Design and Make a Candle Carousel – Grade 7

Understanding Structures and Mechanisms - Form and Function
Understanding Earth and Space Systems - Heat in the Environment

Introduction: This multi-step project is an excellent way to introduce students to sheet metal fabrication and fastening techniques. While such an activity is ideally done in a metalworking facility, the cutting, bending, and soldering of tinplate can be done with just a few basic hand tools. determined by the relationship between input and output forces.

Prior Knowledge and Skills Students will need to be familiar with in order to complete this activity:

- How shape, spin, and foundations affect a structure's stability
- How the position of the centre of gravity determines whether something stands or falls
- Three methods of transferring energy
- Safe use of hand tools and materials

Scenario: There is a special celebration/anniversary about to take place in your family. Because you have been asked to help with the decorations, you want to create something very unique and eye-catching. Design and make a twirling mobile suitable for a table centrepiece.

Resources/Materials/Equipment:

1 9 cm fan wheel template showing 12 blades
1 metal lid of a cookie tin or large food jar* for the base
1 large sewing or darning needle (must have a sharp point)
4 jumbo paper clips or wire, tin plate (could be from recycled food tins*)
50/50 solder and flux, spray paint, acrylic paint & brushes, permanent markers
tin snips, 40 - 80 watt soldering iron, jumbo >bull clips= (for clamping work while soldering), needle-nose pliers, awl (or sharp nail).
Optional: spot welder, or pop riveter.

***N.B. All surfaces must be cleaned before joining.**
Remove paint with emery paper or steel wool.

Design Specifications

The heat from two or more candles must power it. It must be made of metal. For safety reasons, it must be difficult to knock over. It must be interesting and attractive.

Students will be required to submit:

Prior to fabrication – list of brainstorming ideas, 3 rough sketches, final design choice appropriately reflects the social/family occasion
At the end of the design process - completed prototype, self evaluation, a labeled scientific diagram and a brief explanation of how the carousel works using the particle theory

Assessment and Evaluation:

Evidence of Student Learning: design notes/learning log, drawings, prototype has a balanced fan wheel that spins, demonstration of knowledge of design process, oral or written explanation using correct science & technology terminology, scientific diagram follows drawing conventions

Criteria: safe, appropriate, and effective use of materials and tools, design specification requirements are met—including use of design process, a safe product with no sharp edges, an attractive, colourful surface finish.