



ASL Concepts in STEAM

Beth Hamilton and Kristin Stai

Welcome

- Welcome
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- ASL Vocabulary
- ASL Classifiers
- ASL Tips in STEAM
- Conclusion
- Q and A

Beth Hamilton

- Bachelor of Science in Chemistry with a minor in Biology from Muskingum College
- Master of Education in Deaf Education from Kent State University
- Teaching since 2002



Beth Hamilton, continued 2

- Deaf
- Ohio native (also lived in Virginia and Kentucky before settling in Minnesota)
- Hearing husband, 1 CODA, 1 dog and 1 cat
- Enjoys reading, hiking, traveling, coffee and tea, and playing card/board games



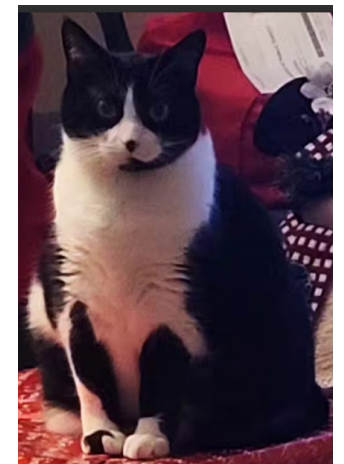
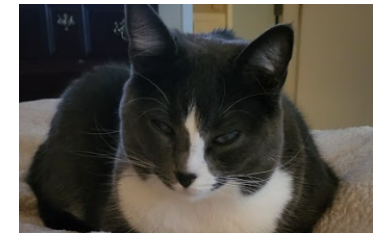
Kristin Stai

- Bachelor of Arts in Biology with a minor in History from University of Minnesota – Twin Cities (U of M-TC)
- M. Ed. in Science Education (U of M-TC)
- M. Ed. in Deaf Education (U of M-TC)
- Teaching since 2001



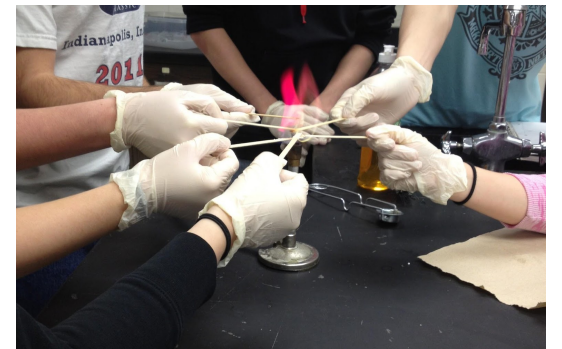
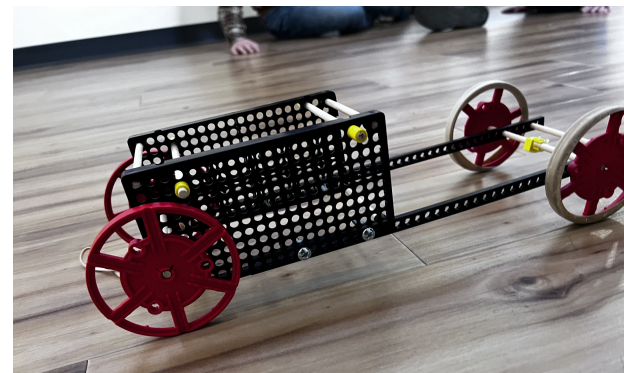
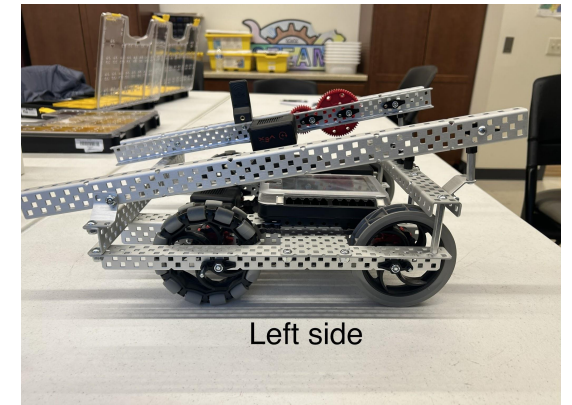
Kristin Stai

