

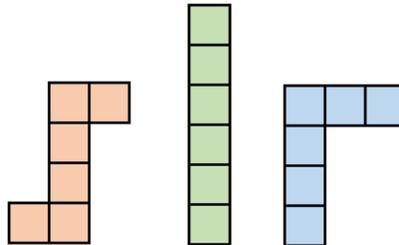


## CEMC at Home

Grade 9/10 - Friday, March 27, 2020

### Hexominoes

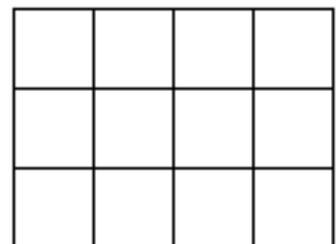
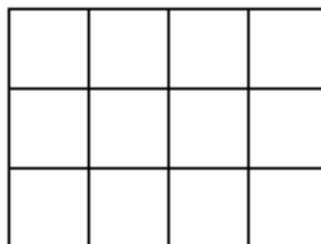
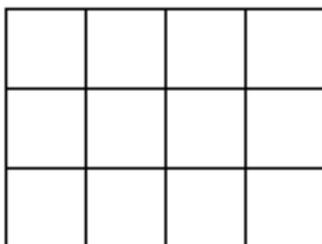
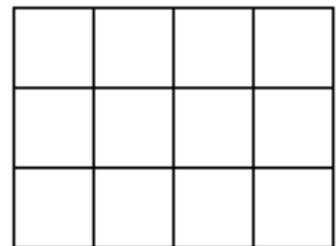
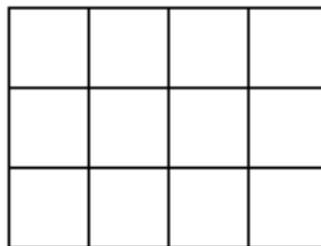
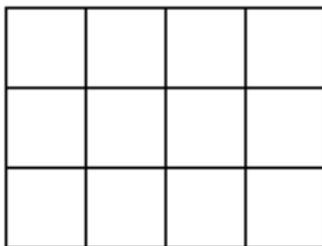
A **hexomino** is a geometric shape composed of six equal-sized squares which are connected at one or more edges. Below are a few examples of hexominoes. Try drawing a few others yourself.



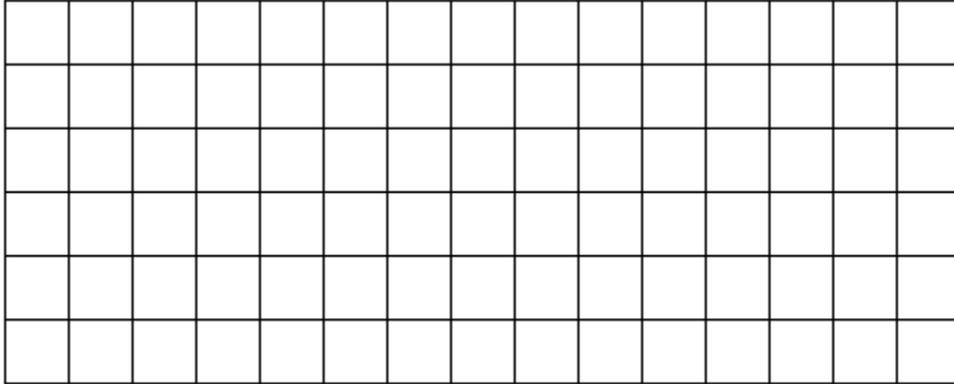
On the last page you will find 35 hexominoes drawn and numbered. Every other hexomino can be obtained by translating, rotating, or reflecting one of these 35 hexominoes, possibly using a combination of these transformations. In the following activities, you will be free to translate, rotate, and reflect the 35 shapes as needed to complete the tasks. The collection of shapes that we will be working with are sometimes called the 35 *free* hexominoes.

