TETN #35072: Teaching Science to Students with Visual Impairments

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Developed by
Texas School for the Blind & Visually Impaired
Outreach Programs
Teaching Science to Students with Visual Impairments
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Overview

- General Inclusion Strategies
- Vision and Concept Development
- Rights
- Tools for Accessible Science

General Inclusion Strategies

- Collaborate with Science Teacher
- General Modifications
  - Media for Books, Handouts, Homework, & Tests
  - Appropriate Tools
  - Work Space

Vision and Concept Development

Figure 1 Clip art picture of two babies in high chairs eating with a spoon.
Teaching Concepts

The Three C’s

1. Concrete
2. Complete
3. Connected

Hands-On Experiences

Figure 2 A young girl mixes a doughy substance with her hands.

Figure 3 A young boy pets a ferret.
Hands-On Experiences

Figure 4 A young man explores the bark of a tree.
Teaching “Concepts”

Role of Visual Images

Figure 5 Image of geyser in Yellowstone.

Figure 6 Image of a platypus.

Figure 7 Image of the Earth as seen from the moon.
Teaching Concepts: Modifications for Visual Images

- **Real Object**  
  Figure 8 A blind student tactiley explores a saber tooth tiger skull.

- **Model**  
  Figure 9 A group of visually impaired students stand in front of a life-sized model of a triceratops.

- **Tactile Graphic**  
  Figure 10 A stack of real wooden cubes beside a tactile graphic of a similar stack of cubes.
- Verbal Description, Written or Oral

Figure 11 A teacher provides verbal description during a science class.
Student Rights

- Right to take lab classes
- Right to participate fully

Student Rights


Full Participation

- Rule #1: NOT the perpetual recorder
- Rule #2: If sight IS essential
  - Partner makes visual observations
  - VI Student assumes other responsibilities
Science Teacher Resources

Figure 12  Web logo for SciTrain website.

http://www.catea.gatech.edu/scitrain/index.php

Tactile Markings

- Bump Ons
- High Dots
- Adhesive Velcro
- Fabric Paint
- Liquid Steel
- Triangular File


Figure 13 Tactile marking on a microwave dial.
Magnifiers

Figure 14 A clamp-on magnifying glass, on a swing arm, with a light.

Microscope Used with a Digital Camera System

Figure 15 Microscope attached to a digital camera system.

Science Models

Figure 16 Model of an eyeball.
Figure 17 Model of DNA strand.

Tactile Diagram Sets: APH

Figure 18 Student’s hands explore a tactile diagram of a skeleton.
Science Resources


American Printing House for the Blind, http://www.aph.org. This is where you can “spend” Quota money. Numerous items shown in this presentation, including collections of tactile graphics (e.g., Basic Tactile Anatomy Atlas), Adapting Science for Students with Visual Impairments: A Handbook for the Teacher and Resource Specialist, Periodic Table in braille, braille and large print rulers, meterstick, and yardstick; Tactile Demonstration Thermometer, and many others.


Graph, free graphing software useful for low-vision students, download from: http://www.padowan.dk/graph/

Independence Science, LLC., source of JAWS scripts for Vernier lab tools. Can purchase entire package of accessible tools through them. Contact Independence Science (Cary Supalo) at 210 W. Hamilton Ave., Box 151, State College, PA 16801, or at 814-441-2589.

Independent Living Aids, http://www.independentliving.com. Provide numerous products for individuals with blindness and low vision, including the swing-arm magnifiers and talking cooking thermometers shown in this presentation.

Orbit Research, source of Orion Talking Scientific Calculator. 


SciTrain, Science and Math for All. Website aimed at high school science and math teachers, to help them work with students with disabilities of various types. 

ViewPlus Technologies, source of Audio Graphing Calculator. 
Figure 19 TSBVI Outreach Programs logo.

Figure 20 Office of Special Education Logo

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