Building a Mobile Activity

Purpose: To practice calculating torques of various sized objects and of course make cool mobiles.

Procedure and Data:

1. Select 1 large object, 1 medium object and 2 small objects. (this does not need to be exact, just only choose 1 large object)
2. Measure the masses of all 4 objects:

|  |  |  |
| --- | --- | --- |
| Object | Shape | Mass (g) |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

1. Grab 1 large wooden dowel, 1 medium thick dowel and 1 thin dowel. Tie fishing line in the middle of each dowel.
2. Measure the masses of the thin and medium thick dowel.

|  |  |
| --- | --- |
| Dowel | Mass (g) |
| Thin |  |
| Medium thickness |  |

1. Draw a diagram of your plan for your mobile and show the necessary calculations below for the placement of the 4 objects. Don’t forget to include the weight of the dowels when necessary.

Post Activity Questions:

1. Five identical keys are suspended from a balance, which is held horizontally as shown. The two keys on the left are attached to the balance 6 centimeters from the pivot and the three keys on the right are attached 5 centimeters from the balance.

What will happen when the person lets go of the balance beam? Explain.

1. A 200 g block is placed 1.3 m from the fulcrum and a 150 g block is placed at 1.7 m from the fulcrum on the other side. Where must a third block (with mass of 50 g) be place so the lever is balanced? **(0.1 m on the 150g side)**
2. A uniform plank is placed with a pivot at its center. A block is placed on the plank to the left of the pivot, as shown in the figure above. A student is asked to place a second block of greater mass on the plank so it will balance when horizontal. Which of the following quantities are needed to determine where the second block should be placed? Select two answers.

(A) The mass of the plank (C) The length of the plank

(B) The mass of each block (D) The distance from the pivot to the left block

1. A beam with mass M and length L is sitting on 2 pivot points separated a distance l apart where l = ¾L. A dancer of mass m walks across the beam. At what value of x will the beam being to tip? Derive an equation for x in terms of M, m, L and l.

