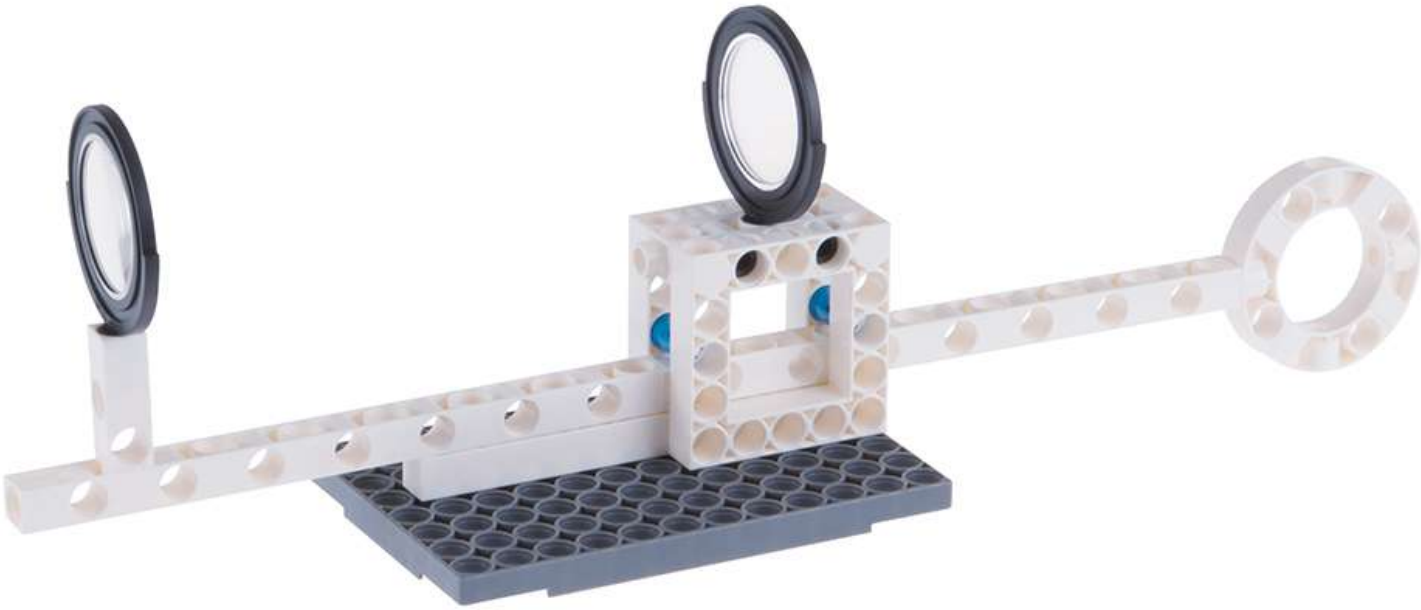
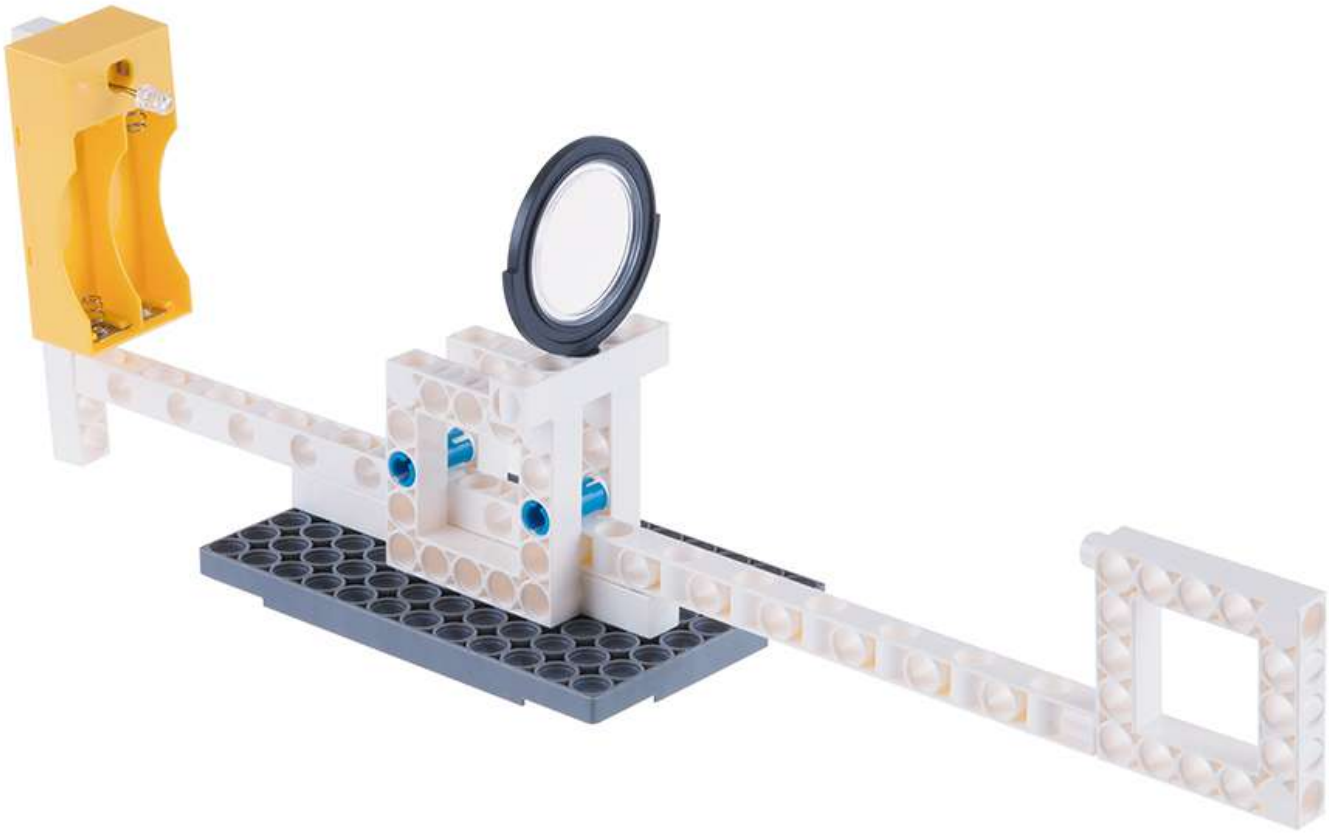
