knowledge and methods for different purposes (attributes), by aggregating the four types of capital: Natural, Human, Social and Economic.	N/A	Multiplayer	Adults	Digital	Online & In-Person	For Free	https://www.bonusportal.org/files/6911/BONUS_MARES_Policy_brief_2_-_Playing_and_eco-game_to_assess_the_quality_of_scienwtific_knowledge_for_evidence.based_decision_making.pdf	EU (BONUS MARES Project); University of Tartu; Geomar; E2 Research; PTT;
8	Floating City	Floating City is a brainstorming game for public spaces in which players can create and publicize their ideas and suggestions for city projects.	N/A	Single Player & Multiplayer	Adults	Digital	Online	For free	http://play-uc.net/?page_id=529	Urban Europe; Faculty of Spatial Sciences, University of Groningen; The Netherlands;
9	Flood Resilience Game	Flood Resilience Game is a game that allows players to explore and learn about flood risks and community resilience in river valleys. It helps participants identify novel policies and strategies to improve flood resilience, as players take different stakeholder roles (workers, farmers, entrepreneurs, financial services agents), local government and water board officials.	>2h	Multiplayer	Adults	Board Game	In-Person	For Free	https://floodresilience.socialsimulations.org/#main	Centre for Systems Solutions (CRS), International Institute for Applied Systems Analysis (IIASA), Zurich Flood Resilience Alliance
10	Game of Floods	Game of Floods is a game where players manage community assets, which are flood-prone. Through strategizing on protecting their parcels, while considering community well-being and resources, players need to consider potential loss or deterioration of homes, community facilities, roads, agricultural land, beaches, wetlands, lagoons, and other resources.	1-2h	Multiplayer	Adults	Board Game	In-Person	Charges Fee	https://games4sustainability.org/gamepedia/game-of-floods/ https://www.adaptationclearinghouse.org/resources/game-of-floods.html	Urban Sustainability Directors Network (USDN), American Society of Adaptation Professionals & US Environmental Protection Agency
11	Land Science Virtual Interns	Land Science is a game where players to become office interns at a fictitious urban and regional planning firm. Players weigh trade-offs for land use decisions in ecologically-sensitive areas, interact with virtual stakeholders and use iPlan, a custom-designed GIS, to develop land use plans for local and national sites.	>2h	Multiplayer	Youth	Digital & Board Game	Online & In-Person	For Free	http://www.virtualinterns.org/virtual-internships/land-science/	Wisconsin Center for Education Research, US
12	Map Your City's Future	Map Your City's Future is a game that builds skills, data and networks to support Disaster Risk Management and Urban Planning in Africa. The game uses OpenStreetMap data, digital cartography, technology & community participation for SD, developing high quality data.	Varied	Single Player & Multiplayer	Youth & Adults	Digital	Online & In-Person	For Free & Charges Fee	Open Cities: www.opencitiesproject.org Grace: gdoherty2@worldbank.org https://www.worldbank.org/en/topic/disasterriskmanagement/brief/city-resilience-program	City Resilience Program – supported by GFDRR Labs, Open Cities Africa, World Bank Group

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13	Mission 1.5	Mission 1.5 is a online game which educates people about climate solutions and asks them to vote on the actions that they want to see happen. It is known as the world's biggest survey of public opinion on climate change.	N/A	Single Player	Youth	Digital	Online	For Free	Game Website https://mission1point5.org/be/about https://unric.org/en/mission-1-5/	The United Nations Development Programme (UNDP)
14	New Shores	New Shores is a game where players are sent to an island with wild forests and rich coal deposits. Players start earning money, building households and public infrastructure. They discover that while exploiting the island's natural resources may quickly improve their living conditions, it may also disturb the island's ecological balance and lead to natural disasters.	1-2h	Multiplayer	Youth & Adults	Digital	Online	For Free	https://newshores.socialsimulations.org	EU, Erasmus + Programme
15	SIMCITY	SimCity is an engaging city-building game intended to let players design a city — imagine being a mayor of the city and designing your city the way you want to. The aim is to convey basic skills such as arithmetic, but an understanding of complex systems such as the economy, the environment and the relationships that tie them together.	N/A	Single Player & Multiplayer	Youth	Digital	Online	For Free	Official Website: www.ea.com/games/simcity Article: SimCity Created a Generation of Urban Planners www.reason.com/2020/02/09/simcity-created-a-generation-of-urban-planners/	TU Delft & Maxis, Electronic Arts (EA)
16	Sprites of Meadowlands	Sprites of Meadowlands is a game designed to activate a specific urban location. It addresses the exploration of hidden green spaces. It starts with a walk and all the details that can characterize the morphology of the garden.	N/A	Single Player	Youth & Adults	Digital	Online	For Free	https://meadowlands.surge.sh/	Mateja Rot (Slovenia)
17	Tradeoff! InVest	Tradeoff! InVest is a series of mapping games introducing concepts related to nature's benefits to people while mirroring the InVest analytical approach.	1-2h	Multiplayer	Adults	Board Game	Online & In-Person	Charges Fee	https://msp.naturalcapitalproject.org/msp_concierge_master/tradeoff.html	Natural Capital Project
18	Tygron	Tygron Geodesic Platform is a game that can be configured for the specific purposes of each project, including features of: water, climate, environment, energy, city planning and GIS BIM.	N/A	Single Player & Multiplayer	Adults	Digital	Online	For Free & Charges Fee	https://www.seriousgamemarket.com/2014/07/tygron-serious-games-for-spatial.html	TU Delft
19	World Climate	World Climate is a game simulation in which participants experience how their decisions affect the global climate system. In the game, players learn about the dynamics of global negotiations on climate change, taking on roles of the world's most important leaders and take the responsibility for the Earth's future and enabling deeper understanding of the systems shaping our world.	>2h	Multiplayer	Adults	Digital & Board Game	Online & In-Person	Charges Fee	https://www.climateinteractive.org	Dr. Elizabeth Sawin and Andrew P. Jones, New Venture Fund

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20	Nexus	Nexus Game is a game that incorporates the interconnected Water-Food-Energy Nexus challenges. Participants get insights of water management challenges for energy and food production, striving to address needs of population, industry and agriculture, at the same time facing challenges of climate change.	>2h	Multiplayer (Large Groups 8-24 players)	Adults	Board Game	In-Person	For Free	https://nexus.socialsimulations.org/#applications	Centre for Systems Solutions, International Institute for Applied Systems Analysis, Sustainable Energy for All Initiative
21	ASPIS Sustainability Game (Auditing the Sustainability of Public Spaces)	ASPIS Sustainability Game is an immersive 3D simulation/ role-playing game designed to support planners, architects, environmental NGOs, teachers or the general public to understand sustainability issues in public spaces (e.g. parks). The impact envisaged concerns the wider benefits of sustainable development in cities and town planning practices, as well as democratic governance (public participation).	#N/A	Single Player	Varied	Digital	Online	For Free	http://serious.gameclassification.com/EN/games/43211-ASPIS-Sustainability-Game-/index.html https://www.youtube.com/watch?v=lvFf45gEfLU	PRISMA
22	B3 - Design your Marketplace!	B3 provides a playful digital environment in which the citizens gain information about the current situation in the city district, have the possibility of submitting their own designs for the marketplace, vote for the preferred designs, and chat with the experts and other participants.	#N/A	#N/A	Adults	Digital	Online	For Free	https://geogameslab.net/portfolio/b3-design-your-marketplace/ Research Paper: https://www.researchgate.net/publication/260275454_Digital_Serious_Game_for_Urban_Planning_B3-Design_Your_Marketplace	GeoGamesLab
23	Complete Street	The Complete Streets Game is a capacity-building workshop tool that enables participants to play with re-arranging and rebuilding their neighbourhood streets and to visualize what the opportunities and options can be.	#N/A	Multiplayer (Small Groups 4-6 players)	Adults	Board Game	In-Person	Charges Fee	Link to game description: https://www.completestreetsforcanada.ca/complete-streets-game-2-0-is-here/ https://www.o2design.com/complete-streets-by-design	The Centre for Active Transportation
24	City Skylines	City Skylines is a a game that mirrors real-world systems (inspired by SimCity), and players face interconnected urban planning and policy challenges. The game mixes strategy and decision-making focused on building and managing cities. Urban planning and policy aspects are coupled with the task of maintaining a city's budget, mobility, pollution (land, water, and noise), population and residents' health, happiness, and employment.	#N/A	Single Player	Adults	Digital	Online	For Free	http://gamesforcities.com/database/cities-skylines/	Paradox Interactive
25	Doodle City	Doodle City is a family game of city building, that allows the drawing a network of road, building a city and trying to score points for their hotels, shops, and taxis, all while avoiding pollution.	<1h	Multiplayer (Small Groups 1-6 players)	Youth & Adults	Board Game	In-Person	Charges Fee	https://boardgamegeek.com/boardgame/162107/doodle-city	999 Games & Aporta Games
26	Dubes Game	Dubes is a decisional making game that supports sustainable development. The game invites players to take on the role of stakeholders and draw a plan-for the sustainable urban renewal of a neighbourhood.	>2h	Multiplayer (Small Groups 2-10 players)	Adults	Digital	Online & In-Person	For Free	www.gamesforcities.com/database/the-dubes-game/ Academia: https://www.academia.edu/4730994/The_DUBES_Game_Combining_DSS_and_Interaction_Seminar_De_Spelende_Stad_-_The_Playful_City Research Publication www.researchgate.net/publication/260224943_The_Dubes_game_supporting_sustainable_urban_renewal_project	Play the City & TU Delft

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27	Keep Cool Mobil	Keep Cool Mobil is a game about climate politics, where young people take control of global metropolises. They decide which path their economies will take, their climate protection strategy and exert influence on an international scale.	<1h	Multiplayer (6 Small Groups of up to 3 players)	Youth	Digital	Online	For Free	http://www.climate-game.net/	Potsdam Institute for Climate Impact Research
28	IBM CityOne	IBM CityOne is a game where players explore new and innovative solutions for a 'smarter planet' in areas of energy, water, retail and banking. Players must evolve all these four areas on a limited budget, while making decisions affecting revenue, profit, citizen satisfaction and environmental betterment. The goal is to create more connected, intelligent and efficient cities.	#N/A	#N/A	Adults	Digital	Online	For Free	http://gamesforcities.com/database/cityone-a-smarter-planet-game/	IBM
29	Pipes – Public Infrastructure Participatory Engagement Simulation	Pipes is a game where players experience problems and dangers connected to ageing water infrastructure. Players practice collaboration among various organisations and groups of interest, and experience problems and opportunities in complex systems.	>2h	Multiplayer (Large Groups 8-24 players)	Adults	Board Game	In-Person	Charges Fee	https://pipes.socialsimulations.org/#benefits	Centre for Systems Solutions (CRS), Michigan State University, Games4Sustainability & Social Simulations
30	Rubbish!	Rubbish! is a game designed to specifically address the waste crisis in Bangalore. Players take the role of John – a Dry Waste Collection Centre (DWCC) manager; players' responsibilities include collection and disposal of dry waste and ensuring the overall cleanliness of the city. Each player runs his own DWCC in one ward. Every round, waste is generated in all wards, but the players can only collect from those wards that have a DWCC, with the remaining waste dumped in the landfill. When the landfill overflows, all players lose. If the players manage to create a DWCC in every ward, they all win the game.	#N/A	Multiplayer (Small Groups 4-6 players)	Adults	Board Game	In-Person	For Free	http://gamesforcities.com/database/rubbish/ https://medialabamsterdam.com/blog/project/rubbish/	Fields of View, mediaLAB Amsterdam
31	StreetComplete	The players are asked simple questions in their vicinity to complete the info on the respective site. The info entered is then directly added to the OpenStreetMap in the name of the player.	#N/A	Single Player	Youth & Adults	Digital	Online	For Free	https://play.google.com/store/apps/details?id=de.westnordost.streetcomplete&hl=en&gl=US	Tobias Zwick
32	Urban Gems	UrbanGems is a game that identifies the visual cues that are generally associated with concepts difficult to define such beauty, happiness, quietness, or even deprivation.	#N/A	Multiplayer (Small Groups 8 players)	Varied	Board Game	In-Person	Charges Fee	https://urbangems.org/	Adam Barwell, Daniele Quercia, Jon Crowcroft
33	Urban Science	Urban Science is a game where players become urban planners to redesign the city. Use of GIS model to propose land use changes.	#N/A	Varied	Youth	Digital	Online	For Free	https://www.cse.msu.edu/~cse498/2016-08/projects/urban-science/	University of Wisconsin
34	ECO	ECO is a game where players harvest from the environment to craft their own creations. Players can collaborate to build a civilisation. Every action affects the environment with many animals and plants.	>2h	Single Player	Varied	Digital (PC Game)	Online	Charges Fee	https://games4sustainability.org/gameopedia/eco/ https://play.eco/	Strange Loop

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35	Animal Crossing	Animal Crossing is a simulation-style game which allows players the chance to create their own versions of paradise on a deserted island inhabited solely by animals. The customizable player/ character names their island and establishes a small village within, and then build elaborate homes, tend gardens, fish, throw parties, and converse with their always-kind animal neighbours.	Varied	Multiplayer (Small Groups <4 players)	Children	Digital	Online	Charges Fee	https://animal-crossing.com/;	Nintendo
36	Article 27: the UN Security Council Game	Article 27: The UN Security Council Game is a game focusing on decision-making process in UN Security Council (Germany is added). Each player can present a proposal to the Council. It marks the start of the negotiations phase.	1-2h	Multiplayer (Small Groups 2-10 players)	Varied	Board Game	In-Person	Charges Fee	https://games4sustainability.org/gamepedia/article-27-un-security-council-game/ https://boardgamegeek.com/boardgame/113293/article-27-un-security-council-game	Stronghold Games
37	Budget Games	Budget Games is a game that lets each group has to unanimously decide on urban investments and social services selection. Each participant has some of the game's currency, but not enough to finance the projects preferred. The players need to work together to reach common solutions. Each team creates its list of proposals. But the final ranking depends on the average from all tables.	N/A	Multiplayer (Small Groups 8-10 groups of 10 players)	Varied	Board Game	In-Person	Charges Fee	http://graobudzet.crs.org.pl/about-the-game/	Luke Hohmann & Innovation Games
38	Civilization	Civilisation is a game where players are tasked with guiding an entire civilization throughout the ages, taking ownership of your people's technology, economy, culture, and military, as well as all the choices that go along with them.	1-2h	Varied	Youth	Digital & Board Game	Online	Charges Fee	https://civilization.com/ https://www.pcgamer.com/civilization-6-review/ https://www.commonsensemedia.org/game-reviews/sid-meiers-civilization-vi	MicroProse
39	Climate-Poker	The players become Climate Diplomats to protect the climate. Players can join forces to organize climate negotiations for climate agreements.	<1h	Multiplayer (Small Groups 2-10 players)	Adults	Board Game	In-Person	Charges Fee	https://games4sustainability.org/gamepedia/climate-poker/	BeWitched Spiele
40	Cultural Memory Game	Cultural Memory Game is a game that teaches the key factor contributing to community resilience. The bits and pieces of past catastrophic events are scattered around the city, offering prompts to those who are ready to relate facts.	1-2h	Multiplayer (Small Groups 6-12 players)	Varied	Board Game	In-Person	For Free	https://culturalmemory.socialsimulations.org	EU Horizon 2020 Programme
41	DisCoord – The Disaster Coordination Game	DisCoord is a game where as the leader of a Sub-County (consisting of 15 villages) in Uganda, a player must ensure that the population is satisfied. However, growing population, floods and landslides frequently occur, and money is not enough. The players need to discuss and interact with each other since policies need to be proposed and enacted at district level gh a majority vote. Each round (year) consists of 4 phases.	>2h	Multiplayer (Small Groups 2-8 players)	Adults	Board Game	In-Person	Charges Fee	https://games4sustainability.org/gamepedia/discoord/	Kewan Mertens, Matthieu Kervyn

Screenshot

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42	Earthgirl	Earth Girl is an interactive game focused on making strategic decisions to minimize risk in communities which are exposed to natural hazards. In the game, a smart and action-loving Southeast Asian girl plays to save her family and friends from natural hazards.	<1h	Single Player	Children & Adults	Digital	Online	For Free	www.earthgirl2.com	Earth Observatory of Singapore (EOS)
43	Earthrise	Earthrise is a game that is a sandbox massively multiplayer online role-playing game shooter set in a post-apocalyptic world where players must craft their gear and fight for survival.	>2h	Multiplayer (Small Groups 2-10 players)	Varied	Digital	Online	For Free	https://www.mmorpg.com/earthrise-first-impact	SilentFuture
44	Full Spectrum Warrior	Full Spectrum Warrior is a game commissioned by the U.S. Army to train light Infantry troops in urban combat situations.	N/A	Varied	Youth	Digital	Online	Charges Fee	https://www.gog.com/game/full_spectrum_warrior?gclsrc=aw.ds&&gclid=CjwKCAjwhMmEBhBwEiwAXwFoEQ09ECYvOyuwBrA-7MbPQ-JNPYT8SqLQlr6l7_DX9r49ehrAtzpD9xoCXEYQAvD_BwE	Pandemic Studios & THQ Nordic GmbH
45	Greenspace	GS is a game to convert/flip (remediate in the real world) all contaminated 2D brownfield tiles in the centre of the Monopoly-like game board to viable 3D green spaces. Rewards from tasks such as cleaning garbage and building renewable energy resources give players a sense of accomplishment as they move through the game. RocketOwl and its partners have vowed to plant a tree in the real world as players complete milestones.	>2h	Varied	Youth	Digital	Online	For Free	https://web.archive.org/web/20121014011354/http://www.appsontapp.com/greenspace/	RocketOwl
46	Gifts of Culture	Gifts of Culture is a game where players represent various groups living in the flood-prone valley. Although their views and ideals differ, they have the same goal of improving living conditions in their communities. The players experience cultural differences, but learn to turn diversity into opportunity.	>2h	Multiplayer (Small Groups 8 players)	Varied	Board Game	In-Person	For Free	https://giftsofculture.socialsimulations.org/en/	EU Horizon 2020 Programme
47	Hazagora	Hazagora is a game where the players are the inhabitants of a volcanic island, which they have to develop and where to sustain a community. Geological hazards are regular, and the community needs to be ready to face them.	>2h	Multiplayer (Small Groups 2-10 players)	Adults	Board Game	In-Person	Charges Fee	https://games4sustainability.org/gamepedia/hazagora/ https://www.wtnschp.be/sciencesays/	Vrije Universiteit Brussel, Science Communication Expertise Brussels Innoviris Free for non-commercial purposes
48	Laudato Si	Laudato Si is a game that manages common goods through a forest (which is the players' home, giving them place to sleep and providing everything they need to live and develop their community)	<1h	Multiplayer (Small Groups 5-6 players)	Youth	Board Game	In-Person	Charges Fee	https://laudatosi.crs.org.pl/en/	New Earth Project by Climate KIC

