



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

Sports and Games anyone?

Sports and games are sometimes played purely for entertainment, but sometimes for achievement or reward as well. They can be played alone, in teams, or online; by amateurs or by professionals. In any sport or game, we normally play to win. The Math Challenge #4 presents you with problems around sports and games. Sometimes, winning or losing does not matter too much if we play to have fun.

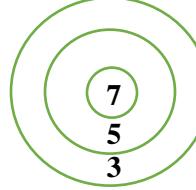
Kinder & First Grade: solve at least 3 problems.

Second & Third Grade: solve at least 6 problems.

Fourth Grade and above: solve at least 12 problems.

Answer

1.	The basketball team has 15 players on the roster. There are 6 other players who are ready to join the team. If the 6 other players join the team, how many players are there in all? $2 \times 12 - 17 = 24 - 17 = 7$	21 [players]
2.	The 'Dare Devil' soccer team won 8 games, lost 5 games, and had 3 ties this season. How many games did the 'Dare Devil' soccer team play?	16 [games]
3.	Ron bought 2 dozen golf balls before the season started. At the end of the season, he only had 17 balls left. How many golf balls did Ron lose? $2 \times 12 - 17 = 24 - 17 = 7$	7 [golf balls]
4.	Andy scored 14 goals, Carlos scored 9 goals and Dan scored 12 goals this soccer season. How many goals did the boys score in all? $14 + 9 + 12 = 35$	35 [goals]
5.	To prepare for swim team tryouts, Leann swam in the pool every morning before school. On Monday, she swam for 24 minutes. On Tuesday, she swam for 18 minutes. On Wednesday, Thursday, and Friday, she swam for 30 minutes each day. She took a break on both Saturday and Sunday. How many minutes did Leann swim this week? $24 + 18 + 30 + 30 + 30 = 132 \text{ min}$	132 [minutes]
6.	Amy, Saranya, Tina and 12 other teammates played soccer in a team. The three girls scored half of the goals last season. Amy scored 12 goals, Saranya scored 7 goals and Tina scored 9 goals. How many total goals did the team make last season? $(12 + 7 + 9) \times 2 = 28 \times 2 = 56 \text{ goals}$	56 [goals]
7.	The top basketball player at High Five High school scored 15 two-point baskets, 2 three-point baskets, and 4 free throws worth 1 point each. How many points did the top player score in the game? $15 \times 2 + 2 \times 3 + 4 \times 1 = 30 + 6 + 4 = 40 \text{ points}$	40 [points]

