SUSTAINABILITY: Our Future, Your Story.

WEEK 2 – Engineering and Renewable Solutions

Welcome to the second week of STEMreach Sustainability: Our Future, Your Story module for Transition Year students.

This week participants will be introduced to the concepts of the engineering cycle, design thinking and the circular economy, where creativity and critical thinking work together to find new sustainable solutions.

For teachers leading the session, **please stop the video at 04.05 min** for the first in class activity. During this task students should write down each of the design cycle steps, re-ordering them in the appropriate sequence. However, please note in practice this is an iterative process so many steps are often revisited throughout the engineering design cycle.

Our weekly task centers on the specially designed 'Happy Planet Game'. The concept which is based on snakes and ladders requires students to imagine the impacts of both positive and negative climate actions.

Note: During game play, it is key to emphasis to students that they have the freedom to imagine as many scenarios as they would like, no idea is too big, small or outside the remit of imagination. This unrestricted method of ideation will aid them in future tasks throughout the module.

Please check out our detailed supplementary instructions, which have been provided to you. If you require additional game boards or supporting materials, they can be downloaded from our website https://www.calmast.ie/stemreach-sustainabiity/ . The Happy Planet Game can be used as a starting point for interactive play with Transition Year's and younger students during the peer learning session on week 6. TY students and younger pupils can influence the difficulty of the game by editing the squares on the dice and board.

Link to this week's video: https://youtu.be/ZiKOCNgdUCk

In this video you will find:

- Introduction to the Engineering and Design Cycle
- Activity: Engineering Design Cycle
- What is the Circular Economy?
- Concepts of Design Thinking
- Weekly Task: Happy Planet Game

Individual or small group activity: Engineering Design Cycle

Engineering Design Cycle Activity: Individually or Groups of 2 (5 – 6 minutes)
There are several steps in the Engineering Design Cycle, ask students to write each step out on a post-it note or into their copy, cut out each step and reorganise the segments in the cycle, from the first to last step.

If students are finding it difficult to settle on a starting point, they may begin the activity by visualising what they would do to solve a litter problem in their school.

N.B The cycle is iterative process, many steps are revisited and repeated until the goal has been achieved, the outline of this cycle as stated in the video is the initial process.

Weekly Task: Happy Planet Game

(In class)

Happy Planet Game: Groups of 4 -5 (20 – 25 minutes)
The Happy Planet Game has been developed by Calmast to introduce elements of play into the topics of sustainability and climate action. Please follow the detailed step-by-step instructions which accompany the game. Participants can co-create their own unique game, by designing their own dice face and climate actions.

N.B Physical game packs have been provided to participating schools, if additional materials are required, please visit our webpage for downloadable PDF files. Students will need to cut out the counters and dice from the game sheet.

A BIT OF EXTRA TIME?

What is the circular economy? Class Discussion:

This week we touched on the concept of a circular economy. By design it is a regenerative cycle which feeds into itself. From raw materials and manufacturing, to distribution and use, the circuit can be extended by utilising methods such as reuse, repair or recycling.

Task students to discuss the concept of a circular economy and come up with one example of a circular economy per group.

This may include:

- A deposit return scheme for recyclable materials (i.e. glass bottle recycling)
- Reusing materials (making new items from waste/pre-loved fabrics)
- Using a waste by product of production for a new purpose (i.e. used old coffee grounds as a fertiliser for plants)

Animated video on Design Thinking:

Here you can find an extra explanatory video on Design Thinking (2.30 minutes):
https://www.youtube.com/watch?v=LhQWrHQwYTk&t=13s

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