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		community)								
49	Lords of the Valley	Lords of the Valley is the action takes place in the river valley, which is in danger because of unexpected droughts and floods. The players take on roles of farmers, local authorities, bank and ecological NGOs. They face numerous challenges, resulting from other players' decisions and unpredictable environmental conditions.	>2h	Multiplayer (Large Groups 12-36 players)	Varied	Digital	In-Person	Charges Fee	https://systemssolutions.org/portfolio-items/lords-of-the-valley/ https://lordsofthevalley.socialsimulations.org/#technical-details	Centre for Systems Solutions
50	Sustainable Shaun Online Game	Sustainable Shaun Online Game is a game that explores how to create a cleaner, healthier, more 'sustainable' future for our cities and the planet, build a new eco-friendly city for stray animals of a farm, making sure to keep them all happy by monitoring resources, food, energy, transport and nature issues.	N/A	N/A	Youth	Digital	Online	For Free	https://ec.europa.eu/environment/sustainableshaun/game_en.htm	Sustainable Learning Team (UK)
51	The World's Future	The World's Future is a game where players adopt high-level leadership roles. They experience the pressure of making trade-offs and the thrill of finding synergies for sustainable development. Players make choices about energy and industrial investments, social development, and environmental management, among other factors, which influence their country – and surrounding countries – in the long term. Incorporates the SDGs and players experience how interconnected the global goals are and what the consequences of their decisions are.	>2h	Varied	Adults	Digital & Board Game	Online & In-Person	Charges Fee	https://worldsfuture.socialsimulations.org	Centre for Systems Solutions, International Institute for Applied Systems Analysis
52	Urban Renewal	Urban Renewal is a game where the players take part in a complete transformation of the city. Each player, starting with the one who takes the role of Mayor, spins the Decision Engine Wheel. The wheel can stop at one of those icons: Condominium, Commercial Building, Public Housing, School, Bulldozer, Park, Planning Directive. The player has to follow the instructions connected to the spinning outcome.	>2h	Multiplayer (Large Groups >10 players)	Adults	Board Game	In-Person	Charges Fee	http://flaviotrevisan.com/2011/the-game-of-urban-renewal/	John Walker
53	Urbanix	Urbanix is a Wii ware game in which player controls a tiny little tractor that has to build a town on an empty field in a given time, while avoiding the enemies. The object of the game it to populate enough of the empty area before a time limit runs out.	1-2h	Varied	Varied	Digital	Online	Charges Fee	https://www.nintendo.co.uk/Games/Wii-Ware/Urbanix-287064.html https://nintendookie.wordpress.com/2011/01/28/urbanix-review-wiiware/	Nodcurrent
54	World Rescue	World Rescue is a game where players learn about SDGs and 21st century development challenges in different parts of the world. The game features five characters from diverse parts of the world—India, China, Norway, Brazil, and Kenya. With culturally relevant and research-based storytelling and art, World Rescue offers a bird's eye view into the food, environment, society and culture through gameplay.	<1h	Single Player	Varied	Digital	Online	For Free	http://worldrescuegame.com	UNESCO MGIEP
55	Darfur is Dying	Darfur is Dying is a game where the player takes the role of a displaced Darfurian living in a refugee camp. The player faces lack of water and needs to find a new source, through a careful search, so he/she doesn't get captured by aggressive security guards.	<1h	Single Player	Adults	Digital	Online	For Free	http://www.gamesforchange.org/game/darfur-is-dying/	Take Action Games

CCE L11WS: SERIOUS GAME DIRECTORY

56	Digital Zoo Gallery	Digital Zoo gallery is a game where player can visit two art galleries with different themes. The game offers 2 galleries for the players; Modern Art Gallery and Jurassic Jungle. In the game players can explore the jungle filled with dinosaurs while at the same time enjoy artworks or visit a modern gallery for a more relaxed experience.	<1h	Varied	Varied	Digital	Online	Charges Fee	Game website: Not Available Resource: https://store.steampowered.com/app/1511330/Digital_Zoo_Gallery/	Digital Zoo
57	Evacuation Challenge Game	Evacuation Challenge Game is a game that the challenges are connected with disaster response and evacuation (in this case – zombie apocalypse!). Participants take the roles of citizens and rescue team members, but the road to safety is not easy.	1-2h	Multiplayer (Large Groups >10 players)	Adults	Digital	Online	For Free	https://evacuationchallenge.socialsimulations.org	Center for Systems Solutions, andEDUCEN project
58	Monument Valley	Monument Valley is an MC Escher inspired puzzle game that bends architecture and follows a silent princess through a captivating world. In the game player leads the princess Ida through mazes of optical illusions and impossible objects while manipulating the world around her to reach various platforms.	>2h	Single Player	Varied	Digital	Online	Charges Fee	Game website: https://www.monumentvalleygame.com/mv2 Resource: https://en.wikipedia.org/wiki/Monument_Valley_(video_game)	Us two
59	My Little Princess : Castle	My Little Princess Stores is a storytelling digital dollhouse game. It is a castle where child interacts with everything.	1-2h	Single Player	Children	Digital	Online	Charges Fee	https://play.google.com/store/apps/details?id=mylittleprincess.castle&hl=en_US&gl=US	My Towns Games Ltf
60	Myst	Myst is a game where players solve puzzles, and by doing so, travel to four other worlds, known as Ages, which reveal the backstory of the game's characters.	>2h	Multiplayer (Small Groups 2-10 players)	Children	Digital	Online	Charges Fee	https://cyan.com/games/myst/ https://www.commonsensemedia.org/game-reviews/myst-nintendo-3ds	Cyan
61	Project Pandora	Project Pandora is a SCIFI board game where one player controls the evil human corporation and the alien eight race on a modular tile board moving miniatures and rolling dice to achieve some scenario-driven objectives.	<1h	Multiplayer (Small Groups 2 players)	Children	Board Game	In-Person	Charges Fee	https://boardgamegeek.com/boardgame/120444/project-pandora-grim-cargo https://www.play-board-games.com/project-pandora-grim-cargo-review/	Mantic Games
62	Second Life	Second Life is a 3D online virtual world which allows players to create virtual representation of themselves and customise their avatars, explore and create a host of different environments and locations. The players can at the same time interact with others and participate in different activities.	N/A	Multiplayer (Small Groups 2-10 players)	Youth	Digital	Online	For Free	www.secondlife.com/	Linden Lab

CCE L7WSC: GAME REVIEW SHEET

13 CLIMATE ACTION

USE THE TABLE TO GATHER INFORMATION ABOUT THE VARIOUS GAMES YOU ARE FINDING

GAME'S NAME	GAME TYPE	# PLAYERS	GAME AIM.	COMMENTS / OPINION

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 12: Climate Change and the Built Environment (Part 1)

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Climate Change and the Built Environment (Part 1)

The aim of this lesson is to highlight why we need to adapt the way we plan and build our cities and towns in the future. The lesson begins by looking at the challenges of existing low-density settlements and then goes on to look at how this might be changed. This includes how we adapt our settlements by increasing density, building in the existing built-up area of cities and towns, and reusing existing buildings. Learners develop understanding of the impact of higher density urban settlements, how this can help mitigate climate change by protecting green spaces and reduce the distances people have to travel.

Vocabulary: Compact Development; Density; Urban Sprawl

In this lesson, the learner will:

- Learn why existing settlement patterns are negative from a climate perspective
- Develop an understanding of why we need to adapt existing living environments
- Understand why using less land is more efficient
- Understand some of the ways we can build in a more compact way

Materials

- Video: 'Climate change and the Built Environment'
- Worksheet: Active Listening Task
- Worksheet and Guide: Using AIRO maps and activity worksheet
- Paper and pens
- Access to Internet on tablets, computers or phones (for the AIRO maps; tablets or computer will be best)

SDG13 Climate Change Engage Game Design
L12: Climate Change and the Built Environment (Part 1)

Activity Instructions

Activity 1 Climate Change and the Built Environment Active Listening Task (30 mins)

1. In pairs, read through the questions on Worksheet: 12.1.1 Active Listening Task. Underline the keywords in each question and clarify any unknown vocabulary by checking a dictionary or asking a peer.

2. Answer the questions while watching the Video: 'Climate Change and the Built Environment'

3. Discuss answers in pairs and then share ideas as a whole class.

Activity 2: Population Growth in Ireland (20 minutes)

1. Working in pairs, use the Guide (using AIRO maps and activity worksheet) to discover population growth in Ireland.

   Learners will examine population change in Ireland and where this has occurred over time. https://airomaps.nuim.ie/id/Census2016/

2. Ask each pair to select a city or town and look at population change between 2011-2016.
3. Using worksheet 12.1.2 learners will
   - identify the location where the population has grown the most (darker blue).
   - write down the name of the location, broadly where it is, the name of the electoral division (ED) and the population change between 2011 and 2016.
   - determine and record the population in 2011, the population in 2016, the overall change in population and the percentage change.
   - identify and write down if the growth is occurring in the centre of the town or on the edge.
4. Do a quick tour of the room to identify where each of the groups have identified population change occurring. Is there evidence of any patterns?

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L12: Climate Change and the Built Environment (Part 1)

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, skip Activity 2 and spend longer on Activity 1, by adding a feedback and discussion session on what the students have learned from the video.
Extension: For a longer lesson, watch the Eco Eye video as a class (see Media Box) from 5.31-20:00mins. Ask learners to reflect on building more densely and the challenges associated with this. Discuss some of the challenges that come from building more densely – what do the learners think of the arguments of local residents? Do they agree or disagree?
Flipped Classroom: Learners watch the full Eco Eye video before the lesson. In addition to Activity 1, discuss what they learned from the Eco Eye programme in their pairs and share the learning from both activities with the rest of the class following the discussion.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Climate Change and the Built Environment' https://youtu.be/VzXFfKXzJ18

Eco Eye Programme Higher Density vs Urban Sprawl (Episode 8, Season 20, 2021). https://www.youtube.com/watch?v=u2OOzj5ZfYI

Department of the Environment Heritage and Local Government (DHELG, 2009) Urban Design Manual: A best practice guide, Dublin, DHELG. Part 1 and Part 2

EPA Greenhouse Gas Emissions latest data https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/latest-emissions-data/

Marmalade Lane:http://www.marmaladelane.co.uk/

Local Trip / Expertise / Additional Work and Assessments

Students can walk around a local town or village to identify and map:

- Any development that is occurring at the edges of the village or town.
- Unused (vacant), underused (where only a ground floor is used), or derelict buildings. Ask students to think about what potential uses could be made of the buildings in the future.

Ask a local planner to visit and talk about how they are encouraging more sustainable compact and mixed-use development in neighbourhoods, towns, and villages of the area where the school is based. The planner could provide an overview of local policy and explain the challenges of accommodating growth in a sustainable manner. It would be particularly interesting if there is a local plan in place or a regeneration/building project that is close to the school, that the planner could use to illustrate how policy is being implemented.

CCE L12WS ACTIVE LISTENING TASK

A. Read through the questions and underline the key words.
B. Watch the video 'Climate change and the Built Environment' - https://youtu.be/VzXFfKXzJ18 and answer the questions

1. What three sectors produce most of Ireland's Greenhouse Gases?

I._____
II._____
III._____

(Note: The Data in the presentation come from the Irish Environmental Protection Agency, EPA update these figures with new data as it becomes available – check out the Latest EPA Greenhouse Gas Emissions Data here)

2. Why are many Irish suburban developments bad for the environment and contributing to Greenhouse Gas Emissions?

_____ _____
_____ _____
_____ _____

3. What is meant by the term 'urban sprawl? Use your own words to define it.

_____
_____

4. What are the disadvantages of urban sprawl?

i._____
II._____
III._____
iv._____

5. What is meant by the term 'compact development'? Use your own words to define it.

_____
_____

CCE L12WS ACTIVE LISTENING TASK

6. What three things about settlement planning do we need to consider and change in order to bring about a greener future?

I._____
II._____
III._____

7. Describe two things that can be done that would increase the density of development.

I._____
II._____

8. Name two environmental advantages of reusing older buildings in towns and cities.

I._____
II._____

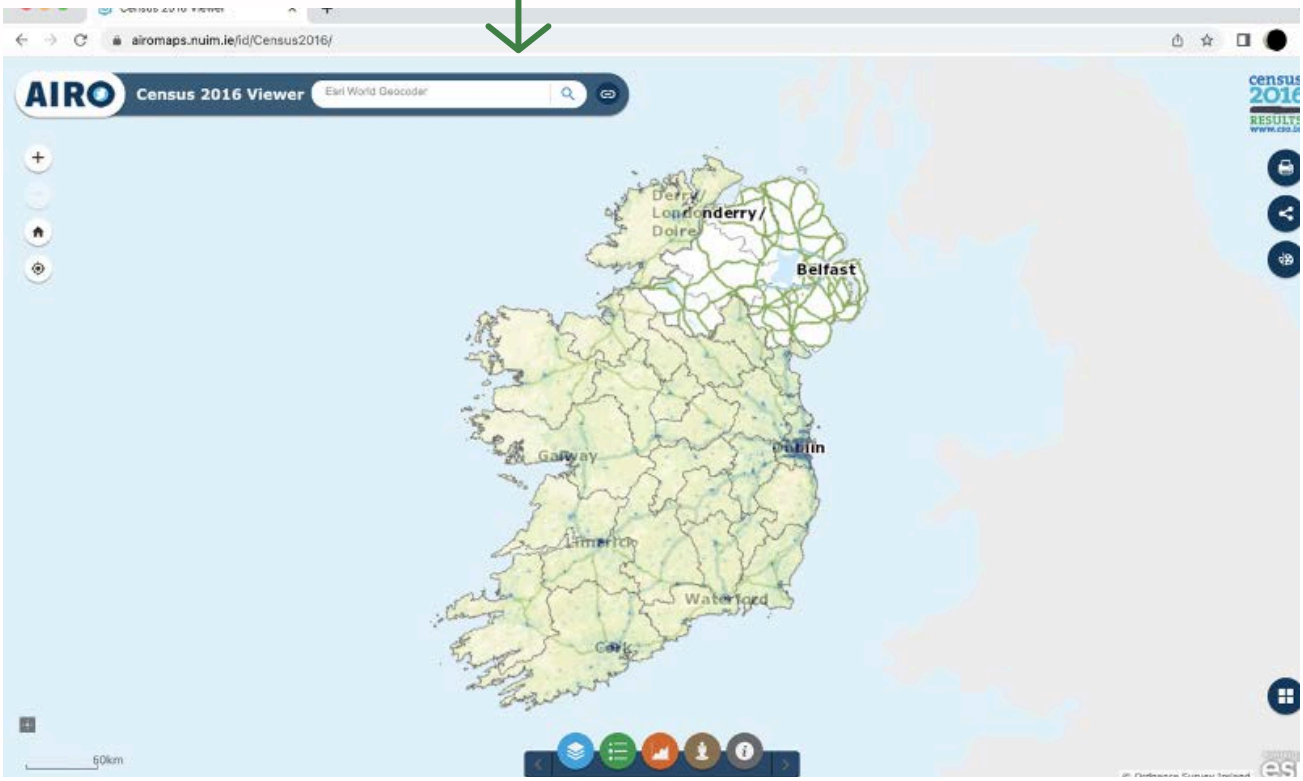
CCE L12WS: AIRO INTERACTIVE TASK

Use this instruction sheet to explore AIRO Census mapping and complete the worksheet on page 7.

