New York Balance

with Dr. Frank

Combining Math and Physics!

Concepts such as greater than (>), Less than (<), equality (=) are readily apparent, and algebra and calculus methods come to life!

Description: A sliding pivot and stand, a 50cm measuring stick, two sliding clamps, a 50g wt, and a 100g weight.

Experiment 1: If I place the pivot at 25cm and put the 50g weight at the "10cm" mark, where will I have to put the 100g weight to balance the sides?

Prediction: _____ *Actual Value:* _____

Experiment 2: If I place the pivot at 25cm and put the 50g weight at the "5cm" mark, where will I have to put the 100g weight to balance the sides?

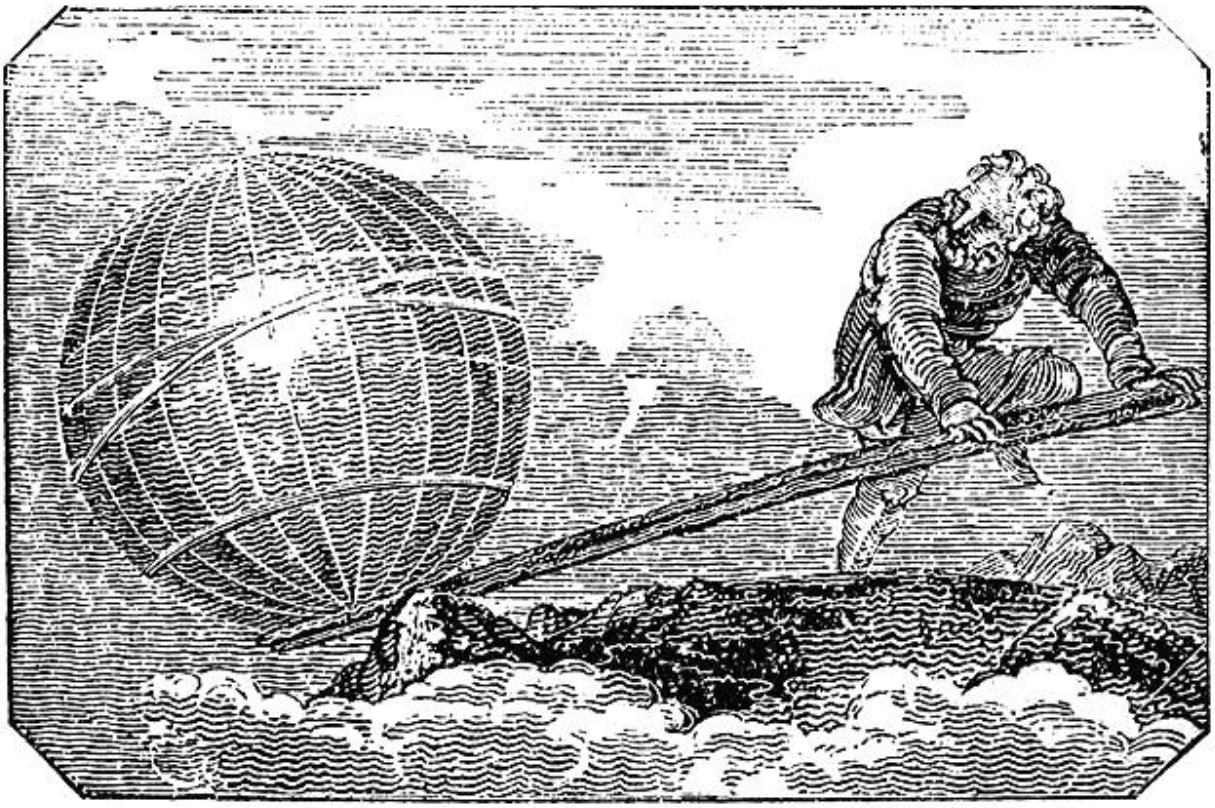
Prediction: _____ *Actual Value:* _____

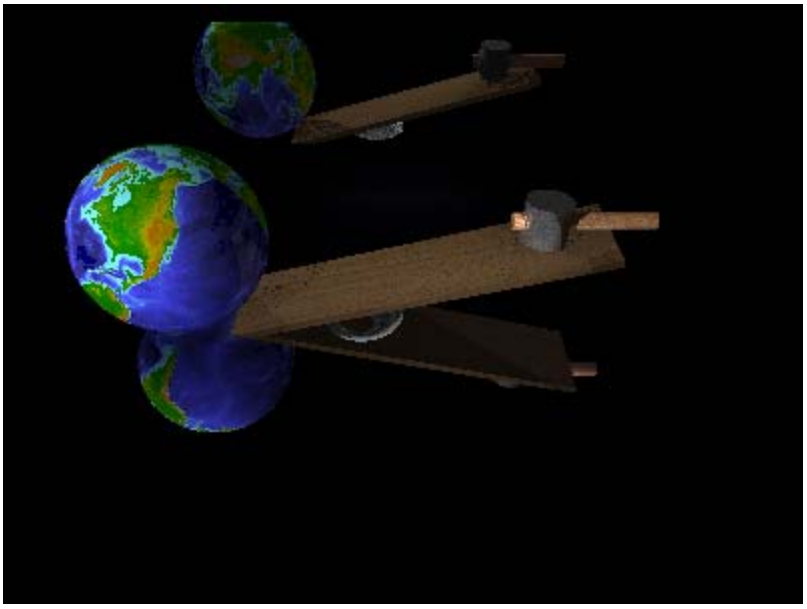
Experiment 3: First, weigh the stick, then answer: If I remove the 100g weight and slider and place the 50g weight at the "5cm" mark, where will I have to put the pivot to balance the sides?