- Deaf
- Born and raised in Minnesota
- Hearing husband, 2 cats and 1 foster cat
- Enjoys reading, hiking at Minnesota State Parks, yoga, weight training, traveling, and spending time with friends and family



Science/STEAM Courses Offered at Metro Deaf School

- Earth Science
- Biology
- Chemistry
- Robotics
- Design and Modeling
- Forensics



Mock Engineering Lesson

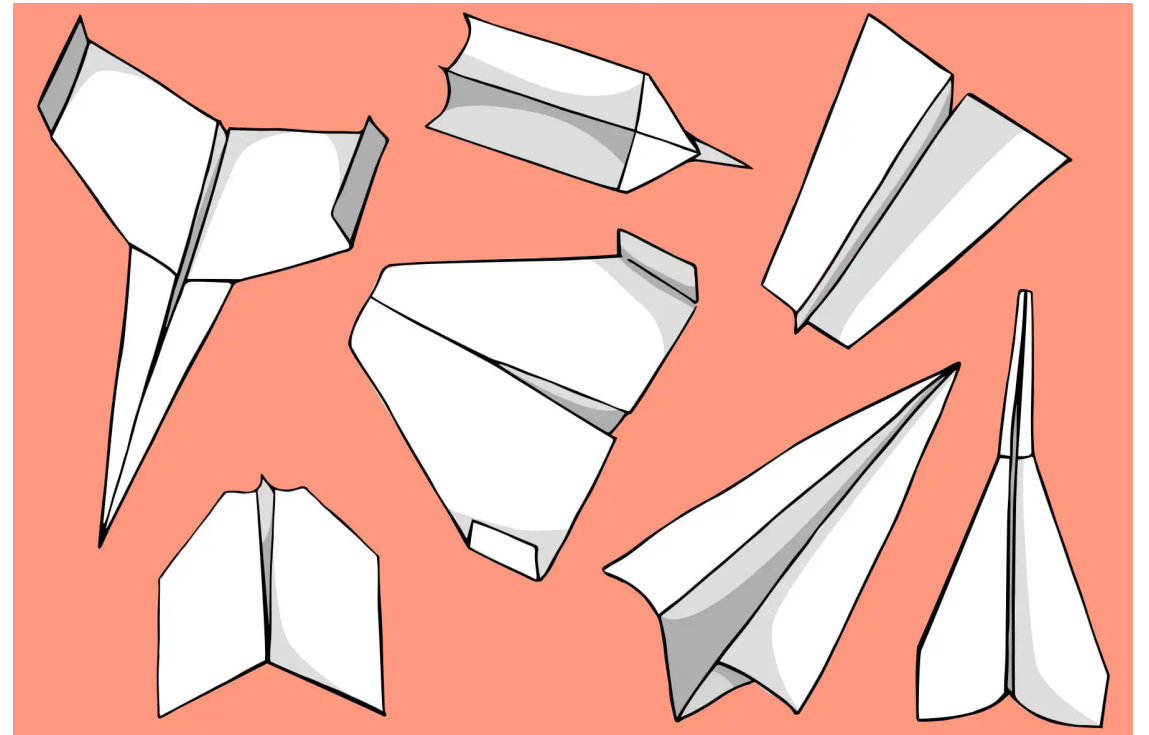
- What makes planes glide in the air?
- What makes planes crash?
- How do you know?

Problem: How can you design a paper airplane that will fly?

- What will your design look like?
- Why do you think it will fly or crash?

Small Group Activity

- Discuss the design of the paper airplane
- Make the paper airplane
- Test the airplane
- Discuss why it worked and why it didn't work



Post Activity Discussion Questions

- Was your design confirmed/not confirmed?
- What did you learn from the observations in your testing?
- How does this apply in real life?
- Vocabulary: lift, drag, thrust, gravity

Demonstration on Scientific Method vs. CER Method

Raisins and Water

- 1) Scientific Method
- 2) CER method (Claim, Evidence, Reasoning)



Raisins and water lab activity – Using Scientific Method

- Ask questions
- Write/draw predictions in journals
- Do activity (experiment)
- Observe
- Discuss results
- Write/draw results and conclusions in journals