TASK 1: EXPLORING THE AIRO MAP

1. Go To AIRO Census 2016 Mapping:
   https://airomaps.nuim.ie/id/Census2016/

   It will bring you to this screen

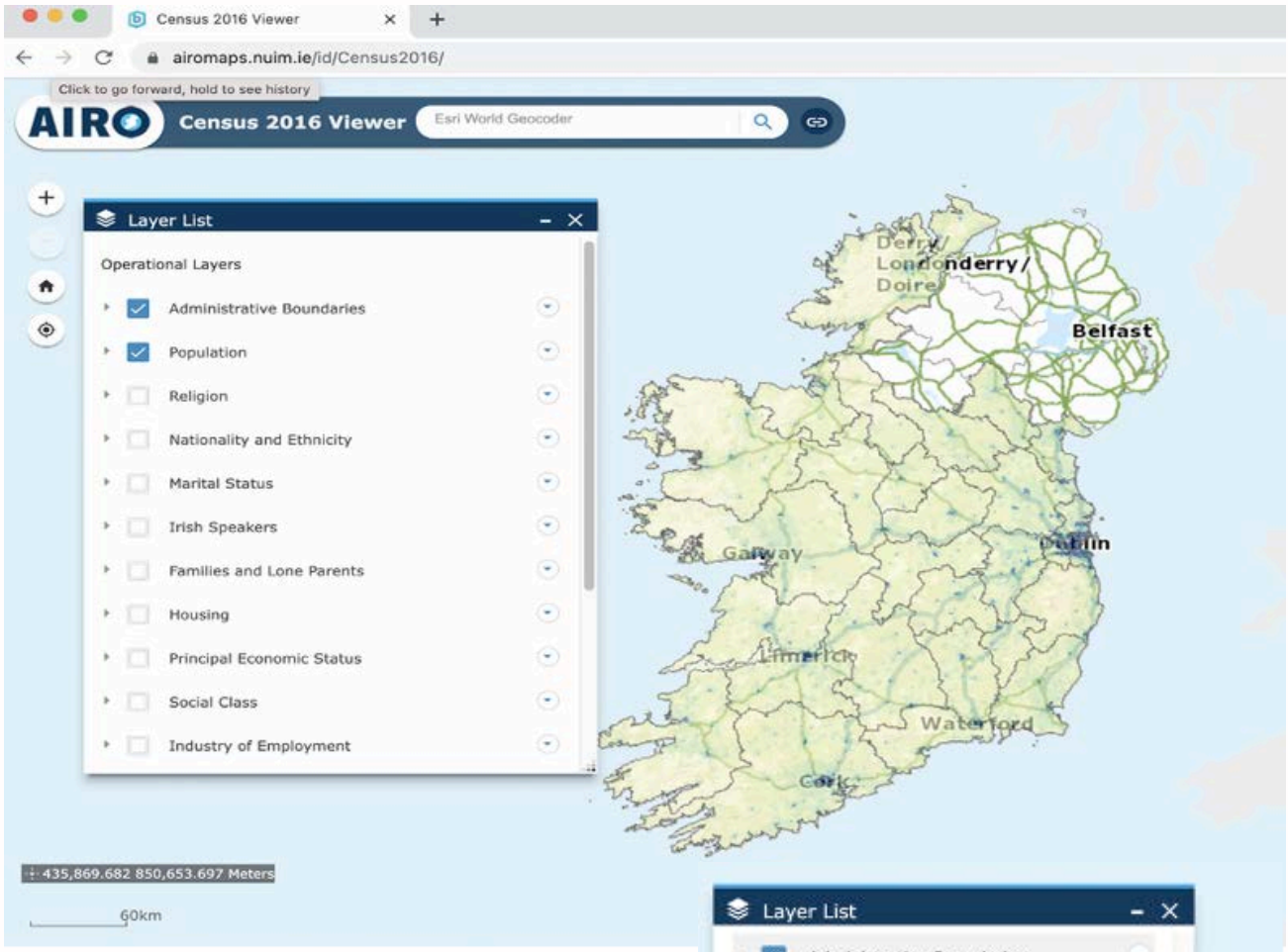


2. To get the population view in a format that is easy to search,
   - go to the layers button, the blue stack button on the bottom menu.

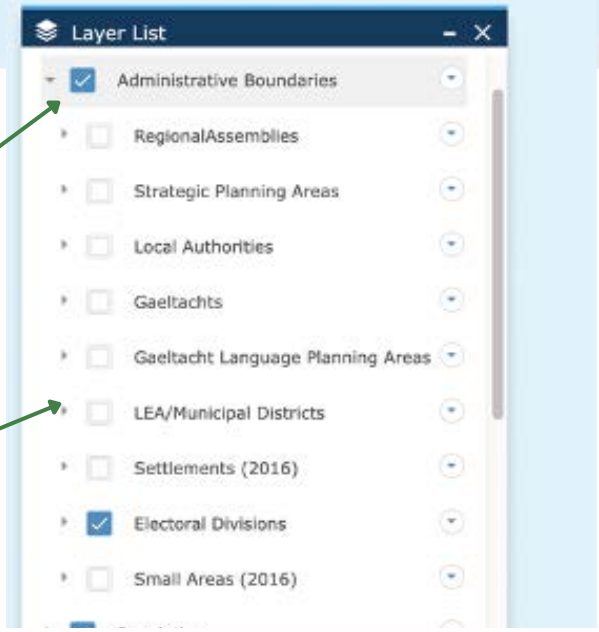
CCE L12WS: AIRO INTERACTIVE TASK

3. By clicking this you will open the layers menu (see screen shot below), here you can select lots of different data from the 2016 census for display.

4. For this exercise you need to select the first two items listed:
   Administrative Boundaries
   Population
   To select them, click the relevant left-hand boxes.



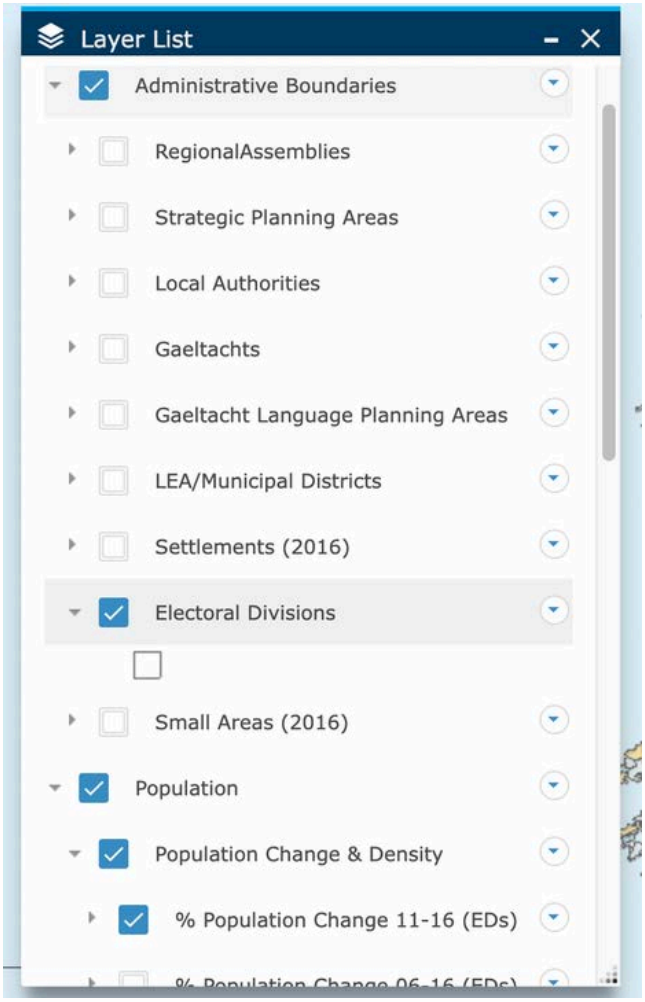
To see the different types of administrative boundaries and the different population data available, you will need to double click on both of these topics in turn to see the drop-down submenus.



5. Double click on the administrative boundaries, this will give you access to lots of potential administrative units with different boundaries.

You can view the local authority boundaries, regional assemblies, etc. but if you want to select the Electoral Divisions (see the layer list), this will allow you to view population change in smaller areas.

CCE L12WS: AIRO INTERACTIVE TASK

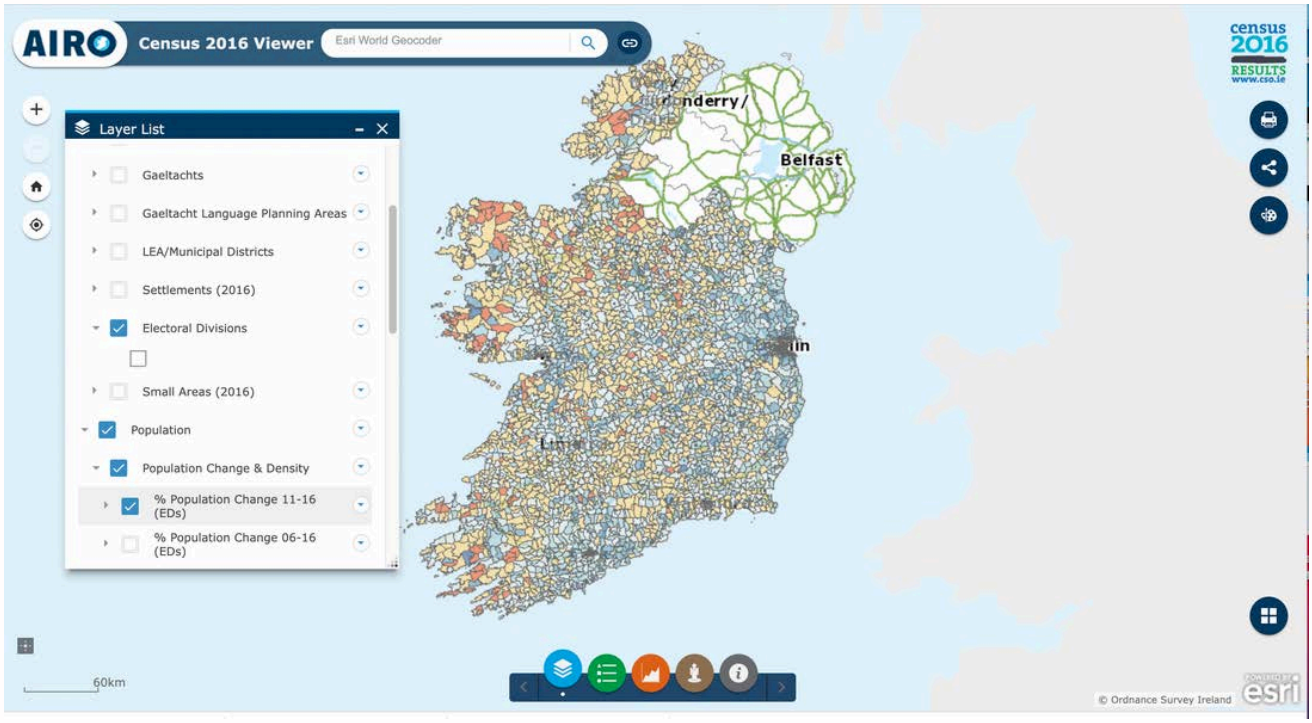


6. You will also need to double click on population so that you see the drop-down menu.

7. Double click on Population Change and Density, then from the second drop-down menu select % Population Change 11-16 (EDs).

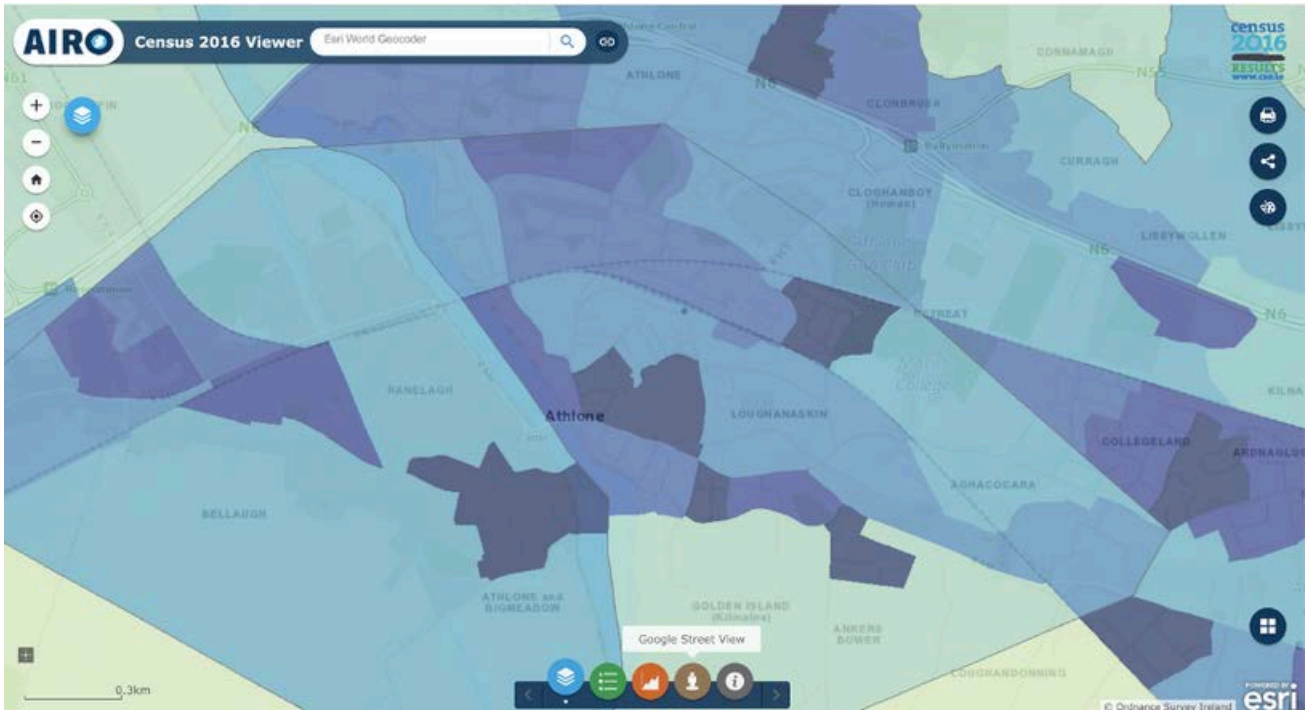
   The map (see below) will now show the electoral divisions across the country and you can zoom in using the + symbol to look at a specific area.

The example below is zoomed in to look at the town of Athlone.



CCE L12WS: AIRO INTERACTIVE TASK

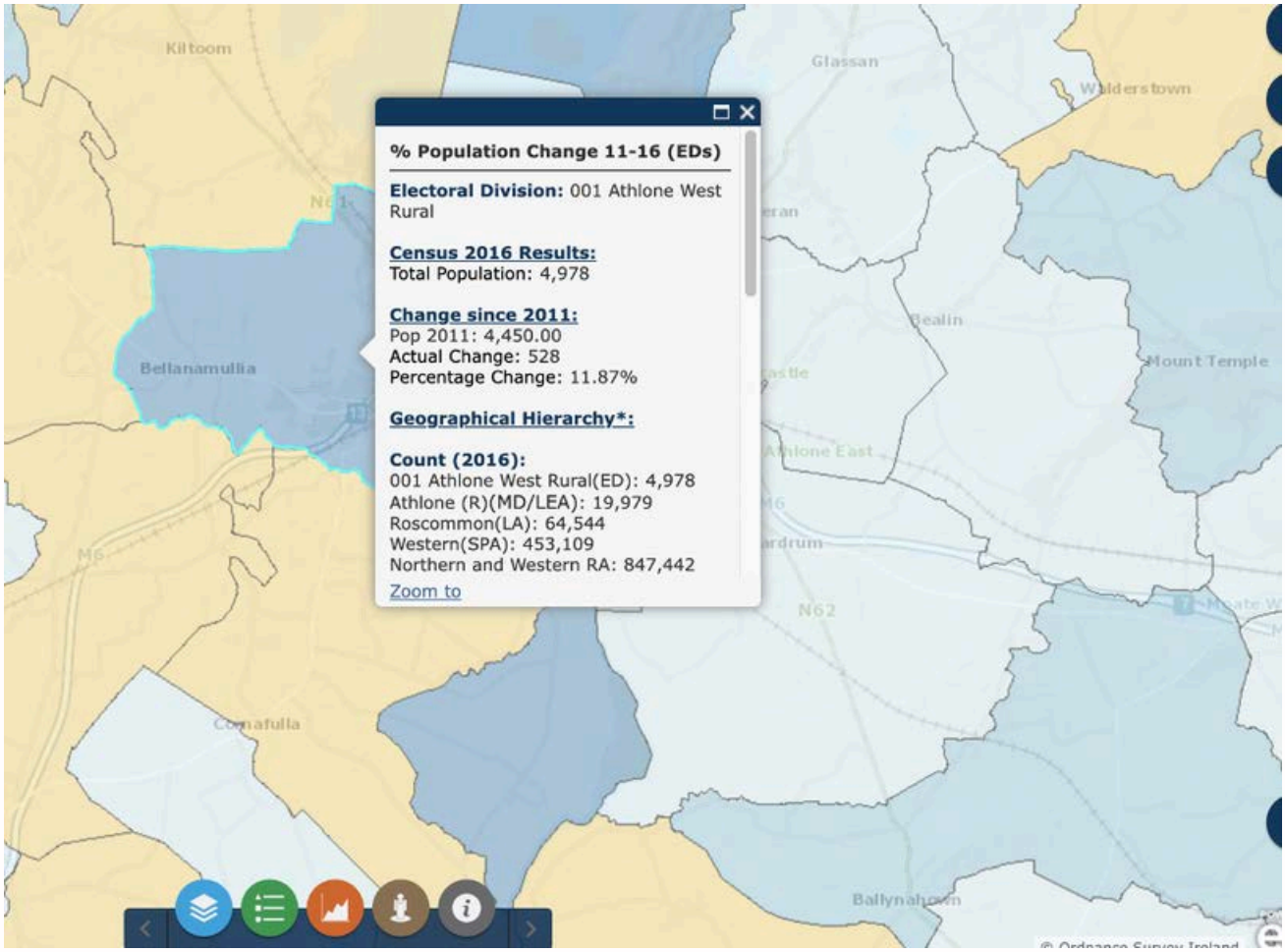
8. You can now click on each highlighted electoral division and view the population change that has occurred between the 2011 Census and the 2016 Census of Population.



The yellow and orange colours show declining population, while the blue colours show increases, the darker the blue the greater the population increases. See the legend below.

CCE L12WS: AIRO INTERACTIVE TASK

When you click on an Electoral Division, a table appears with the detailed information on the change in % population between 2011 and 2016. This includes the exact % change in population and the actual increase in numbers.



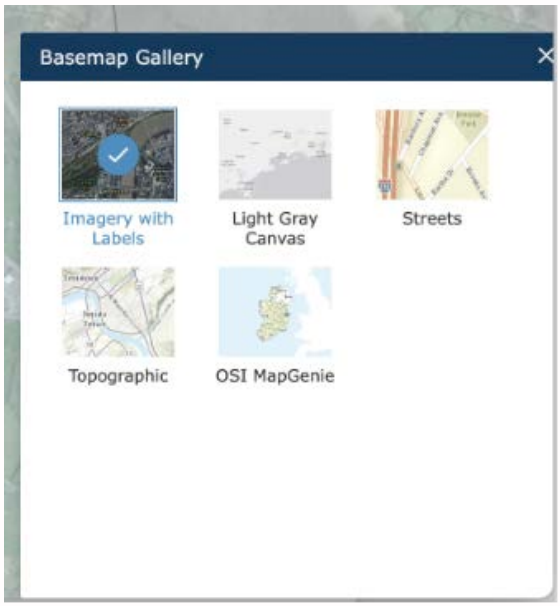
This is very useful for getting detailed information about population change.

For example in the Electoral District on the edge of Athlone that is highlighted, you can see that there has been a growth in the population of this area of 11.87% between 2011 and 2016, and this was an increase of 528 people.

