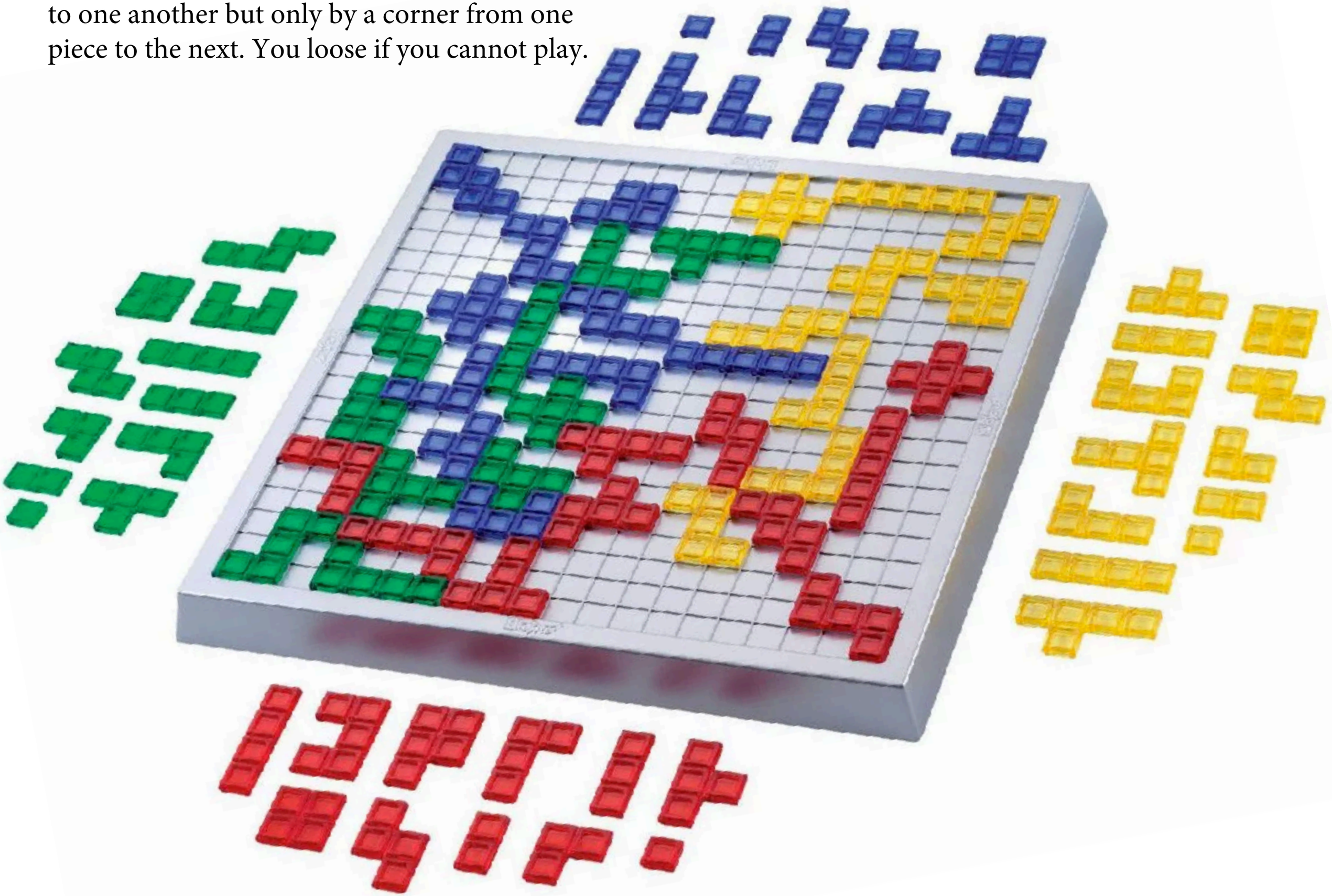
