SCENARIO		
Title	The principle of two-arm lever	
Summery	A lever is a beam connected to ground by a hinge, or pivot, called a fulcrum. The ideal lever does not dissipate or store energy, which means there is no friction in the hinge or bending in the beam. In this case, the power into the lever equals the power out, and the ratio of output to input force is given by the ratio of the distances from the fulcrum to the points of application of these forces. This is known as the law of the lever	
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Didactic objectives				
Check the balance of the lever				
Physics☒	Mathematics☒	Information Technology☒	Robotics☐	Programming☒
Education Level:	10-12 years☐	12-14 years☒		

Problem Statement

The mechanical advantage of a lever can be determined by considering the balance of moments or torque, about the fulcrum. If the distance travelled is greater, then the output force is lessened.
Assuming the lever does not dissipate or store energy, the power into the lever must equal the power out of the lever. As the lever rotates around the fulcrum, points farther from this pivot move faster than points closer to the pivot. Therefore, a force applied to a point farther from the pivot must be less than the force located at a point closer in, because power is the product of force and velocity

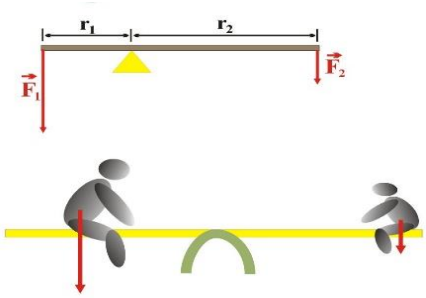
BOM (Bill Of Materials needed)

Computer, program Scratch.

Activity description

The following steps are programmed using Scratch:

1. Basic work scheme



2. $F_1 = m_1 \cdot g$
   $F_2 = m_2 \cdot g$
   $the\ lever\ will\ be\ in\ balance\ when M_1 = M_2,$
   where M_1 – effort moment F_1, $M_1 = F_1 \cdot r_1$,
   M_2- effort moment F_2, $M_2 = F_2 \cdot r_2$,
   Can be calculated r_2, $r_2 = \frac{F_1 \cdot r_1}{F_2}$,
3. Changing m_1, m_2 and r_1, calculate r_2.

Resources

1. To analyze the obtained experimental results.
2. Draw conclusions: what determines the law of the lever?

Students' Evaluation

The first level of achievement.
With the help of a teacher, he performs the study, measures the mass and lever arm, calculates the moments of force, and selects the appropriate lever arms to keep the lever in balance.

The second level of achievement.
Independently conducts research, concludes, and explains the results. It is able to express thoughts clearly in writing.

Third level of achievement.
Students are able to formulate an answer, properly use meaningful concepts (lever, lever support, force, moment of force, law of lever). Able to perform calculations well and lay out units.

Bibliography

Handbook for 8 class

Scalability

Mathematics: Understand and use tables and formulas.
Information technology: Scratch program.

More information

This topic can be used to explain the operation of other simple mechanisms.