



## Martin Luther King Jr. Day 2021 Science Story Time

“Science gives man knowledge, which is power...” --Martin Luther King, Jr., 1963

### Exploring Transparent, Translucent, Opaque, and Reflective Materials in Stained Glass

#### Materials you can use:

- Tissue paper of different colors
- Tin foil
- Construction or craft paper
- Wax paper
- Contact paper
- Transparency sheets, plastic or vinyl binder dividers or folders
- Wrapping paper
- Food wrap film or bags
- Any recycled or scrap material that is lightweight and can be glued to your picture
- Scissors
- Glue

#### Directions

##### *What You Do:*

1. Gather your materials. Try to find all four types of materials: transparent, translucent, opaque, and reflective (see definitions below). Find things in your recycling bin, kitchen, or among office and art supplies.
2. Plan your image. What word or image honors the work and legacy of Dr. Martin Luther King?
3. Choose something transparent (or translucent) for your base piece. (Contact paper works well.)
4. Start cutting pieces to fill in your design. Hint: using opaque or reflective pieces to frame translucent pieces is visually engaging.)
5. Use glue to hold your pieces to the base piece. (If you use contact paper, you do not need glue. After your pieces are placed, put a second piece on top.)
6. Hang your image in a window and explore how light does, or does not, pass through the materials you used.

##### *Let's talk about science:*

**Stained glass** is decorative or artistic glass often found in churches or mosques. Since Dr. Martin Luther King Jr. was a preacher, the book *Martin's Big Words: The Life of Dr. Martin Luther King, Jr.* by Doreen Rappaport with illustrations by Bryan Collier features many images of stained glass. Glass is “stained,” or colored, by the addition of metallic salts when it is made. The colored glass is made into stained glass windows or panels when small pieces of glass are arranged to form patterns or pictures. The glass is held together by strips of **lead** and supported by a rigid frame. Stained glass is **translucent** and when the glass windows or panels are mounted in buildings or against windows, light passes through. This light does not pass through directly and is “scattered,” making objects on the other side fuzzy or unclear.

**Translucent:** When light strikes translucent materials, only some of the light passes through them. This light does not pass through directly and it changes direction many times, scattering as it passes through. Things seen through translucent materials may appear fuzzy or unclear. Materials like frosted glass, tissue paper, filmy fabrics, and colored plastic films are translucent.

**Transparent:** When light encounters transparent materials, almost all of it passes directly through them. Materials like air, water, and clear glass are transparent.

**Opaque:** Light does not pass through opaque materials. When light hits these materials it is either reflected or absorbed and converted to heat. Materials such as dark and solid paper and fabric, wood, stone, and metals are opaque to visible light.

**Reflective:** Light bounces off reflective materials. Glass, water, and polished metal are reflective materials.

