TECH: Land Transportation - Monorail Design - (Class)

Summary

New...pdf. update in December 2011! Students will construct a working model of a monorail and test the results. Students will learn that there may be more than one solution to a problem.

Time Frame

2 class periods of 45 minutes each

Group Size

Small Groups

Life Skills

Thinking & Reasoning, Communication, Social & Civic Responsibility

Materials

Suggested materials in the bags: 2 balloons (suggested supplier: Loftus Novelty 865 South 200 East, SLC - #646 assorted airship balloons) 2 Rubber bands 1 strip of aluminum foil 2 paper clips 1 pipe cleaner (cut in half) 2 large drinking straws 2 napkins 4 popsicle sticks 1 clothespin Outside the bag - but supplied to the groups is about 24" of electrical tape and a scissor.

Background for Teachers

When students arrive for class, the teacher will need to have the problem solving activity ready. Pieces of monofilament fishing line need to be strung between two walls approximately 25 feet apart (the lines can be stretched after roll call while explaining the days activity). The monofilament line can be fastened with eye hooks to boards in vises of a shop bench or in the wall using plastic anchors and eye hooks. Fishing swivels are tied to each end of the monofilament line to fasten the line to the eye hooks. To help prevent the occasional accidental breaking of the monofilament line small springs can be fastened to the swivel. The springs can then be fastened to the eye hooks. This gives the line additional flexibility, but allows it to remain taught for the activity. Note: The fishing swivel should be small enough to fit into the plastic straws being used in the activity. Place the class into groups of 4 to 6 on the day of the activity. You will need to have a monofilament line run for each group. For a class of 30, this would be six lines. Lines can be wrapped on wooden sewing spools for storage. The images on this document come from a variety of sources. They are either public domain, royalty fee, created by the author, or used by arrangement with the copyright holders. No permission is granted for the copying or re-use of any images used in this document, copyrighted or otherwise. Land Transportation - Monorail Design© Mike Breen - Author of document. USOE has purchased rights to the document which gives individual teachers within the state of Utah rights to print this document for use in their classes.

Student Prior Knowledge

It is suggested that students read the booklet prior to activity.

Intended Learning Outcomes

Practice problem solving skills and explore ways to develop independence and take responsibility. Explore the Transportation technologies used in our world. Use career information to explore various occupations of personal interest. Practice skills to function effectively in a group. Identify school

courses that support career interests.

Instructional Procedures

Day 1 : 1 day Class reads the booklet with the instructor providing guidance on who reads. Questions on the worksheet are answered with each student working on their own. Each student is able to use a booklet to look up the answers as the booklet is read. Question #10 can not be answered until after the activity so students will not hand in the worksheet yet. Day 2: Instructor has room set up except for lines as students enter the room. Students are given directions on the goals for the day and quickly put in groups. Monofilament line is stretched out and students are given the materials in the bags to work with. Students work on the problem. Day 3: 5 - 10 minutes - Class discussion on the solutions to the problems and the work sheet is turned in with question # 10 answered. The You Tube site I post on my blog. I let the students watch it from there on their own time. It gives you a great idea of 250 miles per hour as you zoom by vehicles on a major traffic roadway.

Assessment Plan

Students get two separate grades. They receive one grade for testing their monorail, and another grade for the completed worksheet.

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