Raisins and water lab activity – Using CER Method

- Discuss phenomenon/phenomena
- Ask questions and make predictions
- Do activity (experiment), observe and discuss results
- Write/draw in journals:
 - What did you see/what will happen? (Claim)
 - What evidence supports your claim? What did you observe? (Evidence)
 - Why did this happen? Was your claim supported or refuted? (Reasoning)

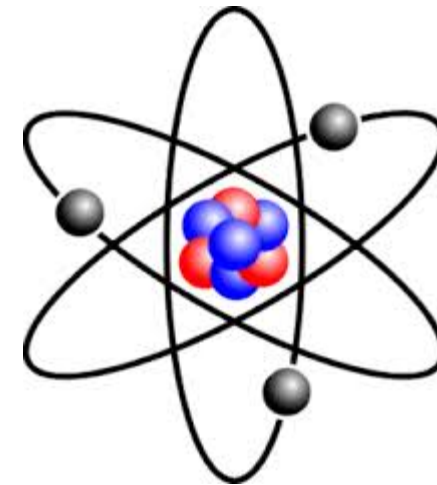


ASL Vocabulary – Physical Science

- matter (#MATTER)
- mass (#MASS – NOT weight)
- volume (#VOL)
- density (#DENSITY – NOT thick)
- temperature (index finger)
- solute (#SOLUTE)
- solvent (#SOLVENT)
- solution (tea or dissolve + mixture, not solve)

ASL Vocabulary - Atom

- atom (#ATOM or fist with C hs holding)
- nucleus (N – center)
- proton (P – inside C hs)
- neutron (N – inside C hs)
- electron (E or index finger – outside C hs)



ASL Vocabulary – Chemical Names

- Use chemical symbols to represent elements
 - Oxygen (#O with circular movement) or (O move down 2)
 - Salt – Sodium chloride NaCl (#NACL)
 - Acid – Hydrochloric acid HCl (#HCL)
- Compounds with Subscripts
 - H₂O (H move down 2 move back up O)

ASL Vocabulary - Physics

- force (C hs with B hs, push or pull signs)
- momentum (#MOMENTUM)
- inertia (#INERTIA)
- acceleration (#ACC or A hs shake)
- mass (#MASS)
- speed
- velocity (V hs with index finger)

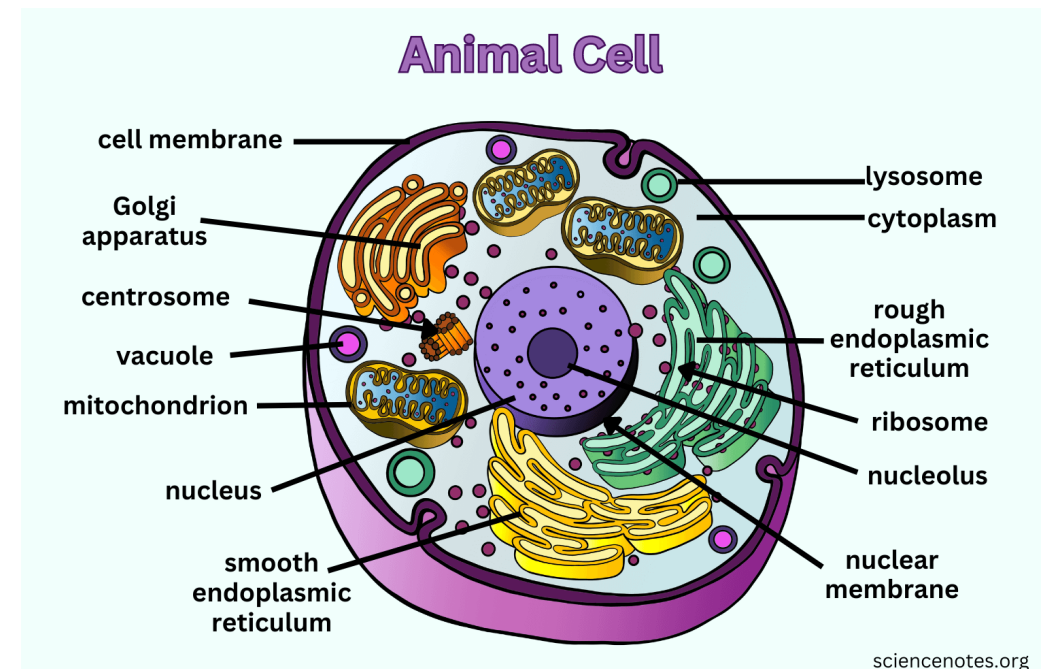
ASL Vocabulary - Biology

- fungi
- bacteria
- virus
- parasite
- DNA (#DNA)
- RNA (#RNA)
- protein

ASL Vocabulary - Cells

- cell (#CELL or fist with C hs)
- nucleus (n center)
- cell parts/organelles
 - all fingerspell unless it's already accepted abbreviations
 - Golgi apparatus = #GA
 - Endoplasmic reticulum = #ER

<https://sciencenotes.org/animal-cell-diagram-organelles-and-characteristics/>



Definition of ASL Classifier

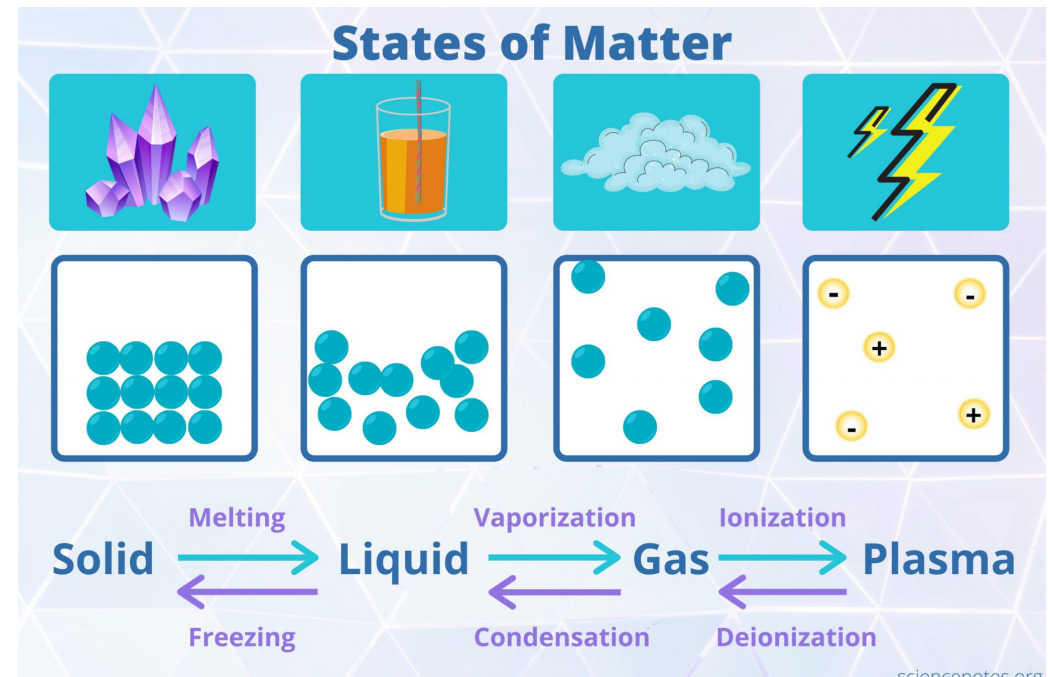
Classifiers can be used to:

- describe the size and shape of an object
- represent the object itself
- demonstrate how the object moves
- convey how it relates to other objects and/or people

<https://www.lifeprint.com/asl101/pages-signs/classifiers/classifiers-00.htm>

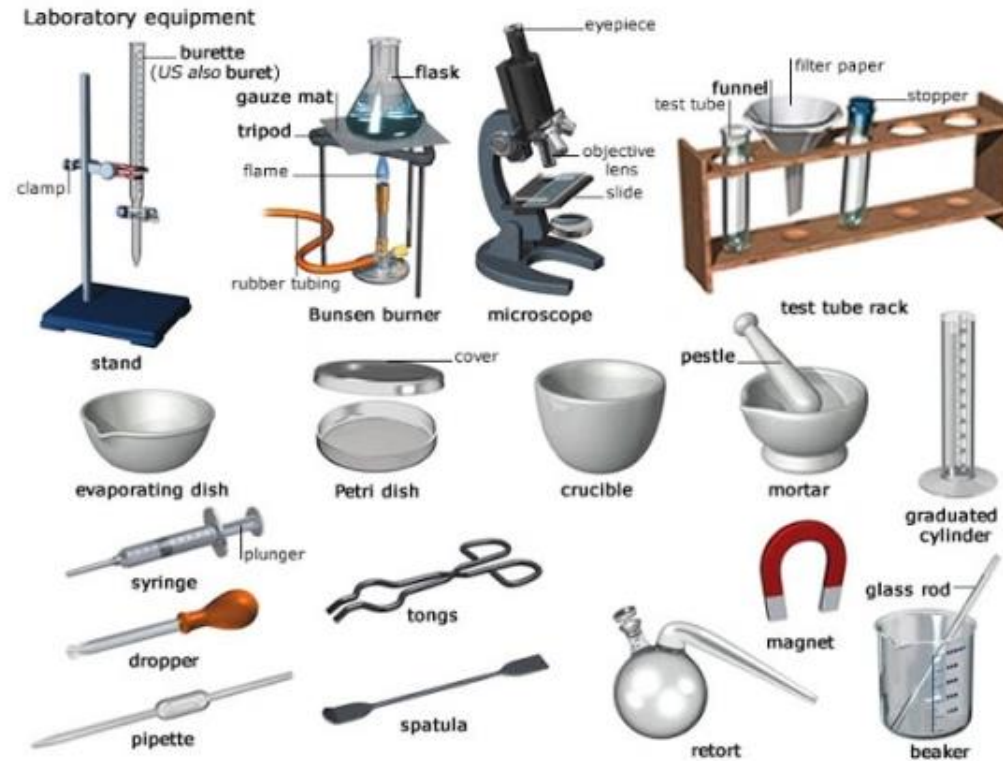
ASL Classifiers – Phases of Matter

- Use of technical signs
- gas (#GAS)
- liquid (#LIQUID)
- solid (rock)
- Use of classifiers to demonstrate phase changes
- evaporation
- Melting



<https://sciencenotes.org/states-of-matter/>

ASL Classifiers – Lab Equipment



ASL Tips in STEAM

- Fingerspell clearly and deliberately
- Use classifiers to demonstrate concepts
- Use placeholders in space as reference
- Think visually as if you're watching a video
- Don't get hung up on words
- Use technical signs when appropriate
- Signs in the visuals (posters, presentations)
- Write/type in the words to show emphasis

Conclusion

- ASL is in state of flux for STEAM. Research vocabulary signs prior using, instead of making them up.
- ASL has natural, spatial, 3D features. Use classifiers appropriately to communicate complex concepts or models with students.

Deaf Studies and STEAM Resources

- Deaf Scientist Corner website
<https://twu.edu/dsc/>
- Johanna B. Lucht - NASA engineer:
<https://www.nasa.gov/centers/armstrong/features/nasa-s-first-deaf-engineer-in-active-mission-control-role-impresses>
- Julia Velasquez - student astronaut for Xploration Station:
<http://www.xplorationstation.com/stories/StudentAstronaut-Finalist:-Julia-Velasquez>

Online ASL Resources

- Atomic Hands
<https://www.atomichands.com/>
- ASLCore
<https://aslcore.org/>
- DeafTEC
<https://deaftec.org/stem-dictionary/>
- TERC Signing Science
<https://signsci.terc.edu/video/SSD.htm>
- NTID/RIT One Stop ASL Resource
<https://www.rit.edu/ntid/dhhvac/resources>
- Science in ASL
<https://www.youtube.com/channel/UCEWSRmvpG01dJegOmsrWbMA>
- Deaf in Scrubs
<https://www.youtube.com/channel/UC1mrgxxrCtcAUBFR5Z9Kn6A>



Thank you!

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