UNDERSTANDING WHY WASTE EQUALS FOOD IN HUMAN SYSTEMS

OBJECTIVE

Understand the problems with current production systems and consider potenital benefits of closed loop systems.

KEY COMPETENCIES

- Using imagination
- Communicating ideas
- Analysing information
- Reflecting & Evaluating

FILM TIME (14 mins)

Watch the following video:

• Get Loopy video – Discover the cyclic nature of natural systems like the forest and also discover the consequences of linear manufacturing processes. Produced by the Ellen MacArthur Foundation (approx 11mins). Search for Get Loopy on You Tube then try to answer the questions below.

• What valuable resources are we wasting with current production systems?

• What's the problem with the current human take-make-dispose system?

• How is nature different from the human take-make-dispose system?

• Why aren't man-made products (like laptops) loopy?

• How can we make man-made products such as mobiles, laptops and fridges loopy?

WM3 Video answer sheet

Alternative video:

• Ellen MacArthur Foundation 'Excite Me' video (approx 2mins). Search http://vidaru.com/ellen-macarthur-foundation-excite-me/63270569 then try to answer the questions below:

UNDERSTAND

CURRICULUM LINKS

Biology[1], Geography[2] and Design & Technology[3]

- Understand open and closed loop systems[1,2].
- Consider sustainability and environmental issues when designing and manufacturing[3].
- There are various ways of disposing of waste[2,3].

MODELLING GAMES (10 mins)*

Play stage 1 of the modelling game. Work as a team to move the "aluminium" through the take make dump linear system.

- What happened to the raw materials needed to make an aluminium can?
- How could this system be improved using Insights from Nature?

Play stage 2 of the modelling game. Add a recycling loop into the model and work together to move the materials around the system.

- Observe that recycling is not perfect and raw materials are still lost over time.
- How can we improve this system further so that it is never-ending?
- Reflect that we need to think about the whole process in order to make the system a truly closed loop. Simply getting better at recycling will still result in a loss of raw materials. Production systems and the products themselves need re-thinking.

IM10 Modelling game instructions

EVERYDAY ITEM SORT (10 mins)*

Work as a team to sort items into 3 groups and explain the groupings you have put them in.

Re-sort the items into groups: Biological nutrients, Technical nutrients or a mixture. Check the answer sheet to see if you are correct.

- How can these 3 groups of items be produced using a closed loop production cycle?

IM11 Everyday item list
WM4 Item sort answers

MODELLING GAME CONTINUED (10 mins)*

Discuss how you could re-model the game so that it is closed loop.

- Why is this better?

**Activities will be covered during the Introductory Module at Epping Forest Field Centre*

A CLOSED LOOP SYSTEM (10 mins)
Research an aquaponics system.
• Is this is a closed loop system? Explain why
• Are there any problems with this system?

WM5 Aquaponics information

CLOSING THE LOOP (10 mins)
There aren't many examples of closed loop products and production systems in the human world. But many companies are trying to close the loop for their products.
• Why do they think this is important?
Choose one of the companies provided.
• List the benefits to the consumers of closing the loop
• List the benefits to the company of closing the loop

WM6 Companies closing the loop

STRUGGLING TO CLOSE THE LOOP (10 mins)
Why is it so difficult for companies to close the loop?
Work as a team to try to close the loop of a orange juice tetrapak
• First separate it into its constituent parts.
• What materials is it made from (biological, technical or mixtures)?
• Can these materials be recycled easily?
• Find out if your local authority collect tetrapaks for recycling. If not find out where you local tetrapak recycling bank is. http://www.tetrapakrecycling.co.uk/locator.asp
• Look at the life cycle analysis of a tetrapak. Are they trying to close the loop? http://www.tetrapakrecycling.co.uk/tp_lifecycle_analysis.asp
• Can you think of anymore ways tetrapak could close the loop?

REFLECTION (5 mins)

You have discovered that Waste equals Food in nature and this concept of closed loops can be applied to human production systems. Add notes to the Reflection sheet and chart your progress on the Learning wall.

Visit the Share page of www.lessonsfromnature.org to comment on the activities you have taken part in.