

Big Buck Bunny—Pendulum

Big Buck Bunny is about an overgrown and very sensitive bunny that takes vengeance on the forest bullies, who are led by a cruel flying squirrel. This movie is created by the Peach Open Movie Project, which offers this movie at www.bigbuckbunny.org.

In this scene, Big Buck Bunny is preparing for the rodent bullies, and he is able to take one out with a log suspended with ropes. Ask the students how to determine the length of the ropes holding the log.

The trap is set up as a simple pendulum whose period is given by:

$$T = 2\pi \sqrt{\frac{L}{g}}$$

From the clip, one can estimate that $\frac{1}{2}$ of the period is about 10 seconds, so the total period of the pendulum is 20s. Solving the above equation for L,

$$L = \frac{T^2 g}{4\pi^2} = 100 \text{ m}$$

As follow-up, ask your students these questions:

- What happens to the period of the pendulum if you increase the length? (it increases)
- What happens to the period of a pendulum if you move it to the Moon? (it increases)
- What happens to the period of a pendulum if you pull the bob back further? (nothing)