

## LEARNING MATERIALS

### Two Apples

Pendulums are some of the simplest tools in physics, and there are different types of pendulums. In this experiment we use a string and two masses to build a coupled pendulum. First, we study the resonance by starting with one pendulum, and we see the other pendulum interacts with the first pendulum and starts moving, however we cannot violate the conservation of energy, so when the second pendulum starts moving, the first one slows down. This transfer of the energy creates a fun experiment.

In the second part of the experiment, we look at the fundamental behavior of pendulums. As the period of their rotation does not depend on how far we move them away from the lowest point, they hit the box at the same time. In fact, the rotation period only depends on the gravitational acceleration of Earth and the length of the pendulum.

#### Questions for testing comprehension:

- (1) What happens if we use two different size (mass) apples in both experiments?
- (2) What happens if we use two pendulums with unequal masses? What about unequal string lengths?

#### Further reading and materials:

- (1) <https://en.wikipedia.org/wiki/Pendulum>
- (2) <https://youtu.be/VjnfLaSVBEM>
- (3) <https://youtu.be/JWtsOiVxIIE>
- (4) <https://thekidshouldseethis.com/post/the-coupled-pendulum-wilburforce-physics-demonstration>