Merit Tutoring

WORKSHEET 51

Year 5 Mathematics — Australian Curriculum v9.0

Data & Chance: Likelihood and Possible Outcomes

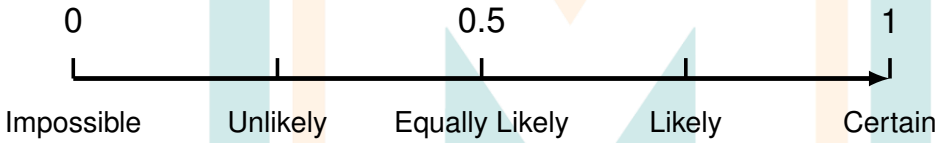
Curriculum Codes: AC9M5P01, AC9M5P02

Name: _____ *Date:* _____

Section 1: Fluency — The Probability Scale

Describe likelihood using probability terms.

Probability Scale:



1. Label the likelihood of this event: "The sun will rise tomorrow."
Circle one: Impossible Unlikely Equally Likely Likely Certain

Answer: _____

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2. If you roll a standard 6-sided die, what is the likelihood of rolling a 7?

Answer: _____

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3. What is the likelihood of flipping a coin and getting either Heads or Tails?

Answer: _____

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4. Is it likely or unlikely that you will see a dinosaur walking down your street today?

Answer: _____

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5. If a bag contains 10 red marbles and no other colours, what is the likelihood of pulling out a red marble?

Answer: _____

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6. What is the likelihood that tomorrow will be either Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, or Sunday?

Answer: _____

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7. Is it likely or unlikely that it will snow in Brisbane in summer?

Answer: _____

Probability Pro!

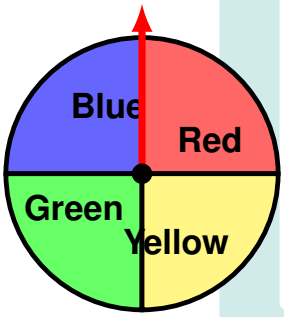
You're amazing at understanding likelihood!

Joke: Why did the student bring a coin to the math test? Because he wanted to have a 50/50 chance of getting the answers right!

Section 2: Reasoning — Listing Possible Outcomes

Identify all possible outcomes of chance experiments.

8. Look at this spinner divided into 4 equal sections:



List all the possible outcomes for this spinner:

Answer: _____

9. Are the outcomes equally likely? Explain why.

Answer: _____

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10. List all possible outcomes when rolling a standard 6-sided die.

Answer: _____

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11. List all possible outcomes when flipping a coin.

Answer: _____

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12. A spinner has 3 sections: A, B, and C. If section A takes up half the spinner and B and C are equal, are all outcomes equally likely?

Answer: _____

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13. How many possible outcomes are there when you pick one day of the week at random?

Answer: _____

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14. A bag contains cards numbered 1, 2, 3, 4, and 5. List all possible outcomes when picking one card.

Answer: _____

_____

Outcome Ace!

You're brilliant at listing all possible outcomes!

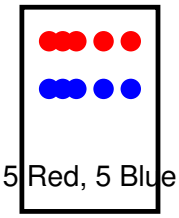
Joke: Why did the spinner go to school? To learn how to make better choices!

Section 3: Challenge — Comparing Likelihoods and Fairness

Compare different chance experiments and determine fairness.

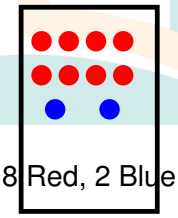
15. Look at these two jars of marbles:

Jar A



5 Red, 5 Blue

Jar B



8 Red, 2 Blue

From which jar are you more likely to pull a Red marble? Why?

Answer: _____

_____

16. Which jar (A or B) gives you an equally likely chance of picking Red or Blue?

Answer: _____

---

17. A spinner has 6 equal sections: 3 are Red, 2 are Blue, 1 is Green. Which colour are you most likely to land on?

Answer: _____

---

18. Is a coin toss a fair experiment? Why or why not?

Answer: _____

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19. A bag has 7 green marbles and 3 yellow marbles. Which colour are you more likely to pick?

