

## Essential knowledge

- Define correlation and difference between that and relationship
- Define discrete and continuous data
- Write probability as fraction, decimal or percentage
- List outcomes for one or more event

## Key Vocabulary

- Variable:** a quantity that may change within the context of the problem.
- Relationship:** the link between two variables (items). E.g. Between sunny days and ice cream sales
- Correlation:** the mathematical definition for the type of relationship.
- Continuous:** quantitative data that has an infinite number of possible values within its range.
- Discrete:** quantitative or qualitative data that only takes certain values.
- Frequency:** the number of times a particular value occurs.

## Prior learning links

Fraction, Decimal, Percentage Conversion (Y7)  
Probability (Y7)

## Discrete and Continuous Data

**Discrete Data** – Data that can only have specific values e.g. shoe sizes, prices. If there is a large spread of values, we can put the values in groups.

| Number of siblings | Frequency |
|--------------------|-----------|
| 0                  | 2         |
| 1                  | 3         |
| 2                  | 4         |
| 3                  | 2         |
| 4                  | 1         |

| Cost of TV (£) | Tally     | Frequency |
|----------------|-----------|-----------|
| 101 - 150      | THL II    | 7         |
| 151 - 200      | THL THL I | 11        |
| 201 - 250      | THL       | 5         |
| 251 - 300      | III       | 3         |

### **Continuous Data –**

Data that can be measured using any value e.g. height, weight, distance.

| x<br>Weight(g)   | Frequency |
|------------------|-----------|
| $40 < x \leq 50$ | 1         |
| $50 < x \leq 60$ | 3         |
| $60 < x \leq 70$ | 5         |

The groups have inequalities because the values could be anything between those parameters

## Probability as Fraction, Decimal or Percentage

The probability of flipping a coin and landing a head:

$$\frac{\text{Head}}{\text{Head or Tail}} = \frac{1}{2}$$

This can only be described in decimal terms:

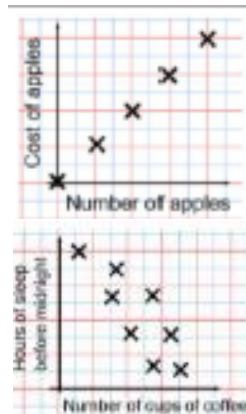
$$\frac{1}{2} = \frac{5}{10} = 0.5 \text{ (5 tenths).}$$

It can also be described in percentage terms:

$$\frac{1}{2} = \frac{50}{100} = 50\% \text{ chance}$$

## Correlation and Relationships

We often describe the relationship between two sets of data. Mathematically we can describe the types of relationships using **correlation**.



### **Positive Correlation –**

As one variable increases, the other variable increases

### **Negative Correlation –**

As one variable increases, the other variable decreases

## Probability

Probability measures how likely an event is to happen.

This is usually expressed in a fraction:

e.g. There are 6 possibilities when we roll a fair dice.

The probability of rolling the number 5 is  $\frac{1}{6}$  (there is only one way this can happen out of 6 outcomes).

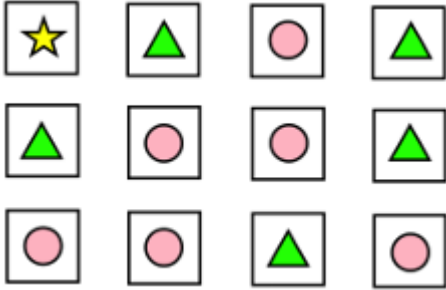
We can list all outcomes using a sample space diagram

Outcomes of rolling a dice

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

Set = { 1H, 2H, 3H, 4H, 5H, 6H, 1T, 2T, 3T, 4T, 5T, 6T }

## Prior learning links



A card is picked at random.  
What is the probability that I pick:  
(a) A star?  
(b) Not a circle?

## Discrete and Continuous Data

Decide whether the following data sets would be discrete or continuous:

Distance between Cities

Number of Siblings

Price of Cakes in a Shop

Age of People in a Shop

Heights of a Group of Year 8s

Are there any that are harder to categorise?

## Converting Fractions, Decimals and Percentages

Convert the following fractions to decimals

- (a)  $\frac{1}{2}$
- (b)  $\frac{3}{5}$
- (c)  $\frac{5}{8}$
- (d)  $\frac{3}{4}$

Convert the following decimals to percentages

- (a) 0.5
- (b) 0.35
- (c) 0.7
- (d) 0.1

## Key Vocabulary

Define the following key words:

**Discrete Data** –

**Probability** –

**Correlation** –

## Correlation

Decide whether the following pairs of data sets have positive correlation, negative correlation or no correlation.

Temperature in Blackpool, and the amount of woolly hats sold in Blackpool.

A person's house number, and their marks in a test.

Number of people in a household, and how much water is used in that household.

## Probability and Outcomes

Lucy has two four-sided fair spinners, each number 1 to 4. She spins both spinners, the add their scores together.

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

- (a) Complete the sample space.
- (b) What is the probability of the total being a multiple of 3?
- (c) What is the probability of the total being greater than 5?