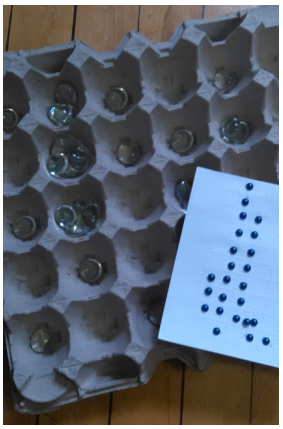
Section 2: Histogram Activity

Histogram - Graph (you can use a sleep mask to see how this works for a BVI student)

1. Usea 5x5 egg crate (you can order these online, see image below), cups, and glass stones (the Dollar Store has a selection of these)
    a. To make a 5X5 array (matrix) with the egg crate:
        i. Put a random amount of glass stones in all spots of the egg crate (just 1, 2, 3, or 4 stones in each spot)
    b. To make a histogram - a frequency chart:
        i. Use tactile graph paper
        ii. Can use gemstone stickers for frequency
        iii. If you do not have tactile graph paper or gemstones, substitute tacky poster mounts or even a small wad of tape. The graph paper can be made of puffy paint, or any raised, tactile substance.
2. Analysis:
    a. The x-axis is the number of counts (glass stones) in individual pixels.
        i. The range for the matrix made here is simply zero to the max number of stones used.
            1. The range on the Prompt6 CCD camera is from 0 to 65,535 (the most that a single pixel can hold)
                a. *Note:* The telescopes we are using use a “16 bit” camera. This means the information stored in each pixel can have 2^{16} = 65,536 different values, in this case, “counts”, or brightness value. The counting of the value starts at zero and goes to 65,535. That gives 65,536 values. (It is similar to why 0 to 9 is ten numbers.)
    b. The y-axis is the number of pixels (egg crate spots) which have each possible value.
        i. For your histogram, what is the maximum range for the **y-axis**?
            1. It is the total number of “pixels” the egg crate has.
                a. *Note:* The telescope we are using has over 4 million pixels!
        ii. Return to the SJS site and answer the questions asked about this activity. The teacher's help notes have the answers to the journal questions.



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 Grender, 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.