



CLASSROOM ACTIVITY

MIXED REALITY HEADSETS

Have you ever wondered how virtual and mixed reality can make fake things seem real?

In this activity, you and a partner will exit the real world as you create a design for a headset geared to make mixed reality experiences as realistic as possible!

STEP 1: CONNECT

Grab a partner and brainstorm what you already know about virtual reality and mixed reality. Do you have a sense of how they are similar and different? Have you ever seen or experienced either one before?

STEP 2: INVESTIGATE

Virtual reality (VR) is like stepping into a game where everything you see and touch is created by a computer. Mixed reality (MR) is different from VR in that it mixes real-world and computer-made elements so you can interact with both at the same time.

Take a look at some of the following examples of mixed reality and/or research on your own. As you do, jot down anything that stands out to you:

- <https://tinyurl.com/medicalMR>
- <https://tinyurl.com/MarsMR>
- <https://tinyurl.com/MRheadset>

STEP 3: DISCUSS

Learn: Mixed reality headsets are wearable devices that blend digital elements with the real world, allowing users to interact with both simultaneously. These headsets come equipped with a variety of technology designed to track the user's movement and environment in order to provide a more immersive and interactive experience than traditional VR headsets.

Learn: Mixed reality headsets rely on magnetometers, which are sensors that measure magnetic fields. They help accurately track the user's orientation and movement in the physical world in order to better integrate digital and real-world elements.

Talk through: How may the use of magnetometers and other sensors in mixed reality headsets impact fields like education, healthcare, or entertainment?

Learn: Mixed reality headsets also use radio wave communication to establish reliable connections with other electronic devices like smartphones and computers. This high-speed connectivity allows for real-time interaction and data exchange, which is crucial for an immersive experience. With this connection, you can stream videos, receive software updates, or even connect to specialized controllers to enhance your virtual world interactions.

Talk through: How could using radio waves to connect mixed reality headsets to phones and computers make them more useful in a variety of environments?

Learn: Artificial neural networks in mixed reality headsets act like a computer brain that understands what you are doing. This makes the digital things you see and touch seem more real and react more naturally to your actions.

Talk through: How may the use of artificial neural networks in mixed reality headsets change the way we play games, learn new things, or train for jobs?

STEP 4: MATERIALS

Ready to design your own mixed reality headset?

You will need:

- Device with internet access
- Device with recording abilities
- Paper and drawing materials *or* classroom/household supplies to make a 3D model

STEP 5: THE CHALLENGE

Your team's challenge is to develop a model of a new mixed reality headset that can be used to help a field of your choice.

Begin by brainstorming and selecting the field you would like to impact—such as sports, education, engineering, healthcare, retail, automotive, tourism, journalism, architecture, or aerospace. Then, narrow it down even further and discuss *how* your MR headset could be used in this field.

Next, create a labeled sketch of a 3D model of your headset design. Be sure to include the integration of artificial neural networks, magnetometers, and radio wave communication. Also, think about how the headset would be best designed to work well in the field you selected.

STEP 6: SHARE

Create a video commercial for your new headset that explains what it will be used for, how it will be used, and a brief overview of the technology that makes this possible.

Post your video with the hashtags #InnovationAtPlay and #MRheadsets so others can learn from it, too!

NGSS STANDARDS

- HS-PS2-6: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
- Disciplinary Core Idea: PS2.B: Types of Interactions
 - Forces at a distance are explained by fields (gravitational, electric, and magnetic) permeating space that can transfer energy through space. Magnets or electric currents cause magnetic fields; electric charges or changing magnetic fields cause electric fields.
 - HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

COMMON CORE ELA STANDARDS

- CCSS.ELA-LITERACY.CCRA.SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.