

History of the Science Signs Lexicon (research and evaluation)

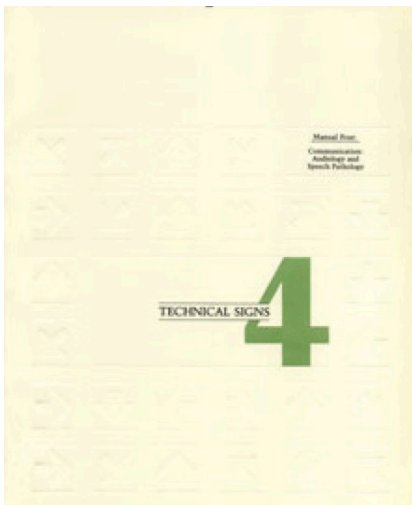
by

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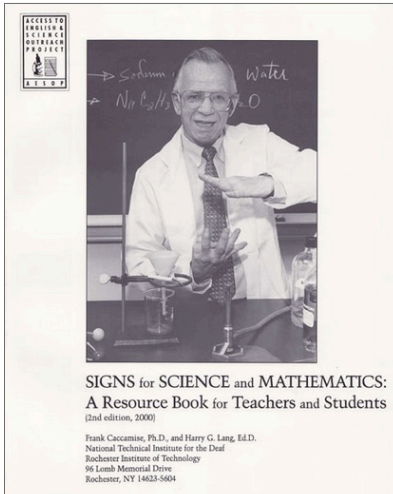
Four Decades of Research and Evaluation

This lexicon represents many years of evolution of a science sign resource, beginning with the NTID Technical Signs Project led by Frank Caccamise to the current resource now under construction, which includes more than 2200 science terms/signs. The evolution is briefly described on this page.

During the 1970s and 1980s, the NTID Technical Signs Project developed videotapes and books with science and math signs. The project used a process of COLLECTING, EVALUATING and SYSTEMATIC RECORDING (CESR) signs.



First Technical Signs Project book for science and mathematics signs.



Second Technical Signs Book developed with the Technical Signs Project (TSP) at NTID.

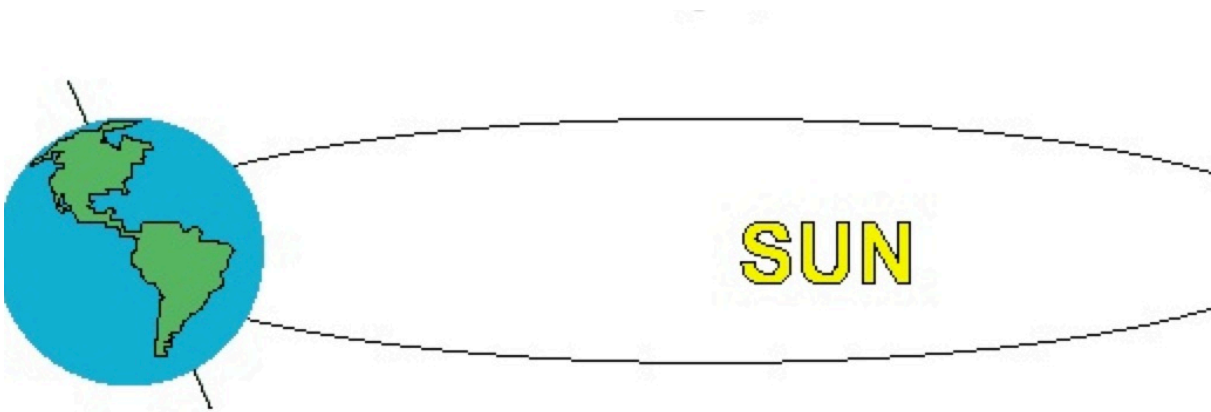
Over the first decade, we realized that finding the most popular signs for science terms was not the best solution. Rather, the best **CONCEPTUALLY ACCURATE** signs became the goal. Discussions of the concept represented by the sign led to ongoing revisions of the lexicon.

We also realized that permanent (unchangeable) resources such as books or videotapes did not allow the continued evolution of signs that comes from research and discussion. An online lexicon allows for replacement of videos on a regular basis as feedback is received.

The development of the current online lexicon (NTID SCIENCE SIGNS LEXICON) has been based on three National Science Foundation grants:

- 1) AESOP (Access to English and Science Outreach Project) - 8 regional workshops with science teachers.
- 2) COMETS (Clearinghouse On Mathematics, Engineering, Technology and Science) - Asynchronous (any time - any place access) Online Resource
- 3) CLASSROOM OF THE SEA (NTID, UCONN, American School for the Deaf) - Marine Science signs developed over four years.

