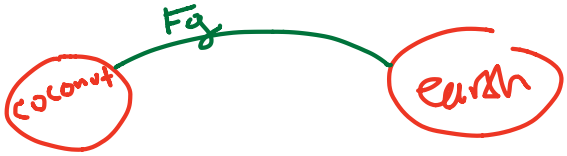
Worksheet 3.6

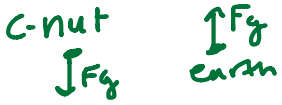
1. Consider a coconut falling to the earth (ignore air resistance).

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?

Same, coconut

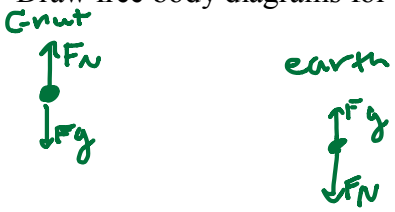
2. Now consider the coconut as it hits the ground.

a. Identify the forces acting on the coconut.

Fg & FN

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?

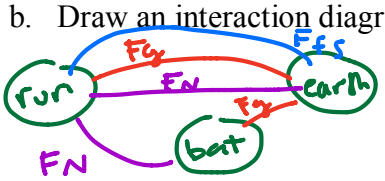
same Coconut

3. An athlete is running around a track balancing a baton vertically.

   a. Identify the forces acting on the runner, baton, and earth.

F_N, F_g, F_S

   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