

**Newton’s Cradle**

**Activity #1**

**9-12**

# **Objective**

The purpose is to build your own Newton’s cradle that demonstrates conservation of momentum and energy using a series of swinging marbles.

# **Materials**

* Craft Sticks
* (6) Marbles
* (6) Beads
* String
* Elmer’s Glue
* Scissors (not included)
* Tape (not included)
* (Optional) Hot Glue Gun

# **Instructions**

* **Step 1** Glue (4) craft sticks together at the corners to make a square. Repeat with (4) more crafts sticks. Let dry. These will be the sides of the frame.
* **Step 2**Cut string into (6) equal pieces approximately 8” long
* **Step 3**Hot glue a bead to the center of one of the marbles. Repeat to end up with (6) separate marbles, each glued to the center of a bead.
* **Step 4** Thread string through the center of the beads.
* **Step 5**Make (6) marks along two craft stick every ½”. Make sure the marks are centered on the sticks.
* **Step 6**Tape one end of the strings with marbles attached along one of the craft sticks at each mark. Set aside.
* **Step 7**Using hot glue, assemble the frame. Take the two sides and hot glue a craft sticks perpendicular to each corner. The final frame will be a cube.
* **Step 8**Glue the craft stick with the taped string/marbles to one side of the frame.
* **Step 9**Glue the second marked craft stick to the opposite side of the frame.
* **Step 10** Tape the loose end of each string with a marble attached to the marked craft stick. Pull on the strings gently to make sure the marbles align. **The marbles must line up both horizontally and when viewed from the top.**

# **The Science**

Newton’s Cradle is a toy named after the very famous scientist, [Sir Isaac Newton](https://en.wikipedia.org/wiki/Isaac_Newton). It demonstrates a scientific idea called momentum.**Momentum is the force of an object as it moves.**  When you swing one of the marbles on the end, it collides with the marble next to it and the force of that collision travels through each of the other marbles until it reaches the last one, which swings upward. When that marble swings back down, the force travels through the marbles again.

