

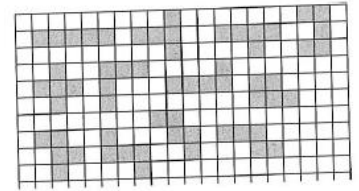
ACTIVITY 7.15

Pentominoes

A pentomino is a shape formed by joining five squares as if cut from a square grid. Each square must have at least one side in common with another. Provide students with five square tiles and a sheet of square grid paper for recording. Challenge them to see how many different pentomino shapes they can find. Shapes that are flips or turns of other shapes are not considered different. Do not tell students how many pentomino shapes there are. Good discussions will come from deciding if some shapes are really different and if all shapes have been found.

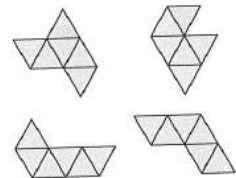
Once students have decided that there are just 12 pentominoes (see Figure 7.27), the 12 pieces can then be used in a variety of activities. Paste the grids with the children's pentominoes onto tagboard and let them cut out the 12 shapes. These can be used in the next two activities. It is also fun to explore the number of shapes that can be made from six equilateral triangles or from four 45-degree right triangles (halves of squares). With the right triangles, sides that touch must be the same length. How many of each of these "ominoes" do you think there are?

Lots of activities can be done with pentominoes. For example, try to fit all 12 pieces into a 6×10 or 5×12 rectangle. (This is very difficult.) Also, each of the 12 shapes can be used as a tessellation tile. Another task is to examine each of the 12 pentominoes and decide which will fold up to make an open box. For those that are "box makers," which square is the bottom? The following activity also uses the 12 pentomino pieces and is an excellent visualization task for young children.

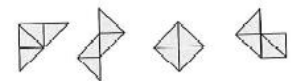


There are 12 pentominoes.

Finding all possible shapes made with five squares—or six squares (called "hexominoes") or six equilateral triangles and so on—is a good exercise in spatial problem solving.



Four of the different shapes that six equilateral triangles will make.



Four of the different shapes that four "half-square" triangles will make.

FIGURE 7.27 Pentominoes and related shape challenges.