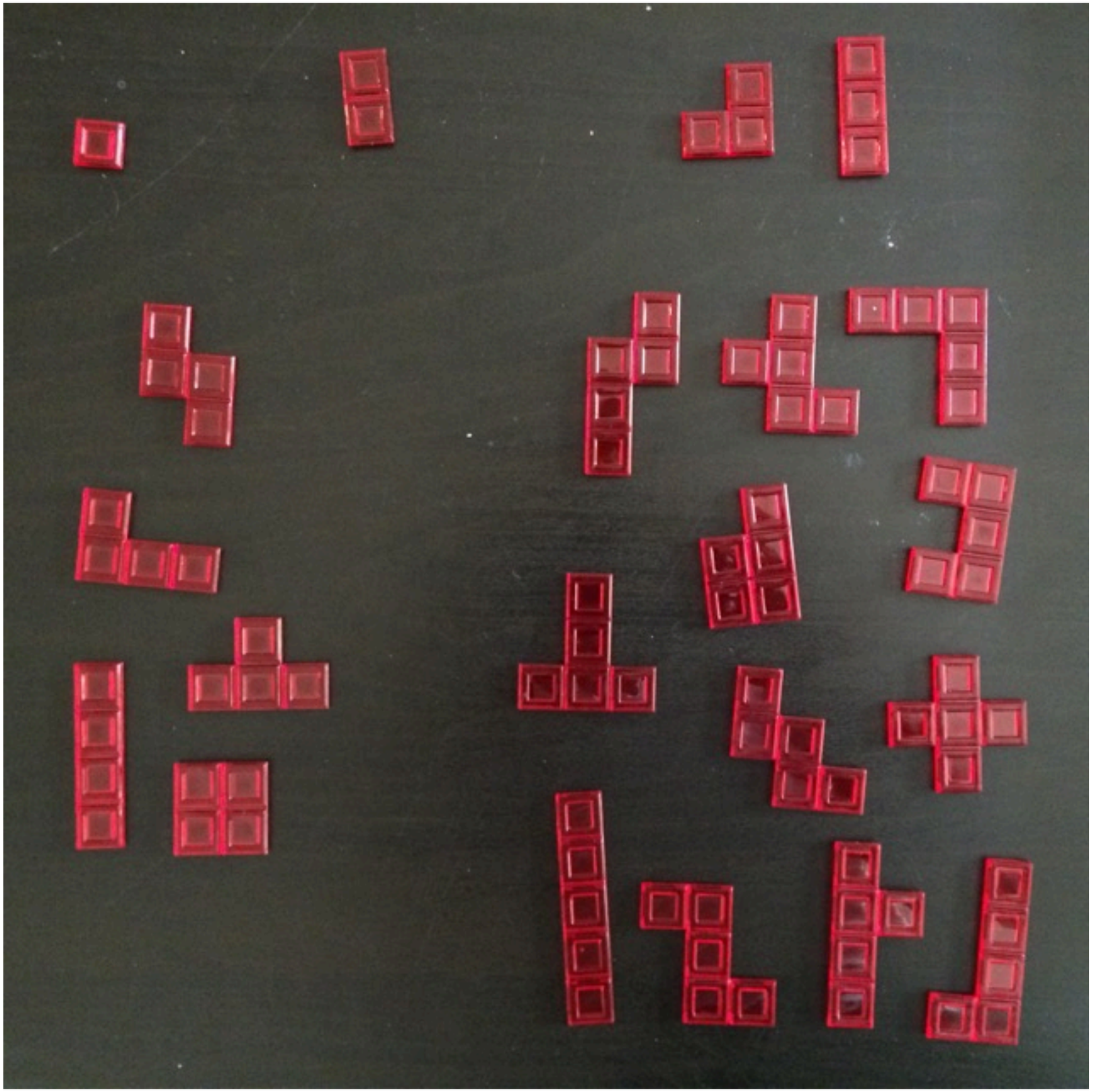
POLYOMINOES AND BLOKUS

