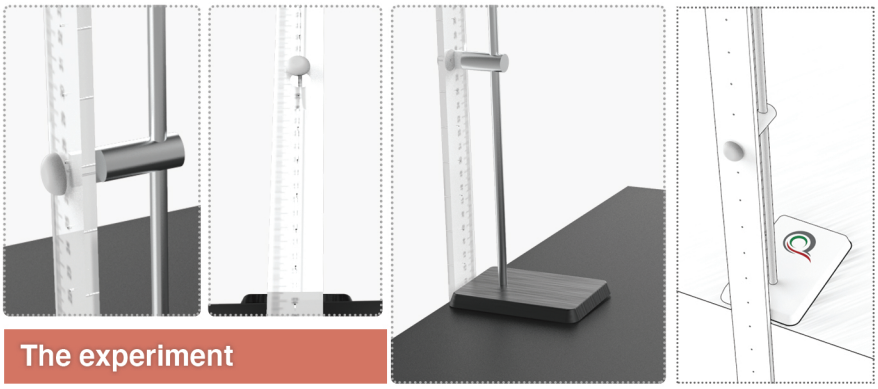
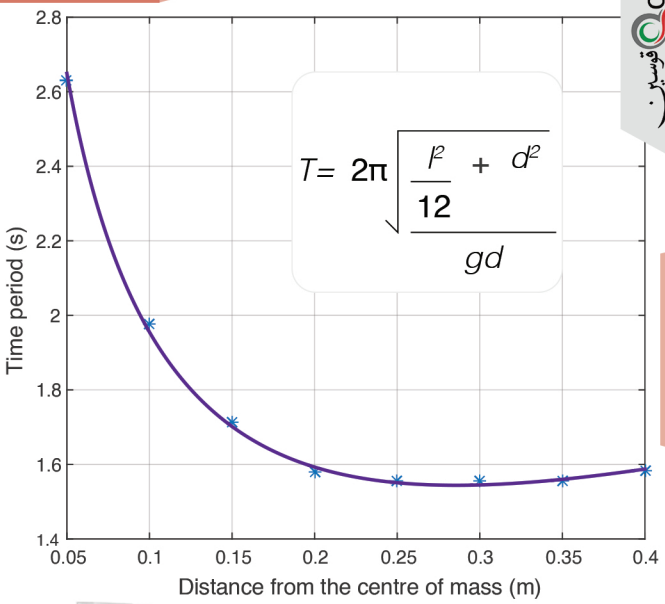
The Swinging Rod



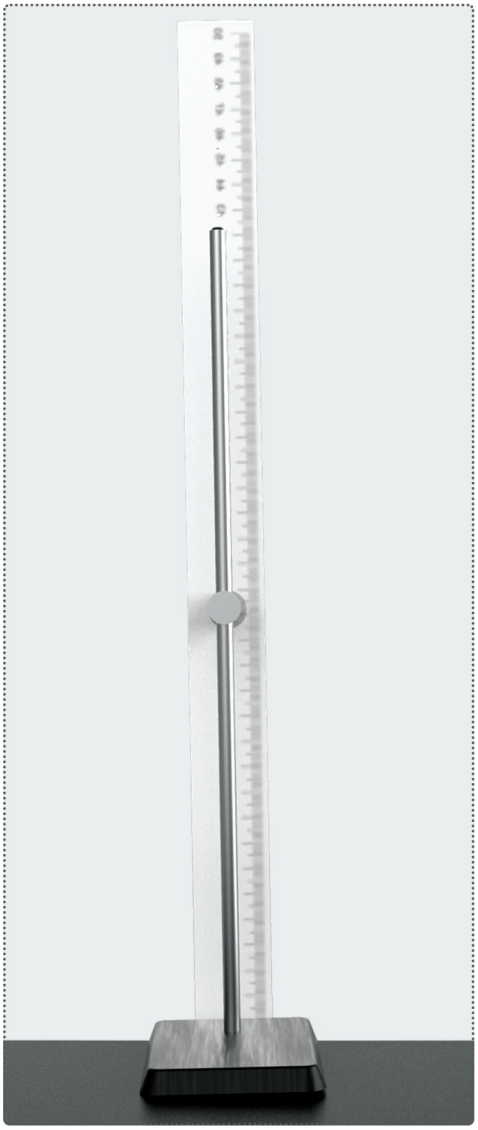
The experiment

- Mathematical model of a simple swinging rod.
- Investigating period, motion and moment of inertia.
- Application of the parallel axis theorem.
- Comparing theoretical predictions with exxperimental observation.
- Calculating uncertainities.



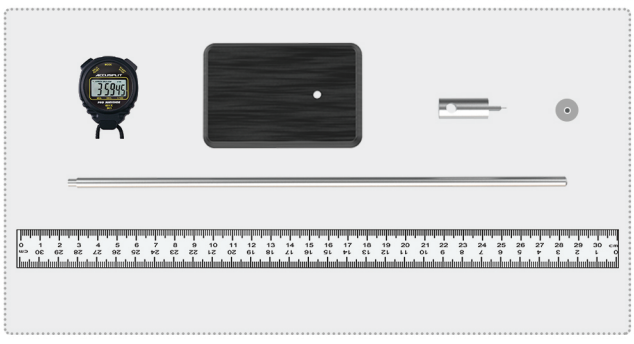
How does it work?

