Big Astronomy Adaptations

Visualize Our Galaxy: Make a Tactile Galaxy

(based on the flat image version of the Milky Way umbrella: https://nightsky.jpl.nasa.gov/docs/UmbrellaMilkyWayFinalApr29.pdf)

Tactile Galaxy Model Version 1:

Supplies:

1 – 8” x 10” piece of cardboard or foam core
1 – 8” x 10” piece of black sticky felt (“stick-it craft felt”)
1 – 8” x 10” piece of textured glitter foam paper with sticky back
1 – 8” x 10” piece of smooth solid color foam paper with sticky back
1 round foam sticker, 1 small brass paper fastener and 1 pushpin

Steps:

1. Stick the black felt to the cardboard or foam core
2. Using the piece of textured glitter foam paper, cut out a Milky Way galaxy and adhere it to the center of the felt.
3. Using the piece of smooth foam paper, cut out the central galactic “bar” and stick it on top of the galaxy’s core.
4. Position the brass fastener on top of the round sticker then place both at the approximate location of the solar system in a spiral arm. Use the pushpin to poke the brass fastener through the felt.

Your tactile galaxy model should look like this:

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(based on the flat image version of the Milky Way umbrella: https://nightsky.jpl.nasa.gov/docs/UmbrellaMilkyWayFinalApr29.pdf)

Tactile Galaxy Model Version 2:

Supplies:

1 – 10” x 17” laminated printout of Milky Way (from https://nightsky.jpl.nasa.gov/docs/UmbrellaMilkyWayFinalApr29.pdf)
1 – small bottle of color glitter fabric paint
1 – small bottle of slick white fabric paint (that has NO glitter)
1 – round foam sticker, 1 brass paper fastener and 1 pushpin

Steps:

1. Using the color glitter fabric paint, outline the Milky Way spiral arms
2. Using the slick white fabric paint, fill in the center of the Milky Way.
3. Position the brass fastener on top of the round sticker then place both at the indicated location of the solar system in a spiral arm. Use the pushpin to poke the brass fastener through the laminated page.
4. Wait 24 hours for the fabric paint to try before using.

Your model should look like this:

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Clues to the Cosmos: Make a tactile Supernova 1987A

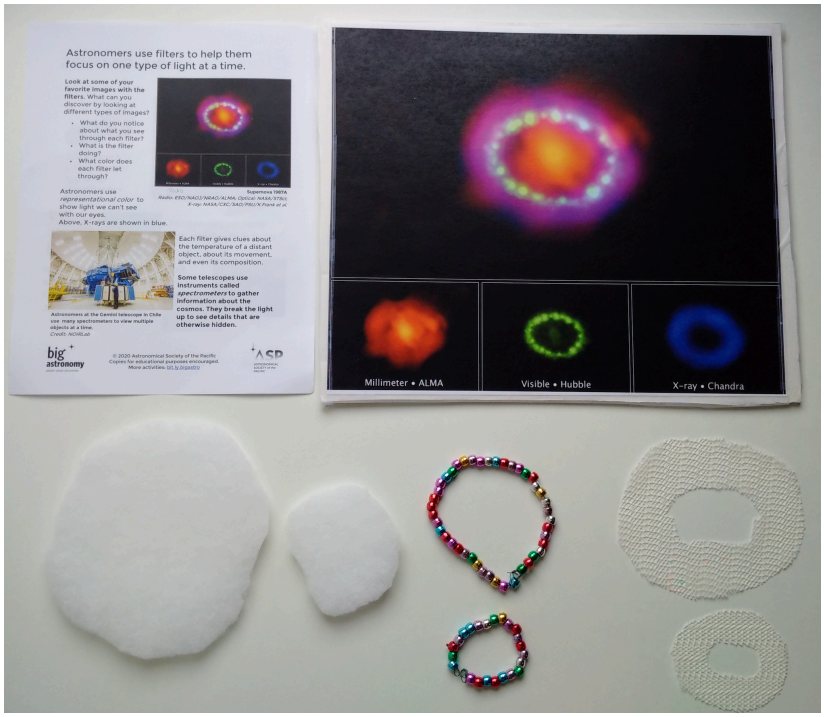
(based on the image of Supernova 1987A that appears on page 2 of https://nightsky.jpl.nasa.gov/docs/02CluesToCosmosFinal.pdf)

Supplies:

1 – 10” x 17” laminated printout of Supernova 1987A (from https://hubblesite.org/contents/media/images/2017/08/3988-Image.html?news=true)
1 – bag of 300 multicolored beads
1 – small package of thin floral wire (from local Dollar Store)
1 – 8” x 10” (or small roll of) nonstick shelf liner (from Dollar Store)
1 – 8” x 10” piece of flat puffy sewing batting