#### Questions:

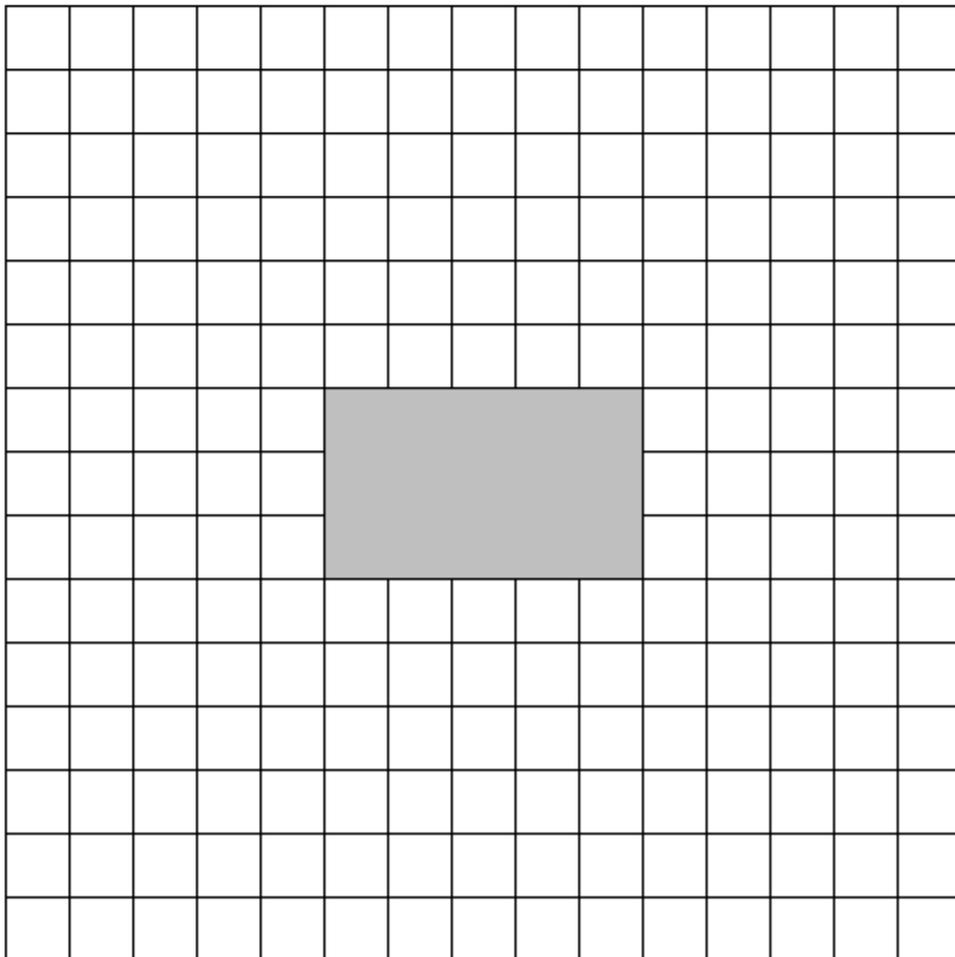
1. Which of the 35 hexominoes represent the net of a cube? In other words, which hexominoes can be folded up into a cube? To help visualize this, you can print the hexominoes onto paper, cut them out, and fold them. Magnetic tiles would also work really well.
2. Cover a  $3 \times 4$  rectangle using two copies of any single hexomino. How many different solutions can you come up with? (Remember you are free to translate, rotate, and/or reflect the shape.)