Sarah Trebat-Leder

AoPS + Emory Math Circle

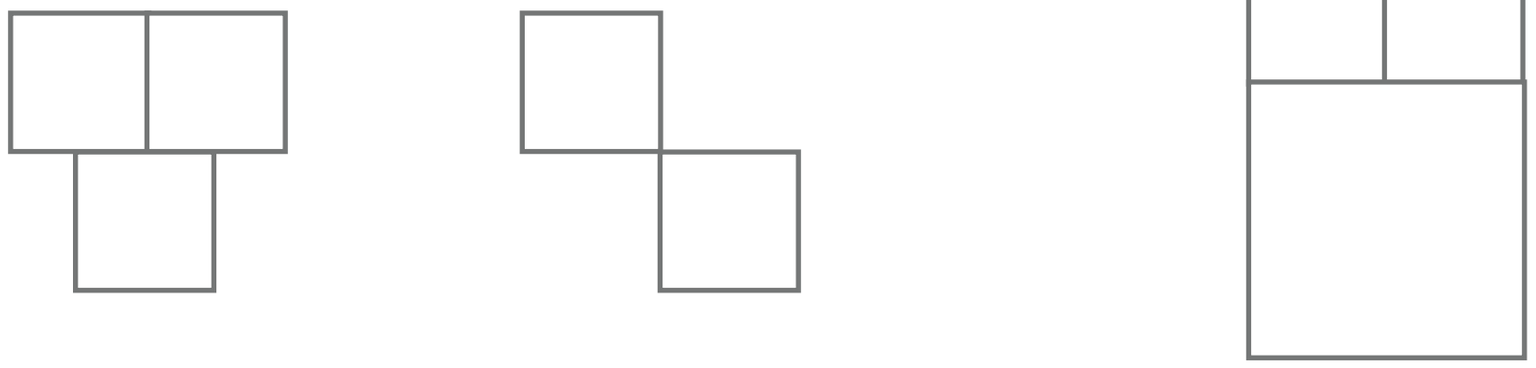
In the actual game a players pieces must be connected to one another but only by a corner from one piece to the next. You loose if you cannot play.



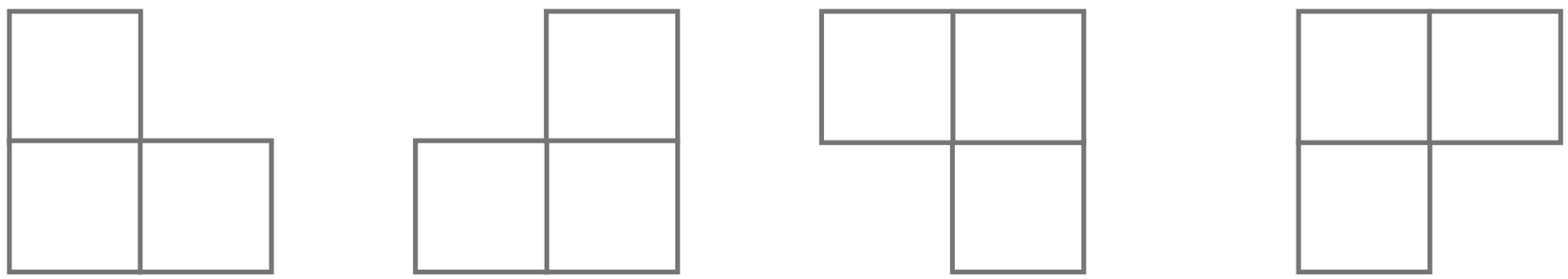


LOTS OF QUESTIONS TO ASK!

- How should we define a polyomino?



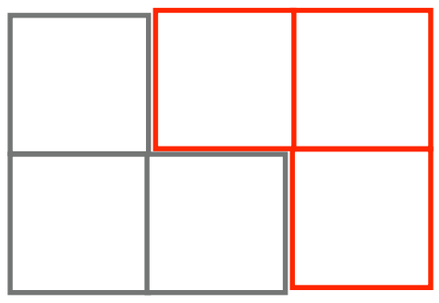
- When should we consider two polyominoes to be the same?



