

# Assistive Technology for Rural Youth

Breaking New Ground Resource Center, Purdue University

National AgrAbility Project

## Lesson 2

Sponsor

**NEC**

NEC Foundation of America

## Principles of Assistive Technology

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### Learning Objectives

**As a result of this lesson, the learner will be able to:**

1. Explain the term "assistive technology."
2. Identify the importance of assistive technology through hands-on exercises.
3. Identify basic categories of assistive technology and identify product examples in each category.



# Introduction (for the Instructor)

Many types of tools, technologies, and innovative work practices have been used to enable farmers or ranchers with disabilities to remain productively engaged in agriculture. These approaches include both commercially available products and “homemade” items.

The purpose of this lesson is to introduce students to the concept of “assistive technology” and the role that this form of technology plays in the lives of people with disabilities. First, the concept is defined, and then students will have an opportunity to experience using some simple forms of assistive technology. The basic categories of assistive technology are described, and then specific examples are applied to individual disability types. It is hoped that students will gain a greater appreciation for the use of assistive technology in the lives of their family members, friends, and neighbors.

## Tools, Equipment, and Supplies Needed to Teach the Lesson



- ✓ Computer
- ✓ Screen
- ✓ LCD projector
- ✓ PowerPoint presentation – Lesson 2: “Principles of Assistive Technology”
- ✓ Black, dry erase, smartboard
- ✓ Spark plug and wire or feeler gauge
- ✓ Magnifying glass
- ✓ Hammer, nails and short length of 2x4 lumber
- ✓ Ladder or stool



## References

*The Toolbox CD* by Breaking New Ground Resource Center, Purdue University, 6<sup>th</sup> Edition

Assistive Technology Act of 1998, as cited on  
<http://www.section508.gov/docs/at1998.html#3>

AbleData Assistive Technology Database [www.abledata.info](http://www.abledata.info)

## Methods/Content

(NOTE: The location of each point on the PowerPoint slide presentation is shown by the PowerPoint icon on the side. In addition, instructors are encouraged to use black, dry erase, or smart boards to record students’ responses to discussion questions.)

# Objective 1

Explain the term of “assistive technology.”



- Start the “Principles of Assistive Technology” PowerPoint presentation



- Play introductory video clip from Ed and Nellie Bell



*Ed and Nellie used the term “assistive technology” when talking about today’s lesson. How do we distinguish assistive technology from other tools and technologies? What makes these tools different than the tools that you use every day?*

- Read the definition of assistive technology.



## Definition

The term “assistive technology device” means any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

- Assistive Technology Act of 1998



*Can someone put this definition in terms that are perhaps easier to understand?*

- Any product used to make life easier or more productive for a person with a disability.
- Something to enhance capabilities and remove barriers to performance for a person with a disability.



*As we said in Lesson 1, we use tools because we can’t do everything with just our bodies. Assistive technologies are tools to help make up for what disability has taken away. We also sometimes call assistive technology “AT” for short.*



*Ed and Nellie also said that assistive technology can be high-tech or low-tech, store bought or homemade, and AT can be made specifically for people with disabilities or made for anyone yet have special benefit for people with disabilities.*



*Can you think of some examples of AT that are used by people you know that enable them to do tasks that would otherwise be difficult for them?*

- List the students’ AT examples on the board.

## Objective 2

Experience the importance of assistive technology through hands-on exercises.



*Now let's do a few activities that demonstrate the importance of assistive technology. We'll let you try some common tasks as if you had a disability. Then we'll give you an assistive technology so that you can see how AT can be important in someone's life. (Time may only allow for only one task or for one student to attempt each task.)*

- Have students attempt to set the gap on a standard spark plug with a wire or feeler gauge using only one hand. Then support the gauge in a vice and try it again. How else could a person with only one hand adjust the gap on a spark plug?
- Have students examine the parts of an insect or read the fine print on the side of the can of spray paint with the naked eye. Then have them use a magnifying glass which allows them to see greater detail.
- Have a student try to start a nail into a block of wood using only one hand. Use a magnet alongside the nail to hold it and then have the student try again.
- Have a shorter student attempt to reach an item on an upper shelf in the classroom. Provide a step ladder or stool and have the student try again.

## Objective 3

Identify the basic categories of assistive technology and identify product examples, in each category.



