

## **CIRCULAR MOTION – hand whirling (pssc)**

Also called 'CENTRIPETAL FORCE KIT' - pssc style

Cat: MF0850-001 hand whirling type

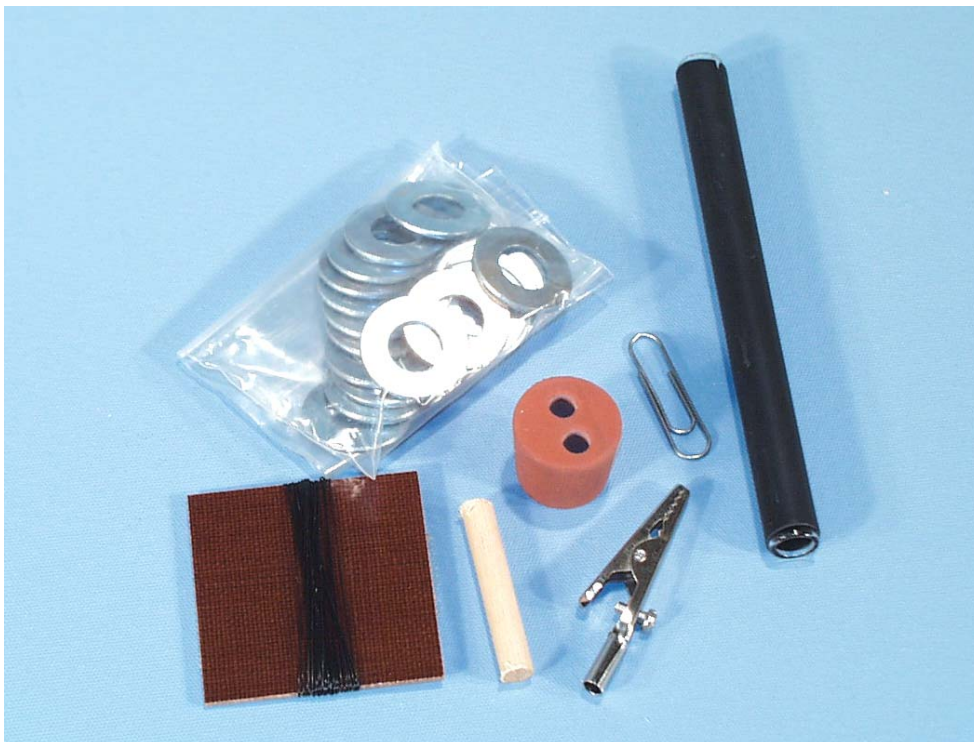
### **DESCRIPTION:**

The IEC **Circular Motion kit** is an old PSSC style and provides only a quite rough approximation of the laws of circular motion. It must be used out-doors and care must be taken with the whirling masses. This kit can be useful for the students to 'feel' the forces involved, however the IEC '**Circular Motion Kit**' (mini electric MF0849-001) provides a much more accurate and reproducible method for the study of circular motion.

### **KIT COMPONENTS LIST:**

- 1 pce Glass tube with plastic coating (used as a handle).
- 1 set 20x washers (used as weights).
- 1 pce Rubber stopper with 2x holes (used as the whirling mass).
- 1 pce Alligator clip (used as the marker on the nylon line).
- 1 pce Paper slide clip (used to support the washers).
- 1 pce Nylon line or filament, approx. 1.5m long.
- 1 pce Short wooden dowel (used to jam the nylon into hole in stopper).

### **MF0850-001 Circular Motion - hand whirling**



Physical size: 130x65x40mm LxWxH (pack size)

Weight: 0.14 kg



**ASSEMBLY INSTRUCTIONS:**

- Tie one end of the nylon filament to the paper clip and spread the paper clip wire so that it forms an inverted 'Vee' shape.
- Thread the nylon through the glass tube and then through one hole of the rubber stopper and back through the second hole of the stopper.
- Anchor the nylon into the second hole by pushing the short wooden dowel into the hole to jam the nylon filament tightly in the hole.
- Anchor the nylon filament around the wooden dowel or tie it off so that the rubber stopper cannot come off the nylon.
- Pull the stopper from the handle the distance that is the radius of the rotation that you are going to perform. Holding the nylon at this position, clip the Alligator clip to the nylon just at the bottom edge of the glass handle.
- Thread some washers over the paper clip on to the nylon line so that they rest on the upper side of the clip and cannot fall off.

**THE EXPERIMENT:**

- One student whirls the stopper around the head so that as the rubber stopper makes a larger and larger circle, the washer weights are pulled up. The weight of the washers equals the force exerted by the whirling stopper. **Take special care regarding students walking into the path of the whirling masses.**
- Keep the whirling speed constant so that the Alligator clip marker remains just below the handle but does not touch the handle.
- Using a stopwatch, a second student times exactly how long it takes for 50 turns of the stopper whilst the Alligator clip is close to the handle but not touching the handle.
- Note the radius from the handle to the centre of the stopper, the mass of the stopper and dowel, the weight of washers and the time per rotation.
- Repeat the experiment using different forces. The force can be altered by adding washers to or removing washers from the paper clip support. The maximum force will be 20 washers.

Refer to classroom notes for formulae and calculations required.

**Designed and manufactured in Australia**