

Three Forks and a Cork

Teacher's Guide

The Initial View (Introducing the Activity)

Give the students the three forks, the push pin and the cork. Tell them to balance these on their index finger. Someone in the group may have seen the trick and that's ok, since they will *immediately* begin teaching the others how to do it with their successful apparatus! (Oooh, we just loooove self-teaching, don't we???)

Take a Deeper View! (More Science)

The balance point was your finger, but in science this point is actually called the **Center of Gravity**. This is the place where the **Mass** (almost the same as **Weight** to the Earthbound) seems to be concentrated. The rule is that **Forces** all go to and from the center of gravity while they're doing their little force thing! The student felt this rule quite nicely when the fork was tapped. They felt the whole thing wobble and a force (**Push** or **Pull**) acting on their index finger! The kids have felt the same thing on the playground when they hit the softball or baseball on the bat's handle instead of in the fat part of the bat. (They will gladly tell you how much their hands stung from the vibration, won't they?) This is the result of the bat *attempting* to send its force to and from the center of gravity, but some poor kid's hands were in the road of the transfer! Ouch! When **Torque** (a twisting force) is calculated using the math, ($T = F \times D$) the force used is multiplied by the distance from where you put in the force. That's why a longer bat swung by a bigger person hits the ball so far!

More and Bigger Views! (Additional Classroom Ideas)

1. Try the same experiment with two forks, or with as many as the kids can cram in place and get the whole thing to balance! CONTEST TIME!!!!!!
2. Repeat the experiment with an apple, an orange, or a rubber ball as the central balance point. Not as easy. Possibly metal forks would help this part out a little better.
3. Torque HUNT!!! Go around the home, school, or community and have the kids bring back individual examples of torque in action! (Start with their fingers, arms, and legs!!!)
4. Go out on the playground and experiment with torque on the teeter-totter or the swings. Have the kids write about the experiments to describe the torque they felt!
5. Have the kids write about their favorite sports and tell where they use torque in playing this sport. If they can, tell how they could increase the torque in any sport.
6. Make a torque bulletin board from the torque hunt results.
7. List all the hand tools kids can find around their home, folks' business, or school. Decide if there is torque involved in any of them.
8. Use a ruler which has a hole in the middle. Suspend this by a string. Hang equal weights from the ruler. Notice the distances from the support string are the same.
9. Repeat #8 with two weights, one of which is half as much as the other one. Notice now the distance to the lighter weight is twice the distance of the heavier weight, that's torque!
10. Try the activity again, only this time turn the forks the opposite direction.

Answers

1. (the other forks balanced out the push you put in) 2. (you felt the push from your finger getting sent to the other forks)