

# Winter Break Activities

At Math Plus Academy we always encourage students to engage in learning of any and all kinds! Winter breaks and breaks in general are great times for progression not regression! This packet includes a number of different activities students can complete to further their learning and earn new badges and credits along the way. These activities are tagged by class. Some challenges labeled 'All Classes' may present challenges for students in Recruit - Operative classes.

**Parents:** Try to be helpful without being too helpful! In other words, ask lots of questions without giving solutions or answers please.

## Activity #1: Watch Hidden Figures

All Classes

100 Experience Points

Hidden Figures tells the story of the forgotten women who were critical in winning the space race.

- 1. Why do you think it was important for the U.S. to win the “space race”.**
- 2. Write about the challenges the women faced during this period in history – both at work and outside that office.**
- 3. Describe three instances of the women working to overcome the obstacles they faced.**
- 4. What is one thing that you were surprised to learn when you watched the movie?**

# Activity #2: Staircases

All Classes

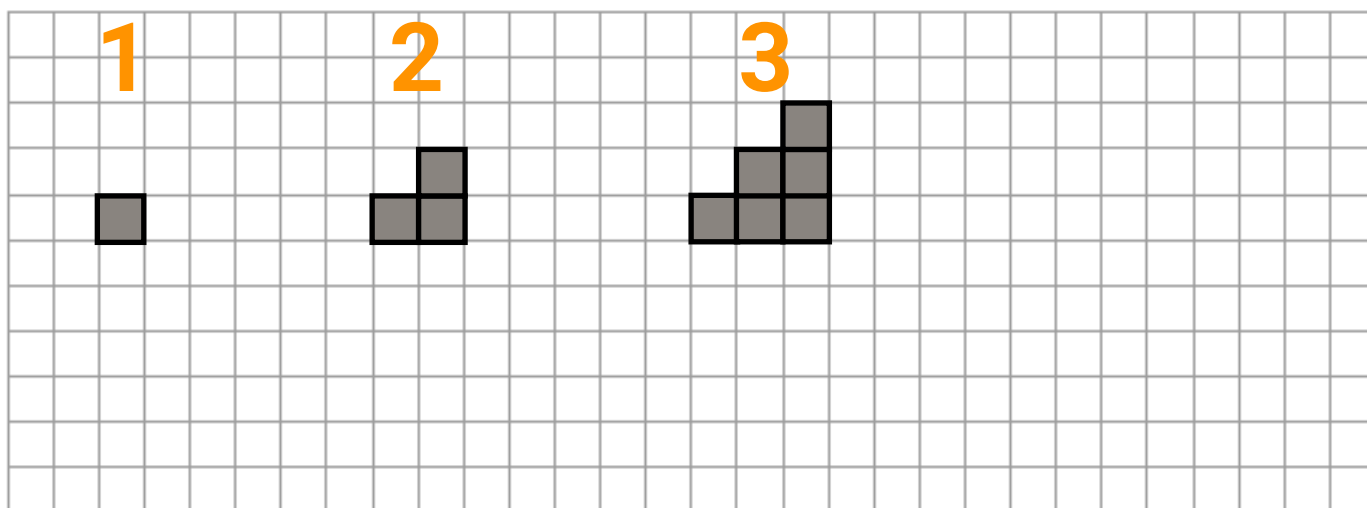
100 Experience Points

Look at the three “staircases” below, then answer the following questions.

1. **What do you mathematical things do you notice about the staircases? Try to list at least three things you notice.**
2. **What math questions might you ask about the staircases? Try to come up with 3 things.**
3. **One question you could ask is how many total block will it take to make the fourth staircase in the pattern. Can you draw the picture to discover the answer?**
4. **How many blocks would it take to make the 10th staircase?**
5. **Can you find a way to figure out how many blocks are in the 100th staircase without drawing the picture?**

**Note: Try to answer as many of these as you can. Look for patterns. Maybe along the way you’ll have some other questions you want to explore.**

**Explore them too!**



# Activity #3: KenKen Puzzles

All Classes

100 Experience Points

The numbers you use in a KenKen puzzle depend on the size of the grid you choose. A 3 x 3 grid (3 squares across, 3 squares down) means you use the numbers 1, 2, and 3. In a 4 x 4 grid, use numbers 1 to 4. A 5x5 grid requires you use the numbers 1 to 5, and so on.

