

1. A child holds a 750g fish out of the water on the end of a 1.40m long fishing pole. Find the torque exerted by the weight of the fish about her hands if (a) she is holding the pole horizontally and (b) if she is holding the pole at 30.0° above the horizontal.

2. (a) Find the rotational inertia of a 150g baseball with a radius of 3.50cm assuming it is a uniform solid sphere. (b) Find the torque that a pitcher must exert on it to get it to go from rest to a spin rate of 2400rpm in the 0.200s it takes to “snap” their wrist.

3. An oxygen molecule consists of two oxygen atoms. The moment of inertia about an axis perpendicular to the line joining the two atoms, midway between them, is $1.9 \times 10^{-46} \text{ kg m}^2$. Find (a) the mass of an oxygen atom in kilograms and (b) the distance between the atoms in a molecule.

4. (a) Find the rotational inertia of a 100g meterstick pivoted one-third of the way down by applying the equation for the rotational inertia of a stick pivoted at the end two times. (b) Find the rotational inertia using the definition and integrate.

