

Pentominoes

Estimated Time: 30 minutes to... infinity!

SUMMARY

Pentominoes are a set of shapes that can be rearranged like a puzzle with dozens of solutions. This low-cost, high-fun activity is great for entertaining while learning and for helping young students expand their ability to visually process and imagine solutions.

WHAT YOU'LL LEARN

- What pentominoes are and how to use them.
- Rotating shapes and two-dimensional visualizations.

Materials Used

- Pentominoes (purchased or printed) *or*
- Construction paper (to make your own)

Resources Used

- [Brandeis Math professor's pentomino page](#)

WHAT TO DO

1. Pentominoes are shapes made of five squares, first described by Solomon W. Golomb of the University of Southern California. Golomb was a mathematician who loved inventing games, including pentominoes which later inspired the video game Tetris! With Golomb's pentominoes, you can create many different shapes by seeking out the right pattern.
2. Using your pentominoes, try to make a rectangle which is **6 squares by 10 squares**. There's more than one solution so keep going if you solve it!
3. Try other pentomino rectangles that have an area of 60 squares including **5 x 12**, **4 x 15**, and **3 x 20**. All of these have multiple solutions, too!
4. Try to create some shapes of your own out of pentominoes. Can you make a reindeer? Or a t-rex? Share with your friends when you find something cool!

TIPS

- Pentominoes are a great way to creatively explore math. They form patterns and the more students play with them the more they will learn about the "tricks" that come from rotating and combining the shapes. Tangrams are a more well-known set of shapes that can also make creative pictures.
- If you don't have a set of pentominoes and don't want to print them out, you can use the picture on the next page to create your own set from construction paper.

Usually pentomino sets are made of squares that are about 0.75 inches to a side, however it's only important that your set has squares as uniform as you can manage.

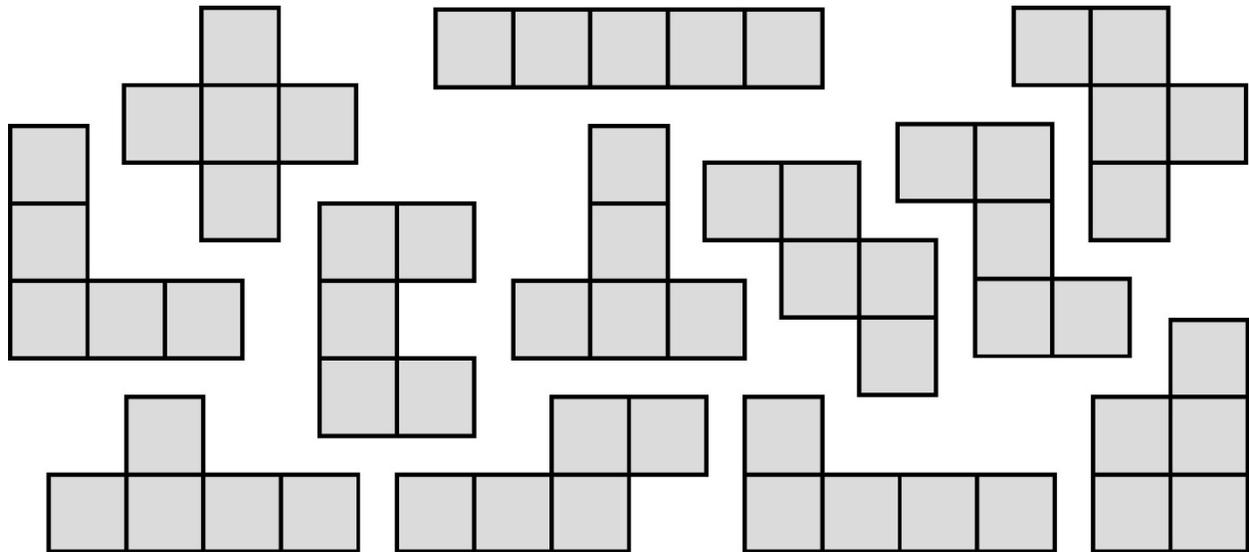


Image from <https://www.cs.brandeis.edu/~storer/JimPuzzles/ZPAGES/zzzPentominoes.html>