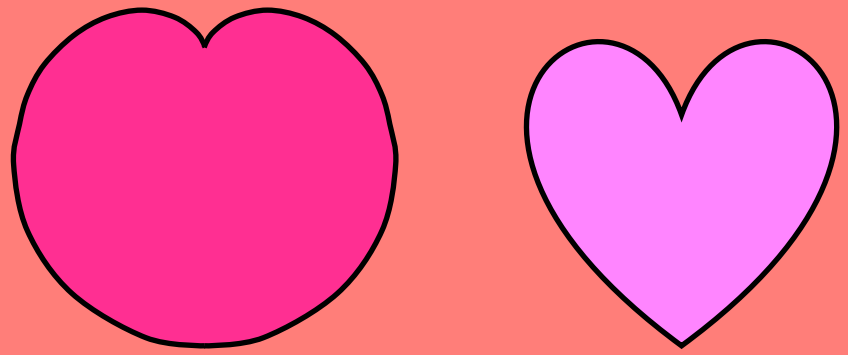
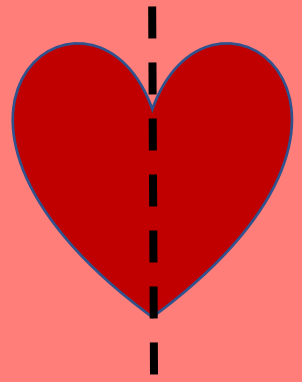
Will You Be My Cardioid?



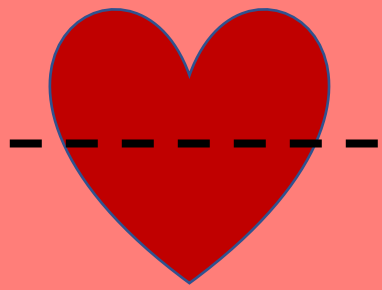
Cardioid (left) versus **Heart** (right):

- Some differences between cardioids and hearts are subtle, and some are stark!
- A *cardioid* is a heart-like mathematical shape. Cardioids are rounded, with a small indent.
- A *heart* is a common symbol familiar to most. Typically, the top half of most heart symbols is made of two curves and the bottom half has straight or curved sides that meet at a point.
- Cardioids do not have a "bottom" point.
- All cardioids, and some hearts, have only one line of symmetry.

Symmetry in Hearts

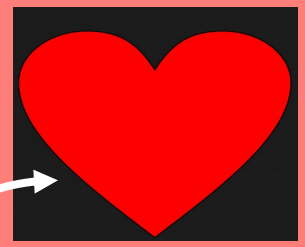


Vertical symmetry: Vertical halves of each heart shown here reflect one another (like a mirror), and each half is identical to the other half.

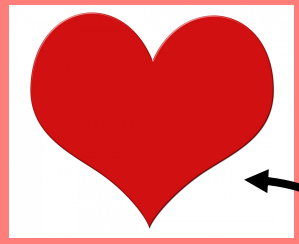


Horizontal asymmetry: Horizontal halves <u>do not</u> reflect one another and are not identical at all!

The top half of each heart is very *curvy*



The bottom half may have *straight* sides meeting at a *point*



…or may have *curved* sides meeting at a *point.*

Prepared by the UMN Math and Numeracy Lab, February 2022 | For more ideas: https://dreme.stanford.edu/valentine

Tangram Activity: **Cut out the red heart (left) and the four puzzle pieces (middle). Use cardstock or cardboard for firmer puzzle pieces.**

- Spatial skills, like rotating shapes mentally or by trial and error, help solve the puzzle!
- Adjust the challenge: Use the red puzzle without the shape outlines, or the gray heart that has shape outlines if children need support fitting the pieces together.