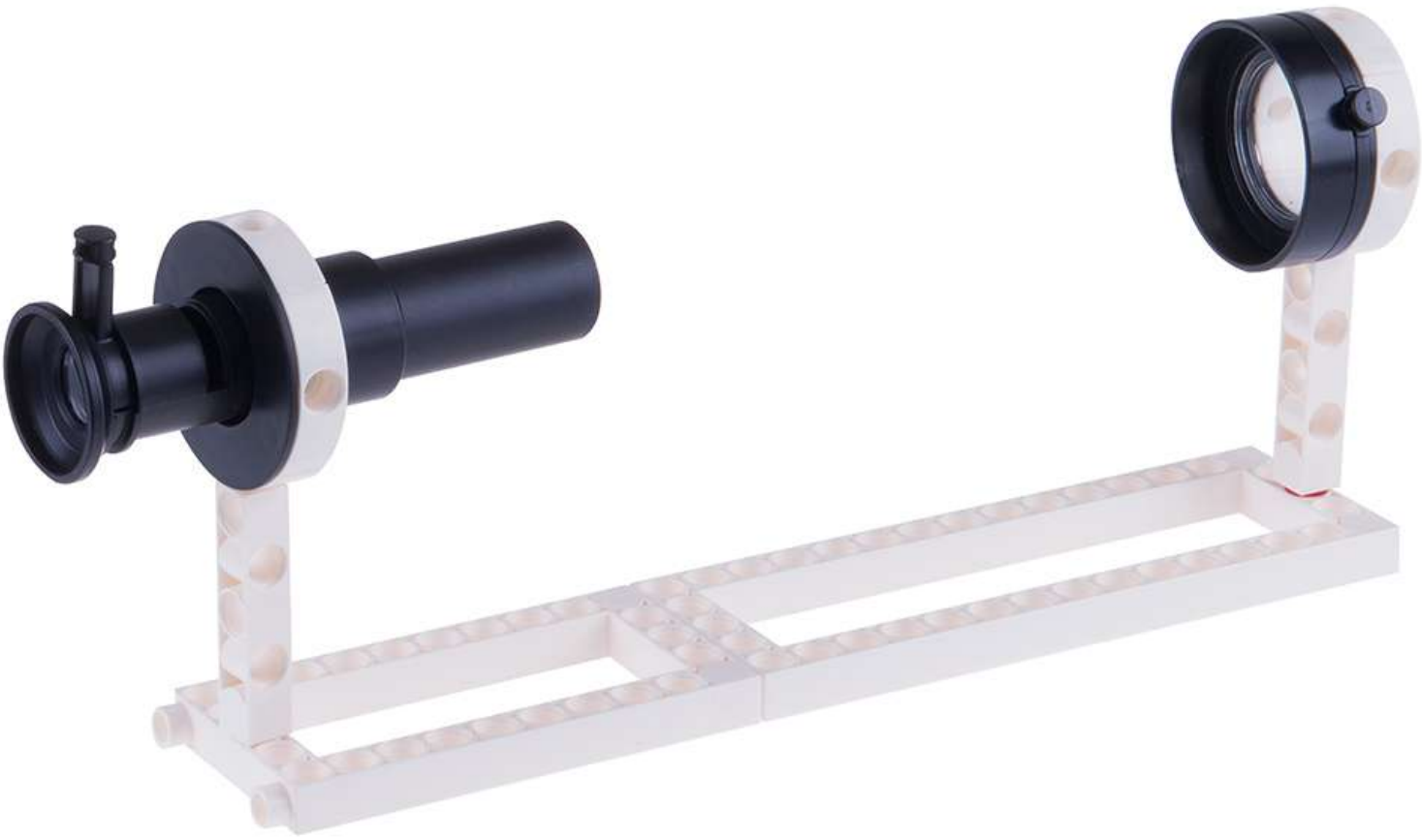
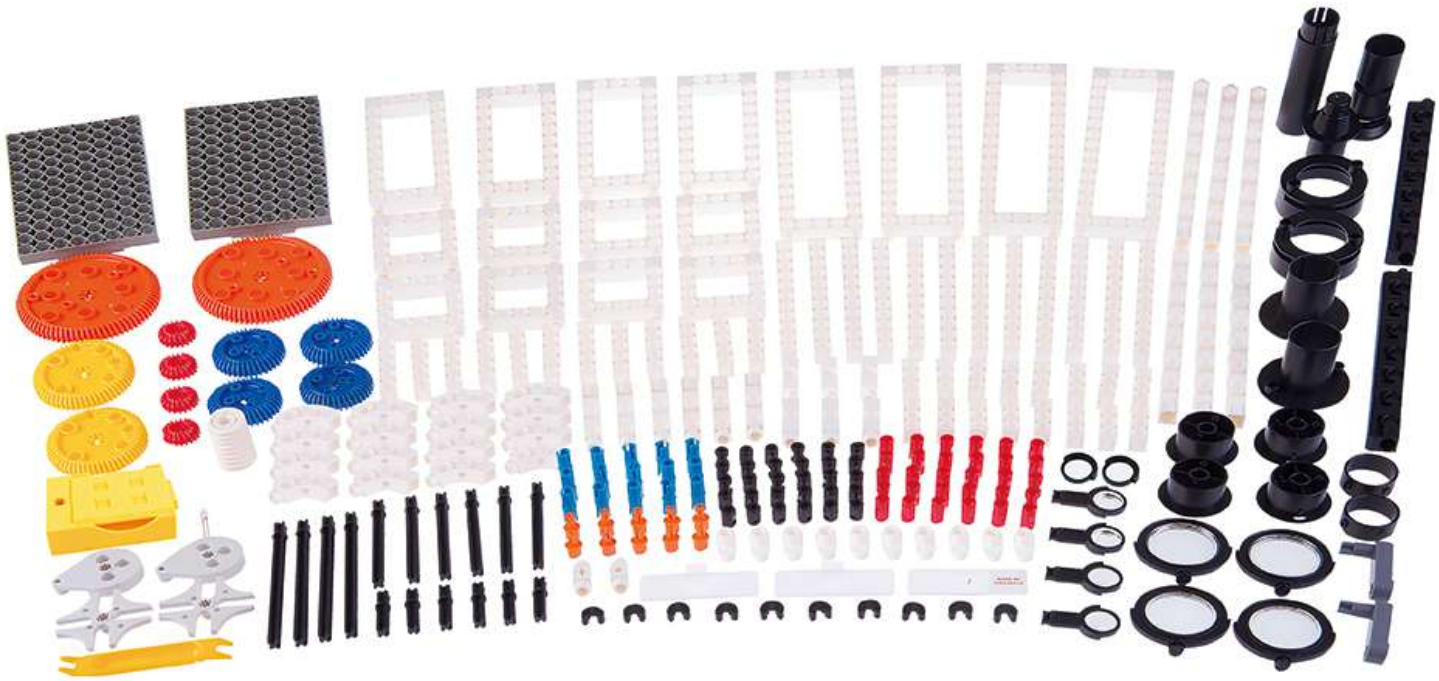