The numbers in each heavily outlined set of squares, called cages, must combine (in any order) to produce the target number in the top corner using the mathematic operation indicated (+, -,  $\times$ ,  $\div$ ).

- Use each number only once per row, once per column.
- Cages with just one square should be filled in with the number in the corner.
- A number can be repeated within a cage as long as it is not in the same row or column.

4+		3
	8+	3+

7+		2-	6+
3-	3+		
		3	
6+			4

8 $\times$		4+	
10+		4 $\times$	
1			11+
3+			

24 $\times$		20 $\times$	6+	
			8+	
4-		5+	16 $\times$	
2 $\div$	9+			
			10 $\times$	

5+	2	1-	
	6 $\times$		
9+			5+
6 $\times$		1	

# Activity #4: Skyscrapers

Operative +

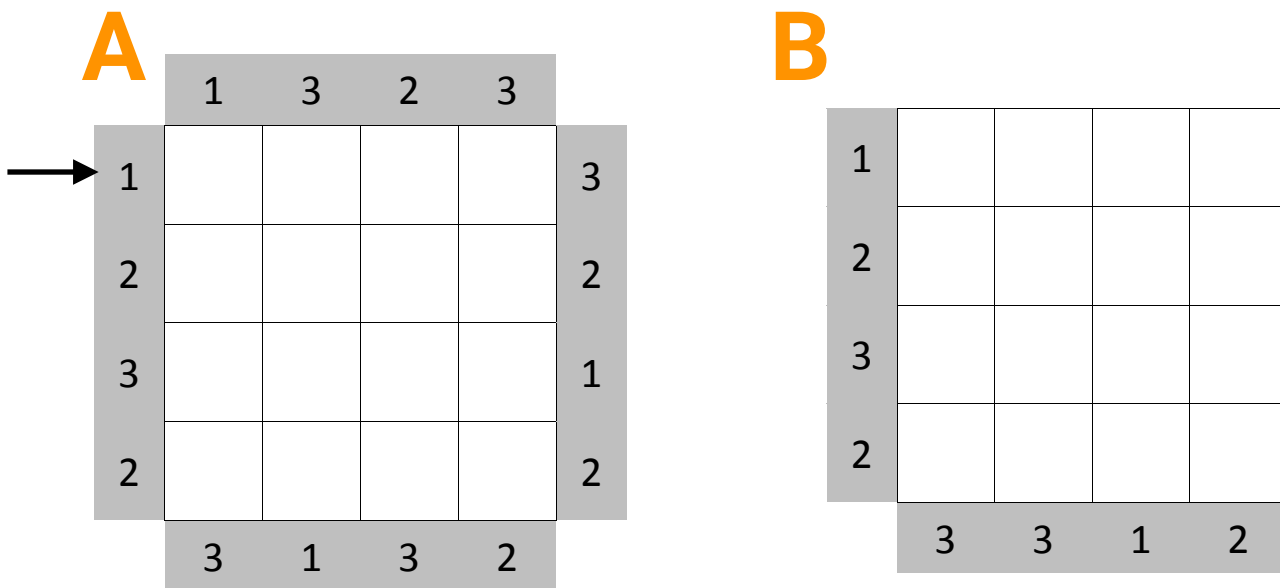
100 Experience Points

Skyscrapers are solved by placing buildings in a grid so the number of visible buildings, as viewed from the direction of each clue, is equal to the value of the clue.

Buildings range in height from 1 to 4 stories.

No two buildings in a row or column can have the same height.

Taller buildings block the view of the shorter ones located behind them.



Puzzle A: On the left side of the first row (see arrow), it says you can only see 1 tower. That means a 4-story tower must be in the top-left corner. It will block the view of all the skyscrapers behind it.