LESSON PLAN: "Freedom Machines"
Technology Transforming Lives

This lesson plan is designed to be used in conjunction with viewing the film *Freedom Machines*, an hour-long look at the concept of disability through the enabling lens of technology. The documentary weaves together stories of a group of unforgettable people, including a high school student and a college student, each of whose talents is made visible in part by assistive technologies. In showing what is possible, the film asks viewers to question accepted ideas of what disability means.

This film is not a profile of unusual people who have "overcome their disabilities" or succeeded "despite" their disabilities. Rather, it is about society and our choices about how we allocate resources such as technology. Who has access and who doesn't? Who bears the costs and who benefits? What choices do we make about the design of our buildings, streets, transportation, and media? Do we see assistive technologies as burdensome disability devices, or, as inventor Dean Kamen says, "enabling devices?" And if they are enabling devices, what do they enable us – all of us – to do?

As an educational tool, "Freedom Machines" can help students think about the attitudes, laws, policies, and opportunities needed to take advantage of what technology can offer. It can help them envision how they might create a genuinely inclusive community, a community that benefits from each of its unique members contributing at their full capacity.

OBJECTIVES
Students will:
- Learn about assistive technologies
- Gain awareness of the assistive technologies they use or benefit from
- Consider the impact of technological innovation on society
- Practice interview and presentation skills
- Have an opportunity for one-on-one time with people living with disabilities
- Use imagination
- Become sensitized to the needs of people whose physical skills and abilities may differ from their own

Depending on how you design the assignment, students may also:
- Learn about the provisions regarding assistive technologies of the Americans with Disabilities Act and/or the Individuals with Disabilities Education Act
- Use mathematics, computer, and/or physics to design an assistive technology
- Use art skills to make a model for a proposed assistive technology

GRADE LEVEL: 9-12

SUBJECT AREAS:
Subject area can vary, depending on how you choose to design the assignment. Possible areas of emphasis include: Art, Civics, Computer Science, Diversity / Multicultural Education, Engineering, Health/Life Skills, History, Mathematics, Science, Special Education, Technology

MATERIALS
- Videotape of *Freedom Machines* and equipment to show it
- Internet access for student research

Other materials will depend on how you choose to structure the assignment (see Step 2).

ESTIMATED TIME NEEDED
5 class periods over several weeks

BACKGROUND INFORMATION
According to the Alliance for Technology Access, **Assistive Technology** is any tool that helps individuals with disabilities to use their own unique abilities to reach their goals. These technological tools (computers and communication devices) are generally used to access education, employment, recreation, communication, and/or to live as independently as possible.

In this lesson, an introduction to assistive technologies provides a gateway for students think more deeply about public policy, the endless possibilities of technological innovation, and the human side of both policy and innovation. The lesson is designed to help you seamlessly integrate diversity education into a civics, mathematics, computer, or science project.

ACTIVITY
Step 1: View the film as preparation for the main assignment. Instruct students to pay special attention to the kinds of technology featured in the film and how it helps those who use it. Also let students know that they will be interviewing people who might need or use assistive technologies and recommend that they pay attention to the kind of language used (keeping it respectful) and the kinds of questions they might ask if it was their job to manufacture the technology.
Option: If time is short, you may want to pick 2-3 people in the film and just show the clips that tell their stories.

Step 2: Assign students the following project:
Invent an assistive technology using the following procedure:
1. Do a needs assessment by looking carefully around your community (or school). What kinds of things present obstacles to people?
   (optional): As part of the needs assessment, civics students might be asked to investigate what laws require in terms of providing assistive technologies. See the Resources sections for links to the Americans with Disabilities Act and the Individuals with Disabilities Education Act.
2. Once you have identified an obstacle, interview people affected by that obstacle to find out what kinds of things might be helpful and what things would not be helpful.
3. Design an assistive technology to eliminate or address the obstacle.
   Note: For this final step, tailor the project requirements to your students' skill level and subject area. Computer, engineering, or math students might be asked to create prototypes. Art students might be asked to produce models or drawings. Civics or Health students might be asked to imagine and describe a possible technology. Or, you might use this as an opportunity for students with varying skills and interests to collaborate.

Step 3: Before sending students out to interview people with disabilities or special needs, brief students on how to ask respectful, effective questions. Discuss appropriate and inappropriate language. For example, it will be especially important to agree on acceptable terminology around disabilities. For example, some people find the terms "handicapped" or "disabled" to be demeaning because they define a person by their disabilities, while others deliberately use the

terms because they find them to be helpful in drawing attention to needed accommodations or assistance.

