# Chance and probability – tree diagrams

Tree diagrams are used to display all possible outcomes in a simple chance experiment. Here is an example: Matilda's father is making her lunch and has given her the following choice: white or brown bread, lettuce or sprouts, tuna or egg. We can then follow each branch along to see the different options.

sandwich

white bread
- lettuce
  - tuna
  - egg
- sprouts
  - tuna
  - egg

brown bread
- lettuce
  - tuna
  - egg
- sprouts
  - tuna
  - egg
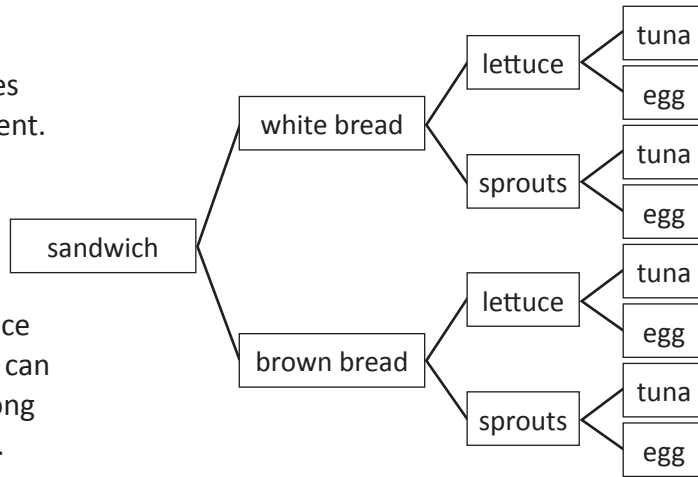
By using a tree diagram, we can see that Matilda has 8 different options for her sandwich.

1 When customers buy a new car from Joe's Motors they can pay an additional cost for each of these optional extras:
- Alloy wheels instead of standard wheels
- Automatic transmission instead of manual transmission
- Metallic paint instead of standard paint
- Leather seats instead of standard seats

a Complete this tree diagram to work out all the possible combinations that customers can choose:

Automatic transmission

Manual transmission
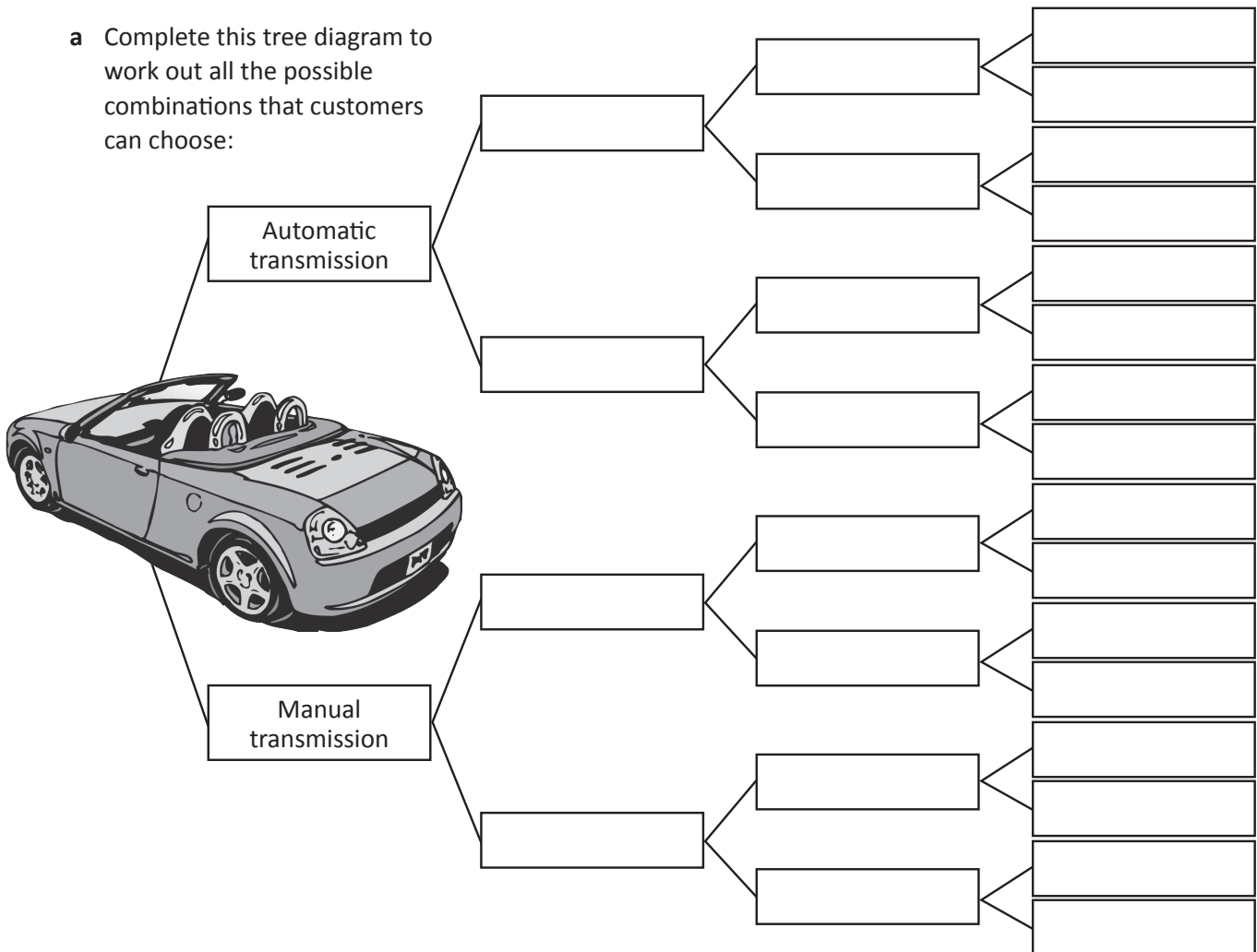
b How many possible combinations are there? _____