<p>8. A group of Rainer Elementary students went on a field trip to see the baseball game. They took 6 vans and 8 buses. There were 7 people in each van and 24 people in each bus, and all of them went to see the game. How many people went to the baseball game?</p> <p>The number of students in vans: $6 \times 7 = 42$; the number of students on buses: $8 \times 24 = 192$ The total number of students: $42 + 192 = 234$</p>	234 [people]																		
<p>9. Maya scored 8 more points than Jenny in the basketball game, and their scores together made up half of the team's total scoring. The total score was 112. How many points did each score?</p> <p>Half score is 56 points. $(56-8) \div 2 = 24$ points Jenny scored $24 + 8 = 32$ points Maya scored</p>	Jenny: 24 [points] Maya: 32 [points]																		
<p>10. Joseph is a runner specializing in the 400-meter event. If the USA record for the 400 meter is 45.13 seconds and Joseph ran it in 45.99 seconds, then Joseph needs to greatly improve to match the record. How much faster (in seconds) does Joseph have to run to tie the record?</p> <p>$45.99 - 45.13 = 0.86$ seconds</p>	0.86 [seconds]																		
<p>11. The first month when Henry trains for a marathon, he runs 2.5 miles each day. Every month he runs one mile farther per day than the month before. If this pattern continues, how many miles total will he be running after a six-month, July through December, training?</p> <p>Make an organized list:</p> <table border="1"> <tr> <td>Jul: $2.5 \times 31 = 77.5$</td> <td>Sep: $4.5 \times 30 = 135$</td> <td>Nov: $6.5 \times 30 = 195$</td> </tr> <tr> <td>Aug: $3.5 \times 31 = 108.5$</td> <td>Oct: $5.5 \times 31 = 170.5$</td> <td>Dec: $7.5 \times 31 = 232.5$</td> </tr> </table> <p>Total: $77.5 + 108.5 + 135 + 170.5 + 195 + 232.5 = 919$ miles</p>	Jul: $2.5 \times 31 = 77.5$	Sep: $4.5 \times 30 = 135$	Nov: $6.5 \times 30 = 195$	Aug: $3.5 \times 31 = 108.5$	Oct: $5.5 \times 31 = 170.5$	Dec: $7.5 \times 31 = 232.5$	919 miles												
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<p>12. During practice, Dana's six arrows land on the target shown. Each arrow is in one of the regions of the target. Which of the following total scores is possible: 44, 41, 31, 26, 19, 16?</p> <p>44 is not possible, she has 6 throws $6 \times 7 = 42$, not 44 $41 = 7 + 7 + 7 + 7 + 7 + 3$ is possible throwing 7 times, not 6 $31 = 7 + 7 + 7 + 7 + 3$ is possible with 5 throws, not 6 $26 = 5 + 5 + 5 + 5 + 3 + 3$ possible with 6 throws $19 = 5 + 5 + 3 + 3 + 3$ is possible with 5 arrows, not 6 $16 = 5 + 5 + 3 + 3$ possible with 4 arrows, not 6</p>	26 																		
<p>13. In a game named Hoopla Ball, a field goal is worth 2 points and a foul shot is worth 1 point. Suppose a team scored 72 points and made 6 more field goals than foul shots, how many foul shots did the team make?</p> <p>One way is to make a table (with data that the team made 6 more field goals than foul shots) and look for a pattern.</p> <table border="1"> <thead> <tr> <th>Field Goals</th> <th>Foul Shots</th> <th>Total points</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>0</td> <td>12</td> </tr> <tr> <td>7</td> <td>1</td> <td>$15 = 14 + 1 \times 1$</td> </tr> <tr> <td>8</td> <td>2</td> <td>$18 = 16 + 2 \times 1$</td> </tr> <tr> <td>...</td> <td></td> <td></td> </tr> <tr> <td>26</td> <td>20</td> <td>$72 = 26 \times 2 + 20 \times 1 = 52 + 20$</td> </tr> </tbody> </table> <p>Another way: Since the number of Field Goals is 6 more than the number of Soul Shots, subtract 12 points from 6 Field Goals from the total points $\rightarrow 72 - 12 = 60$. The 60 points represent the total points for equal numbers of Field Goals and Foul Shots. Since one Field Goal and one Foul Shot together = 3 points, twenty Field Goals and twenty Foul Shots have a total point value of 60. Thus, there must be 20 Foul Shots and 26 Field Goals.</p>	Field Goals	Foul Shots	Total points	6	0	12	7	1	$15 = 14 + 1 \times 1$	8	2	$18 = 16 + 2 \times 1$...			26	20	$72 = 26 \times 2 + 20 \times 1 = 52 + 20$	20 [Foul Shots]
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14.	<p>Andre is a football referee who refs a game seven days a week during the season. Because of his schedule, he can take his striped shirts to the cleaners only one day a week. He takes them in on Monday and picks them up on Tuesday evening after work. If he wears a different striped shirt every day of the week, what is the fewest number of shirts he would need to make it through the season?</p> <p>He will need 9 total shirts. He will need an 8th shirt clean when he takes the 7 dirty shirts to the cleaners on Monday. He'll need a 9th shirt to pick up his 7 clean shirts on Tuesday. Then he can start the cycle all over again on Wednesday.</p>	9 [shirts]																														
15.	<p>The Kennewick High basketball team played 9 games during last year's basketball season. The table below shows the results.</p> <table border="1"> <thead> <tr> <th>Game</th> <th>Total Points</th> <th>W-Won, L-Lost</th> </tr> </thead> <tbody> <tr><td>1</td><td>100</td><td>W</td></tr> <tr><td>2</td><td>105</td><td>L</td></tr> <tr><td>3</td><td>50</td><td>L</td></tr> <tr><td>4</td><td>120</td><td>W</td></tr> <tr><td>5</td><td>98</td><td>L</td></tr> <tr><td>6</td><td>100</td><td>W</td></tr> <tr><td>7</td><td>120</td><td>W</td></tr> <tr><td>8</td><td>70</td><td>L</td></tr> <tr><td>9</td><td>120</td><td>W</td></tr> </tbody> </table> <p>a. What is the average (arithmetic mean) of the total points for Kennewick team?</p> $\frac{100 + 105 + 50 + 120 + 98 + 100 + 120 + 70 + 120}{9} = \frac{883}{9} = 98.11$ <p>b. What percent of the games did they win?</p> <p>5 out of 9 games they won</p> $\frac{5}{9} \times 100 = 55.\overline{5}\% \approx 55.56\%$	Game	Total Points	W-Won, L-Lost	1	100	W	2	105	L	3	50	L	4	120	W	5	98	L	6	100	W	7	120	W	8	70	L	9	120	W	a. 98.11 points b. 55.56%
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16.	<p>Baseball uses a lot of statistics. Look in the sports section of the Washington Post newspaper and you will probably see lots of stats during baseball season. “PCT” is a popular stat: it is the % of games won in decimal form. PCT usually has three decimal places. A Team X played 78 games of which 43 games were won and 35 were lost, what is the PCT of Team X? $\frac{43}{78} = 0.5512 \approx 0.551$</p>	0.551																														
17.	<p>Given the following clues, find out the number of gold, silver and bronze medals that France, Italy and Japan got in this international sports competition?</p> <ul style="list-style-type: none"> Japan has 1 more gold medal, but 3 fewer silver medals, than Italy. Japan has 6 silver medals. France has the most bronze medals (18), but fewest gold medals (7). Each country has at least 6 medals of each type. Italy has 27 medals in total. Italy has 2 more bronze medals than gold medals. The three countries have 38 bronze medals in total. France has twice as many silver medals as Italy has gold medals. <table border="1"> <thead> <tr> <th></th> <th>Gold</th> <th>Silver</th> <th>Bronze</th> </tr> </thead> <tbody> <tr><td>Japan</td><td>9</td><td>6</td><td>10</td></tr> <tr><td>France</td><td>7</td><td>16</td><td>18</td></tr> <tr><td>Italy</td><td>8</td><td>9</td><td>10</td></tr> </tbody> </table> <p>Japan has 6 silver medals. Then Italy has 9 silver medals. Italy has 27 medals in total. Thus $27 - 9 = 18$ gold and bronze medals. Italy has 2 more bronze than gold, thus, Italy: 8 gold, 10 bronzes. The reading all the clues, you'll get the answer.</p>		Gold	Silver	Bronze	Japan	9	6	10	France	7	16	18	Italy	8	9	10	<p>Italy: 10 bronzes, 9 silvers, 8 golds</p> <p>Japan: 10 bronzes, 6 silvers, 9 golds</p> <p>France: 18 bronzes, 16 silvers, 7 golds</p>														
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*Solution is available on November 16, 2018 at www.mathinaction.org
Don't miss the [Math Challenge Tournament!](#)*