Year 6 · Probability: Chance, Spinners and Fair Games

Name: _____ Date: _____

Kia ora! This sheet helps you practise listing all the possible outcomes, working out how likely each one is, and checking that probabilities add up to 1. Take your time and show your thinking.

Warm-up

1. List the sample space for rolling a standard six-sided die.

2. A coin is flipped once. What is the probability it lands on tails?

3. On a number line from 0 to 1, what value shows an event that is certain to happen?

4. A bag holds 4 red and 4 blue marbles. What is the probability of pulling out a red marble?

Practice

5. A spinner has 8 equal sections: 4 red, 2 blue, 1 green and 1 yellow. What is the probability of landing on red?

6. Using the same spinner (4 red, 2 blue, 1 green, 1 yellow), what is the probability of landing on blue or yellow?

7. For the same spinner, show that the probabilities of all four colours add up to 1.

8. Aroha rolls a fair die. What is the probability of rolling an even number?

9. At the Avondale School gala, Mere spins the prize wheel 40 times. It lands on 'Win a prize' 8 times. What is the experimental probability of winning a prize on one spin?

10. A bag has 3 green, 5 red and 2 yellow jelly beans. Tane picks one without looking. What is the probability it is yellow, and what is the probability it is NOT green?

Challenge

11. A spinner is one-half blue and one-quarter red. The rest is split equally between green and yellow. What is the probability of each colour? Check your answers add up to 1.

12. Kauri rolls a fair die 60 times. (a) How many times would you expect to roll a 3? (b) He actually rolled a 3 fourteen times, write the experimental probability as a fraction in simplest form.

Answer key (for parents and tutors)

1. List the sample space for rolling a standard six-sided die.
   The sample space is all the possible outcomes: 1, 2, 3, 4, 5, 6. That is 6 outcomes altogether.

2. A coin is flipped once. What is the probability it lands on tails?
   There are 2 equally likely outcomes (heads or tails). Tails is 1 of these, so the probability is 1 out of 2 = ½ = 0.5.

3. On a number line from 0 to 1, what value shows an event that is certain to happen?
   A certain event has a probability of 1. (0 means impossible, ½ means equally likely, and 1 means certain.)

4. A bag holds 4 red and 4 blue marbles. What is the probability of pulling out a red marble?
   Total marbles = 4 + 4 = 8. Red marbles = 4. Probability = 4 out of 8 = 4/8 = ½ = 0.5.

5. A spinner has 8 equal sections: 4 red, 2 blue, 1 green and 1 yellow. What is the probability of landing on red?
   Red covers 4 of the 8 equal sections. Probability = 4/8 = ½ = 0.5.

6. Using the same spinner (4 red, 2 blue, 1 green, 1 yellow), what is the probability of landing on blue or yellow?
   Blue = 2/8 and yellow = 1/8. Add them: 2/8 + 1/8 = 3/8. So the probability of blue or yellow is 3/8.

7. For the same spinner, show that the probabilities of all four colours add up to 1.
   Red 4/8 + blue 2/8 + green 1/8 + yellow 1/8 = (4 + 2 + 1 + 1)/8 = 8/8 = 1. The total is 1, as it should be.

8. Aroha rolls a fair die. What is the probability of rolling an even number?
   The even numbers are 2, 4 and 6, that is 3 outcomes out of 6. Probability = 3/6 = ½ = 0.5.

9. At the Avondale School gala, Mere spins the prize wheel 40 times. It lands on 'Win a prize' 8 times. What is the experimental probability of winning a prize on one spin?
   Experimental probability = number of wins ÷ number of spins = 8/40 = 1/5 = 0.2.

10. A bag has 3 green, 5 red and 2 yellow jelly beans. Tane picks one without looking. What is the probability it is yellow, and what is the probability it is NOT green?
    Total jelly beans = 3 + 5 + 2 = 10. Yellow = 2/10 = 1/5. Not green means red or yellow = 5 + 2 = 7, so 7/10. Probability yellow = 1/5; probability not green = 7/10.

11. A spinner is one-half blue and one-quarter red. The rest is split equally between green and yellow. What is the probability of each colour? Check your answers add up to 1.
    Blue = ½ and red = ¼. Used so far = ½ + ¼ = ¾. Remaining = 1 − ¾ = ¼, shared equally between green and yellow, so each is ¼ ÷ 2 = 1/8. Check: ½ + ¼ + 1/8 + 1/8 = 4/8 + 2/8 + 1/8 + 1/8 = 8/8 = 1. Correct.

12. Kauri rolls a fair die 60 times. (a) How many times would you expect to roll a 3? (b) He actually rolled a 3 fourteen times, write the experimental probability as a fraction in simplest form.
    (a) The probability of a 3 is 1/6, so expected rolls = 60 × 1/6 = 10 times. (b) Experimental probability = 14/60. Divide top and bottom by 2 = 7/30. So the experimental probability is 7/30, a little higher than the expected 1/6 (which equals 10/60).