**Chance and Probability**

Chance and probability – tree diagrams

2 You have an after school job at the local ice-cream shop. Your boss has asked you to run a special on the strawberry and banana ice-cream flavours as she mistakenly ordered far too much of each.

You decide to offer a double scoop special – customers can choose 2 scoops and a topping for the price of a single scoop cone. As all ice-cream connoisseurs know, it matters which flavour goes on top so customers may choose a strawberry-banana combo, a banana-strawberry combo or 2 scoops of the same flavour.

Work out the different combinations customers could order if they could choose from 2 cone types, the 2 flavours and 2 different toppings. Decide which cones and toppings you will offer.
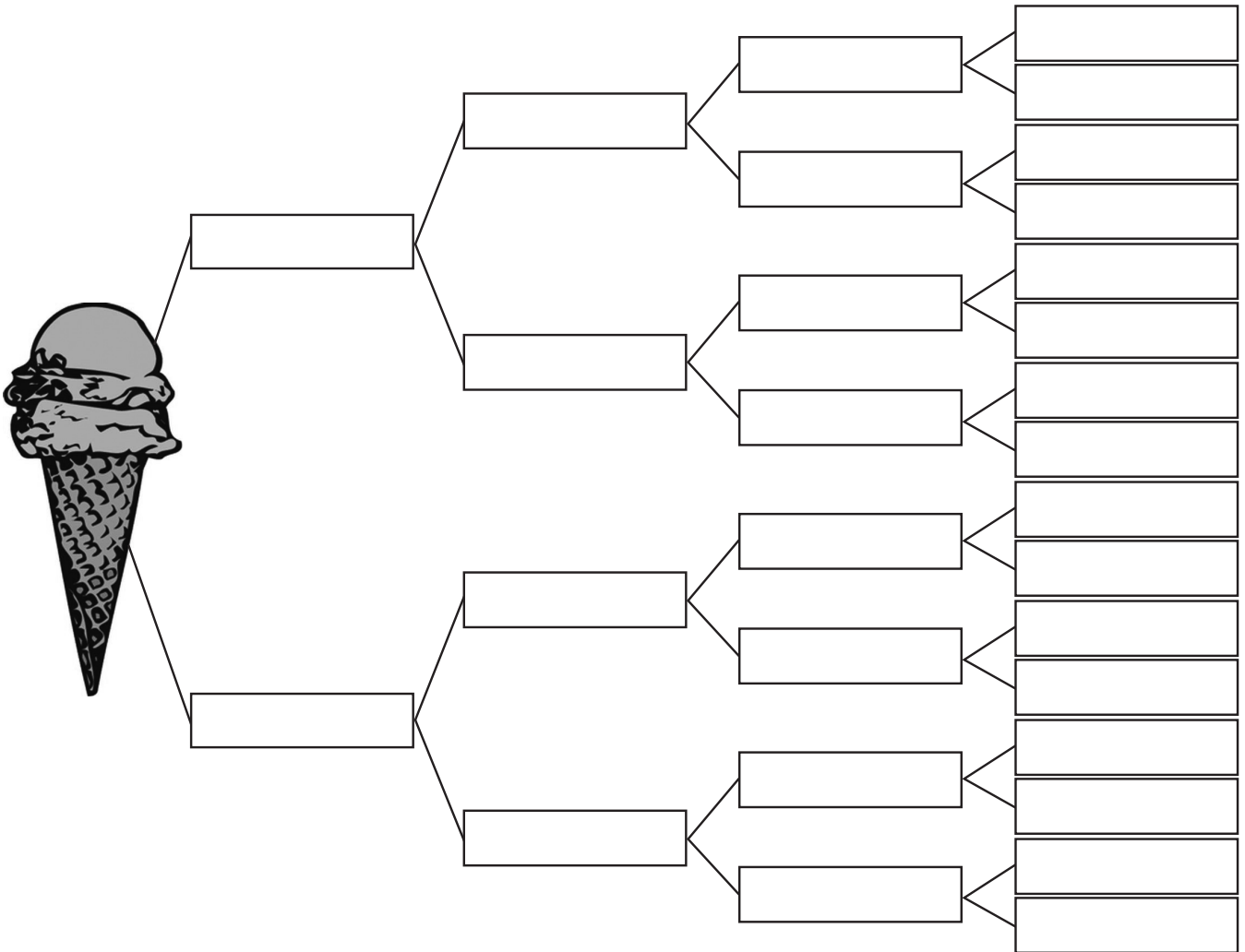
3 Think about this:

