Mechanical Advantage of Levers

Summary

Students will experimentally determine the mechanical advantage of a lever.

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Materials

- ruler
- fulcrum
- mass weights
- spring scales

Student Prior Knowledge

Students need to know what a fulcrum, lever arm and mass are. They should know that resistance is the weight or mass and effort is the force as measured on a spring scale. Introduce mechanical advantage as the length of the effort arm divided by the length of the resistance arm.

Instructional Procedures

Write the question on the board: What determines the best mechanical advantage of a lever?
Show students how the spring scale can be used to measure the effort force. The lever should be near the edge of the table so that the spring scale can lift the mass:
Tell students they will be designing three experiments to look for an answer to this question.
Show them the materials available. A stopper can be used as a fulcrum. Ask the students to draw their experiments on a piece of paper.
Give students time to perform their experiments.
Have each group of students describe their findings.
Ask students to calculate the mechanical advantage of each of their levers by dividing the length of the effort arm by the length of the resistance arm.

Assessment Plan

Scoring Guide

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1. Students participate in appropriate manner……...4
2. Students design and test three experiments to answer the question……4
3. Students are able to clearly describe their findings……..4
4. Students correctly answer questions……4

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

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Utah LessonPlans