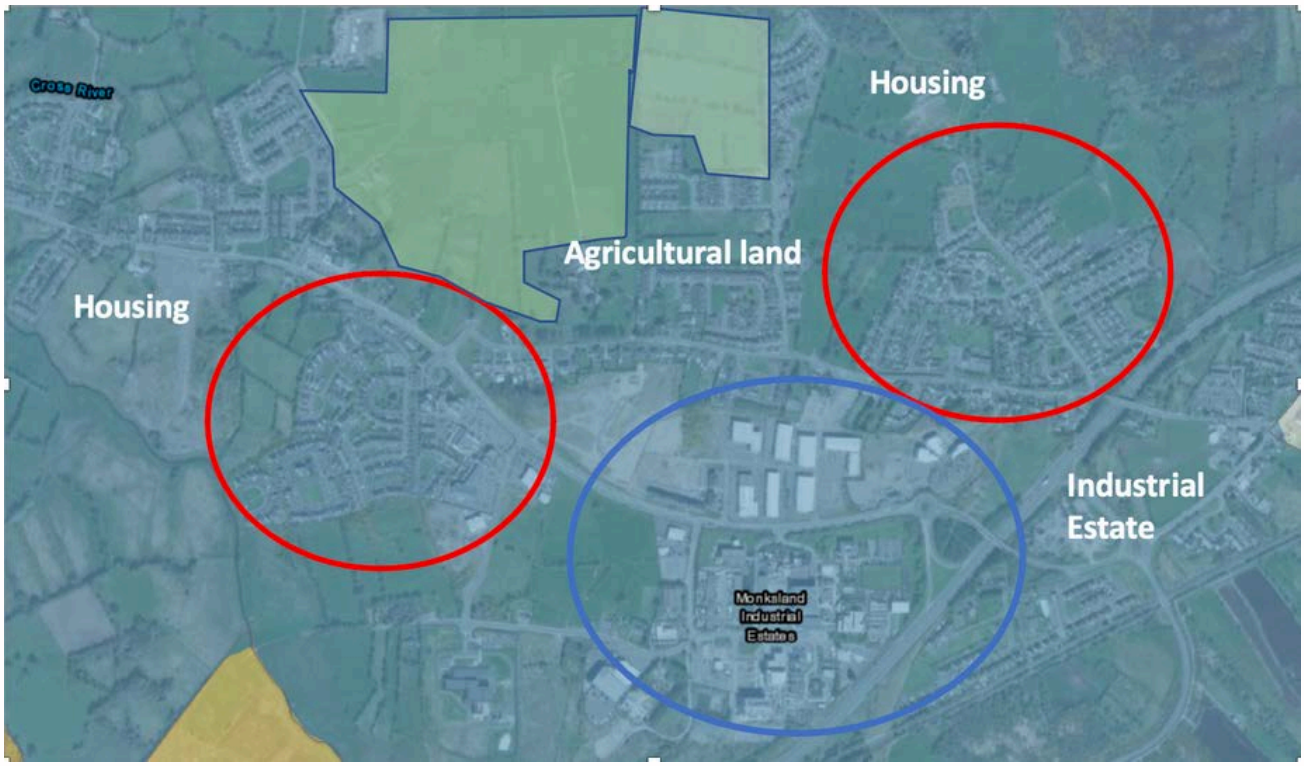
To see the nature of development in the area you can change the base map to an aerial photo. To do this click the Base Map viewer and change to the ‘imagery with labels’ option.

CCE L12WS: AIRO INTERACTIVE TASK

This allows you to see that this Electoral Division is largely an edge of town area (see map below) as it shows a mix of rural agricultural land, an industrial estate and a number of housing estates.



Notice the layout of the housing estates are relatively low density.



You can explore other aspects of population growth and other census information. You can see the amount of growth in areas over a longer period from 2006 -2016 by going back and ticking this layer in the layer options. Using this tool and the attached task sheet explore population change and where this population change is occurring in different towns and cities in Ireland.

CCE L12WS: AIRO INTERACTIVE TASK

TASK 2: EXPLORING IRISH TOWNS AND CITIES

In your group pick an Irish town or city to explore.

1.Name of Town or City: _____

Using the AIRO Census mapping tool provide the following information:

2. In your chosen town or city, identify the location where the most growth has occurred. Name the Electoral Division or number of Electoral Divisions where this growth has occurred.

_____

From the data and map, provide the following information:

3. In the Electoral Division or number of Electoral Divisions with the greatest growth, what was the population in the Electoral Division(s) in 2011?

_____

4. What was the population in the Electoral Division(s) in 2016?

_____

5. What was, the overall change in population numbers in the Electoral Division(s) between 2011 and 2016?

_____

6. What was the percentage change in population between 2011 and 2016?

_____

7. Describe spatially where most growth is occurring (e.g in the city centre, suburbs, edge of the built-up area).

_____

_____

_____

SDG13 Climate Change Engage Game Design

Lesson 13: Settlement Pattern and Sustainability

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Settlement Pattern and Sustainability

In this lesson, learners will reflect on the different settlement patterns in their locality and consider if they are positive or negative for the environment. They do this by firstly reviewing some of the key vocabulary / terms from the previous lesson and secondly, looking at what these terms mean on the ground in the built environment that they are familiar with. They can do this by visually surveying their own local environment, using online mapping and identifying different patterns of development.

The final element of the lesson asks learners to think of the future and what sorts of policies might change these patterns of development.

Vocabulary: Compact Development; High Density; Low Density

In this lesson, the learner will:

- reflect on and define key vocabulary
- explore different settlement patterns in their locality
- think about how these different layouts might have negative climate impacts
- think about how these might be changed with policies to encourage more positive behaviour

Materials

- Worksheet: Reviewing Vocabulary
- Worksheet: Exploring Settlement Patterns
- Reference: Appendix 1 and 2
- Access to Google Maps or Google Earth to explore their local area virtually\
- Internet Access - Access to Google Maps or Google Earth
- Pens, Paper

SDG13 Climate Change Engage Game Design
L13: Settlement Pattern and Sustainability

Activity Instructions

Activity 1 Review Key Vocabulary (10 minutes)

1. Refer to the whole class vocabulary list (paper or digital).
2. In pairs, ask learners to build on the definitions by using each word in a sentence.
3. Monitor and share examples as a whole class.

Activity 2. Exploring settlement layout from a climate perspective (40 minutes)

1. Divide learners into groups of 3-4.
2. Ask groups to think about the area/neighbourhood/town surrounding their school. Take 2-3 minutes to list elements of the area from the top of their head (buildings, green spaces, parking, road, facilities).
3. Using Google Maps or Earth and Worksheet: Exploring Settlement Patterns, ask the groups to:

    - Identify three elements of the layout of this area that are negative from a climate perspective e.g. low-density, lots of parking, lots of roads, and write down the negative elements.
    - Identify a sub-area or an element of the area that is positive from a climate perspective, e.g. an illustration of compact land use (apartment development), has small numbers of parking spaces, communal open space, and cycle lanes; combines a couple of different uses.
    - Identify the area and write down 3 positive elements. Learners can use some of the prompt material included in the task sheet as an aid.

4. Share ideas as a whole class.
5. Ask learners to pretend that they are the planning team for the area and have been asked to produce one new policy in relation to the layout of either the existing settlement or a new neighbourhood, which they think will have the most positive climate impact. This can be a written policy (bullet points) or an illustration.
6. Each group appoints a speaker to present their policy in two minutes to the rest of the class.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L13: Settlement Pattern and Sustainability

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, focus on Activity 2 and reduce the time allocated for each of the tasks.

Extension: For a longer class, reflect and compare learners' maps from lesson 9/10 (on Green Infrastructure) and integrate the information from Google Maps / Earth identified in Step 1 and 2.

The tasks in Lesson 8 & 9 will have helped identify the potential for green infrastructure. Learners can think about how they might complement the green infrastructure they identified in this lesson, with changes to transport infrastructure, or different types of housing, or mixing housing with other uses such as shops or offices.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Cities For People: How Paris & Barcelona Learned Urban Planning from Groningen (32:50min) https://www.youtube.com/watch?v=RYuGWOjm26E

RIBA Sustainable Building (3:32min) https://youtu.be/8GuYe0J5pWo

Royal Town Planning Institute https://www.rtpi.org.uk/netzerotransport

Local Trip / Expertise / Additional Work and Assessments

Organise a field trip in the area surrounding the school, to observe the settlement pattern that the learners will see or have seen on maps. If it is an urban area (city or suburban location), learners can walk around and look at different types of housing developments in the vicinity, using a route where different types of development are visible (i.e. low-density housing estates, compared with an apartment development). If in a rural village or small town, consider looking at the whole location.

Encourage learners to observe whether the car dominates, if mixed-uses are close to each other (e.g. businesses and housing close together; living over the shop in older streets, terraces that include both shops and houses, a modern mixed-use development like an apartment block with shops or other uses on the ground floor). Are there cycle lanes, good quality footpaths, open space that are inviting and usable?

CCE L13WS: APPENDIX 1

Developing Planning Policies

A planning policy can be described is a set of ideas that is used as a basis for determining how development and various changes to the built environment will be managed. A policy could, for example, set out details of how older buildings are to be conserved. A transport policy could set out ideas for reducing car traffic and increasing cycling and walking.

Example of a General Policy for Mixed-Use Development:

It is a policy of some councils to develop more sustainable villages and towns by encouraging a better mix of uses in village and town centres.

To develop your own policy, think about a specific objective that you think needs to be changed in the area you have looked at, maybe it is housing, transport or green space.

An objective is a measurable or defined action or set of actions that can bring about some element of your overall policy. If your policy is to encourage a better mix of uses in the town centre, village or neighbourhood centre, your policy objectives might give a list of actions to achieve this i.e.

- All new developments in the village/town centre area will incorporate a mix of uses.
- The ground floor of all new apartment developments in the village/town centre will include non-residential use.

Here is an example of a transport policy objective from the Dun Laoghaire Rathdown County Council Development Plan for 2022 -2028. The policy objective relates to the overall planning policy of ensuring that the towns and villages in the county act as multifunctional centres, which in addition to providing important retail uses (shopping facilities), also provide a range of other uses including leisure and recreation, employment and tourism, civic, community, cultural, health and education for the communities they serve.

The policy below is focused on accessibility to centres by sustainable transport.

7.2.3.2 Policy Objective MFC2: Accessible and Inclusive Multifunctional Centres

It is a Policy Objective of the Council to promote accessibility to Major Town Centres, District Centres and Neighbourhood Centres by sustainable modes of transportation in order to encourage multi-purpose shopping, business and leisure trips as part of the same journey. Dun Laoghaire Rathdown County Council Development Plan 2022-2028 p 143

Try to write your own policy in the same way -

It is a Policy Objective of the [insert name] County Council to...

13 CLIMATE ACTION

Appendix 2 Sustainable Activity and Mobility Framework, Interventions to Achieve Net Zero Transport

Table 2.1. Interventions, grouped according to the SAM framework

Substitute trips
Active travel infrastructure
Cycling infrastructure - genuine connected network
Walking infrastructure - genuine connected network
Logistics infrastructure
Micro-consolidation - cargo bike / electric vehicle last mile delivery
Flexible pick up / drop off points for home deliveries
Land use planning
Co-working spaces (local, in new developments / disused shops)
Mixed use developments meeting a greater range of local needs
Recreation space embedded in neighbourhoods
Local amenities within short walk and cycle (15-minute neighbourhood)
IT infrastructure
Home working (superfast broadband and house design to allow for work space)
Remote study and 'blended learning' for further and higher education
Digital public services (e.g. GP online)

Shift modes
Shared mobility
Bike share
eBike share
Car share (club)
Electric vehicle car share (club)
Mobility hubs - integrated network
Modern public transport
Demand Responsive Transport & Rideshare
Bus Rapid Transport
Bus priority traffic lights
Automated vehicle shuttles - last mile connectivity
Mobility as a Service - integrated public transport, on-demand and shared mobility services
Street design & access restrictions
Low Traffic Neighbourhoods - active travel priority
Car free zones
Street space reallocation from car to active and public transport
20mph zones
Controlled parking zones
Congestion charging zones
Fiscal measures
Workplace Parking Levy
Fuel tax

Switch fuels
Electric vehicle (EV) charging infrastructure
EV charging (residential) + vehicle to grid technology
EV charging (stations / shops / work / mobility hubs)
Hydrogen fuel cell charging (stations / shops / work)
Conversion of fleets
Convert commercial delivery and servicing fleets to EVs
Convert municipal delivery and servicing fleets to EVs
Convert public transport fleets to EVs
Fiscal measures
Grants to trade in petrol / diesel for EVs
Access restrictions
Low emission zones - Clean Air Zones

These are just some spatial planning policy interventions which could be adopted to achieve Net Zero emissions from Transport. The ideas here might help you think about the type of policies that you could suggest for your local area.

Source: RTPI (2021) **Net Zero Transport: The Role of Spatial Planning and Place Based Solutions**, London, RTPI, p 14.
https://www.rtpi.org.uk/netzerotransport

CCE L13: EXPLORING SETTLEMENT PATTERNS

Think about the area / neighbourhood / town surrounding your school. You can use Google Maps or Google Earth to look at the area to help you.

1 Name of the area and a description of where it is in the local area / neighbourhood.

_____

_____

2. Looking at the wider neighbourhood, identify three elements of the layout of the area that are negative from a climate perspective e.g. low density, lots of parking, lots of roads. Identify the area and write down the negative elements.

_____

_____

_____

3. Using the same area, identify elements that are positive from a climate perspective, e.g. an illustration of compact land use (apartment development), areas with small amounts of parking, good communal open space, cycle lanes, combining different uses. Identify the area and write down 3 positive elements.

   You can use some of the prompt material included in Appendix 1 as an aid, this lists some positive elements that can deliver more climate-positive places.

_____

_____

_____

4. Imagine that you are the planning team for the area and have been asked to produce one new policy in relation to the layout of either the existing settlement or a new undeveloped site (it could be a derelict site or an institutional site) in your neighbourhood / village / town which you think will have the best climate impact.

   For ideas on types of policies and how policies are phrased see the information contained in appendix 1 and 2.

CCE L13: EXPLORING SETTLEMENT PATTERNS

Start by thinking about the negatives and positives you have identified, then think about addressing the negatives and enhancing the positives by describing a policy that would reduce climate impacts. This can be a written policy included below or alternatively you can use a diagram, or a sketch map showing an actual policy implementation. You could do a quick sketch map and show a new cycle lane for example or the location of an electric vehicle charging station.

Policy: It is a policy of the County Council to

_____

_____

_____

_____

_____

_____

_____

_____

_____

Alternatively, create a diagram or sketch map showing policy implementation

5. Present back – appoint a speaker from your group to present your policy in 2 minutes to the rest of the class.

CCE L13WS: REVIEWING VOCABULARY

Working in pairs you will work with your partner to find definitions of the following terms, by using online dictionaries or searching using Google. Rewrite the definitions in your own words:

Compact Development

_____
_____
_____
_____
_____

High-Density Development

_____
_____
_____
_____
_____

Low-Density Development

_____
_____
_____
_____
_____

In class compare your definitions with those of other groups. Create a glossary of terms.

Compact Development

High-density Development

Low-density Development

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 15: Defining the Challenge and Forming Teams

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Defining the challenge and forming teams

In this lesson, learners will begin to consider the key aims of the project and develop teams. In order to come up with a well-rounded pitch, it is important to answer the driving question in full. By breaking down and analysing each part of the question, learners have a more focused approach to their research, ideas and solutions.

Vocabulary: Adaptation; Driving Question, Mitigation

In this lesson, the learner will:

- Break down the driving question into key components
- Examine what each component of the question is asking them to focus on
- Understand the driving question in more detail
- Be able to plan their research and project management tasks more effectively

Materials

- Driving Question
- Poster size paper
- Markers

SDG13 Climate Change Engage Game Design
L15: Defining the Challenge and Forming Teams

Activity Instructions

Activity 1 Breaking down the question (15 mins)

1. Write the driving question on the board

   How do we increase awareness of climate change adaptations for 15-17-year-olds through game design?

2. Ask the learners to work in pairs to briefly discuss the key parts of the question
3. As a whole group, discuss the key parts of the question, underlining them

Key parts of the question

- Increase awareness
- Climate change adaptations
- 15-17-year-olds
- through game design

Activity 2 Examining the components (25 mins)

1. On each piece of poster paper, write one of the key parts of the question
2. Stick each piece of paper at the front of the room
3. Examine each part of the question and write learner ideas/responses onto the poster paper
4. Review the question as a whole and keep the poster paper available to refer to throughout the module - see the discussion prompts in the extension / reduction box

Activity 3 Forming teams (10 mins)

1. Encourage learners to reflect on the skills required for the task based on lessons 1 - 8, and their experience of any group work to date.
2. Ask students to form teams of 3 - 4. This will be their final team for the rest of the project.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L15: Defining the Challenge and Forming Teams

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, reduce the amount of time in Activity 3.
Extension: For a longer lesson,

- Option A, spend more time on the discussion using the prompts below - links into lesson 4
- Option B use the videos in the media box to consider leadership and team building. This can be integrated as a flipped classroom activity, with students choosing their teams post video review and discussion.

Discussion prompts

Increase awareness

- What is awareness? What does it mean?
- What are effective ways to get young people's attention?
- Why is it important to be aware of something, like an issue or problem?
- What do we need to find out more about?

Climate change adaptations

- What is the difference between adaptation and mitigation?
- What are some examples of climate change adaptations? Are there any really important ones to think about locally?
- What do we need to find out more about?

15-17 year olds/through game design

- What is really important for 15-17 year olds to know about climate change? About adaptations?
- What kind of games do 15-17 year olds like to play?
- What is the most effective way to give factual information?
- What do we need to know more about?

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

- Tuckman's Team Building (3 mins) https://www.youtube.com/watch?v=2ZzMlyUzlVY
- 5 stages of Team Building (3 mins) https://www.youtube.com/watch?v=qtpY9zwuzFM
- Disney Team building / Leadership https://www.teambonding.com/disney-leadership-qualities/
- Disney Project management Leadership styles (9 mins) https://www.youtube.com/watch?v=uhUM3hN3qGU

Local Trip / Expertise / Additional Work and Assessments

Invite a local coach or business person to talk to the learners about the value of a strong team.

