

8th grade
Standard 4, Objective 3

Title: Learning About Levers

Description: Students will design experiments to answer the question: What is the relationship between the length of lever arms and the mass placed on them?

Materials: rulers, many rubber stoppers of different sizes, balances, optional student sheet (see below)

Time Needed: 50 minutes

Background Knowledge: Students need to know what a fulcrum, lever arm and mass are.

Procedures:

1. Write the question on the board: What is the relationship between the length of lever arms and the mass placed on them?
2. 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. If you are using the student sheet show students where they will draw or describe their experiments. If they are writing their own sheet, have them write the question and organize their paper.
3. Give students time to perform their experiments.
4. Have each group of students describe their findings.
5. Have students answer the questions.

Scoring Guide

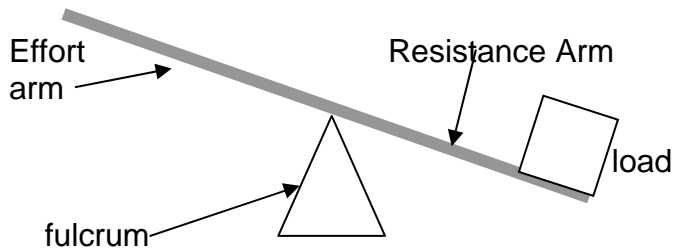
1. Students participate in appropriate manner.....4
2. Students design and test three experiments to answer the question.....4
3. Students are able to clearly describe their findings.....4
4. Students correctly answer questions.....4

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Learning About Levers

Introduction: A lever is a simple machine that makes work easier. Levers are all around us. A lever has parts that are labeled below:



In this activity you will answer the question:

What is the relationship between the length of the lever arms and the force needed to lift the load load?

Materials: ruler, stoppers or other weights, spring scale

Procedure:

Design three tests that help you answer the question above. Draw and describe each test below:

1.

2.

3.

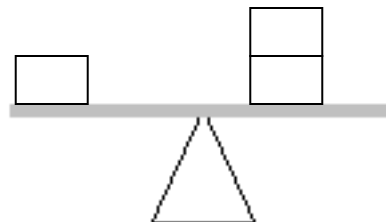
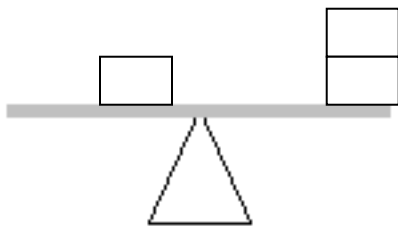
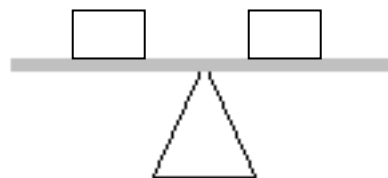
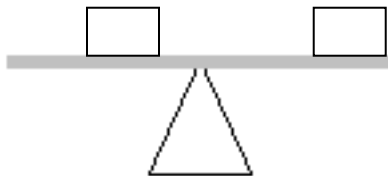
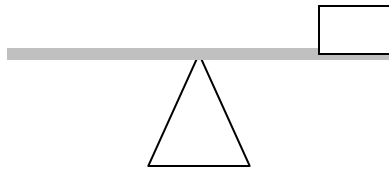
Summarize what your experiments have shown:

Analysis questions:

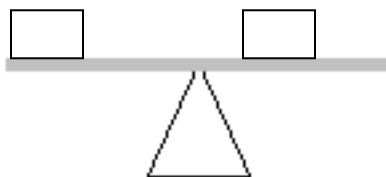
1. What is the relationship between the length of the lever arms and the force needed to lift the load?

2. Draw an arrow to show what will happen in each of the following situations:

a.



3. A 10 gram weight was added to the weight on each side of this lever. The lever was balanced before the weight was added. What will happen to the lever?



Conclusion: