

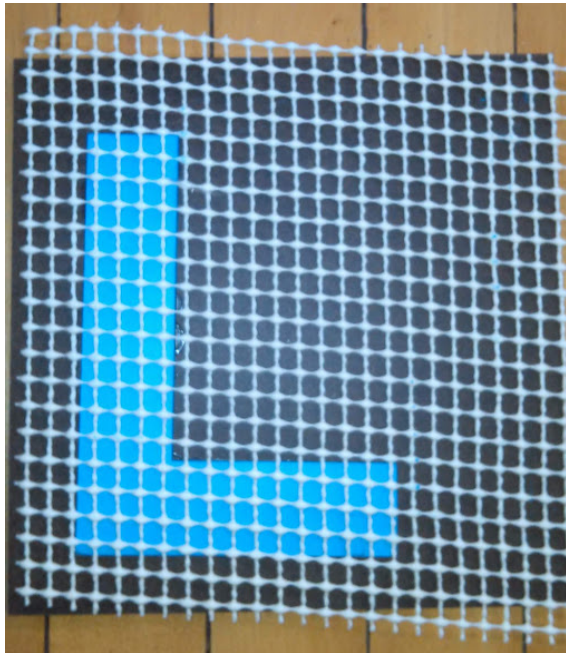
Image Orientation

Materials:

1. Foam grid (this is simply the padding you can buy to put under a throw rug).
2. An L shape. We used laser cut boards, but thick cardstock would work, as long as it's tactile. Attach an "L" to each side, back-to-back.

Activity: Image Orientation (Sleep masks are a fun way to experience this!)

- a. Materials: Letter 'L' glued to a small board. Foam grid.
 - b. Hold a foam grid to the 'L' board.
 - c. Start with the 'L' in a normal position (a reading position). Try a vertical flip (rotate around a horizontal line). What happens to the letter?
 - d. Try a horizontal flip (rotate around a vertical line). Describe the new position.
 - e. Rotate Right (turn 90 degrees to the right - clockwise). Describe.
 - f. Rotate Left. Describe.
 - g. Could you figure out what 'shift' means? Have your group come up with a definition of shift and transpose. Demonstrate to any other group and your teacher.
 - h. Use JOURNAL BOX to record what happened to the letter "L" in each motion: flip, rotate, shift, transpose.
2. Try the same activity with one of the **tactile astronomy images**. How did that work?



Credits: **Innovators Developing Accessible Tools for Astronomy (IDATA)**, officially known as *Research Supporting Multisensory Engagement by Blind, Visually Impaired, and Sighted Students to Advance Integrated Learning of Astronomy and Computer Science*, and the resulting curricular resources, Afterglow Access software, and project research were made possible with support from the U.S. National Science Foundation's STEM+C program (Award 1640131). IDATA institutional collaborators include AUI, GLAS Education, Linder Research & Development Inc., Logos Consulting Group, TERC, University of Nevada – Las Vegas, University of North Carolina at Chapel Hill, and Universidad Diego Portales. Individual consultants on the project include Kathy Gustavson and Alexandra Dean Grossi. IDATA Teacher collaborators in the U.S. include Amanda Allen, Jacqueline Barge, Holly Bensel, Neal Boys, Tim Fahlberg, Kristin Greder, David Lockett, Matthew McCutcheon, Caroline Odden, Michael Prokosch, Kara Rowbotham, Rick Sanchez, and Barbara Stachelski. IDATA Student collaborators in the U.S. include Evan Blad, Naleah Boys, Ellen Butler, Jayden Dimas, Riley Kappell, Joseph Murphy, Logan Ruby, Alex Scerba, Charlize Sentosa, Meg Sorensen, Remy Streichenberger, Trevor Warren, and others. IDATA Undergraduate Mentors include Tia Bertz, Katya Gozman, Chris Mathews, Kendall Mehling, Andrea Salazar, Ben Shafer, Alex Traub, and Sophia Vlahakis. Special thanks to the IDATA external advisors including Nic Bonne, Al Harper, Sue Ann Heatherly, Russ Laher, Luisa Rebull, Ed Summers, and Kathryn Williamson.