

## Lab 6: Angular Momentum and Power

### Angular Momentum

**Be careful!** It's possible to lose your balance and fall down while doing these. Do the following experiments. First predict, using the idea of conservation of angular momentum, what will happen. (Each person in your group should do at least one of these. If no other groups are waiting for the rotating platform, everyone should try each.)

1. Stand on the ground. Spin of the bicycle wheel and hold it horizontally. Then get on the platform. Turn the bicycle wheel upside down.
2. Stand on the platform and hold the wheel. (The wheel shouldn't be spinning yet.) Then, hold the wheel horizontally and give it a spin.
3. Hold the two heavy weights and stand on the platform. Have someone give you a gentle spin. Move the weights in and out.
4. Stand on the platform and hold something heavy and unbreakable.
  - (a) Throw the heavy thing in such a manner that you end up rotating after the throw.
  - (b) Throw the heavy thing equally hard, but now throw it so that you don't rotate after the throw.

### Cartoon Physics

Consider the riddles posed on the handout. Ponder. Discuss. Come up with an answer. Then check your answer with me or on the answer sheet.

## Efficiency

A watt-meter is a device that measures how much power is being drawn by an electrical appliance. Take a look at the watt-meter and see how it works. We will use the watt-meter to measure the efficiency of various water-heating devices.

1. Measure some water into a styrofoam cup and place the cup in a microwave. Determine the temperature of the water. Turn the microwave on for a minute or so and measure temperature of the water and the amount of energy that the microwave used. How efficient is the microwave.
2. Measure some water and put it into the electric kettle. Eventually, the water will come to a boil. Once the water starts boiling, keep track of the energy used by the kettle. Let the water boil for five minutes or so. Then re-measure the mass of the water. (It should be less, since some has boiled away.) How efficient is the kettle?