Prediction: _____ *Actual Value:* _____

Questions

1. Why do the actual values differ from the predicted ones?
2. What is the weight of a sliding clamp?
3. Are there practical applications of these principles?

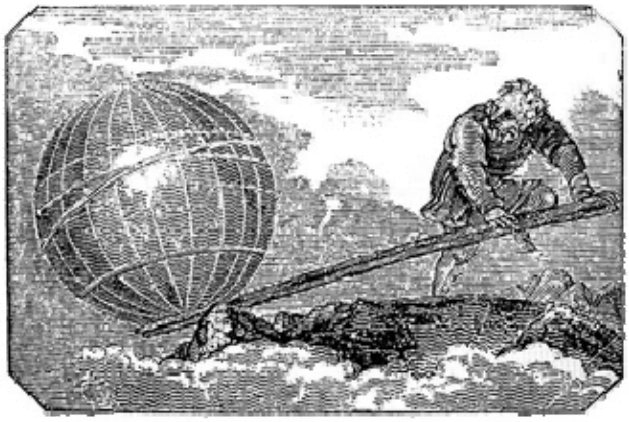


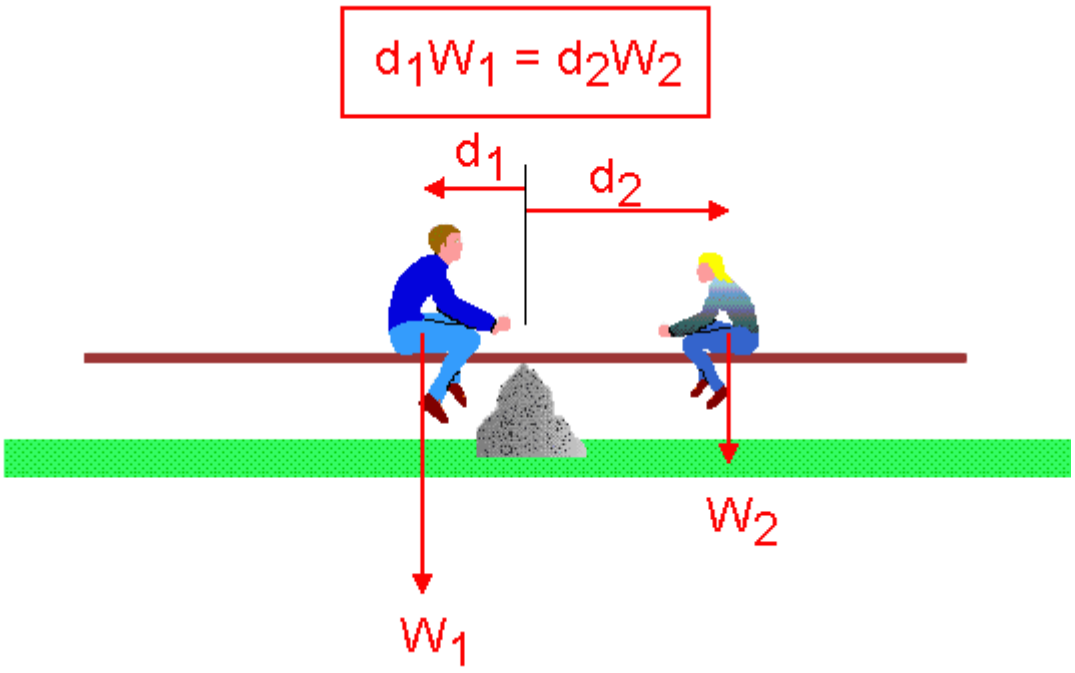


Give me a fulcrum," Archimedes is reported to have said, "and a place to stand—and I will move the world."

"Give me a place to stand on, and I will move the earth."

quoted by Pappus of Alexandria in
Synagoge, Book VIII, c. AD 340





the 140 lb boy 2 feet from the fulcrum (center of gravity)
balances
his 70 pound sister 4 feet from the fulcrum

$$2 \times 140 = 4 \times 70$$

http://physics.weber.edu/carroll/Archimedes/lever.htm