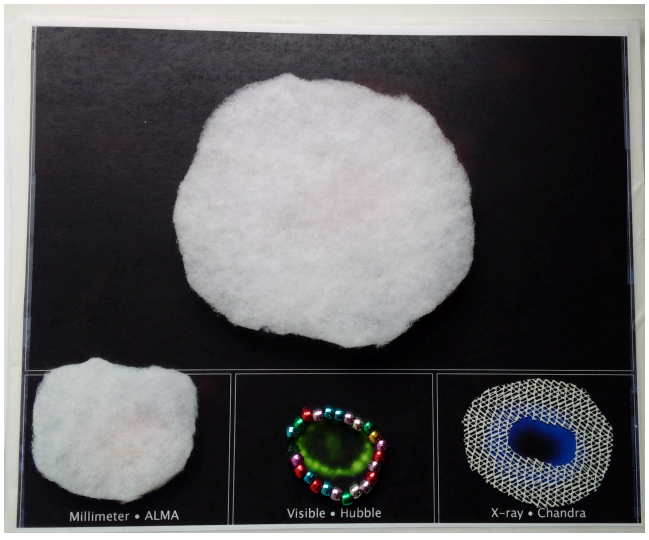
Steps:

1. String beads into floral wire to make a “bracelet” that matches the size of the lower small visible Hubble image. Then make a larger version that matches the beads of visible light in the larger (top) multi-wavelength image.
2. Using the nonstick shelf liner, cut an oval ring the same size as the lower small blue X-ray Chandra view. Then make a larger view that is the same size as the pink oval in the larger (top) multi-wavelength image.
3. Using the cotton sewing batting, cut a semi-round shape that matches the size of the lower small ALMA millimeter (radio) view. Then make a larger version that is the same size as the overall shape of the larger (top) multi-wavelength image.
4. Set up your activity station with all the supplies so it looks like this:



5. Ask participants to place the small beaded bracelet (that represents visible emission) on top of the small Hubble image.
6. Ask participants to place the small shelf-liner oval on the Chandra image (that represents X-ray emission).
7. Ask participants to place the small sewing batting on the Alma image (that represents radio emission).
8. Ask participants to use the remaining items to superimpose them onto the larger multi-wavelength view.

The final version should look like this:



Big Astronomy Adaptations

Good Light, Good Night: Modification for Low Vision

Supplies:
From the Good Light, Good Night Kit: flashlight, plastic cap

To compare light trespass in non-shielded verses shielded light:

1. Turn off the lights in the room. Stand near a wall.
2. Turn on the flashlight and point the flashlight up so the light shines up. Notice how much of the light shines up toward the sky.

3. Now place the shield (the cap) over the flashlight and see how the shielded light now points light down toward the ground.

4. By shielding light fixtures, light pollution is reduced and light is aimed toward the ground and not the sky.

5. To continue a discussion on the effects of light pollution on observing the sky, go to the modified Legends in the Sky activity for a tactile exploration of light pollution.

Big Astronomy Adaptations

Legends in the Sky: Tactile star patterns and light pollution

Supplies:
1 – the set of the black Legends in the Sky star pattern cards that comes in the Big Astronomy Toolkit (Orion, Scorpius, Big and Little Dipper cards)
1 – set of 3 different-diameter-sized brass fasteners (for example: https://www.amazon.com/WXJ13-Fasteners-Office-Supplies-Making/dp/B077461RH9/ref=sr_1_19?dchild=1&keywords=different+size+brass+fasteners&qid=1628561699&sr=8-19)
1 – pushpin and 1 pair of scissors
1 – small box of Ziploc-style quart-size storage bags
6 – assorted samples of sewing batting of different thicknesses

Steps:
1. Use the scissors to round the corners of the Orion, Scorpius and Dipper cards so each card will easily fit in its own quart-size Ziploc bag.
2. Use the pushpin to poke holes in the stars of the Orion, Scorpius and Dipper cards.
3. Insert the smallest brass fasteners into the dimmest stars.
4. Insert the largest brass fasteners into the brightest stars.
5. Insert the medium brass fasteners into the remaining stars.
6. Your tactile star pattern cards should now look like this:

7. Place each constellation card in it's own Ziploc bag.

8. Invite participants to feel the stars in the cards (through the bags).

9. Then introduce the connection between light pollution and the inability to see faint stars on a clear light-polluted night.

10. Arrange your samples of sewing batting of different thickness (each in its own Ziploc bag) and have people re-examine and explore the star patterns with different amounts of (batting) light pollution.

Big Astronomy Adaptations

Dark Sky Wheel: Large Print Adaptation for Low Vision

Based on the provided Dark Sky Wheels:
https://nightsky.jpl.nasa.gov/docs/DarkSkyWheelPrintLetter.pdf

Supplies:

1 – 11” x 17” laminated printout of the Orion Dark Sky Wheel
1 – 11” x 17” laminated printout of the Scorpius Dark Sky wheel
2 – brass fasteners
1 – pair of scissors
1 – pushpin

Steps:

1. Each Dark Sky star wheel has two circular pieces. Cut out each piece.
2. Use the pushpin to poke holes in center of each star wheel.
3. Place the top white Orion Dark Sky wheel onto of the black Orion star wheel circle and connect the two pieces with a brass fastener.
4. Repeat step #3 for the Scorpius Dark Sky Wheel.
5. You have now made two large print versions of the Dark Sky Wheel that are more accessible for low vision participants.