



## TEACHER GUIDE

# OPTICS OF VR VIEWERS

### BACKGROUND

Virtual reality (VR) goggles, headsets, or viewers can be quite fancy or very simple. But many of these devices work in the same way. Many of the build-your-own VR viewers, like this one, work by placing your phone at the optimal distance away from the lenses. By coupling the lenses with the phone's existing technology and a fun app, the goggles create a VR effect when held to your eye, even allowing you to move your head and have the images respond in similar way as if you're in the same place as what you see on your screen. The object you are focusing on is magnified and focused based on the focal length of the lenses in the headset. This math and physical science activity uses the basic optics formulas to help students understand how the viewers work. It may be pertinent to discuss how the eyes and brain work together to view objects.

### OBJECTIVEVS

- Students will be able to apply numbers and operations strategies to solve problems.
- Students will be able to calculate the magnification of the lenses used in a VR viewer, the height of the object viewed, and distance created by the lenses using formulas.
- Students will be able to explain why convex lenses are used in VR viewers rather than concave lenses.

### MATERIALS

- Assembled VR viewer
- Rulers
- Calculators
- Optics of VR Viewers worksheet

### PREPARATION AND PROCEDURE

**TIME:** 30 - 40 MINUTES

- Make copies of the activity for each student and have calculators handy for mathematical operations.
- Start a discussion with the class and ask them if they can explain how their viewer devices might work with the app to create the display.
- Work through the activity as a class or allow students to work through it individually or in small groups.
- Ask students to share their calculations and discuss the distance of the image in relation to the distance of the object. Ask students to explain how the goggles work to create an image with your eyes.