

Math Challenge #8

First Name: _____	Last Name: _____	Grade: _____
Teacher: _____	Parent's email: _____	

Patterns

Welcome to the Math Challenge #8. In this challenge, you will predict “what’s next?” by figuring out the pattern in the problems. A pattern can be a sequence of objects, letters, or numbers even a combination of all three. Enjoy.

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. Identify and draw the missing figures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 5Figure 6

2. Identify and draw the missing figures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 8Figure 9

3. Identify and draw the missing figures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 9Figure 10

4. A function machine is turning every number to a new number. Each time the number is dropped into the machine, the machine changes each number according to a rule. The rule for this particular machine is **‘double the number.’** The table below displays what numbers are being dropped into the machine and the new numbers that come out the other end. Find the missing numbers.

In	Out
2	4
3	?
5	?
10	?

In	Out
2	4
3	
5	
10	

5. Look at the figures on problem number 3. If the pattern continues, draw the missing figures on Figure 15 and Figure 20.

_____ Figure 15 _____ Figure 20

6. If this pattern continues, what would the next term look like?





a.    

Figure 1 Figure 2 Figure 3 Figure 4





b.    

Figure 1 Figure 2 Figure 3 Figure 4

a. _____
Figure 5

b. _____
Figure 5

7. Look at the figures on problem number 6. If the pattern continues,

a. How many hearts are there on Figure 6 and Figure 10?

b. How many stars are there on Figure 10 and Figure 20?


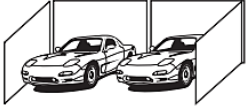

a. Fig. 6: _____; Fig. 10: _____

b. Fig. 10: _____; Fig. 20: _____

8. Marco, Pete and Hayley each made a list of numbers. Marco started at 60 and counted backwards by 3 to 0. Pete started at 60 and counted backwards by 4 to 0. Hayley started at 60 and counted backwards by 2 to 0. What numbers are in Marco's list that are also in Pete's and Hayley's list?

9. Henry baked cookies over the weekend. Each day during the week he took three cookies to school for his lunch. On Saturday he had 18 cookies left. How many cookies did he bake?

10. Tom began building garages for his toy cars, using pieces of cardboard for the walls. For 1 car he used 3 wall pieces. For 2 cars he used 4 wall pieces. His garage for 3 cars is shown below.

1 car 2 cars 3 cars

If he continues with this pattern, how many wall pieces would he need for 100 cars?

11. If the following pattern continues, how many triangles and how many trapezoids will there be in Figure 8? Figure 20?

Hint: create a table or chart, identify the pattern rule and use it to solve the problem.






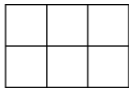






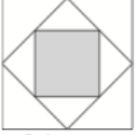
  

Figure 1 Figure 2 Figure 3

Figure 8: _____

Figure 20: _____

<p>12. A robin comes to the birdfeeder every 5 days and a blue jay comes by every 3 days. Today, the robin and blue jay both came to the birdfeeder. How many days will it be before the robin and the blue jay both come on the same day again?</p>	
<p>13. The baseball tickets at the stadium were going on sale at 4:00 p.m. At 1:00 p.m. 15 people were in line waiting to buy tickets. Every 15 minutes 10 more people got in line.</p> <p>a. At what time were 75 people waiting in line?</p> <p>b. How many people were in line at 4:00 p.m.?</p>	<p>a.</p> <p>b.</p>
<p>14. Gordon used toothpicks to make the pattern below. He used 7 toothpicks to make the first shape. Gordon said that he needed 51 toothpicks to make the tenth shape in the pattern. Was he right? Use a chart to support your conclusion.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Shape 1</p> </div> <div style="text-align: center;">  <p>Shape 2</p> </div> <div style="text-align: center;">  <p>Shape 3</p> </div> </div>	
<p>15. Look at the repeating pattern below. RRRBGGYYRRRBGGYY If the pattern continues, what will be the 85th letter?</p>	
<p>16. Sheila collects coins each day. She collects 3 coins on Day 1, and the number of coins she collects each day is double the number of coins she collected the day before. On what day will Sheila collect exactly 96 coins?</p>	
<p>17. Mr. Mahendran has 50 blocks. He uses 22 of these blocks to make the pattern shown below (4 stages). How many stages will Mr. Mahendran be able to complete with the 50 blocks?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Stage 1</p> </div> <div style="text-align: center;">  <p>Stage 2</p> </div> <div style="text-align: center;">  <p>Stage 3</p> </div> <div style="text-align: center;">  <p>Stage 4</p> </div> </div>	
<p>18. Ms. Lewis draws shaded squares on separate identical square pieces of paper. The areas of the first three shaded squares are shown below. If this pattern continues, what will the area of the 7th shaded square be?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>1st square</p> <p>Area = 144 cm²</p> </div> <div style="text-align: center;">  <p>2nd square</p> <p>Area = ___ cm²</p> </div> <div style="text-align: center;">  <p>3rd square</p> <p>Area = ___ cm²</p> </div> </div>	

Solution is available on February 7, 2020 at www.mathinaction.org