

LEARNING MATERIALS

Uphill Roller

One of the most fundamental laws of Physics is that all objects tend to minimize their potential energy. In the presence of the gravitational field, this behavior manifests itself as falling down. Nevertheless, in an extended object, we use the center of mass to describe the overall motion.

In this experiment, the misleading shape of a cone is used in such a way that it seems the cone is moving upwards, however, the combination of the shape and the opening angle of the base create this illusion. In fact, this cone is also falling down and minimizing its potential energy.

Questions for testing comprehension:

- (1) What is the maximum slope that the cone can still roll upward?**
- (2) How will the cone and the cylinder fall if they are heavier (have more mass)?**

Further reading and materials:

- (1) <https://plus.maths.org/content/defying-gravity-uphill-roller>**