CONCEPTUAL ACCURACY has become the most critical focus of this lexicon project.



Like many pictures in textbooks, this one shows the orbit of the Earth around the Sun in a manner that some young people (and some older people) may interpret as elliptical, when in fact the orbit is closer to a circular. In the same manner, some signs may communicate misconceptions to young deaf children. For example, the traditional sign for SHARK with the hand near the forehead may miscommunicate, especially to younger learners, that a fin is located on the head of the animal. We avoid this sign.

Similarly, the sign for ELECTRON is often made in a manner that shows it orbiting the nucleus of the atom. Electrons do not orbit the nucleus. We avoid this sign for that reason.

With such a focus on conceptual accuracy, we welcome suggestions for improving the signs.

RESEARCH AND PUBLICATIONS ON TECHNICAL SCIENCE SIGNS

Some research studies we have conducted on science signs are listed below:

Lang, H.G., Laporta Hupper, M., Monte, D., Scheifele, P., Brown, S., Babb, I. (2007). A study of technical signs in science: Implications for lexical database development. *Journal of Deaf Studies and Deaf Education*, 12, 65-79.

Lang, H.G., & Pagliaro, C. (2007). Factors Predicting Recall of Mathematics Terms by Deaf Students: Implications for Teaching. *Journal of Deaf Studies and Deaf Education*, 12, 449-460.

Tedeschi, M., Lang, H.G. (Capstone Project). Recall and Comprehension of Signs by High School Students: A Study of Two Movie Formats for an Online Lexical Database.

Dowaliby, F.J., & Lang, H.G. (1999). Adjunct aids to instructional prose: A multimedia study with deaf college students. *Journal of Deaf Studies and Deaf Education*, 4, 270-282.

Lang, H.G., and Steely, D. (2003). Web-based science instruction for deaf students: What research says to the teacher. *Instructional Science*, 31, 277-298

CONTINUED EVALUATION

TEN DEAF NATIVE SIGNERS WITH DEGREES IN SCIENCE/MATHEMATICS (plus two ASL linguists) spent a summer discussing and evaluating many of the signs in this lexicon.

FIVE SCHOOLS FOR THE DEAF - EVALUATED COLLECTIONS OF THESE SIGNS AND PROVIDED FEEDBACK RELATED TO [THE NEED FOR STANDARDIZATION](#) WITHIN A SCHOOL.

FOR TEN YEARS AN ONLINE LEXICON EVALUATION PERMITTED USERS TO SUBMIT THEIR OWN SIGNS AND TO RATE EACH SIGN ON A 1-5 SCALE

Previous evaluations have shown many different opinions about science signs.

Example: WHALE (Three signs). Below are some examples of feedback showing different perspectives on the three signs for WHALE.

I like number 2. I just did not like number 3, even though I think it is a whale spouting water. Number 2 and 1 are similar, but number two gives a bigger hand sign for whale, and since whales are big, it gets the point across better.

I liked sign 3 the best, the other 2 seemed more confusing and I would feel more comfortable using sign 3.

I like sign 3 the best

sign 2 is the best....i liked sign 1 as well, but again it reminds me more of a current or wave than an animal, in sign 2 he emphasizes the animal

Sign 3. This sign looks just like water coming out of the blow hole of a whale which is a key feature in describing whales. (note: This is incorrect. AIR is expelled)

The third sign because it was a definitely water (this teacher meant air) spouting and the other two looked like fish or dolphins.

I like sign 2 because it looks similar to the movements of whales in the water.

There are also regional variations.

COLLABORATIONS

ASL STEM FORUM

- THEY UPLOADED MANY OF OUR SIGNS TO THEIR WEBSITE/YOUTUBE

VCOM3D - CONTINUED WORK WITH VCOM3D HAS LED TO MORE AND MORE CONCEPTUAL ACCURACY THROUGH DISCUSSIONS (SOCIAL NETWORKING)

Several chemistry teachers at NTID and several biology teachers at Gallaudet

VCOM3d LIFE SCIENCE

-DISCUSSIONS OF SIGNS WITH GALLAUDET AND NTID FACULTY

Notes:

Space Camp participants and interpreters might be interested in the signs developed in our category ASTRONOMY AND SPACE SCIENCE

[Signs](#)