Identifying Possibilities

In this unit, we’re working with probability—measuring how likely it is that something will happen or not happen. At its core, probability is about comparing possibilities. If you flip a coin, there are two total possibilities: heads or tails. There is one possibility out of two that the coin will land heads-up. That is probability. Before you can solve anything involving probability, you need to be able to identify all of the *possibilities*. That is what you are working on today.

Determine the number of *possibilities*. If needed, write out the sample space.

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| 1.    ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Even*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***#2*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***2 or even*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** | 2.    ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  *N****umber*** *Possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Letter*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Blank*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** | 3.    ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Even*** *Possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Odd*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Odd or even*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** |
| 4. At the zoo, there are 3 tigers, 4 lions, 5 zebras and 3 giraffes.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Tiger*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Cat*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Tiger or cat*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** | 5. In a traditional deck of cards, all of the cards are either red or black. There are 26 black cards and 26 red cards.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Black*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Red*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Purple*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** | 6. A beach ball has two panels of each of the following colors: red, blue, green and yellow. There are no other colors.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Green*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Blue*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Blue or green*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_*** |
| 7. A bag has 18 marbles. There are 5 clear, 2 black, and 7 red marbles. The rest are green.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Red*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Clear*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Not red or clear*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** | 8. In a class, there are 3 sophomore boys, 8 junior boys, 6 sophomore girls, and 12 junior girls.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Girl*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Junior*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Girl or junior*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** | 9. On a playlist, there are 24 songs. 14 of them are hip-hop, 6 are rap, and the rest are opera.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Rap*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Hip-hop*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Not opera*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** |
| 10. Julie had 2 math handouts, 3 English assignments and a History paper in her folder before she turned in 1 English assignment during 1st period. Her English assignment was not returned to her.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Math*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***English*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Math or English*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** | 11. Frank had 8 math handouts, 2 Science labs and 4 English notes in her folder before she turned one math handout during 3rd period. The handout was returned before the end of class.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Math*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***English*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Math or English*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** | 12. In a drawer, there are 7 pairs of white socks, 3 pairs of black socks, and one pair of black gloves.  ***Total*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Black*** *possibilities****: \_\_\_\_\_\_\_\_\_\_\_\_***  ***Sock*** *possibilities:* ***\_\_\_\_\_\_\_\_\_\_\_\_***  ***Black or sock*** *possibilities:* ***\_\_\_\_\_\_\_\_\_*** |

Probability is about *comparing possibilities.* It is when you show the relationship between the possibility of what you want and the total number of possibilities. The most common ways to express probability are:

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| Fractions, | Decimals, | & Percents |
| *(simplify as much as possible)* |  | *Multiply the decimal by 100 to determine the percent* |

You have already determined the number of possibilities for each problem below (see previous problems). Determine the probabilities.

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| 13.    *Probability of a* ***number****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 14.    *Probability of a* ***letter****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 15.    *Probability of a* ***blank:***  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* |
| 16. At the zoo, there are 3 tigers, 4 lions, 5 zebras and 3 giraffes.  *Probability of a* ***tiger****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 17. At the zoo, there are 3 tigers, 4 lions, 5 zebras and 3 giraffes.  *Probability of a* ***cat****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 18. At the zoo, there are 3 tigers, 4 lions, 5 zebras and 3 giraffes.  *Probability of a* ***tiger or cat****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* |
| 19. A bag has 18 marbles. There are 5 clear, 2 black, and 7 red marbles. The rest are green.  *Probability of a* ***red****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 20. A bag has 18 marbles. There are 5 clear, 2 black, and 7 red marbles. The rest are green.  *Probability of a* ***clear****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* | 21. A bag has 18 marbles. There are 5 clear, 2 black, and 7 red marbles. The rest are green.  *Probability of* ***not red or clear****:*  *As a fraction*  *As a decimal to the thousandth*  *As a percent to the tenth* |