

Worksheet 3.6

1. Consider a coconut falling to the earth (ignore air resistance).
 - a. Identify the force(s) acting on the coconut.

 - b. Draw an interaction diagram that shows each of the force pairs.

 - c. Draw free body diagrams for the coconut and for the earth.

 - d. Which object feels the greater force? Which has a greater acceleration?

2. Now consider the coconut as it hits the ground.
 - a. Identify the forces acting on the coconut.

 - b. Draw an interaction diagram that shows each of the force pairs.

 - c. Draw free body diagrams for the coconut and for the earth.

- d. Which object feels the greater force? Which has a greater acceleration?
3. An athlete is running around a track balancing a baton vertically.
 - a. Identify the forces acting on the runner, baton, and earth.
 - b. Draw an interaction diagram that shows each of the force pairs.
 - c. Draw free body diagrams for the runner, baton and for the earth.
4. Which of the following qualifies as a “third law force pair” (according to Newton’s theory) for the downward gravitational force acting on a cup of water sitting at rest on a table?
 - a. the force of water tension at the surface of the water
 - b. the force of air pressure exerted by the Earth’s atmosphere
 - c. the upward normal force acting on the cup exerted by the table
 - d. the upward gravitational force acting on the Earth due to the cup of water
 - e. none of the above