a How many different combinations are there in total?

b If a customer hates banana ice-cream flavour, how many options do they have?

c What would be your pick?
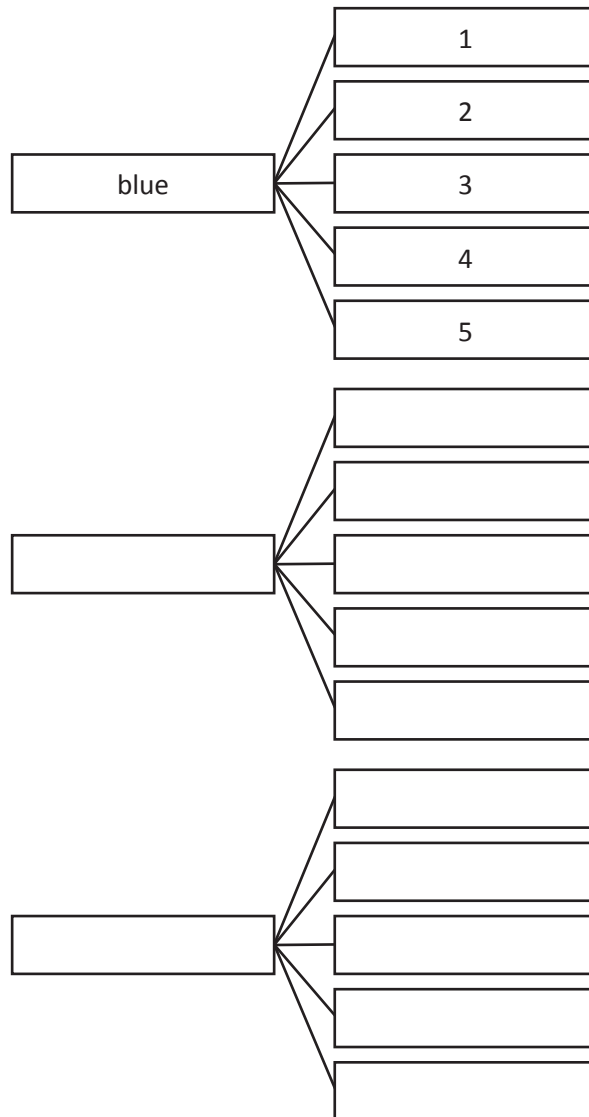
Chance and probability – chance experiments

1 Complete the tree diagram to show all the possible outcomes when you spin Spinner 1 and then Spinner 2. The first one is done for you.
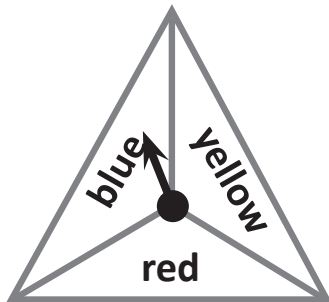
Spinner 1

Spinner 2

blue
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |

....
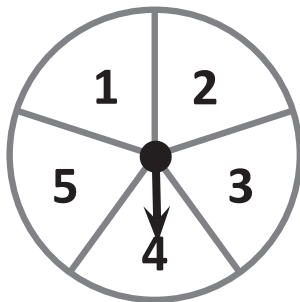
2 What is the probability of landing on:

a a yellow

b blue and 1

c a 4

d yellow and 3

> There were 15 possible outcomes in Question 1. 60 is 4 × 15, so I would expect each number to be 4 times greater.

THINK

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3 If you did this 60 times, how many times would you expect to get:

a blue and 4

b a red

c a 1

d a 5

G **1**
SERIES   TOPIC

Chance and Probability
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