
Texas School for the Blind & Visually Impaired Outreach Program



T S B V I
Outreach Program

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TETN #35072: Teaching Science to Students with Visual Impairments

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Presented by

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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

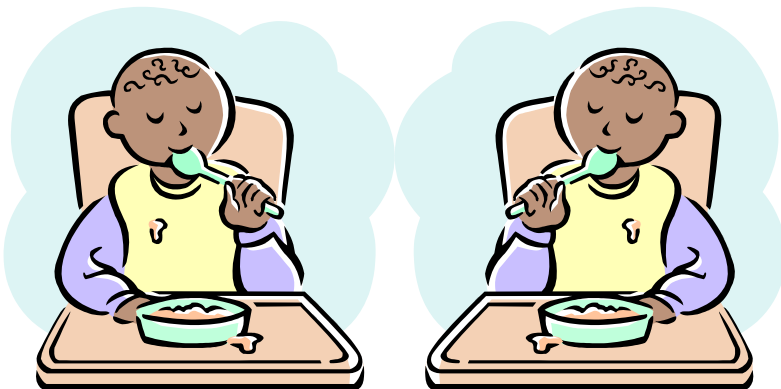


Figure 1 Clip art picture of two babies in high chairs eating with a spoon.

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.

Hands-On Experiences



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 tactilely 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

- Teaching Chemistry to Students with Disabilities: A Manual for High Schools, Colleges, and Graduate Programs, 4th Edition (2001)
- American Chemistry Society:
<http://membership.acs.org/C/CWD/TeachChem4.pdf>

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

<http://www.visionaustralia.org.au/info.aspx?page=773>

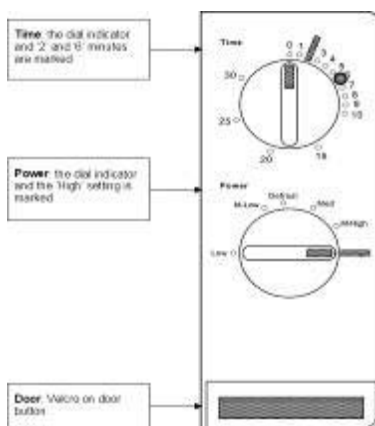


Figure 13 Tactile marking on a microwave dial.

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

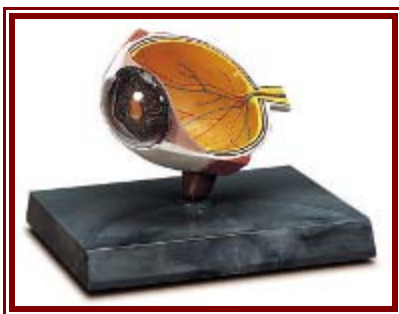


Figure 16 Model of an eyeball.

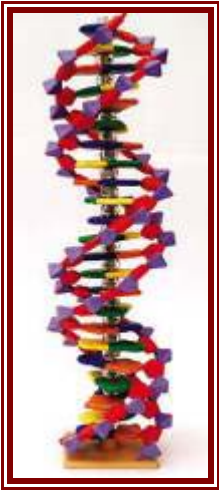


Figure 17 Model of DNA strand.

Tactile Diagram Sets: APH



Figure 18 Student's hands explore a tactile diagram of a skeleton.

Science Resources

American Chemistry Society. Source of *Teaching Chemistry to Students with Disabilities: A Manual for High Schools, Colleges, and Graduate Programs, 4th Edition* (2001).

<http://membership.acs.org/C/CWD/TeachChem4.pdf>

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.

American Thermoform, <http://www.americanthermoform.com/>. Source of Brailables, braille labeling material.

Carolina Biological Supply, <http://www.carolina.com>. Source for science models.

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.

National Braille Press, <http://www.nbp.org/>. Numerous braille books, including *Touch the Stars II*, by Noreen Grice.

Orbit Research, source of Orion Talking Scientific Calculator.
<http://www.orbitresearch.com>.

Science Activities for the Visually Impaired, SAVI. Source of inexpensive science measurement tools such as overflow beakers, graduated cylinders, and syringes. Contact: Center for Multisensory Learning, http://lhs.berkeley.edu/cml/savi_selph/index.html. Voice: 510-642-8941. FAX: 510-642-7387.

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

ViewPlus Technologies, source of Audio Graphing Calculator.
<http://www.viewplus.com/solutions/math-access/>.

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Figure 19 TSBVI Outreach Programs logo.



Figure 20 Office of Special Education Logo

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