ACCOMMODATIONS FOR LABORATORY STUDENTS WITH LOW VISION

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As previously discussed with this group, the Teaching Laboratories at UC San Diego have seen a marked increase in the number of students requesting assistance in laboratory classes. We’ve been able to assist with many different functional limitations, while making the laboratory experience available to a wide range of students.

In recent quarters, we’ve been challenged by 2 students with very low vision. Both have now survived general chem lab and one of them has completed introductory organic chemistry.

Next slide: **Guiding Principles**
We want to assist students to remain in class wherever possible, but “wherever possible” becomes a loaded phrase when department staff and the Office for Students with Disabilities consider what can, should and must be done to facilitate a student’s participation in a particular activity, such as a lab class.

When we look at a situation, our priorities in the Teaching Labs are clear:

- **No one gets hurt**
- Accommodate all, wherever possible
- Scheduling
- Lab credit for lab work

*ADA = US Federal Americans with Disabilities Act (1990, 2008)*

We remind the student that he/she will have a better chance to give the class full attention and perform at his/her best.

A student who is permanently disabled is another case and delayed accommodations would serve no purpose.

Lab credit for lab work. Curriculum and safety professionals in our department and across campus agree that watching someone work is not the same as working; lab class credit should be given to students who have completed the lab.
Resources

TEACHING CHEMISTRY TO STUDENTS WITH DISABILITIES: A MANUAL FOR HIGH SCHOOLS, COLLEGES, AND GRADUATE PROGRAMS. 4th Edition
American Chemical Society Committee on Chemists with Disabilities. Copyright 2001, The American Chemical Society.

OFFICE FOR STUDENTS WITH DISABILITIES
Sometimes called:
- “Disabled student services”
- “Disabled student service program (DSPS)”

Make friends with your on-campus experts. They know:
- What’s required
- What’s available
- Whether there’s any money available

Next Slide: Principles of Universal Design
If products and facilities are usable by all – to the greatest extent possible, without adaptation.

A low workstation may have been installed with a wheelchair user in mind, but functions well for very short student.

Door handles are easier for everyone, where knobs are impossible for some.

Next Slide: Directed assistance
Directed Assistance in Chem Lab

- Helper = student lab assistant paid by CHEM Labs
- Previous experience with class preferred
- Not to teach, coach, direct, or make decisions
- Enrolled student must ask or direct helper
- Helper can confirm a reading but not read for student

Next slide: General Chemistry Lab
Enlarged glassware
Larger samples
Large clear labels
Large-print documents (periodic table)

Safety exam was 36 pages long
**GENERAL CHEMISTRY LAB**

- Hot plate replaced gas burner
- Digital thermometer, pH meter, spectrophotometer (Spec20)
- Larger volume of reactants, larger glassware → more precipitate
- A shelf brought work nearer eye level

Enlarged glassware
Larger samples
Large clear labels
Larger samples
Large clear labels
Student arrived with reading magnifier she had used in other settings:
- Best for type, as designed
- Freeze frame function good for instrument readings
- Available contrast changes

Racks & boxes helped with organization – saved hunting time
Enlarged reading materials
• pH color chart
• Periodic table
• exams

Large-print documents (periodic table)
An enlarging color photocopier is a wonderful thing
Her version of the safety exam ran to 26 pages, as some questions needed 2 pages.

10. In the event of a fire in the Teaching Labs (not involving any person or clothing), a student should:
A. evacuate the room, close doors & call Campus Police from a safe location.
B. fight the fire until the emergency crew arrives.
C. assist others where possible.
D. A & C
E. B & C
Her version of the periodic table was many pages, plus an enlarged table for relationships

**Unfold large periodic table**
Contrast backgrounds and high-contrast glassware

Next slide: Unsolved problems for General Chemistry Lab
Unsolved problems for General Chemistry Lab

Viewing spectra via individual Spectroscope.

Next slide: Organic Chemistry Lab
Our introductory O-chem program uses micro- & Semi-micro-scale glassware. This reduces the costs of materials as well as waste disposal.

But it presents a real challenge to the student with low vision. We went digging for some larger glassware & the instructor provided some samples that were easier to see, especially for solvent-solvent extraction.

We also extended a loan = one of our lecture model kits.
We used all the tricks we learned in general chem lab, plus a few new ones.
One of the great new tools suggested by one of the counselors was a new version of the Acrobat HD projection system which works with a free standing monitor. This helped with chalkboards and demonstrations.

Is anyone a CALIFORNIA TAX PAYER ???

You see your dollars at work....The CA Department of Rehabilitation footed the bill for this $2000 instrument, which become the property of the student.

We made a splash resistant cover for the camera and covered the monitor with a loose plastic cover. Lab Coat for instrument.
Failed attempts to visualize crystals melting in the capillary:
Plenty for another talk...
- Web cam
- Cell phone cameras
- Borescope
Instructor found stage-type MP apparatus

We replaced the thermometer with a digital thermometer with hold function (!)
A little hunting gave me the Colorado University page of instructions.
The combination worked well enough that we can say she saw the melt & recording the temperature.
SUMMARY
However it came to us, we saw an increase in the number of students contacting us and requesting assistance in lab classes.

In each case, we had our best success when we went by our guiding principles, make no assumptions ahead of time, and work openly & honestly with everyone concerned.

GUIDING PRINCIPLES

• No one gets hurt
• Accommodate all, wherever possible
• Scheduling
• Lab credit for lab work