

Research and Design

Academic Representative



Technology Education Concepts
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Description

Students take a model racecar from design to manufacturing. They study the factors that affect the speed of a vehicle and then develop drawings using orthographic projection and exact measurements to minimize or capitalize on those factors. Next, they create a full-scale mock-up model of their car, then analyze and evaluate the model for aerodynamics. Lastly, the students apply all the information they have gathered by building, finishing, and racing their wooden racecars.

Skills

- Analyze performance data to improve a design
- Read specifications correctly
- Properly use basic woodworking and measurement tools
- Develop an end product based on design and testing
- Generate drawings for development of a product

Knowledge

- Careers in Research and Design
- Safety procedures
- Basic steps of design process
- Major factors that affect performance
- Importance of drawings in product development
- Purpose of research in product development

Activities

- Activity 1 - Introduction
- Activity 2 - Design Drawings
- Activity 3 - Mock-Up
- Activity 4 - Mock-up Analysis
- Activity 5 - Layout
- Activity 6 - Carving I
- Activity 7 - Carving II
- Activity 8 - Carving III
- Activity 9 - Assembly
- Activity 10 - Post-Test and Wrap-up
- Activity 11 - Bonus Activities
- Activity 12 - Challenge
- Activity 13 - Open-Ended Challenge
- Activity 14 - Careers
- Activity 15 - Internet

Standards

Math/Measure Problem Solving Reading

Module Includes:

Student Workbook, Instructor's Manual, Installation CD, DEPCO AeroWedge, Wind Generator, Drill Fixture, Styrofoam Cutter, Band Saw, Vice, Cordless Power Drill, Dust Buster, Electronic Scale (grams), Drawing Templates, Drawing Tool Set, Cutting Tools, Organizer Trays (2), CO2 Car Supply Kit for 24 Students

Computer and supplies are required and sold separately.

Requirements

Adequate ventilation for the airbrush painting. Recommend optional spray booth.

Adequate floor space should be allocated for the GT4000 Racetrack which is 30" tall x 15' 3" long x 18" wide, also allow for enough room to move around the track.

In addition, a generous amount of work space is required for the module equipment.

GT4000 Gravity Test Track ships LTL freight.

ET20M CO2 Raceway requires a smooth surface and can be setup in a range of lengths up to 20 meters.

Curriculum Specifications

Format 2000. The Research and Design curriculum consists of a well-illustrated student activity guide with 10 daily activities and 5 additional enrichment activities including careers, problem solving, challenge activities, vocabulary reinforcement, and Internet.

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