MIND TREKKERS
RattleBack Lesson Plan

Amount of time Demo takes: 1:00-3:00 min

Materials:
1. Rattleback pieces

Set up instructions:
1. Take Rattleback objects and place them on table.
2. Spin object counterclockwise and object will continue to spin.
3. Spin the object clockwise and it will stop spinning that direction, rock from end to end, and then starting spinning in its preferred direction (counterclockwise).

SAFETY!
Safe Demo

Lesson’s big idea
- The plastic pieces have an asymmetrical ellipsoid bottom (center of mass does not follow the center line of the object), which when compared to the center-line from the long axis of the flat top, they are not the same (i.e. parallel) therefore it causes the piece to want to spin in a preferred direction.

Instructional Procedure
1. The piece can be spun either direction to exhibit the asymmetrical properties.
2. If you push the piece down on one of its ends it will begin to spin (this is because the asymmetry cause the piece to transfer the “rocking” motion to a spinning motion around the preferred direction.
3. The piece can also be used as a magnifier because it is translucent.
4. Spin object counterclockwise and object will continue to spin.
5. Spin the object clockwise and it will stop spinning that direction, rock from end to end, and then starting spinning in its preferred direction (counterclockwise).

Assessment:
1. Why was the piece made asymmetrically?
2. What ways can you make this piece spin?

Clean Up
Clean up between demonstrations if needed. When completely finished gather all materials listed for this demonstration and make sure everything is accounted for. If something was used up, broken or damaged, let someone know so it can get replaced or fixed.

References:
http://www.4physics.com/phy_demo/rattleback.htm
http://www.icefoundry.org/how-rattleback-works.php

http://en.wikipedia.org/wiki/Rattleback#History

National Standards:
5-8 Content Standard B: Physical Science, Transfer of energy, Motions and forces
9-12 Content Standard B: Physical Science, Motions and forces, Interactions of energy and matter