ACT | *Why So Difficult?* | Name | Period

PURPOSE

To illustrate and feel the qualitative differences between the location of of a mass on a lever arm.

MATERIALS

___meterstick ___meterstick clamp ___1-kg mass ___mass hanger

DISCUSSION

Torque and force are sometimes confused because of their similarities. Their differences should be evident in this activity.

PROCEDURE

Step 1: Hold the end of a meterstick in your hand so that your index finger is at the 10-cm mark. With the stick held horizontally and parallel to the ground, position the mass hanger at the 20-cm mark, and suspend the 1-kg mass from it. Try rotating the stick to raise and lower the free end of the stick without moving the location of your hand.

1. Describe how easy or difficult it is to do this.

Step 2: Move the mass hanger to the 20-cm mark. Rotate the stick up and down about the pivot point (your index finger) as before. Repeat this procedure with the mass at the 40-cm, 60-cm, 80-cm, and 95-cm marks.

2. Describe the relationship between the distance of mass from the pivot point (your wrist) and the "easiness" of rotation.

ANALYSIS

3. Does the weight of the mass increase as you move the mass away from the pivot point (your index finger)?

4. If the weight of the mass is not getting any larger, why does the difficulty in rotating the stick increase in Step 2?

Tech ACT	**A Balancing Act**	Name	Period

Directions

1. Go to https://phet.colorado.edu/
2. Search for "Balancing Act" and click Play.
3. Select the "Game" mode
4. Do each level and get at least 5 out of 6 stars from each level.
5. Get a stamp for each level that you have complete successfully.

Stamp for Level 1	Stamp for Level 2	Stamp for Level 3	Stamp for Level 4

Summing Up Questions

1. Use complete sentences to describe how this "balancing act" works. When will the two sides balance? Do not use equations.

2. Work together as a group to come up with an equation that fits your description above.