



Circuits:

Snap Circuits

Supplies: Snap Circuits Kit, Laminated Design Sheet, AA Batteries
Follow instructions to create a simple circuit loop using materials provided.

Makey Makey

Supplies: Makey Makey, Computer, Play Dough, Laminated Controller Pad
Physical Implementation of Circuit Loops, need to figure out proper way to wire controller together to play Pacman. Also introduces concept of Insulated vs Conductive Materials.

ScribbleBot

Supplies: Plastic Recyclable "Body", 1.5V Motor, Rubber Band (Thick), Masking Tape, Markers, AA Batteries, Paper
Robotic construction as well as continued concept of physical circuits. Loop from the Motor to the battery with correct terminal linkages. Also introduces concept of Electrical Energy transferring into Mechanical Energy inside of the motor.

Coding:

Ozobot Bit

Supplies: Paper, Markers, Ozobot Bit
Visual coding through different colored markers allows Ozobot Bit to drive around space. Also following certain "Color Commands" will allow Ozobot to speed up, circle, and flash lights. Also introduction of Coding vs Programming and how machines can operate.

Tynker

Supplies: iPad with Tynker App installed
Tynker has basic coding guides (in the style of scratch) that allows you to build your own games and such. Introduces concept of Block-Based visual programming and storytelling. The lesson included in the app teaches kids how to complete a joke by programming dialogue commands.

Construction:

Stressful Structures

Supplies: Sheet of Paper, Scotch Tape, Heavy Book
Basic Engineering test where using a single sheet of paper, rolled into a cylinder, you can support the weight of a heavy book. Teaches initial concepts of Tension and Stress in the design of objects.

Marble Races

Supplies: Marble Races, Marbles

Engineering project where you need to complete the pipe system in a specific way so that the multiple systems do not cross paths. Replicates the real-world concept of Water Line/Waste Line in home construction.

Bridge Building

Supplies: Lego Pieces, Cars, 2 White Bins

Engineering Challenge - Bridge Construction using concepts of Tension and Stress to complete a Beam Bridge using Lego Pieces.

Patterns:

3D Shapes

Supplies: Toothpicks, Marshmallows

Construct 3D Shapes using toothpicks. Also reinforces triangle-construction concept and ideas of stress and tension.

Mystery Powders

Supplies: Microscope, 3 Petri Dishes of Salt-Tartar-Sugar

Need to match each powder (Numbered) to corresponding type. Uses text to convey the shape of powder so students have to recognize differences between the actual look of powders under microscope.

Lens Diffraction Glasses

Supplies: 4 Pair of Lens Diffraction Glasses, Microscope

See how the secret pattern on the Diffraction Glasses allows us to see multiple spectrums when we wear the glasses.

Waves:

Spectrum

Supplies: Box, Flashlight, Prism

Use the Prism and Flashlight to see the Spectrum and further learn about how Spectrums allow us to study Lightwaves more easily.

Tuning Forks

Supplies: Tuning Forks

Waves utilize vibrations but how they vibrate can tell us a lot about pitch. Participants can also see similarities between different tuning forks who all claim to be "C". Teaches ideas of Frequency and Amplitude in Sound Waves.

Plucked String

Supplies: Blue Bucket, Big Rubber Band, Masking Tape, iPad Tuner

Construct a Plucked String instrument and then use the iPad Tuner to see if the Pitch raises or lowers when the string is pulled tighter.