



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

Puzzly Math Problems

Welcome to Math Challenge #15. This is the last one for this school year. These problems are puzzle-like. Read each problem a few times so that you are clear with the information. Devise a plan, use a strategy or a combination of strategies you have learned so far. Ask a friend or a family member if you get stuck.

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. | Three birds are hanging out on a cherry tree. Robin was singing about how tasty cherries are. Bluejay heard Robin sing and started eating some cherries. Crow saw Bluejay eating cherries, so Crow also ate cherries. Crow ate 8 more cherries than Robin ate. Bluejay ate 4 more cherries than Crow did. Robin was so busy singing that she ate only 2 cherries. How many cherries did Bluejay eat?
<i>Robin: 2; Crow: $8 + 2 = 10$; Bluejay: $10 + 4 = 14$</i> | <i>14 [cherries]</i> | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|----------------------|-------------|------------------|----------|-------|------------------|-----------------------|---|---|---|---------|---|---|---|---|--------|---|---|---|---|---------------|---|---|---|---|------------|
| 2. | The children in Mr. Corey's class made puppets for children in St. Jude's hospital. The children made 6 puppets on Monday. They made 10 puppets on Tuesday. On Wednesday, they made 14 puppets. They got better at making puppets and every day they made more than the day before. If they follow the same pattern, how many puppets did they make on Friday?
<i>Notice that the pattern is 4 more puppets were made each day.
 On Thursday, they made $14 + 4 = 18$ puppets, therefore, on Friday they made $18 + 4 = 22$ puppets.</i> | <i>22 [puppets]</i> | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | Fran and Kev like to eat dumplings. Fran is smaller than Kev, so she eats fewer dumplings than Kev. For every meal, Fran eats 2 dumplings and Kev eats 3 dumplings. Fran just ate her 12 th dumpling. How many dumplings did Kev eat?
<i>Notice that the pattern is for every 2 dumplings Fran eats, Kev eats 3 dumplings.</i> <table border="1" style="margin-top: 5px; width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Fran</td> <td style="padding: 2px; text-align: center;">2</td> <td style="padding: 2px;">$2+2+2+2+2 = 12$</td> </tr> <tr> <td style="padding: 2px;">Kev</td> <td style="padding: 2px; text-align: center;">3</td> <td style="padding: 2px;">$3+3+3+3+3 = 18$</td> </tr> </table> | Fran | 2 | $2+2+2+2+2 = 12$ | Kev | 3 | $3+3+3+3+3 = 18$ | <i>18 [dumplings]</i> | | | | | | | | | | | | | | | | | | | |
| Fran | 2 | $2+2+2+2+2 = 12$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kev | 3 | $3+3+3+3+3 = 18$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | An old sneaker, a cup, a bottle, and a can fell off Captain Hook's dock and dropped to the bottom of the water. Along came a fish, a snail, a crab, and a water snake who were looking for homes. The water snake slithered into the bottle. The crab crawled into the sneaker, and the fish would not go near the can. What did the fish choose for its home? <table border="1" style="margin-top: 5px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;"></th> <th style="padding: 2px; color: #00aaff;">old sneaker</th> <th style="padding: 2px; color: #00aaff;">a cup</th> <th style="padding: 2px; color: #00aaff;">a bottle</th> <th style="padding: 2px; color: #00aaff;">a can</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px; color: #00aaff;">a fish</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> </tr> <tr> <td style="padding: 2px; color: #00aaff;">a snail</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✓</td> </tr> <tr> <td style="padding: 2px; color: #00aaff;">a crab</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> </tr> <tr> <td style="padding: 2px; color: #00aaff;">a water snake</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✗</td> </tr> </tbody> </table> | | old sneaker | a cup | a bottle | a can | a fish | ✗ | ✓ | ✗ | ✗ | a snail | ✗ | ✗ | ✗ | ✓ | a crab | ✓ | ✗ | ✗ | ✗ | a water snake | ✗ | ✗ | ✓ | ✗ | <i>cup</i> |
| | old sneaker | a cup | a bottle | a can | | | | | | | | | | | | | | | | | | | | | | | |
| a fish | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | |
| a snail | ✗ | ✗ | ✗ | ✓ | | | | | | | | | | | | | | | | | | | | | | | |
| a crab | ✓ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | |
| a water snake | ✗ | ✗ | ✓ | ✗ | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | Maxim is a magician who is getting ready for a show. Behind the curtain, he has to make up his mind what to put on. He can wear a cape or a coat. On his head, he can wear a bright red wig or a hat. He then can put on his cowboy boots or his red shoes. How many different outfits can Maxim wear for his magic show? | <i>8 [outfits]</i> | | | | | | | | | | | | | | | | | | | | | | | | | |

Make an organized a list:
 Cape, Red wig, boot
 Cape, Red wig, Red shoes
 Cape, Hat, boot
 Cape, Hat, Red shoes
 Coat, Red wig, boot
 Coat, Red wig, red shoes
 Coat, hat, boot
 Coat, hat, red shoes



Or $2 \times 2 \times 2 = 8$ since there are 2 options for coat, 2 options for head piece, and 2 options for footwear.