*Many of the assistive technology examples we've seen so far have related to agriculture. However, people with disabilities need AT for all types of activities and lifestyles. There is no single set of categories for all the different types of AT devices being used, but here are some of the most common types.*



1. Aids to daily living
2. Augmentative and alternative communication
3. Computer access
4. Environmental control units
5. Home or worksite modifications
6. Job accommodation



7. Seating and positioning aids
8. Vision and hearing aids
9. Wheeled mobility aids
10. Vehicle modification
11. Recreational aids
12. Prosthetics and orthotics



*So what do these categories actually mean? Let's take a look at some definitions and a few examples...*

[Note: It is important to expose the students to a wide range of AT examples, but because of the large number of examples, not much time can be spent on any single example.]



1. Aids to Daily Living: Devices and adaptations to increase participation or independence in activities such as eating and grooming, as well as routine tasks such as getting out of bed and cooking dinner.



- Button Hook and Bath Lift



- Phone Holder and Wheelchair Poncho



2. Augmentative and alternative communication: These include equipment and services that enhance face-to-face communication and telecommunication. Writing aids are also included in this group. Those with communication difficulties can communicate when traditional speaking and writing are not effective.



- Speech Amplifier and Communication Card



3. Computer access: This type of assistive technology improves access to computers by facilitating input or enhancing output.



- Braille Printer and Eye-access Computer



4. Environmental control units: These units make regulating heat/cold, lights, etc., easier. This would include pre-programmed lighting or heating thermostats.



- Light Switch Extender and Computer Activated Environmental Control Module



5. Home or worksite modifications: These include products that make a home or worksite environment more accessible. Included would be devices to make it easier to enter a building, to use the spaces inside (including lighting), or to move between floors.



- Stair Lift and Lever Handle for Door Knobs



6. Job accommodations: These include environmental changes, assistive technologies, and techniques or work practices that improve the ability of a person with a disability to access their work environment and/or complete their work.



- Extra Tool Handle and Electronic Task Prompter/Reminder



- Accessible Computer Stand and Talking Calculator



7. Seating and positioning aids: These products help people with disabilities sit comfortably and safely.



- Wheelchair Head Support and Adjustable Children's Chair



8. Vision and hearing aids: This is a broad category that includes all types of sensory aids to help people who are blind, low vision, deaf, or hard of hearing. There are also devices to help those with multiple sensory disabilities, such as the deaf-blind.



- Closed Circuit TV Magnifier and Vibrating/Audible Obstacle Detector



- Vibrating Alarm Watch and Cochlear Implant



9. Personal mobility aids: These help people with mobility limitations move more freely indoors and outdoors. They include devices such as wheelchairs, walkers, and canes.



- Forearm Crutch and Wheeled Walker



- Sports Wheelchair and Wheelchair Carrying Vehicle



10. Vehicle modification: Products in this category help people with disabilities drive or ride in cars, vans, trucks, or buses.



- Van Ramp and Vehicle Hand Control



11. Recreational aids: These help people with disabilities enjoy a wide variety of leisure and athletic activities.



- Beach Wheelchair and Switch-operated Toys



- Adapted Paintbrush and Wheelchair Gun Mount





Prosthetics and orthotics: Prosthetics are generally devices to help amputees, and orthotics are braces or other products to support joints or limbs.



- Myoelectric Hand and Prosthetic Leg



- Argo ReWalk

## Summary

Any tool that helps people with disabilities live more independently can be called “assistive technology.” These devices can relate to a wide range of life activities, from basic life tasks, to work, to recreation.

As the population continues to age there will be an increasing demand for all forms of assistive technology, especially for specialized applications such as operating vehicles and machines. Along with this increasing demand will be the need for more trained technicians who have the ability to assess the needs of a person with a disability and prescribe appropriate solutions. These are well-paid positions and require a good understanding of how things work. They also require a passion to help others live more independently.

## Ideas for Additional Activities

1. Consider inviting in a local prosthetist to describe his work, especially with farmers who have lost limbs, or have a durable medical equipment provider share about mobility products or daily living aids.
2. Use the AbleData web site to find products that would help the following people at home, at school, and at play. The teacher could show the AbleData site on the screen, and the students could tell him/her what categories to explore.
  - A blind student at their school
  - A parent with a spinal cord injury who works in the parts department of an equipment dealership
  - A fellow FFA member with a lower leg amputation