Straw Labyrinth

Left, right, right, dead end! Construct an elaborate marble labyrinth from everyday materials. Explore different physics laws as you design a challenging maze!

TEKS:
SCI 4/5.6 A: The student is expected to differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal.
SCI 6.8 A: The student is expected to compare and contrast potential and kinetic energy.
SCI 6.9: The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form.

Materials:
- Marble
- Marker or pen
- Paper or Styrofoam plate
- Ruler
- Scissors
- 10-20 straws
- Tape

How To:
1. Take out your paper or Styrofoam plate. Use a pen or marker to draw out a design for your labyrinth (see next page for an example). Make sure to label a start and finish! Also, make sure that your marble will easily be able to fit through the paths that you sketch.
2. Lay out straws along the lines of your labyrinth and use scissors to cut the straws to the correct lengths.
3. Use tape to secure the straws in place until all of the “walls” of your labyrinth have been created.
4. Now, place a marble at the starting point and test out your labyrinth. See if you can get the marble from start to finish just by tilting the plate. Challenge your family or friends to solve your labyrinth!
STEM Explanation:
The Labyrinth in Ancient Greece was built to house a monster called the Minotaur. The Labyrinth’s architect, Daedalus, made it nearly impossible to solve! Your labyrinth model is solvable, and it works because of a few different physics concepts. In physics, if an object causes change, it has energy. This energy can come in many different forms.

Stored energy is called potential energy. To store energy, work must be done, such as winding-up a spring, charging a battery, or, in this case, holding the marble just at the edge of your labyrinth. An object that has potential energy may release its stored energy to be transformed into other forms of energy. Kinetic energy is the energy of motion. Any object that has mass and is moving has kinetic energy. Once the marble is released into the labyrinth and begins rolling around, its potential energy is transformed into kinetic energy.

An important physics law is also demonstrated by your marble labyrinth. Newton’s Law of Conservation of Energy says that energy may be transformed from one kind to another, but it cannot be created or destroyed. This means that each marble in the labyrinth has a total amount of energy. It changes between potential and kinetic but never disappears completely. Take some time to challenge your friends and family to see who can solve your labyrinth using the most kinetic energy!

Career Connection:
Architects plan and design buildings for various uses. They use their scientific and mathematical knowledge of physics to understand building construction, while using their artistic abilities to design visually appealing structures. Architects are scientists, mathematicians, and artists.

Resources:
http://www.fabdiy.com/make-your-own-marble-maze/
http://www.tackyliving.com/cheap-n-easy-marble-mazes/
http://teachertech.rice.edu/Participants/louviere/Newton/law1.html
https://greece.mrdonn.org/theseus.html