Answer: _____

---

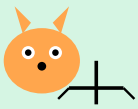
20. Design a simple fair spinner with 2 colours. Draw and label it below.

21. Explain why a die with sides numbered 1, 2, 3, 4, 5, 6 is a fair chance experiment.

Answer: _____

22. If a spinner has 4 sections and 3 are blue and 1 is red, is it fair? Why or why not?

Answer: _____



Fairness Champion!

You're excellent at understanding fair and unfair experiments!

Joke: Why did the probability experiment fail? Because it wasn't giving everyone a fair chance!

End of Worksheet 51

Well done! Check your answers on the next page.

WORKSHEET 51 — ANSWER KEY

Year 5 Mathematics — Data & Chance

AC9M5P01, AC9M5P02: Likelihood and Possible Outcomes

Section 1: Fluency — The Probability Scale

1. Certain

2. Impossible (a standard die only has numbers 1-6)

3. Certain (you will always get one or the other)

4. Impossible (or very unlikely)

5. Certain

6. Certain

7. Impossible (or very unlikely)

Section 2: Reasoning — Listing Possible Outcomes

8. Red, Blue, Green, Yellow

9. Yes, they are equally likely because each section is the same size

10. 1, 2, 3, 4, 5, 6

11. Heads, Tails

12. No, A is more likely because it takes up more space

13. 7 possible outcomes

14. 1, 2, 3, 4, 5

Section 3: Challenge — Comparing Likelihoods and Fairness

15. Jar B; It has 8 red out of 10 total, compared to 5 out of 10 in Jar A

16. Jar A (5 red and 5 blue means equal chance)

17. Red (3 out of 6 sections)

18. Yes; Both outcomes (Heads and Tails) are equally likely

19. Green (7 out of 10)

20. Student drawing should show 2 equal sections with different colours

21. Each number has an equal chance of being rolled (1 out of 6)

22. No; Blue is 3 times more likely than red (not equal chances)

Great work on Worksheet 51!

WORKSHEET 52

Year 5 Mathematics — Australian Curriculum v9.0

Data & Chance: Repeated Experiments and Frequency

Curriculum Codes: AC9M5P01, AC9M5P02

Name: _____ *Date:* _____

Section 1: Fluency — Recording Results

Record the results of repeated chance experiments.

1. A coin was tossed 20 times. The results were: 12 Heads, 8 Tails. Complete this tally table:

Outcome	Tally	Frequency
Heads		
Tails		

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2. A die was rolled 12 times with these results: 1, 3, 6, 2, 3, 5, 3, 4, 6, 3, 1, 3. How many times did the number 3 appear?

Answer: _____

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3. In a spinner experiment, Red appeared 8 times, Blue appeared 5 times, and Green appeared 7 times. How many spins were there in total?

Answer: _____

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4. Draw tally marks to show 15 occurrences.

Answer: _____

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5. A coin was flipped 30 times. If Heads appeared 18 times, how many times did Tails appear?

Answer: _____

---

6. Complete this frequency table for the results: A, B, A, C, B, A, A, C, B, A

Outcome	Frequency
A	
B	
C	

---

7. If you conduct 50 trials of an experiment, what is the total of all the frequencies?

Answer: _____

_____

Recording Rockstar!

You're fantastic at recording experimental results!

Joke: Why did the coin go to the doctor? Because it was feeling a little flipped out!

Section 2: Reasoning — Expected vs Actual Results

Compare expected outcomes with actual experimental results.

8. If you toss a fair coin 100 times, how many times would you *expect* it to land on Heads?

Answer: _____

_____

9. Did the coin *have* to land on Heads exactly that number of times? Explain.

Answer: _____

_____

10. A fair 6-sided die is rolled 60 times. How many times would you expect to roll a 4?

Answer: _____

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11. A spinner has 4 equal sections (Red, Blue, Green, Yellow). If you spin it 40 times, how many times would you expect to land on Red?