6. The people in the Land of Few Residents make up their own telephone numbers. The only numerals they use are 1, 2, 3, and 4. Their telephone numbers are two digits long. Their telephone directory looks like the one in the picture.

12 [telephone numbers]

How many **other telephone numbers** (that are not shown) can be made by the people in the Land of Few Residents?



Hint: Make an organized list.

- 12, 13, 14 21, 23,
 32, 33, 34 41, 42, 43, 44

7. On the school newsletter, a teacher put an advertisement as shown in the picture. Bernard and Dan saw the teacher's ad, so they are bringing a sack of 10 toads and frogs to the teacher. He looks at the animals and then gives the boys \$38. How many animals were toads and how many were frogs?



6 toads and 4 frogs

- Let's assume that all 10 creatures are frogs. $10 \times 5 = \$50$ dollars
- But they've got only \$38, which is $50 - 38 = \$12$ less
 The difference between a toad and a frog is \$2. Thus, there are $\$12 \div 2 = 6$ toads. The number of frogs: $10 - 6 = 4$ frogs

START	14	7	13	15
12	9	11	26	21
16	5	12	19	10
13	10	17	24	11
8	20	4	15	FINISH

In this puzzle, you must go through a number maze and finish with a total of 100. First you start the maze with zero. You may go **right or down only** at each turn. Find at least one possible route.

START	14	7	13	15
12	9	11	26	21
16	5	12	19	10
13	10	17	24	11
8	20	4	15	FINISH

9. Tim works at the Fly High Kite factory. His job is to check all the kites made in the factory before they are packaged. One day, Tim discovered that for every 30 kites that pass inspection, there were 7 kites that did not pass. Out of those 7 kites, 4 kites were without tails and 3 kites had the wrong colors. Of the 296 kites that Tim inspected, how many did not have tails and how many had the wrong colors?

No tails: 32 [kites]

Wrong colors: 24 [kites]

Make an organized list:

32 with no tails and 24 had the wrong colors

Pass	30	60	90	120	150	180	210	240
No tail	4	8	12	16	20	24	28	32
Wrong color	3	6	9	12	15	18	21	24
Total	37	74	111	148	185	222	259	296

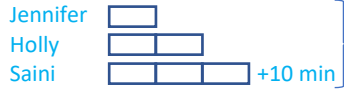
Or another way: using RATIO

Pass : Don't pass : Total = 30 : 7 : 37.

$296 \div 37 = 8$. $4 \times 8 = 32$ had no tails; $3 \times 8 = 24$ had wrong color.

10. Jennifer, Holly, and Saini agreed to meet at the park this Saturday. Jennifer came by skateboard, Holly came by bike, and Saini came on the bus. It took Holly twice as long as Jennifer to get to the park. It took Saini 10 minutes more than it took both Jennifer and Holly. If you sum up the total time it took for them to get to the park, it is 64 minutes. How many minutes did each person take to travel to the park?

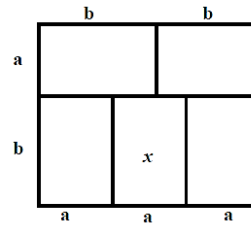
*Jennifer: 9 min
Holly: 18 min
Saini: 37 min*



- 1) $64 - 10 = 54$ min for 6 units
- 2) $54 \div 6 = 9$ minutes per 1 unit
- 3) Jennifer 9 min., Holly $2 \times 9 = 18$ min., Saini 37 min

11. The large rectangle is divided into five **congruent (identical)** rectangles. If $a + b = 10$, find the area of the rectangular region labeled x .

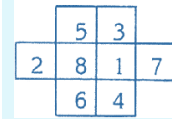
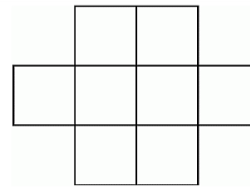
One way:
Since $a + b = 10$, students need to examine the various addends with one other piece of information: $3a = 2b$. Guess and check will give the values of a and b respectively, as 4 and 6. The area: $4 \times 6 = 24$



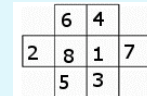
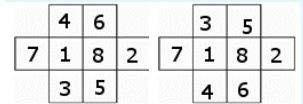
24

12. This puzzle requires you to place a number from 1 to 8 in such a way that no two consecutive numbers are next to each other horizontally, vertically, or diagonally. For example, if the number 5 is placed at the far-left box, then the 4 and 6 cannot be placed in the box directly right of the 5 or the two boxes that are diagonally above and below the 5.

