
6-6: Flow in a Gravitational Field

Introduction

One of the important ideas in the study of fields is the idea of flow. If free to do so, matter flows from a point which has greater potential energy to a point that has less potential energy. How are these points defined for a gravitational field? What does flow look like in a gravitational field?

Materials

materials to construct water wheel, upper reservoir, lower reservoir, support stand, string.

Procedure

1. Design and create a stand-alone waterwheel using any materials you wish as long as it meets the following requirements.
 - a) The wheel is no larger than 10 cm in diameter.
 - b) The axle of the wheel is between 10 cm and 20 cm.
 - c) There are at least six evenly spaced blades on the wheel.
 - d) All materials will keep their shape when exposed to water.
 - e) The stand does not collapse when water is run over it.
2. Adjust the two reservoirs so that water flows out of the upper reservoir, over the waterwheel and into the lower reservoir. The flow should be steady (not trickling) and the reservoirs should be designed so that the waterwheel can be different distances below the upper reservoir.
3. Experimental conditions should be varied in the following ways:
 - a) The distance from the upper reservoir to the waterwheel could be changed
 - b) The rate of flow of water from the upper reservoir could be changed.
4. Record the speed at which the small weight rises for each set of experimental conditions created in step 3.