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 16: Mapping the User

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Mapping the user

This lesson facilitates learners to develop further insight into specific users and develop an understanding of their needs and interests.

From this lesson, learners working within their design teams will begin to identify and focus on the users of their game and the design principles, necessary to design their game. The lesson builds on Lesson 5 by developing learners' understanding of empathic design and the steps required to design for a user.

This supports the students to develop their concept maps in Lesson 17 and move towards creating their prototypes.

Vocabulary: Beneficiaries; Empathy Map, Design Principles; Influencers; Service Providers; Stakeholder Mapping, User Journey

In this lesson, the learner will:

- identify all the stakeholders that could be interested in their game
- explore their understanding and knowledge of their user
- create an empathy map for their user and their game

Materials

- Worksheet: Stakeholder Mapping
- Worksheet: Gamer Journey Map
- Worksheet: ~ Understanding the User
- Pens, pencils, Markers, Chalk
- Paper / whiteboard / blackboard
- Internet access - optional

SDG13 Climate Change Engage Game Design
L16: Mapping the User

Activity Instructions

Activity 1 Undertaking stakeholder mapping (20 mins)

1. Working in their design teams, learners will begin to focus on their challenge using the driving question that was defined in the previous lesson.

2. Remind learners of the driving question below and have them complete the activities on the stakeholder mapping worksheet.

   How do we increase awareness of climate change adaptations for 15-17-year-olds through game design?

3. Project the worksheet on the board and spend 5 mins harvesting input from all the teams using the impact grid on page 2 of the worksheet.

Activity 2 Developing design principles from user profiles (20 mins)

1. Ask learners to focus on their users (15 - 17-year-olds) by answering the questions on the 'Understanding the User' resource to create an empathy map. This will help them consider the look and feel of their game and think about their users' needs - the design principles.
2. Ask the learners to consider the following questions

   - *Did you identify the design principles (their needs) required for your user?*
   - *Did you make any assumptions about your user?*
   - *Did you discover any biases / judgments about your user that you might have assumed?*

Activity 3 Mapping your user's journey (10 mins)

1. The learners will use the 'Gamer Journey' worksheet to begin to focus on their gamers and the gamers' journey to begin to create an outline for their game.
2. Ask the learners to integrate the information about their potential users they have gathered by doing Activities 1 and 2.
3. Ask learners to refer to the gamers' profiles (Lesson 5) to identify the gamers they are designing for. This activity will be used to help them refine their game design over the following lessons.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L16: Mapping the User

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, ask learners to watch the 'Importance of Empathy' video and complete the 'Stakeholder mapping' worksheet individually at home - then ask them to share their work with their other team members and collate their findings.

Extension: For a longer lesson, watch the 'Empathy Mapping' video at the beginning of Activity 2.

- Option B: Open up the discussion using the questions for consideration in activity 2.
- Option C: Spend longer on the 'User Journey' exercise and ask each team to share their users' journey for feedback from the other learners. You can also share some of the resources in the media box.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

The importance of Empathy (3:30 mins) https://www.youtube.com/watch?v=UzPMMSKfKZQ

What is an Empathy map? (5:36 mins) https://www.youtube.com/watch?v=QwF9a56WFWA

Creating personas for User Experience Resesarch (10:00 mins)
https://www.youtube.com/watch?v=u44pBnAn7cM

Article: User Research Journey for Game Design https://uxdesign.cc/a-user-research-journey-for-a-game-design-f7cf755bdf96

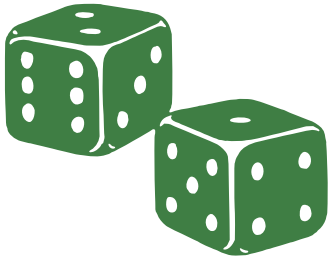
Local Trip / Expertise / Additional Work and Assessments

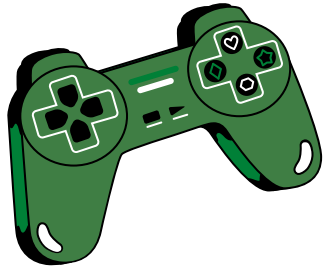
Link learners to Ireland's gaming industry - these links can be used as research for career paths and to inform subject choices / programme choices for the senior cycle - see also lesson 11 for university programmes.

The Irish people dominating the gaming industry
https://www.thinkbusiness.ie/articles/the-irish-people-dominating-the-gaming-industry/

Learners can then research Ireland's University's for Gaming undergraduate programmes
https://www.courses.ie/course-category/game-design-animation/

Career pathways learners can begin to explore career options in the film and games industry
https://www.cgspectrum.com/career-pathways





L16: Gamer Journey Map

13 CLIMATE ACTION

	EXPERIENCE	AWARENESS	ENGAGEMENT	AFTER PLAYING
think	What is your game's purpose	What makes your game idea different?	How will people play your game?	Why will people keep playing your game?
feel	How do you want your game to look or feel?	What do you want people to notice about your game?	How do you want people to feel about your game?	How do you want your user to feel after their visit ?
do	What will you need to do to make it look / feel this way?	What research will you need to do to make sure this happens?	How will you know if you have been successful?	How will you follow up with your players?

CCE L16WS: STAKEHOLDER MAPPING

13 CLIMATE ACTION

Stakeholder Mapping

A project's stakeholders are the people or groups of people who can impact or are impacted by a project. If you are doing a project you will need to understand the different stakeholders involved and how you will need to communicate and engage with them.

You will now begin to undertake a stakeholder mapping of your project. Usually, you will start this by having your decision challenge at the centre of your mapping.

As a team, create a list of all the different individuals, groups, or organisations that you can begin to identify and categorise with whom you might need to discuss or share your challenge and your game.

SERVICES / PROVIDERS

USERS / BENEFICIARIES

YOUR CHALLENGE

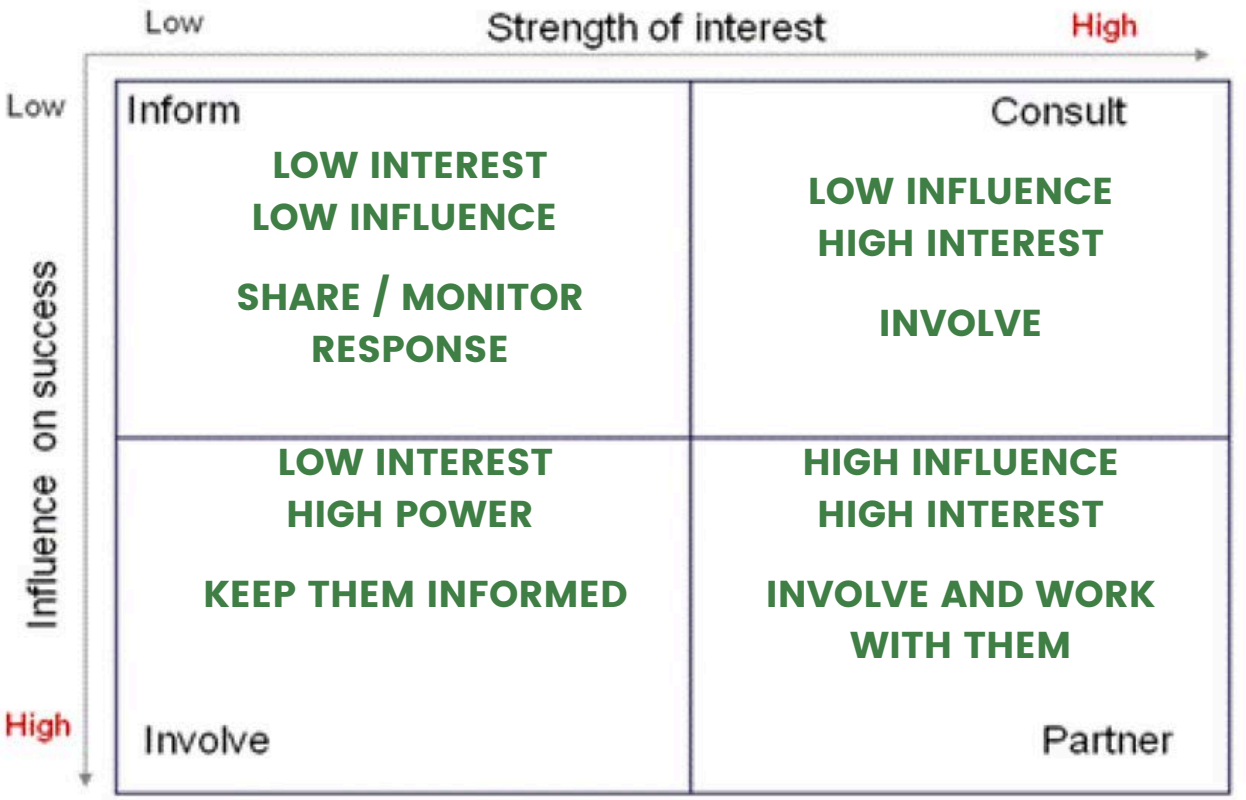
GOVERNANCE

INFLUENCERS

CCE L16WS: STAKEHOLDER MAPPING

DIFFERENT WAYS OF MAPPING

Now that you have a list you are going to practice organising them with using your challenge (the driving question) outlined below the impact square at the bottom of the page.



This is your challenge.

You are developing a game / elements of a game to teach other young people your age (15-17) about climate change, adaptation and taking action. Teachers will use your game to work with their students.

Use the grid above to organise your list of stakeholders and how you will need to communicate and engage with them.

CCE L16WS: Understanding The User

What does your gamer think and feel?

- What really matters to them?
- What do they think about?
- What are their worries, dreams or aspirations?

THINK AND FEEL

What sort of things does your gamer hear / listen to?

- Where does your gamer get their information?
- Who might your gamer listen to or be influenced by?

HEAR

SEE

What does your gamer see?

- When do they use the locality and what do the see - do they walk, cycle or drive through the locality?
- What might they notice?

WHAT DO THEY SAY AND DO

- What other things might your user do?
- What other things are they interested in?

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 17: Generating and Remixing Ideas

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Generating and Remixing Ideas

This lesson builds on Lessons 7 and 8, enabling students to develop an understanding of the process of generating ideas using the fundamental components of a game.

The learners will work in teams to identify 4 components of 3 games building on their understanding of games from Lesson 7 and how to use random variables to create useful building blocks for design ideas.

Vocabulary: Agility; Creativity; Disruptive Innovation; Open Source; Remix

In this lesson, the learner will:

- feel comfortable with exploring experimental approaches
- develop skills around idea generation
- accommodate variables and limits into design processes
- learn to transfer and apply skills

Materials

- Worksheet: Ideate Rapid Remix
- Worksheet: Rapid Remix SWOT analysis
- Pens, pencils
- Paper

SDG13 Climate Change Engage Game Design
L17: Generating and Remixing Ideas

Activity Instructions

Activity 1 Remixing Ideas – Rapid Response 1 (30 mins)

1. Watch the Video: 'Ideate' - see Media Box.
2. Explain the activity – learners will use aspects from their own gaming experience and the understanding of games from Lesson 7 to practice the concept and begin to understand how to develop creative problem-solving skills.
3. Organise learners' teams into pairs.
4. Working in their pairs, the learners fill in a row on Worksheet: Ideate Rapid Remix

- *How many players?*
- *How do players move around the game?*
- *What are the games core components?*
- *What are the goals / objectives of the game?*

PLAYERS	PLAYER MOVES	COMPONENTS	GOALS

4. Ask pairs from the class to input from the grid randomly e.g. “Pair XX, tell me what’s written in the second column, row 2.' Write their answer on the board.
5. Repeat this three more times until you have something on the board from each of the columns e.g. 'group 4 tell me what’s written in column 3, row 1', 'group 2 tell me what’s in column 4, row 2', 'group 3 tell me what’s in the column 2 row 3.'

Activity 2 Remixing Ideas Rapid Response 2 (20 mins)

1. Ask learners to invent 3 more games, using the four variables (number of players, players movement, game components and the goals of the game) with a focus on climate change awareness and adaptation e.g. a game with x players who virtually travel, (players moves define different options in the game) gathering clues to destinations (components) earn points, to move up a global leader board having travelled the furthest with the lowest carbon footprint with the winners getting a grand prize (goals).

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L17: Generating and Remixing Ideas

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 only and use Activity 2 in a follow-up lesson.

Extension: For a longer class, use the work in Activity 2 with the lesson's Rapid Remix SWOT worksheet.
Option B: Learners can develop an empathy map for the user of the games that has come out of Activity 1.

Linked learning: Lesson 5 and 16 worksheets,(Gamer-profiles, Gamer Journey and Empathy Map) can be revisited to hone in on their gamer, their interests and focus their game design.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Design Thinking Ideate' (4:04min) https://www.youtube.com/watch?v=zbLxs6te5to

'The Four Types of Video Game Designers' (8:56min) https://www.youtube.com/watch?v=suhANDk1h40

'Non-Professional Game Dev - The Joy of Making' - Extra Credits (8:14min) https://www.youtube.com/watch?v=m4p7T9O_tqg

'Making Your First Game: Minimum Viable Product - Scope Small, Start Right - Extra Credits' (7:38min) https://www.youtube.com/watch?v=UvCri1tqlxQ

Local Trip / Expertise / Additional Work and Assessments

Link learners to Ireland's gaming industry - these links can be used as research for career paths and to inform subject choices / programme choices for the senior cycle

The Irish people dominating the gaming industry
https://www.thinkbusiness.ie/articles/the-irish-people-dominating-the-gaming-industry/

Learners can then research Ireland's University's for Gaming undergraduate programmes
https://www.courses.ie/course-category/game-design-animation/

Career pathways learners can begin to explore career options in the film and games industry
https://www.cgspectrum.com/career-pathways

CCE L17WS IDEATE RAPID REMIX

Team Name _____

Date _____

13 CLIMATE ACTION

Developing a Game

This worksheet will help you play with game fundamentals. Fill in the boxes - we will then work with the whole group to develop a number of possible game ideas using the Rapid Remix process.

HOW MANY PLAYERS?	HOW DO PLAYERS MOVE AROUND IN THE GAME?	WHAT ARE THE GAME'S CORE COMPONENTS?	WHAT ARE THE GOALS / OBJECTIVES OF THE GAME?

#PLAYERS	PLAYER MOVES	COMPONENTS	GOALS

#PLAYERS	PLAYER MOVES	COMPONENTS	GOALS

#PLAYERS	PLAYER MOVES	COMPONENTS	GOALS

CCE L17WS: RAPID REMIX SWOT

This worksheet will help you play with your game ideas using an adapted Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. Fill in the boxes with the variables for three different game ideas generated using the Rapid Remix activity.

PURPOSE	STRENGTHS	WEAKNESSES	USERS

PURPOSE	STRENGTHS	WEAKNESSES	USERS

PURPOSE	STRENGTHS	WEAKNESSES	USERS

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 18-20: Developing Designs on Paper and Building Prototyping Skills

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Developing designs on paper and building prototyping skills

In these lessons, learners will begin to consider their ideas for their prototype, develop a concept statement and look at ways to prototype their ideas depending on their gamers / audience.

They will also develop their designs on paper using their user profiles and selected game theme. They will also begin to prepare materials and ideas for their vision board.

Vocabulary: Concept Statement; Enterprise; Innovation; Prototype

In this lesson, the learner will:

- explore how to evolve ideas
- iterate their ideas
- develop a concept statement
- explore prototyping methods using paper and card
- develop prototyping skills

Materials

- Worksheet: Rapid Response Prototyping
- Worksheet: Concept Statement
- Video: 'Design Thinking - Prototype'
- Pens, pencils
- Paper and card
- Internet Access

SDG13 Climate Change Engage Game Design
L18-20: Developing Designs on Paper & Building Prototyping Skills

Activity Instructions

Lesson 18 Activity 1 Prototyping – Rapid Response (10 mins)

1. Watch Video: 'Design Thinking: Prototyping'
2. Discuss the benefits of prototyping.

Activity 2 Creating a Concept Map (20 mins)

1. Review Worksheet: Concept Statement to ensure task understanding.
2. Ask learners to complete a concept statement for their game.
    - *Learners focus on their game and its selected problem area e.g. climate adaptation. Using their empathy maps and the project's driving questions learners will create a concept statement. It is important that learners document this process as they will use images in their vision board and Pecha Kucha lessons.*

Activity 3 Developing your Prototype (20 mins)

1. Ask learners to complete page 1 of Worksheet: Rapid Response Prototyping
2. Ask learners to begin developing their designs on paper using their concept statements.

Lesson 19 Developing your Prototype

1. Using pages 2 - 4 of Worksheet: Rapid Response Prototyping, ask learners to complete one of each of the elements of construction.

Learners can watch the videos at home as a flipped classroom or together in class

Lesson 20 Completing your Prototype

1. Learners use this lesson to complete their paper game designs and a paper prototype

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L18-20: Developing Designs on Paper & Building Prototyping Skills

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, divide the tasks in Lessons 18 - 20 across more lessons. Set some of the worksheet tasks as Flipped Classroom tasks.

Extension: For a longer class, extend the prototyping tasks to begin the work on their 3D prototype

Learners can also take part in a Ready Steady Design challenge - see the video in the Media Box and P5 Rapid Response Prototyping worksheet - Ready Steady Design Challenge.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Design Thinking: Prototyping' (4:54mins) https://www.youtube.com/watch?v=Q4MzT2MEDHA

'What is a Prototype?' (4:11mins) https://www.youtube.com/watch?v=4XenqN5Ib9o

'Paper Prototyping' https://www.youtube.com/watch?v=85muhAaySps

'Rapid Prototyping' (7:31min) https://www.youtube.com/watch?v=JMjozqJS44M

'Ready Steady Design' (3:26min) https://www.youtube.com/watch?v=jIXSuZg2awA&feature=emb_logo

This and the following lesson links to lessons 21 - 22 and 28 - 29 to guide learners in consolidating and presenting their ideas, while learning presentation and communication skills.

Local Trip / Expertise / Additional Work and Assessments

Contact Game designers to host an online talk/in-person visit to talk about their design process.

