Curiosity Guide #803
Balance and Stability
Accompanies Curious Crew, Season 8, Episode 3 (#803)

Design a Squooshy Ball Structure

Description
Design and build a balancing ball structure!

Materials
• Squooshy ball
• Wooden skewers
• Toothpicks
• Scissors
• Gumdrops
• Straws in assorted sizes
• Modeling clay
• Miniature marshmallows
• Play-Doh
• Ruler

Procedure
1) Use the available materials to build a stable structure that will support a ball at least 12 inches above the surface of the table.
2) Plan your structure.
3) Build and test the design.
4) Redesign as necessary.
5) What makes your structure stable?
6) Can your structure withstand a slight disturbance without making the ball fall or the whole structure collapse?
My Results

Explanation
For an object to be stable, the system’s center of gravity needs to be in line with its base of support. However, the ball has a significant amount of mass compared to the skewers and other items. Raising the ball up by twelve inches makes the center of mass and center of gravity much higher. A higher center of gravity has the potential to be unstable. Some structural designs increase stability. For example, a wider base or the inclusion of triangular supports could help. In architecture, triangle supports add stability and stiffness to distribute weight more effectively to the base.

Think about this! You had to think about the mass of the ball in order to create balance and support. A larger base is one solution to make structures more stable. We can see this in racecars, too. Formula 1 cars have a broad base and sit very low to the ground in order to lower the center of mass and improve stability. That’s really important to prevent the car from rolling when going into a curve at over 200 miles per hour. Now that’s a great stable design!

Parents and Educators: use #CuriousCrew
#CuriosityGuide to share what your Curious Crew learned!

Curious Crew is a production of Michigan State University.
Learn more at WKAR.org.
© MSU Board of Trustees. All rights reserved.