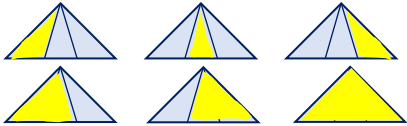
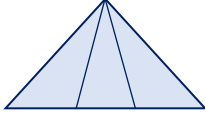


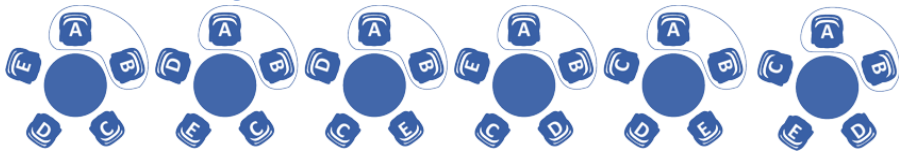


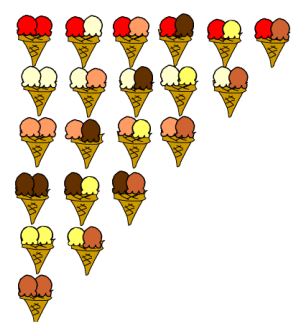


One through Twelve

		<i>Answer</i>
1.	<i>Cindy found $3 + 2 + 2 + 1 = 8$ coins in total.</i>	<i>8 [coins]</i>
2.	<i>Since there are 8 ducklings altogether, and one is left behind, there must be $8 - 1$ or 7 ducklings crossed the street safely?</i>	<i>7 [ducklings]</i>
3.	<i>They bring $3+3+3 = 9$ in all.</i>	<i>9 [graham crackers]</i>
4.	<i>The are 4 different ways 3 and 9 4 and 8 5 and 7 6 and 6</i>	<i>4 [ways]</i>
5.	<i>If they want to collect 12 pinecones, they need 4 more pinecones. $12 - 5 - 3 = 4$</i>	<i>4 [pinecones]</i>
6.	<i>Work backward. Before Caitlin and Desmond ate two each, there were $3 + 2 + 2$ or 7 jellybeans. There were $7 + 5 = 12$ before Boris ate jellybeans. Therefore, 12 jellybeans were in the jar at first.</i>	<i>12 [jellybeans]</i>
7.	<i>$5 + 5 + 2 = 12$ stars (Calista, Joel, Miraya together) Half of 12 is 6 stars. Tom earned 6 stars.</i>	<i>6 [stars]</i>
8.	<i>There are 6 triangles (of any size) are there in the figure.</i>  	<i>6 [triangles]</i>
9.	<i>List out the arrangements: 1 by 12 2 by 6 3 by 4 4 by 3 6 by 2 12 by 1</i>	<i>6 [arrangements]</i>
10.	<i>Draw a diagram.</i>  <p><i>The youngest daughter is: $(12 - 6)/2 = 3$ years old. Thus, the oldest daughter is $3 + 6 = 9$ years old.</i></p>	<i>9 [years old]</i>

11.	<p><i>Make an organized list.</i></p> <div style="display: flex; justify-content: center; gap: 10px;"> <div style="border: 1px solid gray; padding: 5px; width: 30px; text-align: center;">9</div> <div style="border: 1px solid gray; padding: 5px; width: 30px; text-align: center;">2</div> <div style="border: 1px solid gray; padding: 5px; width: 30px; text-align: center;">0</div> <div style="border: 1px solid gray; padding: 5px; width: 30px; text-align: center;">5</div> </div> <p>205, 209, 250, 259, 290, 295, 502, 509, 520, 529, 590, 592, 902, 905, 920, 925, 950, 952</p> <p>Then cross out the even numbers: 205, 209, 250, 259, 290, 295, 502, 509, 520, 529, 590, 592, 902, 905, 920, 925, 950, 952</p> <p>There are only 8 possible ways.</p> <p>OR</p> <p>To get an odd number, the last digit must be odd digit at the end, there are two ways to do it: __ 9 or __ 5.</p> <p>First digit can not be 0, so there are two options to fill the first digit. Out of 4 digits we used 2, so there are two possible ways to fill the second digit. In total there are $2 \times 2 \times 2 = 8$ ways</p>	8 [ways]
12.	<p>a. Since the sum of their ages is the same as the product, they are: 1, 2, and 3 years old.</p> <p>b. Since the sum of their ages is the same as the product, they are: 1, 1, 2 and 4 years old.</p> <p>c. Since sum of their ages is the same as the product, they are: 1, 1, 1, 1, 2, and 6 years old.</p>	<p>a. 1, 2, and 3</p> <p>b. 1, 1, 2, and 4</p> <p>c. 1, 1, 1, 1, 2, and 6</p>
13.	<p><i>Make a list or a diagram.</i></p> 	8 [outfits]
14.	<p><i>Make an organized list.</i></p> <p>We can name the book a, b, c, d, e, and f. She can bring: a and b, a and c, a and d, a and e, a and f (5 ways) b and c, b and d, b and e, b and f (4 ways) c and d, c and e, c and f (3 ways) d and e, d and f (2 ways) e and f (1 ways) $5+4+3+2+1 = 15$ ways</p> <p>OR as the first choice she can have any of the 6 books, let's say book A. As the second choice is any of the five books that are left, let's say choice B. $6 \times 5 = 30$. But AB is the same set of books as BA, thus, $30/2 = 15$ ways to choose 2 books out of 6.</p>	15 [ways]
15.	<p>What is the total number of possible outcomes when 2 pairs of coins are tossed? 2 pairs mean 4 coins. First coin has 2 outcomes, second coin has 2 outcomes, and so does the third and fourth coin. Total outcome = $2 \times 2 \times 2 \times 2 = 16$</p>	16 [outcomes]

16.	<p>Draw it out.</p> <p>We can consider these two (A and B) as one unit, along with 3 others. So, effectively we've to arrange 4 people in a circle, the number of ways being $(4 - 1)!$ or 6.</p> <p>We can make a diagram to show our answer:</p>  <p>But wait, in each of these arrangements, AB can also switch places in 2 ways. So, the total number of arrangements will be $6 \times 2 = 12$</p>	12 [ways]
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17.	<p>Make an organized list or draw a picture.</p> <p>Note: chocolate-vanilla is the same as vanilla-chocolate</p> <p>Organized list: Let's label the six different flavors as A, B, C, D, E, and F. AA, AB, AC, AD, AE, AF BB, BC, BD, BE, BF CC, CD, CE, CF DD, DE, DF EE, EF FF Total = $6+5+4+3+2+1 = 21$</p> <p>Draw a picture:</p> 	21
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18.	<p>How many ways are there to arrange the letters of the 5 letter word QUEUE without any duplicate arrangements?</p> <p>If we arrange the 5 letter word, we will have $5!$ or 120 arrangements. However, the letter U can be interchanged, and the letter E also can be interchanged. Because of this, there will be 4 duplicates in the arrangements.</p> <p>Thus, the number of ways to arrange the word QUEUE without any duplicate arrangements is $120/4 = 30$ ways</p>	30 [ways]
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