EXPERIMENTAL PROBABILITY

Task 1

1) A biased coin is flipped 200 times. It lands on heads 128 times. Work out the relative frequency of the coin landing on heads. Give your answer as a decimal. $\frac{128}{200} = \mathbf{0.64}$

2) A spinner is spun 80 times. The table shows the results.

Colour	Frequency
Red	20
Blue	15
Green	25
Yellow	20

Work out the relative frequency of the spinner landing on green. Give your answer as a fraction in simplest form.

$$\frac{25}{80} = \mathbf{\frac{5}{16}}$$

3) In an experiment, a biased dice is rolled 120 times. The number 6 appears 42 times. Work out the relative frequency of rolling a 6. Give your answer as percentage.

$$\frac{42}{120} = \mathbf{35\%}$$

4) A student records how many times a bus arrives late. Out of 50 journeys, the bus is late 18 times. Use their findings to estimate the probability of the bus arriving on time. Give your answer as a fraction in simplest form.

$$\frac{32}{50} = \mathbf{\frac{16}{25}}$$

5) A basketball player takes 40 free throws and scores 28 of them. Estimate the probability that the player scores the next free throw. Give your answer as a fraction in simplest form.

$$\frac{28}{40} = \mathbf{\frac{7}{10}}$$

Task 2

6) In a jar there are only red, yellow and green counters. The probability of choosing each colour is shown in the table.

Colour	Red	Yellow	Green
Probability	0.25	0.36	0.39

a. Complete the table to show the probability of choosing green. **See above**

b. Work out the probability of drawing a red or yellow counter.

$$0.25 + 0.36 = \mathbf{0.61}$$

7) A box contains black, blue and red pens. The probability of choosing each colour is shown in the table below.

Colour	Black	Blue	Red
Probability	0.5	0.3	0.2

a. Complete the table to show the probability of choosing blue. **See above**

b. Work out the probability of choosing a red or black pen.

$$0.5 + 0.2 = \mathbf{0.7}$$

8) A biased spinner can land on one of four colours. The probability of landing on red and purple are equally likely.

Colour	Green	Yellow	Red	Purple
Probability	0.48	0.12	0.2	0.2

a. Complete the table to show the probability of landing on red and purple. **See above**

b. Work out the probability of landing on green or red.

$$0.48 + 0.2 = \mathbf{0.68}$$

9) Orange, strawberry and lemon sweets are in a bag in the ratio 1 : 2 : 1. A sweet is chosen at random. Use this information to complete the probability table below.

$$1 + 2 + 1 = 4$$
$$1 \div 4 = 0.25$$

Flavour	Orange	Strawberry	Lemon
Probability	**0.25**	**0.5**	**0.25**

10) A biased spinner can land on red, green, blue or yellow. The probability of landing on red is 0.15 and the probability of landing on yellow is 0.35. The probabilities of landing on blue and green are the same.

a. What is the probability the spinner does not land on green?

$$1 - 0.15 - 0.35 = 0.5$$
$$P(green) = 0.5 \div 2 = 0.25$$
$$P(not\ green) = 1 - 0.25 = \mathbf{0.75}$$

b. What is the probability the spinner lands on red or green?

$$0.15 + 0.25 = \mathbf{0.4}$$

11) Jasmine rolls a dice 100 times. The results are shown in the table below.

Number	1	2	3	4	5	6
Frequency	20	8	12	24	8	28

Estimate the probability of landing on:

a. An odd number $\frac{40}{100} = \frac{2}{5}$

b. A cube number $\frac{20}{100} = \frac{1}{5}$

c. A multiple of 2 $\frac{60}{100} = \frac{3}{5}$

d. A factor of 20 $\frac{60}{100} = \frac{3}{5}$

e. A prime number $\frac{28}{100} = \frac{7}{25}$

Task 3

12) The probability that a biased dice will land on a 5 is 0.25. The dice is rolled 160 times. Work out an estimate for the number of times the dice will land on 5.

$$0.25 \times 160 = \mathbf{40\ times}$$

13) The probability that a tomato in a garden will spoil the day after it is picked is 0.15. Given that 20 tomatoes are picked in a day, estimate the number of tomatoes that will spoil.

$$0.15 \times 20 = \mathbf{3\ tomatoes}$$

14) The probability that an outdoor plant will survive in the winter is 0.3 Given a garden has 20 of these plants, estimate how many will survive.

$$0.3 \times 20 = \mathbf{6\ plants}$$

15) The probability that Lana wins a game is 0.6. She plays 50 games. Estimate the number of games she will win.

$$0.6 \times 50 = \mathbf{30\ games}$$

16) In a science test, the probability that a student will pass is 0.72. 40 students take the test. Estimate the number of students expected to fail.

$$0.28 \times 40 = 11.2$$
$$\mathbf{11\ students}$$

17) Out of 60 bus journeys, a bus was late 19 times.

a. Work out the relative frequency of being late. $\frac{19}{60}$

b. Estimate the probability of the bus being on time. $\frac{41}{60}$

c. Estimate how many times the bus would be late in 180 journeys.

$$\frac{19}{60} \times 180 = \mathbf{57\ times}$$

18) A biased dice is rolled 240 times. The number 6 appears 84 times.

a. Work out the relative frequency of rolling a 6. $\frac{84}{240} = \frac{7}{20}$

b. Estimate the number of sixes in 600 rolls.

$$\frac{7}{20} \times 600 = \mathbf{210}$$

19) A spinner has four numbers. The spinner is spun 200 times. The relative frequency is shown in the table below.

Number	1	2	3	4
Relative Frequency	0.25	0.31	0.175	0.265

    a. How many times did the spinner land on a 1?

$$0.25 \times 200 = \mathbf{50}$$

    b. How many times did the spinner land on a 3?

$$0.175 \times 200 = \mathbf{35}$$

    c. Work out the difference between the number of times it landed on a 2 and a 4.

$$0.31 \times 200 = 62$$
$$0.265 \times 200 = 53$$
$$62 - 53 = \mathbf{9}$$

20) A box contains black, blue, red and green pens. The table shows the probabilities that a randomly selected pen will be red or green.

Colour	Black	Blue	Red	Green
Probability	0.15	0.5	0.25	0.1

The probability that the pen will be blue is twice the probability that the pen will be red. There are 15 red pens in the box. Work out the number of black pens in the box.

$$P(blue) = 0.25 \times 2 = 0.5$$
$$P(black) = 1 - 0.5 - 0.25 - 0.1 = 0.15$$
$$Total\ pens = 15 \div 0.25 = 60$$
$$Number\ of\ black\ pens = 60 \times 0.15 = \mathbf{9}$$