LOTS OF QUESTIONS TO ASK!

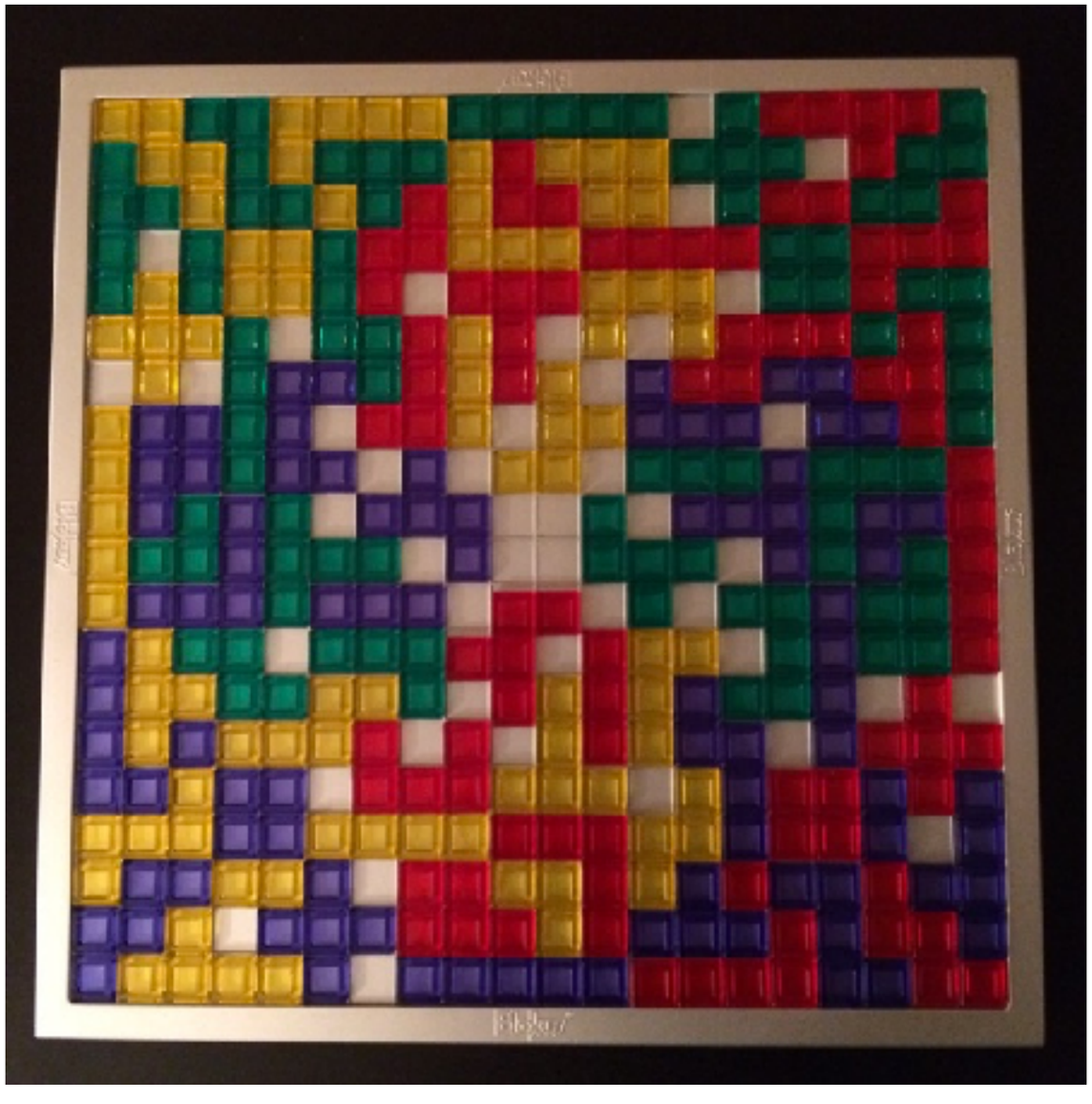
- How many different n-ominoes are there for the first few n's? Is there a pattern? Are any missing from Blokus?