- Research iForm, National Research Centre in Advanced Manufacturing at University College Dublin - https://www.i-form.ie
- Arrange a meeting or presentation with their community engagement and education team about rapid prototyping https://www.i-form.ie/communityengagement/overview/

Arrange a visit to a local engineering company or manufacturing company to find out more about product design and their prototyping process.

CCE L18WS: CREATING A CONCEPT STATEMENT

13 CLIMATE ACTION

What is a Concept Statement?

A concept statement summarises a project's meaning, purpose, direction and depth. Concept statements are used at the beginning of the project planning stage. Within innovation and product development, the concept statement helps to focus ideas and keep the team on task.

Use the prompt boxes below to help your team create a concept statement for your game and its users.

1. Define the need in two sentences

You are developing a game for... Who? (tell us about your gamer). To do what? (This is the purpose of the game, include your specific theme / game focus).

2. The problem / issue - explain how your game concept will address the problem

3. Gamer's needs - tell us about your gamer and their needs from a game

4. Details- explain how your game's concepts meets this need

CCE L18 – 20: RAPID RESPONSE PROTOTYPING

INTRODUCTION

Watch the following video: 'What is Design Thinking?'
https://www.youtube.com/watch?v=a7sEoEvT8l8

Answer the questions below. You can re-watch the video as many times as you need to.

a) What or who does design thinking help you focus on?

_____

b) How do design thinkers learn? _____

c) What do simple prototypes do? _____

d) What do rapid prototypes do? _____

e) If you ideate, prototype and test too early - what are three mistakes that can be made?

_____

f) Write down the two reasons for using design thinking.

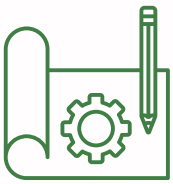
_____

g) What are the five stages of design thinking?

_____ _____ _____

_____ _____

Watch the video: 'How to make a cardboard prototype'
https://www.youtube.com/watch?v=k_9Q-KDSb9o Write down as many tips as you can.



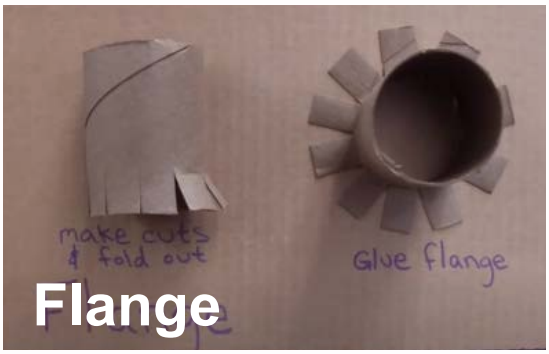
CCE L18 – 20: RAPID RESPONSE PROTOTYPING

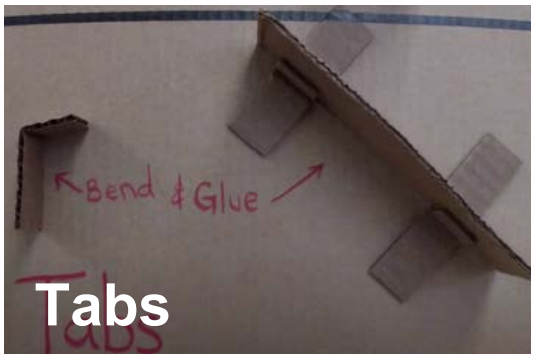
READY, STEADY, BUILD: KNOWLEDGE GATHERING

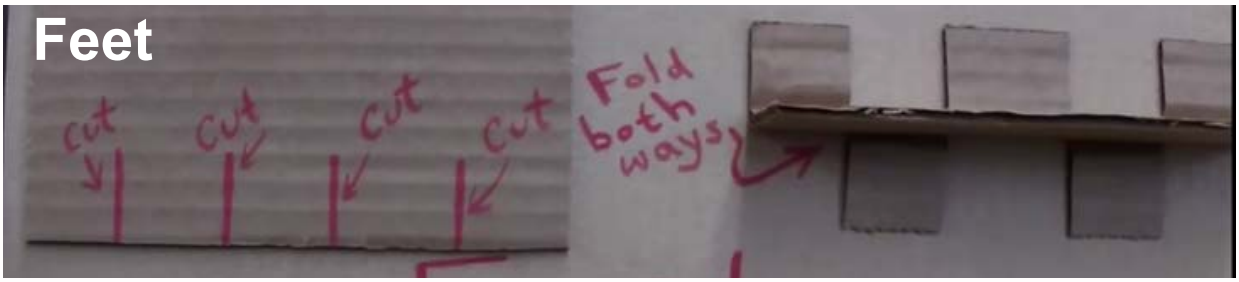
Today we are going to experiment with rapid prototyping with materials that we have to hand. You will explore three basic elements - useful for rapid prototyping:

- Structure
- Fastening / Joining
- Surface

1. Structure - this will provide support and form to your prototype. The structure provides strength by load-bearing if re-enforced or solid e.g. columns or supports for covering or other materials e.g. tent poles. Here's some simple tips for creating structure.







Watch the short video on structural techniques - all these processes can be scaled up to make bigger models and forms.

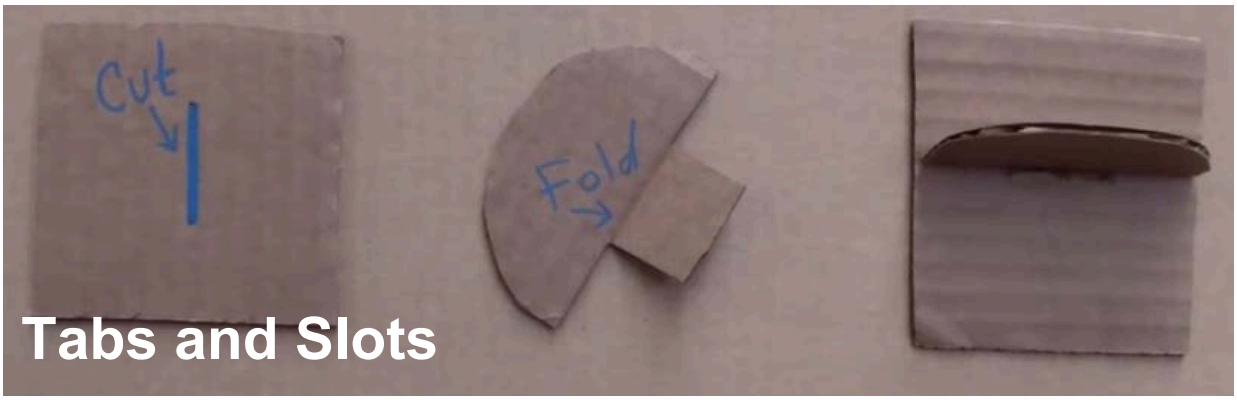
Write down the key ideas in the video. Use bullet points.

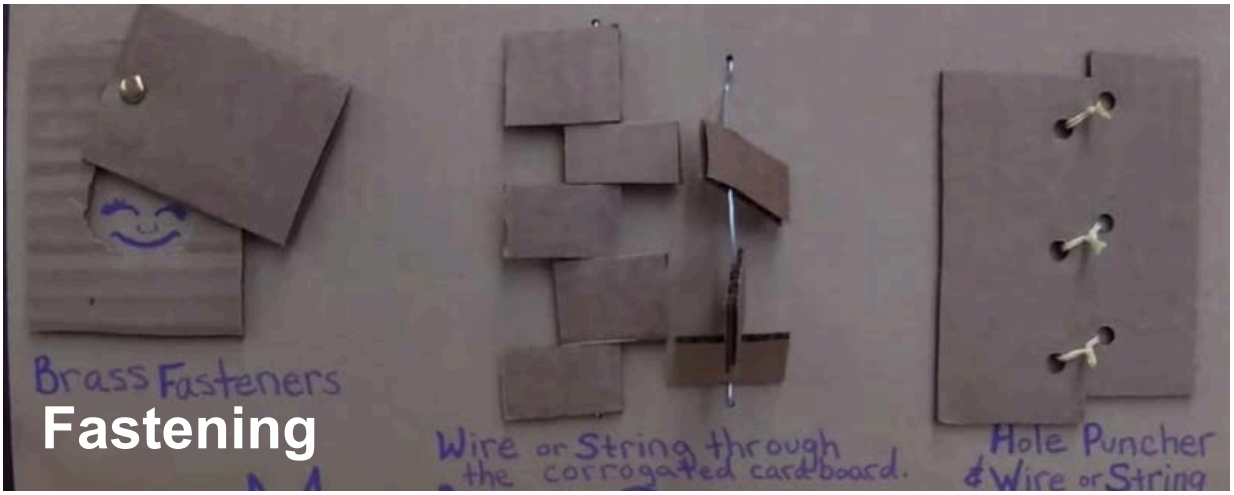
Creating 3D sculptures https://www.youtube.com/watch?v=pi6Y7yCz7Y8

CCE L18 – 20: RAPID RESPONSE PROTOTYPING

13 CLIMATE ACTION

2. Fastening / joining and attaching - this can be done using structural approaches such at slots and tabs or using other materials like pins, paperclips, string tape or glue.





Some techniques can be both structural and used to join things together like the slots / tabs - here on the left.

What other ways do you know of joining things together? Discuss this in your group and make a list.

Knots are another useful joining technique- here's a useful website for learning to tie knots https://www.animatedknots.com/complete-knot-list

CCE L18 – 20: RAPID RESPONSE PROTOTYPING

3. A surface - a surface has a number of functions, protection, decorative, textural, adhesive and are made from numerous materials e.g. plastic, wood, fabric, paper, both natural and synthetic.

Sometimes they can be structural as well as serving other functions. This surface material could provide support and be used as an attachment or joining function as well as offering a decorative purpose

Natural materials often have other properties such as insulation, waterproofing, protection as well as being structural, making them good for outdoor construction.

Waterproof or those that are water repellent materials, (hydrophobic) are often inspired by nature, whether a rough surface that minimises water contact and absorption or the nanopatterns of insects who fly in the rain undisturbed. You can also treat materials with sprays to make them waterproof.

Safety surfaces can be both decorative and functional. They often use bright colours and recycled materials from other processes. They can be highly durable and so reduce maintenance

Interior design surfaces e.g. upholstery, curtains, wallpaper, bedding, worktops are increasingly synthetic and made from recycled materials e.g. SeaQual or Econyl from recycled fishing nets. They can be durable and easily cleaned and pleasurable to look at.

CCE L18 - 20: RAPID RESPONSE PROTOTYPING

READY, STEADY, BUILD: THE CHALLENGE

The Challenge:

1. Indoor activity- set by the teacher
2. Outdoor activity- selected from the list below in Challenge 2

The rules of the challenge:

1. 5 minutes to plan + 15 mins to build a prototype
2. You must include at least one material / object from each element
    - Structure
    - Fastener / Joiner
    - Surface

Challenge 1 (Indoor): Set by the teacher.

Challenge 2 (Outdoor):

Select one of the following challenges to complete in your team.

1. Create something to shelter from the weather - wind, sun, rain.
2. Create something to encourage more biodiversity or wildlife to the area.
3. Create a raised bed that stops animals eating what's growing but looks good and is interesting.
4. Create a table / seating that allows buggies, and wheelchairs to fit comfortably

Post-Challenge Discussion

Let's discuss each teams' design. Use these questions to help focus the discussion:

- How would you help them?
- What might be the next stage of the project?
- If this was to be developed, what are the issues that should be considered e.g. users' needs, surveys, market research?
- Is there anyone local that they could talk to if this was a real project?

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 21-22: Creating and Using Vision Boards

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Creating and Using Vision Boards

This lesson prepares learners to present their work in a structured way and preparing them for organising documentation (images, details) of their idea development and process.

This lesson will begin to help them test their ideas by developing their vision boards using the Vision Board support worksheets and prepare them for their final pitch - their Pecha Kucha presentation.

Vocabulary: Documentation; Test; Vision Board; Visualisation

In this lesson, the learner will:

- further define key elements of their game
- structure their thinking
- understand the purpose of a Vision Board
- present their thinking visually

Materials

- Worksheet: Vision Board Support
- Support Resource: Creating a Game Vision Board
- Internet Access
- Pens, pencils
- Large pieces of paper
- Whiteboard

SDG13 Climate Change Engage Game Design
L21-22: Creating and Using Vision Boards

Activity Instructions

Activity 1 Testing and Defining your elements of your game (20 mins)

1. Watch the video 'Design Thinking TEST'.
2. As a class, discuss each of the boxes on the Vision Board Support worksheet, so that learners understand the task and its purpose.
3. Using the work from Lessons 17 - 20, ask learners to fill in the Worksheet: Vision Board Support, which will help them to define the key elements of their game idea.
4. Once they have completed this activity they will be ready to develop their Vision Boards.

Activity 2: Using and Creating your Vision Boards (30 mins) and lesson 22

1. Explain the activity, going over the key elements of the Worksheet: Game Vision Board
2. Watch the video 'Create a Digital Vision Board'
3. Ask leaners to google 'vision boards' and select 3 styles that they like and take a screen grab as inspiration for their own vision boards.
4. Ask learners to decide if they want to create a digital vision board or use physical materials
5. Once decided, learners can either make a list of the materials they will need to create their vision board, or set up a Canva account for a digital vision board.
6. Learners will begin to think about the materials and images required to help them present the key elements of their game ideas and their paper designs and paper prototypes.
7. Learners will begin to work through the worksheet: Game Vision board required to create their vision board and complete their vision board in the next lesson.
8. Learners can begin to gather images and start their preparation work for their vision board.

Learners will continue to work on their vision boards in the next lesson.

Evaluating an idea is a key aspect of Design Thinking. Learners will see that this is not the end of the process and that it may reveal something that means they might need to return to an earlier stage e.g. Define or Ideate. They will begin to create their vision board in preparation for creating their design and pitch.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L21-22: Creating and Using Vision Boards

EXTENSION / REDUCTION ACTIVITIES

Depending on class duration and number of teams, it is suggested that two lessons are used to allow learners to create their vision boards which will form the initial steps in helping them develop their Pecha Kucha's in lessons 28 - 30.

Learners will be able to gather images and use their vision boards and the vision board support worksheet as prompts to think about some of the ideas within their game.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: 'Design Thinking TEST' (3:19min) https://youtu.be/UVEQCNM6X-A

'Create a Digital Vision Board' https://www.canva.com/create/vision-boards/

'How to make a pitch using a mood board' (4:00min) https://www.youtube.com/watch?v=8dG--KvDIX8

'Paper Prototyping' (2:36min) https://www.youtube.com/watch?v=85muhAaySps

Local Trip / Expertise / Additional Work and Assessments

Invite the Local Enterprise Officer to their final pitch presentations - share their vision boards in advance.

Present their vision boards to a Local Development company or Community and Business Alliance.

Organise a visit from the Local Enterprise Office to discuss Enterprise.

Create a local enterprise event / exhibition to share their vision boards and present their Pecha Kucha e.g. in school at the end of school year, in the local library or online - align to National Enterprise Month.

Develop a Rocket Pitch event - 3 mins 3 slides – create an event to share your game ideas.

Look at enterprise competitions encouraging this as part of the students learning process.

CCE L21 – 22WS: VISION BOARD SUPPORT

13 CLIMATE ACTION

Who are you/your team?
Does your game have a name?

What is your game about? (players, backstory, landscape/world, purpose)

Who are your characters? Why did you select them? How do they contribute to the game?

How does the game increase awareness of climate change and adaptations?

What makes your game different?
What is your unique selling point?

CCE L20WS - 21: CREATE YOUR GAME VISION BOARD

Develop the central message this is an image that will represent your game idea.

Keep it colourful and visual Our brains love images.

STEP 1 THE 'WHAT' OF YOUR GAME

Develop an image that represents the reason for your game - the 'problem' you want to fix. Use pictures, texts or quotes that help you tell what your business is.

You can use Pinterest, Google images, cut out images and texts from magazines and drawings

STEP 3 THE 'WHO 'OF YOUR GAME

Develop an image of the people who will use your business. Use pictures, texts, quotes, statistics that help to you define your customers.

Vision board examples on Pinterest.

https://www.pinterest.ie/scrappinmichele/vision-board-samples/?lp=true

STEP 2 THE 'WHY 'OF YOUR GAME

Use pictures, texts and quotes that help you show how your game address the challenge and raise awareness of climate change and adaptation for your players.

STEP 4 THE 'HOW' OF YOUR MARKETING FOR YOUR GAME

How will you reach your players / gamers? Use pictures, texts and quotes, that help you tell the reason for your game.

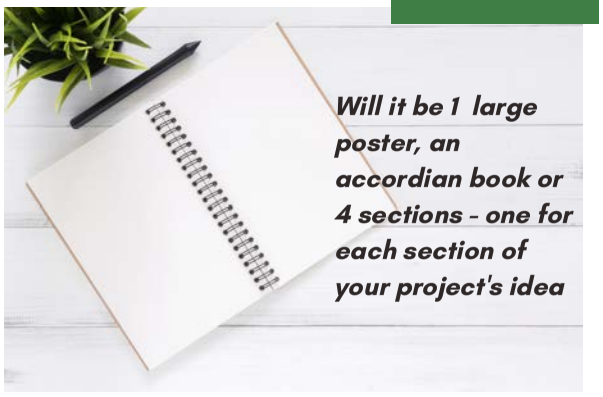
CCE L20WS - 21: CREATE YOUR GAME VISION BOARD

STEP 5 MATERIALS

You can choose to do your vision board online but if you make it you will need to gather card board, card /paper, glue, scissors, images.

STEP 6 DECIDE ON WHO WILL DO WHAT

Each person in the group should be responsible for one of the five sections in the image board worksheet.



STEP 7 PLANNING YOUR BOARD

As a group you can start to plan the size, shape and format of your vision board - see examples but don't be limited. It should reflect your project.

STEP 8 GATHERING IMAGES

Begin to gather images that tell the story of your project - you can use drawings, cut outs, images printed from Google or Pinterest or if digital, you can scan your images online.

STEP 9 ORGANISE YOUR INFO

You can organise the sections in different ways - think about your audience - who are you trying to reach? Look at examples of posters, communication for that audience.

