

# Educational Innovations<sup>®</sup>

#TOP-255

## Amazing Long-Spinning Top

When the top is spun on a hard surface, the spin accelerates and soon stabilizes at a constant rotation for hours. A blinking light on the top changes colors and produces various patterns. The outside surface of the top appears to be solid with no moving parts.

### Directions:

To Insert the Batteries:

- Gently grasp the shaft in one hand.
- Firmly grasp the outer rim of the top in the other hand.
- Gently wiggle the shaft back and forth in the direction of the two dark blue pins until the shaft piece comes off.
- Insert two 3v button batteries (#CR2032) with the POSITIVE (+) side upward.
- Replace the shaft cover, which is held securely by the friction fit of the two pins.

To Start:

Place the tip of the top upright on a smooth hard solid surface such as the bottom of an inverted drinking glass or a porcelain mug and spin the shaft between your fingers.

To Stop:

Pick up the top firmly by the shaft and set it down. It may be necessary to reposition the top until the light goes out.

### Explanation:

The top contains two button batteries, which provides the energy to power the top. The initial spin causes a small mass on the end of a spring to come into contact with a flat piece of metal on the inside rim of the top, thus completing the circuit. Contained in the top is a small motor that includes an eccentric weight. This spinning, vibrating motor is similar to those found in cell phones. After the initial spin, the acceleration of the top is accomplished by the transfer of energy from the spinning eccentric weight in the center of the top to the rotational energy of the whole top. The top soon stabilizes as the spin velocity couples with the resonance frequency of the vibrating disk. The blinking tricolored LED creates various patterns due to the persistence of vision. Your brain thinks it is seeing the light for about a tenth of a second after the light has moved to another place.

Replacement Batteries Available from Educational Innovations, Inc.: #BAT-51



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