- Can a particular polyomino be used to tile a plane? What about a prescribed region of the plane?



LOTS OF QUESTIONS TO ASK!

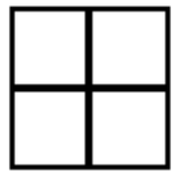
- If the players cooperated, would they be able to fit all the pieces on the board while following the rules of the game?



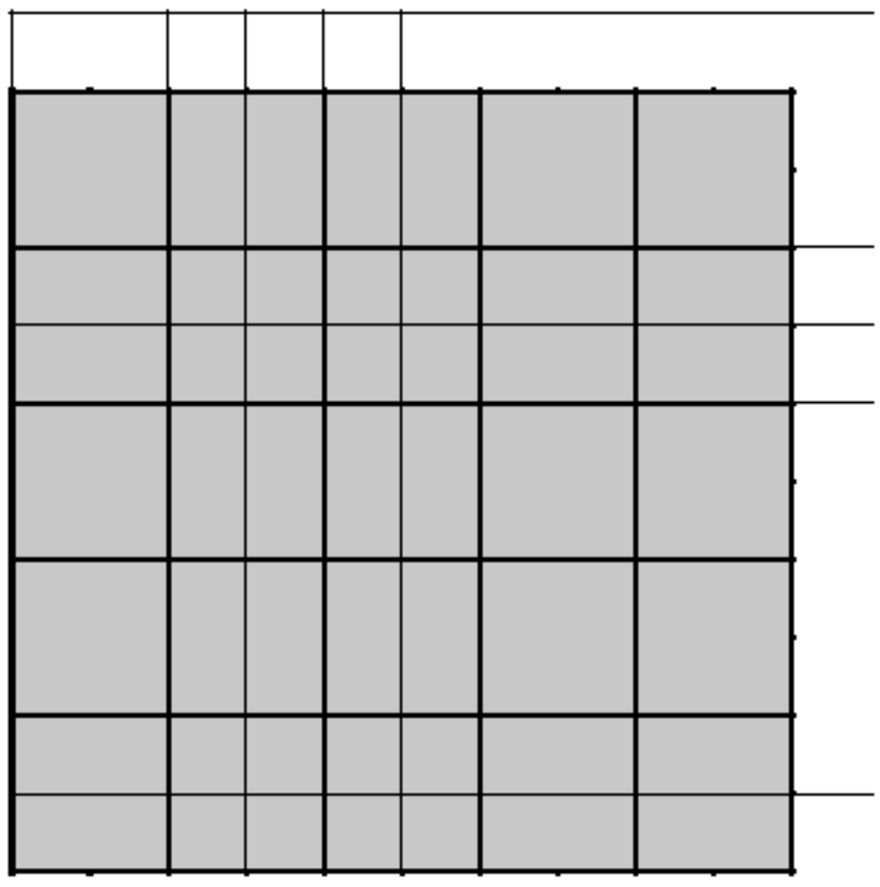
WHAT WE ACTUALLY DID IN MATH CIRCLE

- 75 minute session with ~20 students in grades 5 - 7.
- When they arrived, there were a handful of Blokus pieces at each table.
- Warmup: Pick a shape. How many copies of it can you fit on an 11x11 grid?

If the piece you picked looked like the following:



You might try to fill up the grid in the following way:



This gives you 25 copies on the grid. Is that the best we can do? Is there a better configuration which can fit more than 25 copies?

WHAT WE ACTUALLY DID IN MATH CIRCLE

- Class discussion: How to define a polyomino? When are two the same? How many n-ominoes are there for n = 1, 2, 3?
- Main activity: How many n-ominoes are there for n = 4, 5?
- Wrapup: Give a few more numbers in chart. What do you notice?

n	# of n-ominoes
1	1
2	1
3	2
4	5
5	12
6	35
7	108
8	369
9	1285
10	4655