SCIENCE CAREER ADVENTURES

Ophthalmologist: Fixing Eyesight

NGSS Standard: MS-LS1-8

Adventure Description:

In this adventure, you will think like an ophthalmologist and develop a smart contact lens that will monitor eye health in patients.

Activity

Step 1: Background Information on Ophthalmologists and Eye Health (5 minutes)

- Show Video: Fixing Eyesight.
- Ask students what happens if the eye isn't able to send messages to the brain effectively. Discuss how people might have blurry vision, be unable to see completely, or be unable to see color.
- Next, ask students what types of treatments are currently available if people have problems with eyesight. Discuss how contact lenses, glasses, surgery, and other options are available.
- Explain to students that contact lenses have become very popular. Over 45 million people in the United States wear contact lenses! Many people wear contact lenses instead of traditional glasses if they lead an active lifestyle, if they don't like the way they look in glasses, or if they feel more comfortable in contacts.
- Next, explain to students that ophthalmologists are developing new contact lenses to solve a problem: many people do not know if they are having problems with their eyes and when they should see an ophthalmologist.
- Ophthalmologists want to design a "smart" contact lens. "Smart" refers to an object that can interact with its user and share information. A "smart" lens would be able to send information about a patient's eye directly to the ophthalmologist. The ophthalmologist can then contact a patient to tell them if there is something wrong with their eye.

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Step 2: Building a Model of an Eye (15–20 minutes)

- Explain to students that they will build a model of an eye and a smart contact lens. The smart contact will include a tiny microchip (like a small computer) to monitor a patient's eye health and send information back to an ophthalmologist.
- Pass out Handout: Building Smart Contact Lenses and read through the steps that students will take.
- Explain to students that they will first complete Step 1, building an eye.
- Provide students with art supplies and building supplies to build their eye. Students can work in pairs or individually.

Step 3: Brainstorm and Sketch a Design for a Smart Contact Lens (10 minutes)

- Explain to students that they will now complete Step 2, sketching a smart contact lens. Have students spend 10 minutes filling out Step 2 on the handout. If students finish early, they can move on to Step 3.

Step 4: Building a Smart Contact Lens (15+ minutes)

- Explain to students that they will now complete Step 3, building the smart contact lens.
- Provide students with art supplies and building materials.
- If time permits, have students present their eye models and smart contact lenses to the class.

Materials List

Provided online:

- Video: Fixing Eyesight
- Handout: Building Smart Contact Lenses
- Handout: Eye Diagram
- Handout: What are Contact Lens?

Not Provided online (each student or group needs):

- Art supplies and building materials (including saran wrap, ziploc bags, or other clear materials)
- Real contact lenses (optional- to show class what they look like)

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