REMEMBER MESSAGE AND AUDIENCE

1. Will they read left to right?
2. Will you direct them how to read using arrows or numbers?
3. Will your central idea be the biggest image?

CREATIING A DIGITAL VISION BOARD USING CANVA

Step 1: Gather and share your digital Images

When you have decided who is working on what section – gather your digital images and save them all together in a folder. You can create and use a shared drive folder to work in a group.

Step 2: Open an account in Canva

https://www.canva.com/

Step 3: Open a new design in Canva

Once you're signed in, you'll want to click "Create a Design," and choose the template you like, perhaps poster or photo collage.

If you plan on printing your vision board, you can choose USE CUSTOM DIMENSIONS. You can see this in the top right of the screen.

Step 4: Import your images into Canva

https://www.pinterest.ie/sunflowerways/creating-a-vision-board/

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Lesson 23-26: Self-directed Learning and Making

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Self-Directed Learning and Making

The following four lessons enable the learners to apply the skills and knowledge of the Design Thinking process to the creation of a prototype of their game. Please add more self-directed making sessions as required.

Learners are encouraged to explore materials and processes (digital and analogue); organise their team to manage workload and consolidate and present their ideas. Their prototype with their vision boards (Lessons 21 - 22) presentation (Lessons 28-30) and Peer Assessment / World Café (Lessons 31 - 33) complete the learning process of the module.

Vocabulary: Collaboration; Prototyping; Self-Directed Learning; Self-Organisation; Teamwork

In these lessons, the learner will:

- apply and consolidate the skills and knowledge of Design Thinking within their game ideas
- develop time and project management skills
- develop collaboration skills
- develop their design concepts and principles into a game prototype

Materials

- Craft Materials
- Digital templates - see Media Box
- Access to the internet - e.g images
- Printers if requiring images

SDG13 Climate Change Engage Game Design
L23-26: Self-directed Learning and Making

Activity Instructions

Before the sessions begin,

- *Consider organising extended sessions e.g. double classes or blocks of classes to facilitate focused hands-on making.*
- *Consider exploring / introducing the support tools in the media box.*
- *At the beginning of the first of the making sessions, set out agreed processes e.g. recycling materials / waste management, tidying up at the end of the sessions.*

Activity (Small Group Work) - suggested x4 1hr lessons minimum

1. Review the aims and objectives of the making sessions and reconnect to the prior lessons around the user / their chosen gamer, components of a game e.g. character development, backstory, world-building - the look and feel of their game.
2. Learners work in their teams over the course of the time-tabled making sessions to complete their prototypes. Learners can present their prototype as part of the end of module presentation.
3. Remind Learners to delegate tasks and work collaboratively to manage their time.
4. Remind learners to document the process, using their vision boards as prompts to gather images for their presentation.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Proto.io - learners can sign up for a free account and begin developing their prototype online https://proto.io/

Creately.com - learners can access a free web account to get limited templates for UI mock-ups or wireframes if they are developing a digital game https://creately.com/diagram/example/ju0paqbc1/ui-mockup-example

Canva.com - If Learners set up a canva account in lesson 21 - 22 they can continues to explore and use their templates e.g. for storyboarding their game https://www.canva.com/storyboards/templates/

Article: Game Design mockups https://medium.com/strike-the-pixels/game-design-101-ui-mockups-2d5850a536eb

'

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 27: Peer Assessment - Developing Pitch Criteria

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Peer Assessment- developing pitch criteria

In this lesson, learners will define their peer assessment criteria. Peer assessment enables those directly involved in the task or project to appraise their own learning. Learners are encouraged to consider what is most important, valuable and successful from what has been learned and the process of learning it.

By engaging in the development of peer assessment criteria and the assessment itself, learners take responsibility, learn to evaluate, are more motivated and get practice at giving and receiving feedback.

Vocabulary: Consensus; Criteria; Evaluation,; Feedback; Peer Assessment,

In this lesson, the learner will:

- break down the different parts of a pitch
- decide what criteria can be assessed
- come up with a peer assessment to use for pitching game design ideas
- share ideas and perspectives
- come to a consensus

Materials

- Board
- Markers

SDG13 Climate Change Engage Game Design
L27: Peer Assessment - Developing Pitch Criteria

Activity Instructions

Activity 1 Paired discussion (10 mins)

Before the lesson, divide the board into 3 columns

- *What makes a great pitch?*
- *The driving question - How do we increase awareness of climate change adaptations for 15-17-year-olds through game design?*
- *Peer assessment criteria for pitching*

1. Elicit from learners what a pitch is. Can they think of examples of where a pitch might be made? (i.e. a new business idea)
2. Give learners time to discuss their answers to the question; 'What makes a great pitch?'
3. Share ideas as a whole class and write keywords on the board (1st column).

Activity 2 Developing pitch assessment criteria (40 mins)

1. Refer to the driving question in the 2nd column on the board and give pairs time to discuss what could be important to include in the pitch that will answer this question. Ideas might include: character development, entry into the game, links to climate change adaptation, storyline.
2. Share ideas as a whole class and write keywords on the board (2nd column).
3. Refer to the 3rd column and begin to elicit what criteria the learners would like to include in the pitch assessment.
4. Once there is a list of ideas, ask learners to take time to narrow them down and finalise their criteria. They could do this by having a short discussion in pairs and then a sharing circle as a whole group, with one learner leading the discussion and making edits to the information in the 3rd column. At the end of this activity, learners will have a peer-led list of criteria that their pitches will be assessed on.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L27: Peer Assessment - Developing Pitch Criteria

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, reduce the amount of time in Activity 2.

Extension: For a longer lesson, allow more time in Activity 1 and allow learners to create the peer assessment worksheet for the pitch (after completing Activity 2).

Watch some of the feedback / peer assessment short videos (see Media Box) with learners and discuss through pair and share. This can also be used as a flipped classroom to watch at home and discuss at the beginning of this lesson.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Self and Peer Assessment' (3:46min) https://www.youtube.com/watch?v=1wwo09Lb9hw

'Peer Assessment' (7:14min) https://www.youtube.com/watch?v=2hRu5i-gfXo

'Feedback' (5:43min) https://www.youtube.com/watch?v=cRJmdk3s4mk

'How-to: Peer Feedback 1' (1:25min) https://www.youtube.com/watch?v=3y7jgpe-k5I

'Introduction for Assessment for Learning (2:20min) https://www.youtube.com/watch?v=63PdFKIFzNU'

'Assessment for Learning Practices' (4:49min) https://www.youtube.com/watch?v=cNPFwCbA_mE

'Teenage Brains Wired for learning' (3:00min) https://www.youtube.com/watch?v=1GSvzgrBKaM

Local Trip / Expertise / Additional Work and Assessments

- Work with other teachers to consider different forms of assessment that they might use and that the students might have experienced
- Review with learners the classroom-based assessment processes they experienced in their Junior Certificate process as an example of assessment

SDG13 Climate Change Engage Game Design

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Lesson 28: Preparing to Pitch - Pecha Kucha 1

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Preparing to Pitch- Pecha Kucha 1

A Pecha Kucha ('chit chat' in Japanese) is a presentation format that encourages presenters to be concise and use the relationship between image and text. The Pecha Kucha format is 20 slides with a 20 second limit – 400 seconds.

In this lesson, students will be introduced to the Pecha Kucha format and begin to analyse what makes a good presentation so they can prepare to create their own Pecha Kucha presentation.

Vocabulary: Outline; Pecha Kucha; Pitch

In this lesson, the learner will:

- learn about the Pecha Kucha format
- develop research and analysis skills
- share ideas and opinions
- develop an understanding of what makes a good presentation
- develop an awareness of presentation skills

Materials

- Video: A Pecha Kucha About Pecha Kucha
- Video: Bad Presentation 1
- Video: Bad vs Good Presentation
- Worksheet: Pecha Kucha Analysis
- Internet
- Paper
- Pens, pencils or markers

SDG13 Climate Change Engage Game Design
L28: Preparing to Pitch - Pecha Kucha 1

Activity Instructions

Activity 1 What is a Pecha Kucha? (25 mins)

1. Watch Video: 'A Pecha Kucha About Pecha Kucha' and ask learners to answer the following: What is different between a Pecha Kucha and a traditional presentation?

2. Visit www.pechakucha.com in pairs and select 1-2 Pecha Kucha presentations to watch and complete Worksheet: Pecha Kucha Analysis.

3. As a whole class, discuss responses in the Pecha Kucha Analysis worksheet.

   - *Does this feel easier or harder as a format for a presentation?*
   - *Did you notice anything interesting about the presentations?*
   - *What did you like about the format?*
   - *Was there anything you didn't like?*

Activity 2 What makes a good presentation? (25 mins)

1. Watch Video: Bad Presentation 1 - review in pairs.
2. Share your thoughts with your partner, then share your comments with the whole class.
3. Repeat Steps 1 & 2 with Video: Bad vs Good Presentation and watch up to up to 1:24 min.
4. Compare the two bad presentations. What was similar between the two?
5. After the comparison and discussion begin the video from 1:24 min and watch the good presentation example.
6. Compare the good presentation with the bad ones.
   - What made it good?
   - Ask learners to thing about anything else that is important for a good presentation

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L28: Preparing to Pitch - Pecha Kucha 1

EXTENSION / REDUCTION ACTIVITIES:

Reduction: For a shorter lesson, complete Activity 1 only and follow up with Activity 2 in the next lesson, or set it as an at-home task.

Extension: For a longer lesson, encourage learners to explore the Pecha Kucha presentations and find an example they like to present to small groups. Extend discussion time in Activity 1 & 2.

Learners could look at other videos for tips on presentations- see Media Box.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'A Pecha Kucha about Pecha Kucha' - https://www.youtube.com/watch?v=jJ2yeplaAtE

'Pecha Kucha' https://www.pechakucha.com

'Bad Presentation 1' https://youtu.be/KgObza4ek1U

'Bad Presentation vs Good Presentation' https://www.youtube.com/watch?v=S5c1susCPAE

'Pecha Kucha Presentation' tips (6:58min) https://www.youtube.com/watch?v=zAZ_8UJUpno

'Using PowerPoint for your presentation' (4:26min)
https://www.youtube.com/watch?v=q0XWIPbXmVY

'How to give a great presentation' (7:04min) https://www.youtube.com/watch?v=MnIPpUiTcRc

'7 Presentation structures used by the best Ted' Talks (11:22min)
https://www.youtube.com/watch?v=hMk5s1y486I

Local Trip / Expertise / Additional Work and Assessments

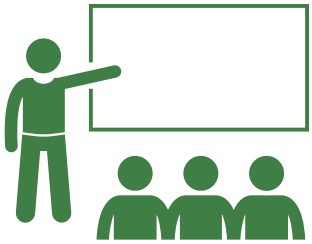
Stakeholder mapping worksheet supports students to focus on their local audience - see Lesson 16.

Develop the project across subject areas through multiple outcomes such as video, poster, Pecha Kucha, Interviews or Podcasts

- SDG 8 Media Communication - supports the development of the 4Cs skills - Creativity, Communication, Critical Thinking and Collaboration, sign in using your school email https://www.codesres.ie/_files/ugd/92a067_a8f108ce0a6448e9851a5b03dd2e8d40.pdf
- SDG 4Supporting Skills https://www.codesres.ie/sdg-4-supporting-resources sign in using your school email

CCE L28WS: PECHA KUCHA ANALYSIS

13 CLIMATE ACTION



Pecha Kucha (pe cha ku cha) means 'chit chat' in Japanese and was devised as a presentation format to get presenters straight to the point.

1 Watch the following presentation and answer the questions below
https://www.youtube.com/watch?v=jJ2yepIaAtE

- What did you like about the format?
- Was there anything you didn't like or thought was boring?
- What stood out most for you about the presentation?
- Does this feel easier or harder as a format for a presentation?

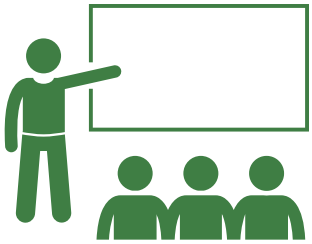
2 Visit www.pechakucha.com and select 2 contrasting presentations. Use the questions in box 2 and 3 to make notes about the presentations.

Peach Kucha #1 Title: _____

- What was the presentation about?
- What stood out to you about their images?
- Did the image and words work well together?
- What did you learn from the presentation?

CCE L28WS: PECHA KUCHA ANALYSIS

13 CLIMATE ACTION



Pecha Kucha (pe cha ku cha) means 'chit chat' in Japanese and was devised as a presentation format to get presenters straight to the point.

3

Pecha Kucha #2 Title: _____

- What was the presentation about?
- What stood out to you about their images?
- Did the image and words work well together?
- What did you learn from the presentation?

4

Think about your answers above - use them to start thinking about your presentation.

- Who is your audience - think about their age and interests or what might interest them about your topic.
- What style will you use - drawings, photos, collage?
- What information do you want them to know?

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 29-30: Creating a Pecha Kucha

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Creating a Pecha Kucha

In this lesson students will continue to plan 'how to' plan, create and present their Pecha Kucha. The lesson and its resources support students to create their outline and begin to develop their presentation step-by-step.

Vocabulary: Outline; Prompt; Pecha Kucha

In this lesson, the learner will:

- summarise work done (to date)
- create an outline for their presentation
- begin to gather their images and set up their presentation template
- develop team skills
- develop presentation skills
- create a Pecha Kucha presentation
- deliver a Pecha Kucha

Materials

- Worksheet: Pecha Kucha Planning Guide
- Worksheet: Pecha Kucha Outline
- Worksheet: Pecha Kucha Checklist
- Internet
- Computer or tablet access
- Paper
- Pens, pencils or markers

SDG13 Climate Change Engage Game Design
L29-30: Creating a Pecha Kucha

Activity Instructions

Before the lesson, give each team a copy of the Pecha Kucha Planning Guide and ask them to read through it before the lesson. They can underline words or phrases they aren't sure of.

Learners will work through the creation of their Pecha Kucha as a team and will divide the work between them.

Activity 1 Planning an outline (20 minutes)

1. Give learners 5-10 minutes in their teams to review the Pecha Kucha Planning Guide. As they should have read through it before the lesson, they can use this time to summarise the key points and check understanding of unknown vocabulary. Monitor and support.
2. Ask learners to complete worksheet: Pecha Kucha Outline using their vision boards and worksheet: vision board support from lessons 21 - 22 to help define key elements of their game idea

Activity 2 Develop the Pecha Kucha template (30 mins)

1. Using worksheet: Pecha Kucha Template, allow learners to work through developing their ideas and plans for their Pecha Kucha. They can also use this time to begin gathering images and sourcing information.
2. Monitor and check each team's template and encourage learners to refer to the Planning Guide and their Outline for support.
3. Encourage learners to keep asking themselves about the image / script relationship and to ensure minimal text on their slides.

There are two structured sessions to support the learners' development of their Pecha Kucha, with an additional session proposed for finalising the activity, allowing approx 3x 1hr classes. However, teachers may elect to offer more time depending on class length and learners' needs.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L29-30: Creating a Pecha Kucha

EXTENSION / REDUCTION ACTIVITIES:

Reduction: For a shorter class, complete Activity 1 only and extend discussion time. Complete Activity 2 in a follow-up lesson.

Extension: For a longer lesson, allow learners to continue to work on developing their ideas and planning.

Flipped Classroom: Learners are encouraged to look at other presentations for their styles and delivery. Ask learners to visit https://www.pechakucha.com for inspiration.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

How To Improve Communication Skills? (10 min 28s)
https://www.youtube.com/watch?v=v3DiMAPolIs

Tips on giving oral presentations (2:06min) https://www.youtube.com/watch?v=QKOO99UjsSE

Dos and Don'ts of making presentations effective (2:55min)
https://www.youtube.com/watch?v=X50StnWVh9I

Be a confident public speaker:
- Video (4:49min) https://www.youtube.com/watch?v=tShavGuo0_E
- Public speaking worksheet https://static.tumblr.com/nw2r6wp/2LAmj0c61/publicspeaking.pdf

Nine habits that are destroying your confidence (6:50min)
https://www.youtube.com/watch?v=_RtUt0RsGMc

Local Trip / Expertise / Additional Work and Assessments

Stakeholder Mapping worksheet supports students to focus on their local audience - see Lesson 16.

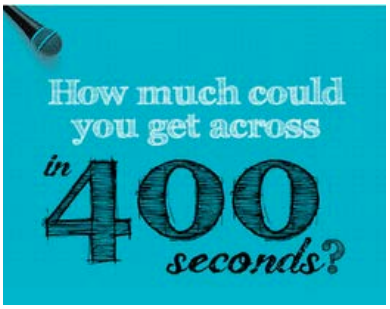
Develop the project across subject areas through multiple outcomes such as video, poster, Pecha Kucha, interviews or podcasts.

- SDG 8 Media Communication - supports support the development of the 4Cs skills – Creativity, Communication, Critical Thinking and Collaboration - sign up using your school email https://www.codesres.ie/_files/ugd/92a067_a8f108ce0a6448e9851a5b03dd2e8d40.pdf
- SDG 4 Supporting Skills - https://www.codesres.ie/sdg-4-supporting-resources - sign up using your school email

CCE L29 – 30WS: PECHA KUCHA PLANNING

Your task: Create a basic Pecha Kucha on your game and its development

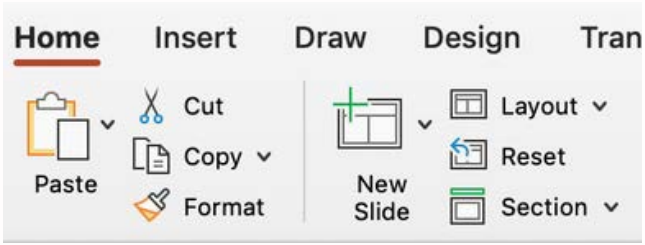
20 SLIDES X 20 SECONDS =
6 MINUTES & 40 SECONDS!



