Keep Scotland Beautiful

STEM the Flow
The #Source2Sea marine litter challenge

‘Defining the Problem’ design and planning

Overview

This activity introduces pupils to the design and planning process for project-based enquiry, such as the STEM the Flow challenge. After this activity, students should be able to identify the need for a specific engineering design project, describe the design project context and identify and differentiate the design project constraints and requirements.

Resources

- Sticky notes/ note cards
- Marker pens/ highlighters
- Copy of the STEM the Flow Guidance Booklet per group/ team

Instructions

Using the questions below to prompt discussion, make bullet point notes on each of the key topics within the Design and Planning Process to identify an engineering solution to source to sea marine litter.

1. Description of Problem, Need or Value

- What are the problems and/or needs that justify the project?
- Describe the target area— where specifically experiences this problem or need?

2. Overview of the Design Team

- What is the overall aim of the project team?
- What are each team member’s role to accomplish this project?

3. Overview of Proposed Project

- What is the basic purpose of the project?
- Who will benefit from this project? Describe the location and population that will be influenced by your project.
- How will you make this project unique? What way can you make it stand out?

4. Project Requirements and Constraints

- What are the project requirements?
- What constraints have been placed on your team?

5. Project Activities and Timeline

- What exactly must be done in order to achieve the aim of the project?
- When, and in what order, must these activities be done to achieve the project aims?

6. Outcomes

- What immediate and long-range results are expected from the project solution?
- Will the solution change people’s lives, the educational community and/or the world?

7. Evaluation

- How will the success or failure of the design/prototype be measured?
- How will evaluation results be used? Will feedback be used to improve the design?

8. Funding

- How could cost affect the project?
- Are there any methods you will consider to minimise costs?

Extension

Case Studies: Have each team research an engineering design product that is related to their assigned

design challenge and present the research as a case study to the class. Require that information provided in the case study identify the need for the project, target population, requirements and constraints, as well as provide a description of the engineering solution and an assessment of whether or not the solution met the target population need.