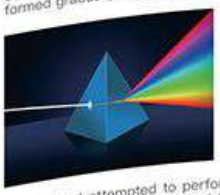



LEARNING LAB
OPTICAL DEVICES
20

1 Whipping Top

Scientific Application: The Primary Color of Light

In ancient times, people believed that white was the color of purity and that white light was a monochromatic light that could not be decomposed. In 1558, Giambattista della Porta conducted an experiment that demonstrated how seven colors appear when sunlight passes through glass. He believed that the colors formed gradually when white light passed through glass of different thickness and that light would remain naturally white. Although this concept turned out to be wrong, it provided Sir Isaac Newton a basis from which to work and draw his own conclusions.



In 1666, Newton drilled a hole in the wall of a dark room to let sunlight enter a prism and emit colorful light. The experiment didn't actually prove anything aside from the fact that the results of previous past experiments had been correct.

Newton thought that it would be interesting to mix colors and turn them into white light, but no one had attempted to perform such an experiment before. And so, Newton conducted his own experiment by letting different colors of light enter another inverted prism which then recombined into original white light. This experiment proved that white light is really composed of many colors.

Daily Application

Newton's dispersion experiment using a prism divided white light into seven main colors; namely, red, orange, yellow, green, blue, indigo and violet. We can conduct an inverse experiment by drawing seven colors on a circular piece of cardboard and then inserting a rotation axis in the middle of the board to create a spinning top. We can observe the rotation of the seven colors which turn white despite the cardboard's low weight and the spinner's fast rotation.

Brainstorming

Why can light form a rainbow with multiple colors?

Parts List