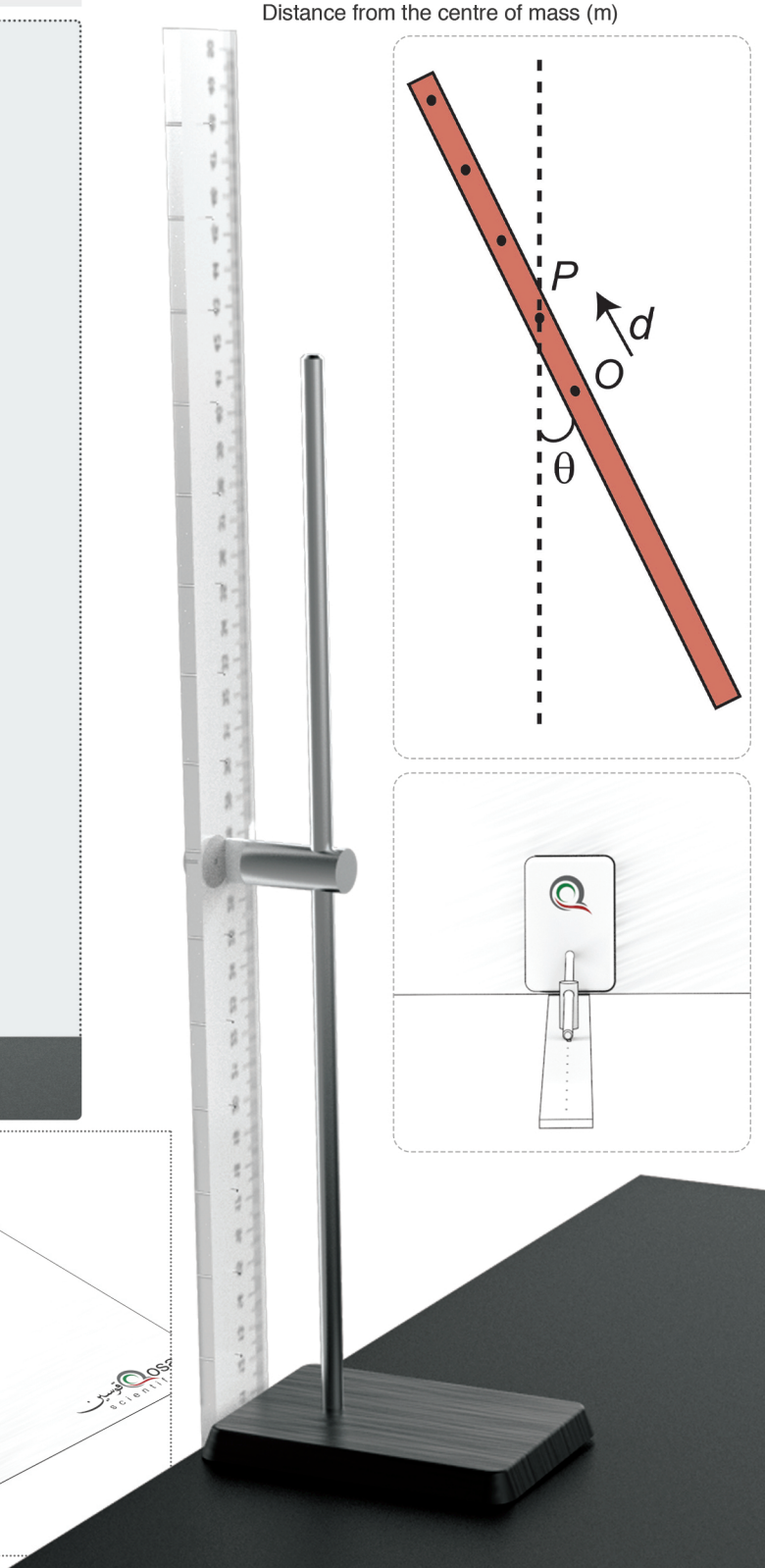
In this experiment, the object of interest is a rectangular wooden rod, specifically, a meter rule of mass *M* and length *L*. The rod can be hung on-to a pin pivoted on a firm post. To experiment with different moments of inertia, there is a series of holes drilled through the midline of the rod. As shown in the figure, the position of the pin is P and the rod is made to swing in a vertical plane about this pivot. The center of mass is, of course, the geometric center of the wooden rod, point O. Students are required to measure the time period *T* of the oscillation with a stopwatch as the pivot P is varied and plot a graph between *T* and $d = \overline{OP}$. These observations are analysed for uncertainities and compared with the mathematical model.



Parts included :

- **Stand**
- **Pivot**
- **Rod**
- **Stopwatch**





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