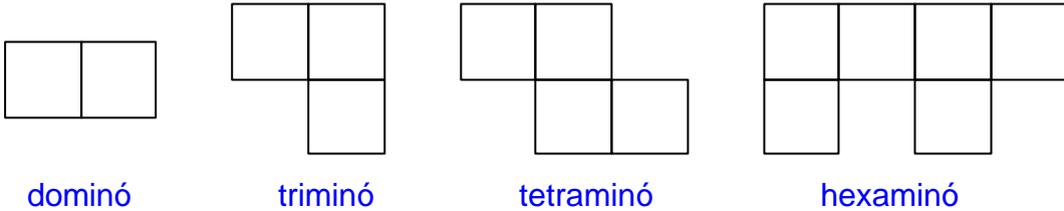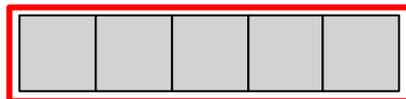# PENTOMINOES

Two squares completely joined by a side make a DOMINO; when we join three squares with this same criterion, what we get is a TRIMINO; with four squares a TETRAMINO; and so on. In general, all these constructions are called polyominoes. Here you can see some of them:

dominó   triminó   tetraminó   hexaminó

There are 12 different **pentominoes** (two pentominoes **are different when it is not possible to make them match** one with the other, neither by means of **rotation,** nor by means of **reflection**). In order to find them all, we are going to take advantage of a characteristic that enables us to classify them (each pentomino will be in one and only one of the different groups in which they are classified): the dimensions of the frame or rectangular box in which it would fit, without being able to move.

{ There is a pentomino that fits a **rectangular box of 1x5** (the unit is the measurement of the side of one of the squares).

{ There are two pentominoes that fit a rectangular box of dimension **2x3**.

✎ There are 3 different pentominoes that fit a rectangular box of dimension **4x2**.

1,2-GE-C1-3,4,5
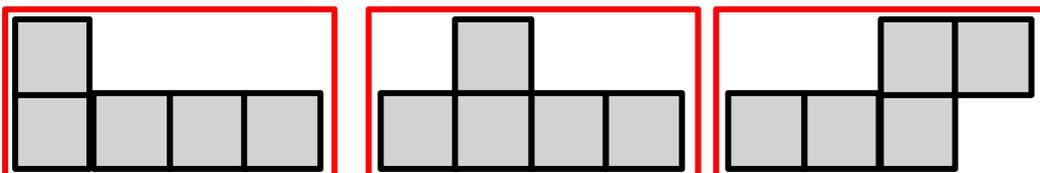
✎ **Which** are the 6 pentominoes that fit a box of dimension 3x3?

> In order to find them all, you can use the 5 squares and the box of dimension 3x3 that you have.

> When you find one, **draw it** in a squared sheet so that you can notice that you have already got it and not to repeat it again.

> If you have any doubts about if two pentominoes are different or not, **construct them** with the fitting squares and check that they cannot match one with another in any way.

{ With five squares we could construct a cube without one of its faces. We will call it: **cube without cover** : *folding properly its faces by the edges and sticking common edges, we will construct the cube.* **Which** of the 12 different pentominoes that there are (the 6 that you have drawn in this paper plus the 6 which you have found and that they fit the box 3x3) are flat developments of a cube without cover?

> You must do this activity mentally: try to fold in your mind the 'faces' of the pentomino and imagine what you get; is it a cube without cover?

> Use the fitting squares to check it.

✎ **Point**, in each of the pentominoes that are flat developments of a cube without cover, which is the square that will be the base, when we place the cube with the uncovered face upwards.

Although these activities can be individually done, it will be much more stimulating to do them with a mate. You can agree a maximum time (for example one or two minutes) for each one and, in turns, you should get one of the solutions. If you run out of time and you do not get anything, pass the turn to your mate.

YOU WILL NEED:
A box 3x3 with 5 squares, 10 fitting squares, pencil and one squared paper.

1,2-GE-C1-3,4,5