

# Math Challenge #2

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_ Grade: \_\_\_\_\_  
 Teacher: \_\_\_\_\_ Parent's email: \_\_\_\_\_

## Patterns

Welcome to the Math Challenge #2. In this challenge, we look at problems involving Patterns. The ability to identify patterns and sequences is an important aspect of critical thinking and problem solving. Patterns are all around us. For example, look at your classroom wall or ceiling. You can also find patterns in quilts and kitchen tiles. Some are easy to notice, some are hard. Grab your parents and siblings to solve these patterns problems with you. Good luck!

**Kinder & First Grade:** solve at least 3 problems.

**Second & Third Grade:** solve at least 7 problems.

**Fourth Grade and above:** solve at least 12 problems.

### Answer

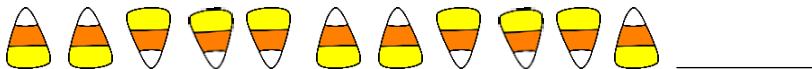
1. Complete each pattern below.

- a. Draw the next picture:



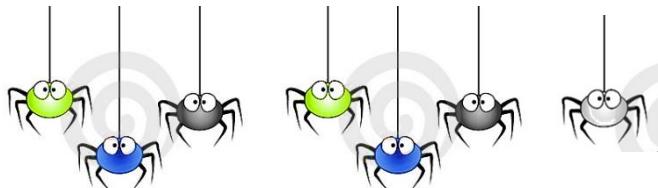
a.

- b. Draw the next candy corn:



b.

- c. Color the next spider:



c.

(green) (blue) (gray) (green) (blue) (gray) ( )

2. What are the next two numbers in the following number patterns:

- a. 1, 3, 5, 7, \_\_\_\_\_, \_\_\_\_\_.

a.

- b. 4, 8, 12, 16, \_\_\_\_\_, \_\_\_\_\_.

b.

3. Complete each pattern below.

- a. Draw the next two arrows:



a.

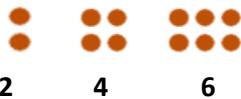
- b. Draw the next two rectangles:



b.

4. Study the pattern below.

Fig. 1   Fig. 2   Fig. 3



2      4      6

Fig. 4

Fig. 5

\_\_\_\_\_

a.

b.

a. Draw the next two figures belong to the pattern.

b. How many dots will there be in figure 7?

5. Find the next three numbers in the following patterns.

a. 5, 8, 11, 14, 17, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

a.

b. 80, 75, 70, 65, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

b.

c. 121, 131, 141, 151, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

c.

6. Study the pattern bellow.

Fig. 1   Fig. 2   Fig. 3

Fig. 4

Fig. 5



1      3      6

\_\_\_\_\_

a.

b.

c.

a. Draw the next two figures and write the number of circles in each figure.

b. How many dots will there be in figure 6?

c. How many dots will there be in figure 8?

7. Find the missing numbers in the following patterns:

a. 4, \_\_\_\_\_, 10, 13, \_\_\_\_\_, 19, 22

a.

b. 3, 13, 23, 33, \_\_\_\_\_, \_\_\_\_\_, 63, \_\_\_\_\_, 83.

b.

c. 1, 6, \_\_\_\_\_, 16, 21, \_\_\_\_\_, 31, \_\_\_\_\_, 41.

c.

d. 211, \_\_\_\_\_, 195, 187, \_\_\_\_\_, 171, \_\_\_\_\_.

d.

8. Complete each pattern below.



\_\_\_\_\_

a.

b. A, C, E, \_\_\_\_\_, I, \_\_\_\_\_, \_\_\_\_\_, Q.

b.

9. Find the next three numbers in the following patterns.

a. 2, 6, 18, 54, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

a.

b. 101, 86, 71, 56, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

b.

10. Study the clock pattern to answer the questions below.



stage 1



stage 2



stage 3



stage 4



stage 5

a. What is the time in stage 17?

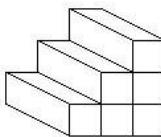
a.

b. What is the time in stage 29?

b.

Hint: Find the times for stages 1, 5, 9, and 13. Notice its pattern.

11. Jose used 6 blocks to build this staircase with 3 steps. How many blocks will Jose need to make a 6-step staircase?  
*Hint: Make a table and look for a pattern.*



12. There are pentagonal tables at a banquet hall, joined together as shown below. There is one seat for each exposed table edge.



- a. How many seats are there if the banquet has 30 tables?  
b. If the banquet has 71 seats, how many tables are there?

a.

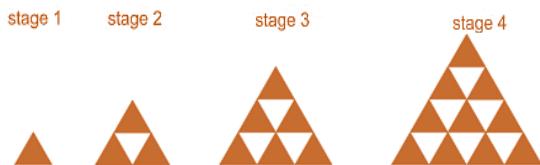
b.

13. A bat ate 1050 dragon flies on four consecutive nights. Each night she ate 25 more than on the night before. How many did she eat at the end of the fourth night?  
*Hint: Draw a model.*

14. All tables at a school are equilateral triangles. Each table can sit three students, one on each side. If two tables are joined, four students can sit. If three tables are joined, then five students can sit, and so on. How many tables are needed to sit 50 students? Hint: make a table or an organized list.

15. The fifth-grade students have five days to sell tickets to a talent show. The students predict that each day they will sell 10 fewer tickets than the day before. How many must they sell the first day if they want to sell a total of 200 tickets?

16. Study the figures constructed from unit triangles. Stage 1 has 1 shaded triangle. Stage 2 has 4-unit triangles (3 shaded and 1 unshaded).



- a. At what stage is there a total of 900-unit triangles?  
b. How many unshaded unit triangles are there in stage 11?

17. Notice the pattern of odd numbers in the pyramid of numbers. What is the sum of the seventh row?