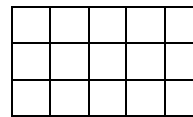
When you are thinking about consecutive numbers, all other numbers have two numbers (let's say 6 has 5 and 7 as its consecutive numbers, which can't be placed next to it.). 1 and 8 have only 1 consecutive number. Thus, you can put 1 and 8 in the middle squares. Then, think how to place the rest of the numbers. There are 4 symmetrical ways to do it.



Other solutions:

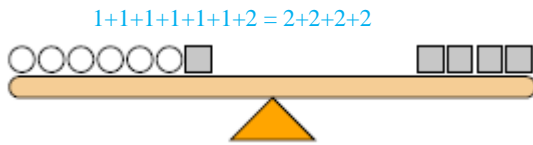


13. How many squares, of any size, are there in this figure?
Small size squares: $5 \times 3 = 15$ squares; medium size squares: 8 squares
Large size squares: 3; Total: $15 + 8 + 3 = 26$

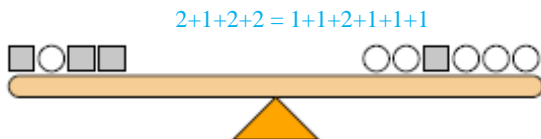


26 [squares]

14. The scales below are balanced. Use the scales to answer each question.



Both give us the clue: **1 Square = 2 Circles.**
⇒ If we have 8 circles on the left, we should have 4 squares on the right to keep it balanced.



⇒ If we add 5 squares on the right, it will be 9 total squares on the right, so we need total $9 \times 2 = 18$ Circles on the left. Since we already have 8 circles on the left, we need to add 10 circles.

a. If you added 8 circles to the left side, how many squares would you have to add to the right side to keep it balanced?

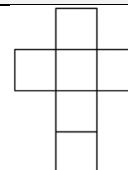
a. 4 [squares]

b. If you added 5 squares to the right side, how many circles would you have to add to the left side to keep it balanced?

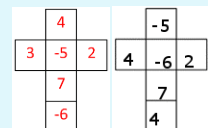
b. 10 [circles]

15. Write the numbers -6, -5, 2, 3, 4, and 7 in the squares so that each horizontal line and each vertical line adds up to 0. What is the number that must be placed at the center?

There are 2 solutions: -5 or -6.



-5 or -6



<p>16. The numbers between 1 and 2011 are written on a piece of paper. Logan circles the even numbers with red circles and Nicole circles the multiples of 5 with blue circles. How many numbers are circled with only one color? Logan circle 1005 numbers, Nicole circled 402 numbers. The only numbers which are circled by two colors are the multiples of 10; thus, there are 201 numbers circled both with red and blue colors. There are $1005 - 201 = 804$ numbers circled only with red, and $402 - 201 = 201$ numbers circled only with blue. In total there are $804 + 201 = 1005$ numbers circled with only one color.</p>	<p>1005</p>
<p>17. During a basketball game, the 'Green Goblin' team scored three times as many 2-point field goals than it did 3-point field goals. The team scored a total of 90 points. How many field goals did the Green Goblin team score? (There were no 1-point free-throws.) If we call the number of 3-point goals made G, then there were $(3 \cdot G)$ 2-point goals made, and the total score would be: $3points \cdot G + 2points \cdot 3 \cdot G = 9 \cdot G = 90 points$. So $G = 10$, and the total number of field goals made is $4 \cdot G = 40$ (Ten 3-pointers and thirty 2-pointers). Another way: use Ratio 2-points : 3-points : total = $3 : 1 : 4 \rightarrow$ total 4 goals with $3 \times 2 + 1 \times 3 = 9$ points total $90 \div 9 = 10$ units. $4 \times 10 = 40$ field goals</p>	<p>40 [field goals]</p>
<p>18. A girl and a boy play Rock, Paper, Scissors ten times, where Rock beats Scissors, Scissors beats Paper and Paper beats Rock. The boy uses Rock three times, Scissors six times and Paper once. The girl uses Rock twice, Scissors four times and Paper four times. None of the ten games was a tie. How many games has the boy won? Scissors are used ten times altogether. Since there are no tied games, exactly one player uses scissors in each game. In the six games where the boy uses scissors, the girl wins two of them when she uses rock and lose the other four games (when the girl uses Paper). In the four games where the girl uses scissors, the boy wins three of them when he uses rock and lose the other one. Hence the boy wins seven games.</p>	<p>7 [games]</p>

Solution is available on May 24, 2019 at www.mathinaction.org