Finding Poise with St. Patrick

Experiment Express

STEM Field of Study

Technology

Engineering

Specific STEM Area

Physics

Age Group

All

Cost

$0 - $5

Time

30 minutes

Materials

1 Large Funnel; Ruler, Various Change (pennies, nickels, dimes, quarters)

Safety

It's a good idea to have an adult nearby

IEP Goals

Academic

Behavioral

Motor

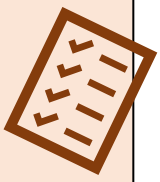
Social

Question:

Can you create a fulcrum (see definition below) and what household items can you use to make it?

Hypothesis:

Before you do this experiment; try to predict the answer to the question above. Write down your Hypothesis in your logbook



Instructions:

1. Gather all your materials together.
2. Review all Safety Precautions.
3. Using the funnel, flip it upside down so the wide section is on a table.
4. Place the ruler on the small narrow spout of the funnel and make sure it balances.
5. Taking two pennies, place one on each side so the ruler continues to balance. You may have to take the ruler off the funnel first, place the pennies equally distant from the center and then try to rebalance the ruler on the funnel.
6. Move both pennies toward the center of the ruler and try to balance the ruler on the funnel. After you moved both near the center and balanced them, move only one away from the center of the ruler and observe.
7. Now place a penny at one end of the ruler and a nickel at the other end. However, this time move the nickel closer to the center until the ruler is level and balanced.
8. Try using different change, try to maintain a balanced ruler. For example, place a quarter on one side and try to balance the ruler with a change on the other.

Foraging for Fulcrums! One important word you should learn is: Fulcrum. A Fulcrum is a pivot on which a lever is supported, rests and moves around. For example, the center portion of a See Saw is a fulcrum. What we want you to think about is finding more fulcrums in your home, community or school! So, time to go on a scavenger hunt and Foraging for Fulcrums. Make sure to show us what you found at: www.stemwithsaints.org

Think about it!

Did you know? When St. Patrick was a teenager, he was kidnapped by Irish raiders and spent several years as a slave / indentured servant. After escaping to France in his 20's he became ordained as a priest and went back to the very country that enslaved him. To learn more about the Patron Saint of Engineers, St. Patrick, go to: https://saintpatrickscathedral.org/saint-patrick

Finding Poise with St. Patrick

Post Experiment Questions for Adults to ask:

1. How difficult, or easy, was it to maintain a balanced ruler using only pennies?
2. What did you have to do in order to maintain a balanced ruler using the pennies?
3. How difficult, or easy, was it to maintain a balanced ruler using the penny and the nickel?
4. What did you have to do in order to maintain a balanced ruler while using the penny and nickel?
5. In Step #8 of this experiment, you were invited to use a variety of change; however, you had to maintain a balanced ruler. What coin combination to you use in order to balance the ruler?

Discussion of Results / Post Experiment Answers:

1. Answers will vary, however, your student may indicate it was slightly difficult or tricky to balance the ruler with the pennies.
2. For the ruler to remain balanced, the pennies must be equidistant (equally distant) from the center – regardless of how close or far.
3. Answers will vary, however, your student may indicate that balancing the penny and nickel proved to be more difficult. Your student had to place more effort in finding the right balance.
4. In order to balance the penny and the nickel, the nickel will have to be closer to the center and the penny will be further away from the center of the ruler.
5. Answers vary. the goal is to discuss the various techniques your student used in order to maintain a balanced ruler.

Draw your own conclusion:

Have you ever seen the large cranes used to construct very tall buildings? These large cranes appear as though they're off balance and you may be wondering why they don't tip over. We do too! So, based on your experiment, and maybe a little bit of research at the library- we want you to tell us how the large cranes function and, more importantly, why they don't tip over! We can't wait to hear (learn) what you discovered at: www.stemwithsaints.org

Expansion Experiments:

Try moving this experiment outdoors! The perfect place to try this experiment is at the playground with friends and family! Give it a try and let us know how you did at: www.stemwithsaints.org

Log your work:

Go for it!

What a great chance to log a unique experiment. This activity is slightly challenging, but you can do it! Try recording each effort to balance the ruler. You can also take a picture of your Balancing Act and send it to us at: www.stemwithsaints.org.

Real World Application:

Engineering

Math

Physics

Construction

Force / Load / Effort

Additional Resources:

https://educationpossible.com/science-activities-learn-levers/

Hands-On Science: Forces and Motion by Jack Challoner (Author), Maggie Hewson (Author)

Motion: Push and Pull, Fast and Slow by Darlene Ruth Stille (Author), Sheree Boyd (Illustrator)