Pre Engineering & Design

Balsa Bridge

Group size: 2 students

Project length: 10 days (research, design, construction, testing)

day1 &2- research & vocab, day3-preliminary design sketches, day4-6- technical drawings, day7-10-construction

Objective: Design a balsa wood bridge that will span a 10" gap and support a maximum load TBD.

Materials: balsa wood strips (1each 1/8" x1/8", 1/8" x 1/4", 1/8" x 3/8"), 1 sheet of 8.5x11 copy paper, wood choice

Research: Name and sketch 5 different truss types of bridges.

Vocabulary: (as they refer to bridges) camber, support, I-beam, laminate, truss, stringer, floor beam, strut, sway bracing

Details: Research 5 types of truss bridges, and choose one design that you think can be built using the materials given, AND support a load. Your design process will begin with several sketches of your bridges that you think may work. Once you narrow it down to ONE design, you will need to draw detailed construction plans. This will include a view from the side, top, and end. You will be using AutoCad for these 2D drawings. After your plans are complete, you will be given the materials to construct your bridge. Be sure to use caution with the tools, and take care while cutting and gluing. The best bridges will be constructed very carefully with exact cuts and glue joints. Your bridge must fit onto the "Destroyer" test bed. If it extends below the test surface, that portion must touch the inside of the test frame. It will be tested with pressure from above applied to a 4" square plate.

Remember the sequence for design: research, vocabulary with sketches, multiple preliminary design sketches, technical drawings, construction, evaluation, and conclusion.

** record your research, process, results, and conclusion in your engineering notebook.

Grading:

Notebook: research____/25; vocabulary____/25

CAD drawing____/75; revisions____/25

Bridge construction technique____/100

Testing ____/50

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