squishycircuits® ALIGNMENT TO NGSS STANDARDS

Standard	Description	Use in Squishy Circuits
1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Users can use buzzers with Squishy Circuits. The mechanical buzzer in particular can be felt vibrating back and forth and pushing it against a surface makes it louder.
1-PS4-2	Make observations to construct an evidence-based account that objects can be seen only when illuminated.	Users can use Light Emitting Diodes (LEDs) to light up their circuits. This light can illuminate dark areas so they can be seen.
1-PS4-3	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	Users can light an LED and insert objects in the light's path. Some things will let light through, other will not.
1-PS4-4	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance	Users can blink LEDs or beep the buzzers in a code to communicate. Users can also use different colors of LEDs (Green=Go, Red=Stop, etc).
2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties	Conductive and insulating doughs feel and look different because they have different recipes. They're both "dough" but act very differently when used in Squishy Circuits!
2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	Users can insert different objects in series with the circuit to see if they conduct electricity. Some materials will work good as conductors, others will not. But, both can be useful and should be chosen for the proper application.
K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Squishy Circuits can be modeled into any shape and a particular problem may determine the ideal shape.
K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Users may design different types of circuits such as series and parallel that both light an LED, but both circuit types have their strengths and weaknesses depending on the application.
4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	Squishy Circuits is directly focused on energy transfer through electrical current.
4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	Squishy Circuits uses batteries to power LEDs to create light, motors to create motion, and buzzers to create noise. These are all examples of energy conversion.
5-PS1-3	Make observations and measurements to identify materials based on their properties.	Materials can be grouped into their electrical characteristics and generalized observations can be deduced. For example, most metals are conductive and most plastics are insulating.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Users can be tasked with creating a circuit with given materials to turn on LED or similar.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Users may design different types of circuits such as series and parallel that both light an LED, but both circuit types have their strengths and weaknesses depending on the application.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Squishy Circuits models can be constructed and quickly adapted to account for potential failure points.