Answer: _____

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12. In an experiment, you flipped a coin 50 times and got 30 Heads. Is this close to what you expected? Explain.

Answer: _____

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13. Why might your actual results be different from your expected results?

Answer: _____

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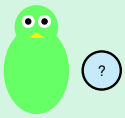
14. If you roll a die 12 times and get six different numbers (1,2,3,4,5,6) exactly twice each, is this expected or unusual?

Answer: _____



Prediction Pro!

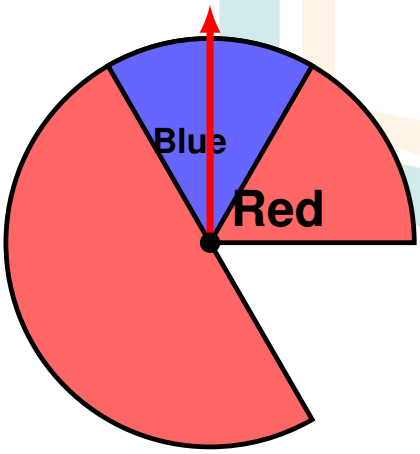
You understand the difference between expected and actual results!

Joke: Why don't probability experiments ever get exactly what they expect? Because that would be too predictable!

Section 3: Challenge — Biased Experiments and Design

Identify biased experiments and design your own.

15. Look at this spinner where the Red section is much larger than the Blue section:



Is this spinner fair? Why or why not?

Answer: _____

16. If you spin this spinner 50 times, which colour will likely have the highest frequency?

Answer: _____

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17. Design a spinner where Green is twice as likely to be landed on as Yellow. Draw and label it below.

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18. A bag contains 6 red marbles and 2 blue marbles. Is this a fair way to select a random marble? Explain.

Answer: _____

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19. If you want to create a fair dice game, what should be true about all the outcomes?

Answer: _____

20. A spinner has 5 sections: 2 Red, 2 Blue, 1 Green. Which colour is least likely to be landed on?

Answer: _____

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21. Plan an experiment: Describe how you would test if a coin is fair by conducting repeated tosses.

Step 1: _____

Step 2: _____

Step 3: _____

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22. Why is it important to repeat chance experiments many times?

Answer: _____

Chance Champion!

Amazing! You understand biased experiments and can design your own!

Joke: What did the biased spinner say to the fair coin? You're too balanced for me!

End of Worksheet 52

Excellent work! Check your answers on the next page.

WORKSHEET 52 — ANSWER KEY

Year 5 Mathematics — Data & Chance

AC9M5P01, AC9M5P02: Repeated Experiments and Frequency

Section 1: Fluency — Recording Results

1.

Outcome	Tally	Frequency
Heads	|||| |||(12)	12
Tails	|||| |||(8)	8

2. 5 times

3. 20 spins ($8 + 5 + 7 = 20$)

4. |||| |||| |||(three groups of 5)

5. 12 times ($30 - 18 = 12$)

6. A: 5, B: 3, C: 2

7. 50

Section 2: Reasoning — Expected vs Actual Results

8. 50 times ($100 \div 2 = 50$)

9. No; Results can vary due to chance, but should be close to 50

10. 10 times ($60 \div 6 = 10$)

11. 10 times ($40 \div 4 = 10$)

12. Yes, fairly close; Expected 25, got 30 (within reasonable variation)

13. Due to random chance/variation in experiments

14. This is expected for a fair die (equally likely outcomes)

Section 3: Challenge — Biased Experiments and Design

15. No; Red takes up much more space than Blue (not equally likely)

16. Red

17. Student drawing should show Green taking up 2/3 and Yellow 1/3 of spinner

18. No; Red is 3 times more likely to be selected than Blue

19. All outcomes should be equally likely

20. Green (only 1 out of 5 sections)

21. Example: 1) Toss the coin many times (e.g., 100); 2) Record each result; 3) Check if Heads and Tails are roughly equal

22. To get more reliable results and see if outcomes match what is expected

Congratulations on completing Worksheet 52!

You've mastered the Data & Chance strand!

Well done on completing Year 5 Mathematics!