

Sustainable engineering

DESIGN ABACUS

Description of activity

The design abacus is a method by which students can evaluate the sustainability of a product, compare two products or evaluate their own design ideas.

Provide each individual or small groups of students with a blank abacus sheet (overleaf) and a product to evaluate.

Think about the type of assessment (focal area) you want your students to consider – environmental, economic or social issues.

As a class identify, up to seven criteria (issues) that students would like to assess e.g. use of energy, cost of product.

On the design abacus sheets students need write in each issue, listing the ideal condition at the top and the worst condition at the bottom e.g. for 'Disposal of product', the ideal condition is that its easy to disassemble for recycling and the worst condition is it is difficult to disassemble for recycling.

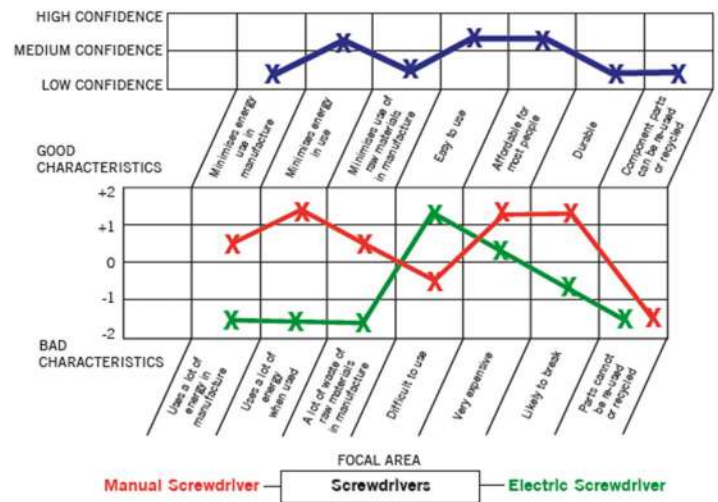
Students can then estimate how good or bad the current product is within each criteria, and how confident they are about their estimates.

Once all the issues and confidence levels have been considered ask students to draw a line to connect all the points in the issues area and all the points in the confidence levels.

The abacus is useful when:

- Comparing two products or designs, using different coloured pens.
- Assessing confidence levels that give students an indication of where they need to focus further research for their project.

Example of completed abacus sheet



Learning objectives

1. To help students to use an eco-design tool to evaluate one or more products against agreed sustainability criteria.
2. To help students to identify the best sustainability features of two different products with a view to incorporating them into an improved product of their own design.

Learning outcomes

1. Students will be able to communicate graphically an analysis of the impact of an engineered product.
2. Students should be able to explain and justify why they have chosen to include some features in their own design.

PLTS

1. **Independent enquirers** – students research information on the features of the products.
2. **Reflective learners** – after their research students will evaluate how sustainable the manufacture of those products is.

