

Tactile Graphics: Defining, Learning, and Creating

Tactile graphics utilize raised lines and patterns on paper, or plastic, to convey the shapes, textures, and other information contained in images. The raised surfaces often include the use of lines, shapes, and multiple textures to communicate printed visuals, such as maps, diagrams, graphs, drawings, charts, and pictures. In the same way that individuals who are blind or visually impaired use their fingers to read by feeling braille dots that form words, they can touch raised surfaces in tactile graphics to gain an understanding of images.

Although many images can be conveyed to sight-impaired readers through braille or verbal descriptions, tactile graphics are superior for subject matter related to mathematics, science, and geography. For instance, instead of merely describing a color-coded map detailing area climates, a tactile graphic uses raised lines to outline the areas and raised textures, such as a cross-hatching or striped pattern, to differentiate the varying map regions the way color distinguishes regions for a sighted person. Patterns are then defined in a braille key that may be on the graphic or an adjacent page of braille text. The figure title and labels may be included on the graphic in braille or, if the print text is lengthy, there may be an abbreviation or symbol in braille on the graphic that is explained in a key.

Importance and Challenges in Learning

Tactile graphics are vital to inclusion in education, employment, transit, and many other areas, according to a 2018 article in *Lighthouse News* by Lighthouse For the Blind and Visually Impaired. The article goes on to explain that people who don't have access to visual cues because of blindness get excluded from educational, practical, and recreational information. It's crucial to provide children accessible versions of visual information at the same time as their sighted peers.

Effectively using and understanding tactile graphics is an important skill for individuals who are blind and visually impaired to master, to avoid exclusion from all the visual information provided to sighted individuals. However, knowing how to effectively interpret tactile graphics is not an innate skill.

The *Lighthouse News* article states, "...the reader must have some experience with the object or concept pictured. Background information and context are key."

If students don't understand the objects or concepts represented in the graphics, they won't get the information they need from them. Educators say that students must be introduced to tactile graphics over time to develop skills in areas such as spatial

orientation, how to discern the difference between real objects and the two-dimensional, abstract representations of them, as well as how to find and use keys, and how to systematically search the graphic for information.

“Numerous studies have shown that blind students have poor haptic skills, especially related to tactile discrimination, spatial orientation, systematic searching, and tracking and tracing,” according to the Texas School for the Blind and Visually Impaired.

The Texas School for the Blind suggests developing these skills by using three-dimensional objects with their symbolic representations. For example, students hold a pear to feel the shape of it before learning to understand the raised outline of a pear on paper.

In terms of exploring and processing the graphic as a whole, the Texas School for the Blind suggests using a vertical approach to feel everything because this can cover more area quickly with less sweeps and overlapping. Other approaches include horizontal or circular search patterns, any of which should ensure that information is not missed. Another suggestion is to incorporate teaching aids such as origami to teach basic constructions.

Learning how to use tactile graphics while learning braille is a best practice and helps students develop skill levels similar to their sighted peers. The Braille Authority of North America (BANA) recommends introducing tactile graphics, in combination with 3-dimensional models, early in the process of learning braille. BANA's *Guidelines and Standards for Tactile Graphics, 2010* explains, “The ability to read graphics will be required for the understanding of concepts such as diagrams, graphs, and maps, and to be able to participate in standardized testing.”

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