Explore! The Human Body: Eyes and Ears

Original Air Date: January 22, 2014
Grade Levels: 3-6

Program Description:

For this episode of Explore! we focus on two specific parts of the human body, our eyes and ears, and ask the big picture question, “How can we better understand our senses of sight and hearing and the impact they make on our lives?” Through the course of this energetic and interactive cross-curricular half hour program, students get a chance to answer that question for themselves as they interact with a visually impaired student, teachers that work with the visually impaired, an educator who is deaf, and his sign language interpreter. As they do this, they’ll learn fascinating facts about their eyes and ears, and explore the world with different levels of sight and hearing.

Students will learn from the guests joining the program. They’ll discover fascinating facts about their eyes and sense of sight and their ears and sense of hearing. We’ll learn how the eye and ear operate and compare human sight and hearing to that of other creatures. We’ll investigate how 3D glasses work and why some people have a physical reaction to watching 3D movies. We’ll see the world through the eyes of the blind and hear it through the ears of the deaf. And through it all, we include student questions and contributions to help us understand the topics better. More details on the order of segments in the program and the pre-program activities designed to go with them are included later in this document in the Program Format and Pre-Program Activities sections.

Program Objectives:

Students will:
1. Engage in critical and creative thinking.
2. Engage in interactive activities and discussion about the human senses of sight and hearing and how our eyes and ears operate
3. Interact with eye and ear professionals as they ask questions and learn about their career.
4. Develop an answer for themselves to the question: “How can we better understand our senses of sight and hearing and the impact they make on our lives?”

Program Format: (Time Codes are provided to help you find specific segments in the program.)

I. Welcome and Introduction—An overview of the program’s theme and topics is presented as student groups are welcomed to the program. (00:00 to 01:42)
II. The Human Eye—In this segment we focus on the eye and our sense of sight. Topics and cross-curricular questions included in this segment are listed below. Depending on the archive you are viewing, students will learn from teachers of the visually impaired and/or a visually impaired high school student. Video, images, factual information, vocabulary words, and student questions are included throughout the segment.

A. The Operation of the Eye (How Does That Work?/Why You Ask?) (01:43 to 05:29)
   1. Anatomy of the Eye
   2. How the Eye Works to Provide Vision
   3. Comparing Human Sight to Sight of Other Animals

B. Living With Your Eyes (Where is That?/When Did That Happen?/How Does That Work?) (05:30 to 16:50)
   1. Being Blind and Using Braille
   2. Technological Innovations for the Visually Impaired
   3. Watching 3D Movies

III. The Human Ear—In this segment we focus on the ear and our sense of hearing. Topics and cross-curricular questions included in this segment are listed below. Students will learn from an educator who is deaf and his sign language interpreter. Video, images, factual information, vocabulary words, and student questions related to each topic will be integrated throughout the segment. (16:51 to 22:13)

A. The Operation of the Ear (How Does That Work?/Why You Ask?)
   1. Anatomy of the Ear
   2. How the Ear Works to Provide Hearing
   3. Comparing Human Hearing to Hearing of Other Animals

B. Living With Your Ears (Where is That?/When Did That Happen?/How Does That Work?) (22:14 to 28:14)
   1. Being Deaf and Using Sign Language
   2. Technological Innovations for the Hearing Impaired

V. Summary and Closing—We summarize the major concepts learned today, say thank you and goodbye. (28:15 to 29:15)

Featured National Standards:
The following Common Core Standards for English/Language Arts and Literacy in History/Social Studies, Science and Technical Subjects are referenced in this program:

Grades 3-6 College and Career Readiness Anchor Standards for Reading
   7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
Grades 3-6 College and Career Readiness Anchor Standards for Writing

6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Grades 3-6 College and Career Readiness Anchor Standards for Speaking and Listening

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.

2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

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.

5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Grades 3-6 College and Career Readiness Anchor Standards for Language

6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Pre-Program Activity Options: Based on your curriculum, time schedule, and student learning needs, consider using the activity below before viewing the archive of the program.

1. **Background Information**—The purpose of this activity is to give students background information on their sense of sight and sense of hearing to help provide a context for learning from the guests in the program. Have students explore any of the web resources below and/or resources of your own related to topics in the program.

   **Web Resources Related to Sight:**
Web Resources Related to Hearing:
http://kidshealth.org/kid/htbw/ears.html --Kids Health web exhibit on the ear
http://en.wikipedia.org/wiki/Hearing_range --Wikipedia website on human hearing range and comparing that to the range of other animals.

Post-Program Activity Suggestions: Building on the content and activities explored in the program, consider the following options as extension/enrichment activities for your students to engage in individually, in small groups, or as an entire class.

1. Student Polls— The purpose of this activity is to provide students the opportunity to conduct a poll of their own creation on a subject related to eyes and/or ears and have the results of that research published on our HEC-TV website on the Program Materials page (http://www.hectv.org/teachers/curriculum/hec-tv-live/explore-the-human-body-eyes-and-ears/) that accompanies the archived edition of the program. Teacher instructions for the activity are included in the document entitled SandHPollArchiveTchrInstr.pdf. A student worksheet for the activity, SandHPollArchiveStdntWksht.pdf, is also provided.

2. Tell Us Your Story— The purpose of this activity is to provide students the opportunity to write a short remembrance, essay, or story about an experience of their own related to eyes and sight or ears and hearing, or to create a fictional story about the same subject. If you choose, you can submit student writings for possible publication on our HEC-TV website on the Program Materials page (http://www.hectv.org/teachers/curriculum/hec-tv-live/explore-the-human-body-eyes-and-ears/) that accompanies the archived edition of the program. Teacher instructions for the activity are included in the document entitled YourStoryArchiveTchrInstr.pdf. A student worksheet for the activity, entitled YourStoryArchiveStudentWksht.pdf, is also provided.

Vocabulary:
The following vocabulary words will be highlighted in the program.
Auditory
Incus
Malleus
Optometry
Stapes

Supplemental Resources:
In addition to website resources included in Pre-Program Activity Option 1, additional video resources related to the program may be found on our HEC-TV website at http://www.hectv.org/teachers/curriculum/hec-tv-live/explore-the-human-body-eyes-and-ears/.

Additional web resources on topics related to our senses of hearing and vision are included below:
1. How do corrective lenses work?

http://science.howstuffworks.com/innovation/everyday-innovations/lens.htm
2. How are glasses made?

http://www.eyeweareyecare.com/ArticleHowLensesEyeGlassesAreMade.html
http://www.youtube.com/watch?v=uY1mcdCAvbY
http://inventors.about.com/od/gstartinventions/a/glass_3.htm
http://www.webmd.com/eye-health/eyeglasses-eyes

3. How do 3D glasses work?

http://www.howstuffworks.com/question360.htm
http://www.scientificamerican.com/video.cfm?id=instant-egghead---how-do-3-d-glasses2012-09-27
http://mentalfloss.com/article/12876/how-do-3d-glasses-work

4. Invention of sign language and its impact on the deaf

http://www.rocketcityspacepioneers.com/space/who-invented-sign-language
http://www.funbrain.com/signs/

5. Invention of Braille and its impact on the blind

http://www.ideafinder.com/history/inventions/braille.htm
http://en.wikipedia.org/wiki/Louis_Braille
http://www.howstuffworks.com/braille.htm
http://brailleproject.weebly.com/effects-on-communication.html

Program Keywords:

explore, exploration, optometry, science, anatomy, sight, vision, hearing, auditory, eyes, ears, medicine