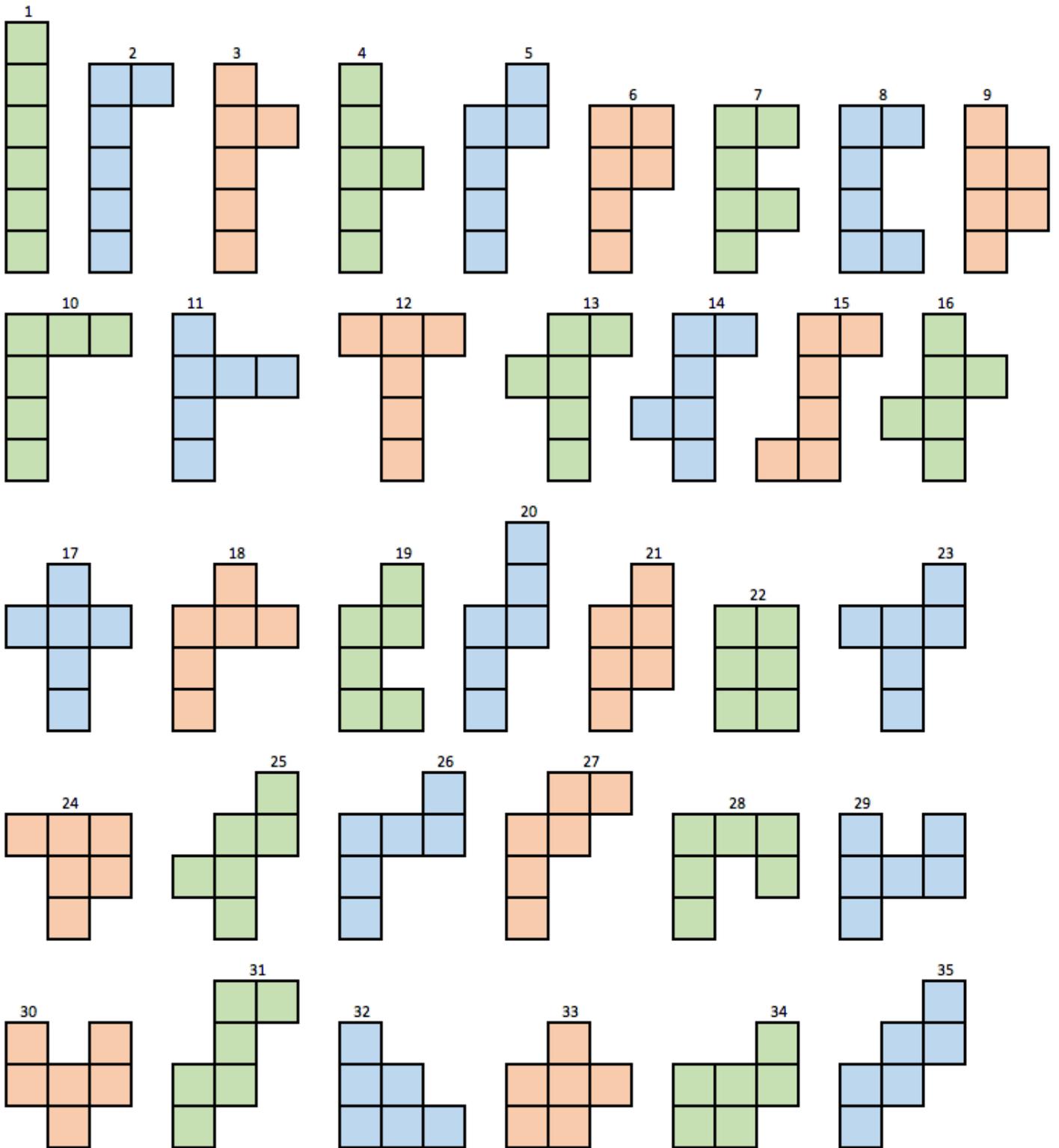


3. Cover the  $6 \times 15$  rectangle below using any combination of hexominoes. Can you do so using each hexomino at most once?



4. Take a  $15 \times 15$  square and cut out a  $3 \times 5$  rectangle from the middle. Cover the remaining white squares using each of the 35 hexominoes exactly once.





**More Info:**

Check out the CEMC at Home webpage on Friday, April 3 for the solution to Hexominoes.

When four equal-sized squares are used instead of six, the geometric shapes are called **tetrominoes**. Tetrominoes are the building blocks of the original *Tetris* game.