# Year 7 Worksheet 6: Probability

Question 1: Basic Probability Concepts.

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| 1 | A standard deck of playing cards contains 52 cards, with 4 suits (hearts, diamonds, clubs, spades). What is the probability of drawing a heart? |
| 2 | If you roll a fair six-sided die, what is the probability of rolling an even number (2, 4, or 6)? |
| 3 | You have a bag with 10 marbles: 5 red and 5 blue. What is the probability of randomly selecting a red marble? |
| 4 | In a jar, there are 30 candies: 12 are chocolate, 10 are mint, and 8 are caramel. What is the probability of picking a caramel candy? |
| 5 | If you flip a fair coin, what is the probability of getting heads? |

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| 6 | A spinner has 8 equal sections, numbered 1 through 8. What is the probability of landing on an even number? |
| 7 | In a bag, there are 12 marbles: 3 green, 5 blue, and 4 red. What is the probability of drawing a green marble? |
| 8 | If you randomly select a letter from the word "MATHEMATICS," what is the probability that it is a vowel? |
| 9 | There are 20 students in a class, and 12 of them play soccer. What is the probability that a randomly selected student plays soccer? |
| 10 | A jar contains 50 marbles: 20 are red, 15 are blue, and 15 are green. What is the probability of selecting a blue or green marble? |

Question 2: Probability of Simple Events.

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| 1 | A deck of cards has 52 cards, with 4 suits (hearts, diamonds, clubs, spades). What is the probability of drawing a red card? |
| 2 | You have a bag of marbles containing 8 red, 6 blue, and 4 green marbles. What is the probability of drawing a blue or green marble? |
| 3 | If you roll two fair six-sided dice, what is the probability of getting a sum of 7? |
| 4 | In a jar, there are 12 candies: 4 chocolates, 3 caramels, and 5 mints. What is the probability of picking a caramel or a mint? |
| 5 | A bag contains 6 white socks and 4 black socks. What is the probability of randomly selecting two white socks without replacement? |

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| 6 | You have a spinner with 5 equal sections labeled A, B, C, D, and E. What is the probability of landing on A or B? |
| 7 | If you have a bag with 8 marbles, 3 of which are red and 5 are blue, what is the probability of drawing a red marble, replacing it, and then drawing another red marble? |
| 8 | In a game, there are 20 cards: 8 are numbered 1 to 8, and 12 are numbered 9 to 20. What is the probability of drawing a card with a number greater than 8? |
| 9 | You have a bag with 5 blue marbles and 7 green marbles. What is the probability of drawing a green marble and then, without replacement, drawing another green marble? |
| 10 | If you spin a wheel with 12 equal sections, each labeled with a different month, what is the probability of landing on a month with 31 days? |

Question 3: Probability and Real-Life Situations.

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| 1 | The weather forecast predicts a 30% chance of rain tomorrow. What is the probability that it will not rain? |
| 2 | In a factory, there is a 10% chance of a safety incident occurring during a particular task. What is the probability that the task will be incident-free? |
| 3 | In a survey, 25% of respondents said they prefer tea over coffee. If 80 people were surveyed, how many prefer tea? |
| 4 | A medical test for a disease is 95% accurate. If a person tests positive, what is the probability that they actually have the disease? |
| 5 | At a busy intersection, the traffic lights are green 60% of the time. What is the probability of encountering a red light? |

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| 6 | The probability of a flight departing on time is 75%. What is the probability that the flight will be delayed? |
| 7 | In a survey, 60% of respondents said they would attend a school event. If 120 people were surveyed, how many would attend the event? |
| 8 | In a lottery, the odds of winning the jackpot are 1 in 10 million. What is the probability of not winning the jackpot? |
| 9 | A manufacturer has a quality control process that catches 85% of product defects. What is the probability of a product defect going undetected? |
| 10 | In a customer satisfaction survey, 90% of customers rated the product as satisfactory. What is the probability that a randomly selected customer is dissatisfied? |

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# Answer Key

Question 1: Basic Probability Concepts:

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| 1 | A standard deck of playing cards contains 52 cards, with 4 suits (hearts, diamonds, clubs, spades). What is the probability of drawing a heart?<br>Answer: Probability = 1/4 (There are 13 hearts out of 52 cards.) |
| 2 | If you roll a fair six-sided die, what is the probability of rolling an even number (2, 4, or 6)?<br>Answer: Probability = 1/2 (There are 3 even numbers out of 6 possible outcomes.) |
| 3 | You have a bag with 10 marbles: 5 red and 5 blue. What is the probability of randomly selecting a red marble?<br>Answer: Probability = 1/2 (There are 5 red marbles out of 10 total.) |
| 4 | In a jar, there are 30 candies: 12 are chocolate, 10 are mint, and 8 are caramel. What is the probability of picking a caramel candy?<br>Answer: Probability = 8/30 (There are 8 caramel candies out of 30 total.) |
| 5 | If you flip a fair coin, what is the probability of getting heads?<br>Answer: Probability = 1/2 (There are 2 equally likely outcomes: heads or tails.) |
| 6 | A spinner has 8 equal sections, numbered 1 through 8. What is the probability of landing on an even number?<br>Answer: Probability = 4/8 or 1/2 (There are 4 even numbers out of 8 total.) |
| 7 | In a bag, there are 12 marbles: 3 green, 5 blue, and 4 red. What is the probability of drawing a green marble?<br>Answer: Probability = 3/12 or 1/4 (There are 3 green marbles out of 12 total.) |
| 8 | If you randomly select a letter from the word "MATHEMATICS," what is the probability that it is a vowel?<br>Answer: Probability = 4/12 or 1/3 (There are 4 vowels out of 12 letters.) |