You can access Powerpoint through Office 365

- **How to make a Pecha Kucha**
  https://www.youtube.com/watch?v=32WEzM3LFhw

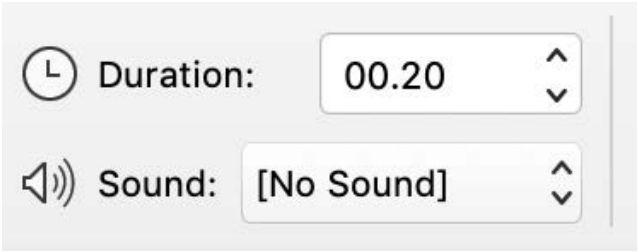
- **Using powerpoint for a pecha kucha**
  https://www.youtube.com/watch?v=q0XWIPbXmVY



1. Open PowerPoint. In slide view, right-click on the first slide on the left and select 'Layout' then 'Blank' on the dropdown menu. This creates a blank canvas.
2. Right-click again on the slide and select 'Duplicate'. This creates another slide just like it.

3. Since the duplicate command is already in PowerPoint's memory, use the shortcut Ctrl-Y to repeat the duplicate (or just right-click duplicate again) 18 more times, for a total of 20 blank slides.

4. Use Ctrl-A to Select all slides in the left, and then go to 'Transition', advance slide and set it to 20 seconds. If you didn't select all slides then apply timing to all slides



5. You can also select transition styles and speed here. The simplest is the best. Maybe nothing more than a simple fade, particularly as you only have 20 seconds per slide.

Tips on creating a Pecha Kucha

- Most important, keep it simple as you have less than 7 minutes. Focus on the most important points.
- Remember your slides should be images only with your text spoken / read out
- Your images - You can resize your images to your liking. Best is to fill the whole slide with your image unless you have a reason for using space e.g. emphasising something.

CCE L29 – 30WS: PECHA KUCHA PLANNING

- Also limit the text on your images and superimpose your text over the image use colour to make your text standout

Free presentation software

- https://prezi.com/
- https://www.canva.com/
- https://www.libreoffice.org/
- https://pc.wps.com/

20 SLIDES X 20 SECONDS =
6 MINUTES & 40 SECONDS!

Getting Free images

In public domains such as Wikimages or Pixabay often you just have to credit the photographer or they are free for non-commercial or educational use. Remember to check and credit!

- https://pixabay.com/
- https://www.flickr.com
- https://en.wikipedia.org/wiki/Wikipedia:Public_domain_image_resources
- https://blog.hubspot.com/marketing/free-stock-photos
- https://blog.snappa.com/free-stock-photos/

Examples of Pecha Kuchas

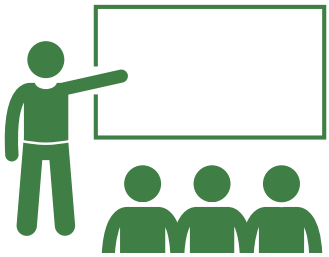
- https://www.pechakucha.com/presentations/daily-acts-of-creativity
- https://www.pechakucha.com/presentations/random-acts-of-courage
- https://www.pechakucha.org/cities/dublin/presentations/fenced-in
- https://www.pechakucha.com/presentations/changing-the-rules-of-our-reality-with-technology
- https://www.youtube.com/watch?v=FHuB4my_UT4
- http://www.pechakucha.org/presentations/time-based-art

Remember to share with your peers anything that helped you and your group.

- What tips would you add?
- How would you explain to someone what a Pecha Kucha is?
- How would you explain how to design a Pecha Kucha?

CCE L29 - 30: PECHA KUCHA OUTLINE

13 CLIMATE ACTION



Pecha Kucha (pe cha ku cha) means 'chit chat' in Japanese and was devised as a presentation format to get presenters straight to the point.

Planning Your Slides

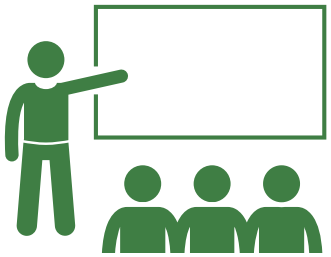
What are the most important things you want people to learn from your presentation? Use the boxes to help you plan your outline.

1 Slide 1: Greeting and introduction location

2 Slide 2: Introduce the problem or your topic

3 Slide 3 - 18 : The Core of your presentation

CCE L29 - 30: PECHA KUCHA OUTLINE



Pecha Kucha (pe cha ku cha) means 'chit chat' in Japanese and was devised as a presentation format to get presenters straight to the point.

4 Slide 3 - 18 continued : The Core of your presentation

19 Slide 19: Conclusion - Start to talk about the main message you want to leave with your audience. End with a strong image and thank your audience for listening

20 Slide 20: References - It is important to reference all the sources you used for the Pecha Kucha. This includes all images, and websites that you used to get your information from

CCE L29 – 30WS: PECHA KUCHA CHECKLIST

1. Start With an Outline - All presentations should start with an outline

What is an outline – this is the structure of the story you are going to tell. Stick to one idea per slide then have 1 or 2 sentences about that idea / slide – Remember you have only 20 seconds per slide.

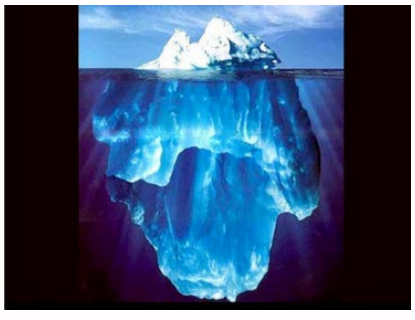
- Use the points below to help you order your outline
- Think about how many people are in your group
- Think about how many slides that is each per person
- Divide your content between your group
- You should always have an introduction slide
- You should always have an summary slide at the end
- You can can use paper, post-its, the outline function in Powerpoint, or a digital notebook or Microsoft Word to plan your presentation.

2. Tweak Your Outline

- Play around with the order of your information and slides to tell your story. Remove details or slides if they don't help you say what you want to say.
- You might separate some of your sentences / ideas or combine them depending on what you want to say - you only have 20 slides x 20 secs each slide.
- Think about your audience try to make it interesting for them. Keep playing with the order of your ideas and your story / message.

3. Make your template and add your pictures - Once you have your 'story' then find strong visual images for your 20 slides that help tell your story. Work together – think about your image choices and how they fit with your text.

Let your images be the tip of the iceberg – as presenters you will explain what's 'behind' your image.



- You will have to import images into your Pecha Kucha template - instructions are in the Pecha Kucha planning guide.
- You should limit the text on your slides – try to keep them as only images / graphics or images / graphics with titles.
- The most successful Pecha Kuchas don't use much if any text. No more than 5 words per slide is a good reference.

CCE L29 – 30WS: PECHA KUCHA CHECKLIST

4. Practice - Practice as much as you can. And practice again.

- Speak your text out loud with your slide show running more than once and time it – you will see that even with your 1 or 2 sentences per slide you might have too much.
- Keep practicing your slides with the text you want to speak – do they tell your story well? Keep re-doing them until you are happy.

'The 7Cs of Effective Communication': https://www.youtube.com/watch?v=xXz1oZONUIM

- You can also have a number of slides for each idea or sentence to help slow things down or improvise. Be careful when improvising – it is easy to run over time.
- Tips on giving oral presentations https://www.youtube.com/watch?v=QKOO99UjsSE

5. To Animate or not?

- Animations and transitions can be distracting and also mess up your timings. General advice is not to animate as the slides are only 20 secs long.

6. Practice your masterpiece again

- Yes, time to practice again. With less than 7 minutes to present, you can afford to practice more often. The slideshow runs automatically so you will run out of slides or have images that do not connect to your ideas / spoken text if you're timing isn't right.
- Remember add your own personal flair, humour and interest.
- Oh, did I mention practice?

7. Finally, don't forget your audience! Make eye contact, be warm, be human.

SDG13 Climate Change Engage Game Design

SDG13 Climate Change Engage Game Design

Lesson 31-32: Peer Review and Pitching Your Ideas

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Peer Review and Pitching Your Ideas

Peer assessment enables those directly involved in the task or project to appraise their own learning. Learners are encouraged to consider what is most important, valuable and successful from what has been learned and the process of learning it. By engaging in the development of peer assessment criteria and the assessment itself, learners take responsibility, learn to evaluate, are more motivated and get practice at giving and receiving feedback.

This lesson builds on Lessons 27 - 30, enabling learners to develop their presentation skills learn to give peer feedback and constructive criticism.Each team will present their game ideas to the other teams and using the supporting resources assess their peers.

Vocabulary: Learner-driven Assessment; Peer Critique; Peer Review

In this lesson, the learner will:

- implement their assessment criteria
- assess their peers through peer review
- develop constructive criticism skills
- experience peer critique

Materials

- Support Resource: Peer Review table
- Pens, pencils
- Large pieces of paper
- White board

SDG13 Climate Change Engage Game Design
L31-32: Peer Review and Pitching Your Ideas

Activity Instructions

Before the lesson, divide the board into 3 columns

- *What makes a great pitch?*
- *The driving question*
- *Peer assessment criteria for pitching*

Activity 1 Paired Discussion (15 mins)

1. Give learners time to discuss their answers to the question; what makes a great pitch?
2. Share ideas as a whole class and write key words on the board (1st column)

Activity 2 Developing pitch assessment criteria (35 mins)

1. Refer to the driving question in the 2nd column on the board and give pairs time to discuss what could be important to include in the pitch that will answer this question. Ideas might include: character development, entry into the game, links to climate change adaptation, storyline.
2. Share ideas as a whole class and write key words on the board (2nd column).
3. Refer to the 3rd column and begin to elicit what criteria the learners would like to include in the pitch assessment.
4. Once there is a list of ideas, ask learners to take time to narrow them down and finalise their criteria. They could do this by having a short discussion in pairs and then a sharing circle as a whole group, with 1 learner leading the discussion and making edits to the information in the 3rd column.

NB: The accompanying support resource 'Peer Review Table' has both a blank copy for learners self-generated assessment criteria and a copy with sample headings that have been used previously. Teachers can decide on which option is most appropriate for their class and timetable.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design
L31-32: Peer Review and Pitching Your Ideas

EXTENSION / REDUCTION ACTIVITIES

For a shorter lesson, reduce the time in Activity 2. Increase the length of the Activity to include more peer discussion.

For a longer lesson, allow more time in Activity 1 and allow learners to create the peer assessment worksheet for the pitch (after completing Activity 2).

Option B: Use one of the videos from the Media box to introduce peer assessment / feedback e.g. 'Feedback Helps' or 'How-to: Feedback 1'

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'Study Skills Learning from feedback' https://www.youtube.com/watch?v=GT6hkmj0MgU

'Feedback helps' https://www.youtube.com/watch?v=EtnxACx3eDE

Self and Peer Assessment (3:46min) https://www.youtube.com/watch?v=1wwo09Lb9hw

'Peer Assessment' (7:14min) https://www.youtube.com/watch?v=2hRu5i-gfXo

'Feedback' (5:43min) https://www.youtube.com/watch?v=cRJmdk3s4mk

'How-to: Peer Feedback 1' (1:25min) https://www.youtube.com/watch?v=3y7jgpe-k5I

'Introduction for Assessment for Learning' (2:20min) https://www.youtube.com/watch?v=63PdFKIFzNU

'Assessment for Learning Practices' (4:49min) https://www.youtube.com/watch?v=cNPFwCbA_mE

'Teenage Brains Wired for learning' (3:00min) https://www.youtube.com/watch?v=1GSvzgrBKaM

Local Trip / Expertise / Additional Work and Assessments

Depending on the confidence of the learners, invite other students to watch and review the presentations once the game design students have presented their class peers.

Invite other teachers, parents' council or board of management to learners presentations.

Invite lecturers or third-level learners from UCD computer science – game development module https://hub.ucd.ie/usis/!W_HU_MENU.P_PUBLISH?p_tag=MODULE&MODULE=COMP30540

or TCD - Game Design programme https://www.tudublin.ie/study/undergraduate/courses/game-design-tu984/ to watch learners' presentations and feedback on their games.

LESSON 31 PEER REVIEW TABLE

Team: _____

Team:				
Team:				

SDG13 Climate Change Engage Game Design

Lesson 33: Facilitating a World Café

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Facilitating a World Café

In this lesson, the learner will experience the World Café methodology as a reflective tool.

A World Café is a series of conversations around a question or issue. It was developed in 1995 and is a simple, flexible and effective way to host large group dialogue. By facilitating a World Café as a reflective exercise for your learners, it will enable them to process their thoughts on the game design process and feedback further on each others' work.

Vocabulary: Collective Discovery, Diverse Perspectives, Harvest, Open Space Technology, World Café

In this lesson, the learner will:

- contribute to discussion
- record information
- actively listen
- reflect and share perspectives

Materials

- Teacher's Guide: Facilitating a World Café
- Poster paper (1 piece of paper per table, per round)
- Markers (1-2 per group)
- Blue-tac
- Tables and chairs or other props to set up a speaking space

SDG13 Climate Change Engage Game Design
L33: Facilitating a World Café

Activity Instructions

Before the lesson:

- *Set up the space how you wish. Refer to Support Resource: Facilitating a World Café for suggested ideas.*
- *Decide how many groups you will facilitate. Ideally, there are no more than 5 learners per group.*
- *There will be 3 rounds of conversation. Write each round's question at the top of each piece of paper per group and put them face down in each group's area, in the order that you want them used. Each group will have 3 pieces of poster paper.*
- *Assign 1-2 markers per group.*

In this module, we are using the World Café format as a reflective exercise on game design, see the Support: Facilitating a World Café for question examples.

Activity 1 Preparing for the World Café (10 mins)

1. Divide learners into small groups (no more than 5 per group).
2. Invite them to sit at one of the pre-prepared spaces, where they will find paper and markers.
3. Ask each group to assign a recorder (someone who will write down the ideas that are shared). The rest of the group can either be speakers or listeners (or both), but whichever role they choose, they must be active in it.

Activity 2 World Café rounds (40 mins)

1. Begin the first round of the Café by asking the recorder in each group to turn over the first piece of poster paper. Give learners 10 minutes to discuss the question, the recorder writing and/or drawing key ideas down.
2. Begin the second round by either;

- Asking the recorder to turn over the second piece of paper
- Asking all learners to move to a new table (with the exception of the recorders). The recorder can then turn over the second piece of paper with their new group.

3. Repeat the above steps for round three.

Activity 3 The Harvest (10 mins)

1. Ask the recorders to pin the poster paper from each round to the wall.
2. Give learners time to walk around and read the reflections of other members of the class.
3. Ask each learner to share 2 interesting things they learnt from the other reflections.

SDG13 Climate Change Engage Game Design
L33: Facilitating a World Café

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

As this is the last lesson and the World Café is a reflective lesson - this 3-2-1 can be used to gather feedback on the overall module.

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, reduce the number of rounds in Activity 2.

Extension: For a longer lesson, extend the amount of time for the World Café rounds. Ask each recorder to present key ideas from each round to the whole class.

Other ideas:

- Encourage learners to think about how they might share their game design or implement a playable prototype.
- Flipped classroom: Watch some of the videos (see Media Box) and host a class discussion on how the learners could organise and co-ordinate the World Café themselves - see World Café Hosting Kit in the media box. This could include how they want to set up the space, encourage them to bring props to create the setting, what they want to find out and develop the questions.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

- 'How to Run a World Café' (4:52min) https://www.youtube.com/watch?v=Tfpyu84pg6k
- 'How to Facilitate a World Café' (3:07min) https://www.youtube.com/watch?v=bImYMj88b20
- 'Powtoon World Café Creativity Technique' (3:51min) https://www.youtube.com/watch?v=qTiBLZJmd00
- 'World Café Method' - http://theworldcafe.com/
- World Café Hosting Kit http://theworldcafe.com/tools-store/hosting-tool-kit/

Local Trip / Expertise / Additional Work and Assessments

- Invite a local expert (e.g. Local Authority Environmental or Planning Officer) to facilitate or attend the World Café
- Invite a local member of the community into facilitate the Café.
- Invite other teachers into the facilitation process.

CCE L33TG: FACILITATING A WORLD CAFÉ

A World Café™ is a facilitation / social innovation tool that promotes a series of conversations around a question or issue. It was developed in 1995 (Brown and Isaacs) and is a simple, flexible and effective way to host large group dialogue. You can find out more at theworldcafe.com

Before running a World Café session with your class, here are some tips to get you started based on the :

Create a space

Ideally, you want the space to feel inviting for students to share their ideas in. When they are comfortable, they will be more creative. You could set up the tables to look like a restaurant, with tablecloths and flowers, or you could set up cushion spaces on the floor.

Encourage everyone to contribute

Some people like to contribute by speaking, others by recording and others by listening. Encourage students to contribute in the ways that they feel most comfortable, but remind them that whatever they choose must be active!

Groupings

Each table or space should have no more than 5 students.

Materials

For each table or space, you should prepare the following for the session:

- One piece of poster (or A3) paper per round (e.g. 3 pieces for 3 rounds)
- Write each question at the top of each paper and put them face down on the table, in the order you want them used1-2 markers for the recorder
- Blue-tac for putting the papers on the wall for the Harvest

Find out more about the World Café method at: http://www.theworldcafe.com/

L33: FACILITATING A WORLD CAFÉ

As a teacher you can decide, based on your learners and your timetable, how you wish to undertake your World Café (see Extension/ Reduction box in the lesson plan).

You may wish to involved learners more by developing questions linked to Lesson 31 - 32 peer assessment or more about their experience of the project.

Below are some sample question ideas you could use as prompts to generate questions or use within your World Café:

- How do you feel your game helps your peers understand the issue of climate change more?
- What kind of changes would you make to your game design and why?
- In what ways has the process of designing a game, helped YOU understand the issue of climate change better?
- What did you find most easy and most difficult about the process? Why?
- How did the process help you to understand how you like to learn? Which other subjects or topics you feel could be learned this way?
- What are the most interesting skills you have developed during the process?
- What skills do you feel might need to develop more? Why?
- How would you improve the learning process? Include suggestions for activities.

We hope you enjoyed the module. We are keen to improve the module, and we would love to know how it went and what you found out. To share any feedback, 321s or what you found out from the World Café, please contact us:

Dr. Anita McKeown, anita.mckeown@ucd.ie and Dr Mick Lennon, micheal.lennon@ucd.ie