The Real Bionic Man

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Objectives	Students will understand the following: Scientists have been working for years on sophisticated artificial human parts, including technologically superior artificial limbs, hearing devices implanted in the cochlea, and eyes that transmit electric signals to the visual cortex. Their work is already being used to help people with disabilities. In an artificial human part, each device functions in place of an actual biological structure
Materials	For this lesson, you will need: • Research materials on the human eye and brain • Computer with Internet access • Plurk account
Procedure	Initiate a class discussion centering on what your students know about cyborgs and recent work of scientists who are creating sophisticated bionic human parts to help people with disabilities. Encourage them to use the Internet to find out more about the work of Professor Richard Norman, who is attempting to restore sight by stimulating the brain in a normal fashion. Encourage students to share their findings, making sure they are all aware that Norman is utilizing a video camera, microchips, and a microelectrode array to send signals to the visual cortex of the brain. These findings should be added to their Plurk page with a short passage stating why they thought the information was important. In addition, they should comment on two other classmates' Plurks with relevant opinions on the different technologies. Share some Plurks in class and discuss. Tell students that each device used in Norman's bionic "eye" corresponds to an actual biological

	structure in the human eye or brain. Challenge students to use research materials to determine the biological structure(s) that correspond to the following devices: Video camera Microchips Microelectrode array Students should draw a clearly labeled diagram of each device and another diagram of the biological structure to which the device corresponds. Each pair of diagrams (device and corresponding biological structure) should be accompanied by a short explanation of the function of the device and structure. Have students upload the diagram to their Plurk account.
Evaluation	You can evaluate your students on their diagrams and explanations using the following three-point rubric: **Three points:** artificial devices and biological structures correctly paired; all six diagrams provided; all diagrams accurate and clearly labeled; explanations of functions correct and clearly stated **Two points:** artificial devices and biological structures correctly paired; all six diagrams provided; most diagrams accurate and clearly labeled; explanations of functions correct, but lacking in clarity **One point:** artificial devices and biological structures incorrectly paired; some diagrams missing; some diagrams inaccurate, not labeled correctly, or not labeled at all; some explanations inaccurate You can ask your students to contribute to the assessment rubric by determining how devices and structures should be paired Additionally, **Five points** for successful Plurk uploads and comments.

Modified from: http://www.discoveryeducation.com/teachers/free-lesson-plans/the-real-bionic-man.cfm