

# 8 Listing outcomes – Part 2

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

| English      | 中文   | Write it 3 times (English) |
|--------------|------|----------------------------|
| sample space | 样本空间 | _____                      |
| tree diagram | 树状图  | _____                      |

## Recall

When two things happen, we can list all the outcomes to find a probability.

## New ideas

Read these first, then do the Practice.

### ■ 1 Sample space

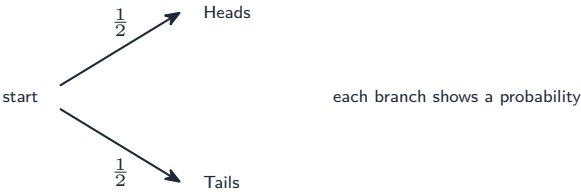
A **sample space** 样本空间 lists every possible outcome. For two dice, a grid shows all 36 sums:

|        |   |        |   |   |    |    |    |                  |  |
|--------|---|--------|---|---|----|----|----|------------------|--|
|        |   | dice 1 |   |   |    |    |    |                  |  |
|        |   | 1      | 2 | 3 | 4  | 5  | 6  |                  |  |
| dice 2 | 1 | 2      | 3 | 4 | 5  | 6  | 7  | sums of two dice |  |
|        | 2 | 3      | 4 | 5 | 6  | 7  | 8  |                  |  |
|        | 3 | 4      | 5 | 6 | 7  | 8  | 9  |                  |  |
|        | 4 | 5      | 6 | 7 | 8  | 9  | 10 |                  |  |
|        | 5 | 6      | 7 | 8 | 9  | 10 | 11 |                  |  |
|        | 6 | 7      | 8 | 9 | 10 | 11 | 12 |                  |  |

You can count outcomes from the grid (for example, there are 6 ways to score a sum of 7).

### ■ 2 Tree diagrams

A **tree diagram** 树状图 shows the outcomes as branches, each with its probability:



**Watch out:** a **sample space** lists *every* outcome — count from it carefully (two dice have  $6 \times 6 = 36$  outcomes, not 12). On a **tree diagram** the numbers on the branches are the probabilities.

## Practice

Try these in order.

8.6 How many outcomes are there when two dice are rolled? [1]

**8.7** Using the grid, how many ways are there to get a sum of 7? [1]

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**8.8** What is the probability of a sum of 7 with two dice? [2]

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**8.9** On a tree diagram, what do the numbers on the branches show? [1]

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**8.10** Two coins are flipped. List all the possible outcomes. [2]

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**8.11 Challenge.** Two dice are rolled. Using the sample space, find the probability that the two numbers add up to 9. [3]