

Part A · Probability

This is the first half of your Buddy Games Day folio. The second half happens in Term 4, after Games Day. Your teacher judges the two halves together.

|          |  |       |  |      |  |
|----------|--|-------|--|------|--|
| Name     |  | Class |  | Date |  |
| Our game |  |       |  |      |  |

You work on your own. You may use your Lesson 7 planner, the conversion mat, a calculator and the Chance Simulator. You may not use anything else and you may not talk to your teammates, even though you share a game. If the simulator will not work, put your hand up straight away.

There are seven items. A1 to A3 come straight off your planner. A4 and A5 need the simulator. A6 and A7 need writing, so leave yourself at least ten minutes for them.

Your game

- SF  
A1

List every possible outcome of your game. One row per outcome. Your list must cover everything that can happen, with nothing listed twice.
- SF  
A2

For each outcome, write the probability as a fraction, a decimal and a percentage.

| Outcome | Ways it can happen | Fraction | Decimal | Percentage |
|---------|--------------------|----------|---------|------------|
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |
|         |                    |          |         |            |

If your game has more than eight outcomes, keep going on the back of this page.

Check before you move on: your fractions must add to 1 and your percentages must add to 100%. If they do not, an outcome is missing or one has been counted twice.

Where the numbers sit

SF  
A3

Choose two of your outcomes. Mark each one on the scale below with a cross and label it. Then explain why each one sits where you put it.



THE FIRST OUTCOME I MARKED, AND WHY IT SITS THERE

Sentence starter: I put \_\_\_\_\_ at \_\_\_\_\_ on the scale because its probability is \_\_\_\_\_, and that is \_\_\_\_\_ than a half.

THE SECOND OUTCOME I MARKED, AND WHY IT SITS THERE

Sentence starter: I put \_\_\_\_\_ at \_\_\_\_\_ because \_\_\_\_\_.

What should happen

CF  
A4

Work out the expected frequency of each outcome for 20 trials, 200 trials and 2000 trials. Show your working for one of them.

| Outcome | Probability | Expected in 20 | Expected in 200 | Expected in 2000 |
|---------|-------------|----------------|-----------------|------------------|
|         |             |                |                 |                  |
|         |             |                |                 |                  |
|         |             |                |                 |                  |
|         |             |                |                 |                  |
|         |             |                |                 |                  |
|         |             |                |                 |                  |
|         |             |                |                 |                  |

MY WORKING FOR ONE OF THEM

One way: turn the probability into a fraction, divide the number of trials by the bottom number, then multiply by the top number. Another way: turn it into a decimal and multiply. Use a calculator.

What actually happened

CF  
A5

Run your game in the Chance Simulator at 20 trials, then 200, then 2000. Record the observed frequency of each outcome at each scale.

| Outcome | Observed in 20 | Observed in 200 | Observed in 2000 |
|---------|----------------|-----------------|------------------|
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |
|         |                |                 |                  |

Do one scale at a time. Set the simulator to 20, run it, fill in that column, then change it to 200. Do not try to remember three sets of numbers at once.

Comparing the two

CF  
A6

Compare observed with expected at each scale. Describe what happens to the difference as the number of trials grows, and explain why it happens.

| Scale       | Expected | Observed | Difference |
|-------------|----------|----------|------------|
| 20 trials   |          |          |            |
| 200 trials  |          |          |            |
| 2000 trials |          |          |            |

Choose one outcome from your game and fill the table in for that outcome only.

WHAT HAPPENS TO THE DIFFERENCE, AND WHY

Sentence starters: At 20 trials the difference was \_\_\_\_\_. At 2000 trials it was \_\_\_\_\_. I think this happens because \_\_\_\_\_.

## Your judgement

Is this a fair game for a Prep buddy? Make a judgement and justify it using the evidence in your own tables above.

CU  
A7

There is no right answer waiting to be found here. Two people can decide opposite things and both be right. What makes an answer strong is the evidence behind it, so use numbers from your own tables — not just what you think.

## MY JUDGEMENT — IS THIS GAME FAIR FOR A PREP BUDDY?

## WHY I THINK THAT, USING MY EVIDENCE

Sentence starters: I think this game is / is not fair for a Prep buddy because \_\_\_\_\_. My evidence is that \_\_\_\_\_. A Prep buddy would \_\_\_\_\_.

## Before you hand it up

Tick each one. If you cannot tick it, go back.

- ☐ Every outcome of my game is listed, and nothing is listed twice.
- ☐ My fractions add to 1 and my percentages add to 100%.
- ☐ Every box in A4 and A5 has a number in it.
- ☐ My A6 answer explains why, not just what.
- ☐ My A7 answer has at least one number from my own table in it.
- ☐ My name is on this booklet and on my planner.

|                                   |  |
|-----------------------------------|--|
| Adjustments applied (teacher use) |  |
|-----------------------------------|--|