

SAMPLE SPACE DIAGRAMS

- 1) A fair coin is tossed and then a fair 6-sided dice is rolled.



- a. Complete the sample space diagram below with the possible outcomes.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|----|---|---|---|---|---|
| H | H1 | | | | | |
| T | | | | | | |

- b. What is the probability of landing on heads and an odd number?
c. What is the probability of landing on tails and a multiple of 3?
- 2) Two fair 6-sided dice are rolled. The numbers on the dice are added together.

- a. Complete the table to show all possible totals.

| | | Dice 1 | | | | | |
|--------|---|--------|---|---|---|---|---|
| Dice 2 | + | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1 | | | | | | |
| | 2 | | | | | | |
| | 3 | | | | | | |
| | 4 | | | | | | |
| | 5 | | | | | | |
| | 6 | | | | | | |

- b. Which total is most likely?
c. What of the probability of scoring a 2?
d. What is the probability of scoring a 5?
e. What is the probability of scoring an odd number?
f. What is the probability of scoring a number less than 4?

- 3) Two fair 6-sided dice are rolled. The numbers on the dice are multiplied together.

- a. Complete the table to show all possible products.

| | | Dice 1 | | | | | |
|--------|---|--------|---|---|---|---|---|
| Dice 2 | × | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1 | | | | | | |
| | 2 | | | | | | |
| | 3 | | | | | | |
| | 4 | | | | | | |
| | 5 | | | | | | |
| | 6 | | | | | | |

- b. What is the probability of a product of 1?
c. What is the probability of the product being a square number?

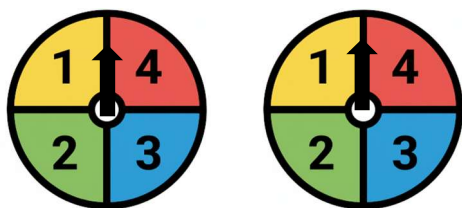
- 4) Two bags contain numbered counters. The first bag has even numbers from 2 to 8 inclusive. The second bag has odd numbers from 1 to 7 inclusive. One counter is drawn from each bag and the positive difference between the numbers is taken.

- a. Complete the table below to show all possible outcomes.

| | | Bag 1 | | | |
|-------|---|-------|---|---|---|
| Bag 2 | - | 2 | 4 | 6 | 8 |
| | 1 | | | | |
| | 3 | | | | |
| | 5 | | | | |
| | 7 | | | | |

- b. What is the most common difference?
c. Work out the probability of a difference of 3.

- 5) Two fair 4-sided spinners are spun. Their outcomes are squared and then added together.



- a. Complete the table below to show all possible outcomes.

| Spinner 1 | | 1 | 2 | 3 | 4 |
|-----------|---|---|---|---|---|
| Spinner 2 | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

- b. There are four outcomes that only occur once. What are they?
c. Work out the probability of an outcome greater than 10.

- 6) Two fair coins are tossed. Each coin has an outcome of heads and tails.

The score is given as:

Heads = +2, Tails = -1

- a. Complete the sample space diagram to show all possible totals.

| | H | T |
|---|---|---|
| H | | |
| T | | |

- b. Work out the probability that the score is positive.
c. Work out the probability that the score is 0.

- 7) Two fair spinners are shown below.



Both spinners are spun, and the final score is given by:

Letter value: A = 1, B = 2, C = 3, D = 4

Final score = (letter value) \times (number)

- a. Complete the table to show all possible scores.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

- b. Work out the probability the score is a multiple of 4.
c. Work out the probability the score is less than 5.

- 8) A game at a local fair involves rolling a fair 6-sided dice two times. The numbers on the dice are added together and then cubed. Each person plays £2 to play the game. If they score a square number, they win £10. The game is played 200 times. Calculate the expected profit made by the fair.