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| 9 | There are 20 students in a class, and 12 of them play soccer. What is the probability that a randomly selected student plays soccer?<br>Answer: Probability = 12/20 or 3/5 (There are 12 soccer players out of 20 students.) |
| 10 | A jar contains 50 marbles: 20 are red, 15 are blue, and 15 are green. What is the probability of selecting a blue or green marble?<br>Answer: Probability = (15 + 15)/50 or 30/50 or 3/5 (There are 15 blue and 15 green marbles out of 50 total.) |

Question 2: Probability of Simple Events:

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| 1 | A deck of cards has 52 cards, with 4 suits (hearts, diamonds, clubs, spades). What is the probability of drawing a red card?<br>Answer: Probability = 26/52 or 1/2 (There are 26 red cards out of 52 total cards.) |
| 2 | You have a bag of marbles containing 8 red, 6 blue, and 4 green marbles. What is the probability of drawing a blue or green marble?<br>Answer: Probability = (6 + 4)/18 or 10/18 or 5/9 (There are 6 blue and 4 green marbles out of 18 total marbles.) |
| 3 | If you roll two fair six-sided dice, what is the probability of getting a sum of 7?<br>Answer: Probability = 6/36 or 1/6 (There are 6 ways to get a sum of 7 out of 36 possible outcomes.) |
| 4 | In a jar, there are 12 candies: 4 chocolates, 3 caramels, and 5 mints. What is the probability of picking a caramel or a mint?<br>Answer: Probability = (3 + 5)/12 or 8/12 or 2/3 (There are 3 caramels and 5 mints out of 12 total candies.) |
| 5 | A bag contains 6 white socks and 4 black socks. What is the probability of randomly selecting two white socks without replacement?<br>Answer: Probability = (6/10) × (5/9) = 30/90 or 1/3 (On the first draw, there's a 6/10 chance of picking a white sock, and on the second draw, there's a 5/9 chance.) |
| 6 | You have a spinner with 5 equal sections labeled A, B, C, D, and E. What is the probability of landing on A or B? |

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| | Answer: Probability = 2/5 (There are 2 favorable outcomes out of 5 possible outcomes.) |
| 7 | If you have a bag with 8 marbles, 3 of which are red and 5 are blue, what is the probability of drawing a red marble, replacing it, and then drawing another red marble?<br>Answer: Probability = (3/8) × (3/8) = 9/64 (On the first draw, there's a 3/8 chance of picking a red marble, and on the second draw, with replacement, there's still a 3/8 chance.) |
| 8 | In a game, there are 20 cards: 8 are numbered 1 to 8, and 12 are numbered 9 to 20. What is the probability of drawing a card with a number greater than 8?<br>Answer: Probability = 12/20 or 3/5 (There are 12 cards with numbers greater than 8 out of 20 total cards.) |
| 9 | You have a bag with 5 blue marbles and 7 green marbles. What is the probability of drawing a green marble and then, without replacement, drawing another green marble?<br>Answer: Probability = (7/12) × (6/11) = 42/132 or 7/22 (On the first draw, there's a 7/12 chance of picking a green marble, and on the second draw, without replacement, there's a 6/11 chance.) |
| 10 | If you spin a wheel with 12 equal sections, each labeled with a different month, what is the probability of landing on a month with 31 days?<br>Answer: Probability = 7/12 (There are 7 months with 31 days out of 12 total months.) |

Question 3: Probability and Real-Life Situations:

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| 1 | The weather forecast predicts a 30% chance of rain tomorrow. What is the probability that it will not rain?<br>Answer: The probability of no rain is 70% (100% - 30%). |
| 2 | In a factory, there is a 10% chance of a safety incident occurring during a particular task. What is the probability that the task will be incident-free?<br>Answer: The probability of an incident-free task is 90% (100% - 10%). |

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| 3 | In a survey, 25% of respondents said they prefer tea over coffee. If 80 people were surveyed, how many prefer tea?<br>Answer: 20 people prefer tea (25% of 80). |
| 4 | A medical test for a disease is 95% accurate. If a person tests positive, what is the probability that they actually have the disease?<br>Answer: The probability of having the disease given a positive test is 95%. |
| 5 | At a busy intersection, the traffic lights are green 60% of the time. What is the probability of encountering a red light?<br>Answer: The probability of encountering a red light is 40% (100% - 60%). |
| 6 | The probability of a flight departing on time is 75%. What is the probability that the flight will be delayed?<br>Answer: The probability of a delayed flight is 25% (100% - 75%). |
| 7 | In a survey, 60% of respondents said they would attend a school event. If 120 people were surveyed, how many would attend the event?<br>Answer: 72 people would attend the event (60% of 120). |
| 8 | In a lottery, the odds of winning the jackpot are 1 in 10 million. What is the probability of not winning the jackpot?<br>Answer: The probability of not winning the jackpot is 9,999,999/10,000,000. |
| 9 | A manufacturer has a quality control process that catches 85% of product defects. What is the probability of a product defect going undetected?<br>Answer: The probability of an undetected defect is 15% (100% - 85%). |
| 10 | In a customer satisfaction survey, 90% of customers rated the product as satisfactory. What is the probability that a randomly selected customer is dissatisfied?<br>Answer: The probability of customer dissatisfaction is 10% (100% - 90%). |