There is no absolute right or wrong. Work with people with disabilities in your community or school to find out what terms are commonly used where you live and which terms are interpreted as offensive. Help students list possible terms and phrases (e.g., disabled, handicapped, differently abled, people with disabilities). Ask students to discuss how the terms differ in the kinds of images they evoke and why people in their community might prefer some terms over others.

You might consider using this assignment to help students in your class become better acquainted with your school's students with disabilities, who are often socially isolated. Prior to beginning this project, consult with your colleagues who teach special needs students about how you might work together to facilitate interaction between students with disabilities, who will take the role of "expert" in this project, and students who will need to get information from people with disabilities about what kinds of things might improve their abilities to succeed.

Step 4: Give the students several weeks to complete their projects. Set a date for them to present their ideas to one another. Let students know that they will have to choose the idea they think is best, so they will need to pay close attention to each project.

Step 5: Ask students to complete the sentence, "From this project, I learned…" Discuss their answers. Note that the point is not necessarily to come up with the next earth-shattering invention (though, if that happens, kudos to you), but rather, to think about how technology can change lives and to become more aware of how people with disabilities might be able to participate and contribute more fully if provided with the right tools.

Step 6: ASSESSMENT

After all students have presented their ideas, ask each student to select the one that they think is the most promising. They should write one-two paragraphs explaining their choice, including how the idea met the following criteria: How significant is the need it meets? How well does it meet that need? Assuming that funding and other professional expertise was available, is it realistic? Would it be affordable for the end user? Would it be easy to use by the people who need to use it?

Another option would be to have your students present their ideas to an expert panel made up of people with disabilities. You might contact your local Independent Living Center to recruit volunteers.

EXTENSIONS & ADAPTATIONS
- Together with local government agencies, civic groups, or independent living centers, raise funds for assistive technologies needed by students in your graduating class or your school district.

- Host a science fair or engineering competition with entrants who have developed some kind of assistive technology.

- Draft a public policy statement on assistive technologies and/or universal design and advocate in your city or town council for its adoption.

- In consultation with students with disabilities and their families, develop a list of adaptations to your school building or institutional practice that would help someone living with a disability to access classes, resources, and activities or improve academic performance.

- Investigate the history of the eugenics movement in the U.S. and in Nazi Germany.

- Investigate this history of major technological advances and how those advances changed societies. Include a wide range of innovations, from iron, to the stirrup, to the transistor, and influencing a variety of fields, e.g., health, military, construction, etc.

RESOURCES

www.ataccess.org - The Alliance for Technology Access (ATA) is a network of community-based resource centers, developers, vendors and associates who provide information and support to help children and adults with disabilities increase their use of standard, assistive, and information technologies. The website includes a helpful FAQs section (click on "resources" from the homepage) and a helpful assessment and information tool, "An Introduction to Creating Access for People with Disabilities in Community-Based Organizations": http://www.ataccess.org/resources/acaw/startingpoints.html

http://www.usdoj.gov/crt/ada/adahom1.htm - The U.S. Department of Justice's home page on the American with Disabilities Act. Information on compliance requirements for a wide variety of situations, links to related agencies, standards for accessible design, and the rights conferred by the Act.

http://www.ed.gov/offices/OSERS/Policy/IDEA/the_law.html - The text of the Individuals with Disabilities Education Act – signed into law by President Clinton in June 1997 - covers what school districts are responsible to do.

STANDARDS
The Standards addressed by the lesson will vary, depending on how you design the assignment in Step 2, but may include:

Level IV Grade: 9-12

Technology
> Standard 3: Understands the relationships among science, technology, society, and the individual
> Standard 4: Understands the nature of technological design
> Standard 6: Understands the nature and uses of different forms of technology

Thinking and Reasoning
> Standard 1: Understands and applies the basic principles of presenting an argument
> Standard 5: Applies basic trouble-shooting and problem-solving techniques

Language Arts – Listening & Speaking
> Standard 8: Uses listening and speaking strategies for different purposes

Language Arts – Writing
> Standard 1: Uses the general skills and strategies of the writing process
> Standard 4: Gathers and uses information for research purposes

Civics

      Standard 26: Understands issues regarding the proper scope and limits of rights and the relationships among personal, political, and economic rights.

Mathematics

      Standard 1: Uses a variety of strategies in the problem-solving process

Science – Nature of Science

      Standard 13: Understands the scientific enterprise

            2. Understands that individuals and teams contribute to science and engineering at different levels of complexity

            6. Knows that creativity, imagination, and a good knowledge base are all required in the work of science and engineering

Source: www.mcrel.org.