Quantitative & Qualitative (Answers)

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This lesson has been created by Effini in partnership with Data Education in Schools, The Data Lab and Data Skills for Work, with funding from the Scottish Government.

1. Quantitative & Qualitative data

Reminder
Qualitative - Descriptive, normally using words rather than numbers
Quantitative - Measures of values or counts and expressed as numbers

Section 1.1

1) For each example state whether it is qualitative or quantitative

Data	Data Type	Reason
Number of website visitors	Quantitative	Can be measured and expressed as a number
Eye colour of a class	Qualitative	Descriptive, using words rather than numbers
Photos of different cake types	Qualitative	Can't be measured and expressed as a number
Speed of cars	Quantitative	Can be measured and expressed as a number
Birth rates in a country by year	Quantitative	Can be measured and expressed as a number
Average world temperatures by year	Quantitative	Can be measured and expressed as a number
Feedback on survey (Agree/Disagree)	Qualitative	Descriptive, using words rather than numbers

2) Are these examples of data 'quantitative'?

	Yes/No	Reason
Number of movies watched	Yes	Can be counted and expressed as a number
Name of the movie	No	Descriptive, using words rather than numbers
Number of leaves on a tree	Yes	Can be counted and expressed as a number
Colour of leaves on a tree	No	Descriptive, using words rather than numbers
Average age of class	Yes	Can be measured and expressed as a number
Number of pupils in a class	Yes	Can be counted and expressed as a number
Song lyrics	No	Descriptive, using words rather than numbers
Name of artist	No	Descriptive, using words rather than numbers

1. Quantitative & Qualitative data

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Section 1.2

3) Describe the difference between qualitative and quantitative data.

Quantitative data represents things that can be measured, counted or expressed as a number whereas, qualitative data is descriptive and normally uses words rather than numbers.

Section 1.3

4) A bakery is reviewing the data it holds, give 2 examples of quantitative and 2 examples of qualitative data it might hold?

Quantitative examples	Qualitative examples
Stock levels e.g. amount of flour	Types of cakes e.g. chocolate, cheesecake
Sales e.g. number of cakes sold	Days bakery is open
Number of customers	Customer feedback (Satisfied/Unsatisfied)
Any bakery item that can be measured or counted	Any bakery item that is descriptive (words)

5) Give 2 examples of quantitative and 2 examples of qualitative data that you might find in a weather forecast.

Quantitative examples	Qualitative examples
Temperature	Day of the week e.g. Monday, Tuesday
Time of the day	Sunny, cloudy, raining etc
Sunrise time	Location e.g. Edinburgh, Inverness, Shetland
Wind speed	Wind direction, e.g. north, east, west, south

1. Quantitative & Qualitative data

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Section 1.4

6) Here is a paragraph about a new cinema,

" On Sunday, 1,000 people come to the opening of the new cinema. There were 5 new films shown. Customers loved the new building, but complained about the price of the popcorn (£10.50 per box)"

Here are all the quantitative data items from that paragraph.

Number of people	1000
Number of films	5
Price of popcorn	£10.50

Create a paragraph on a subject you are interested in (e.g. football, music, cooking) that contains at least 3 quantitative data items, then list all the quantitative data items from it.

Example of the type of paragraph they could write: " This basic cake recipe will make 8 cupcakes. You will need 100g self-raising flour, 100g butter, 100g sugar and 2 eggs."

Number of cupcakes	8
Amount of self-raising flour	100g
Amount of butter	100g
Amount of sugar	100g
Number of eggs	2

2. Discrete vs. Continuous

Reminder
Discrete - Whole numbered data, obtained by counting
Continuous - All possible values, obtaining by measuring

Section 2.1

1) Are these quantitative data examples continuous or discrete data?

Data	Type	Reason
Number of fans at a football match	Discrete	Cannot be meaningfully divided, you can't have 0.5 of a fan
Journey time between Edinburgh and Inverness	Continuous	Obtained through measuring device rather than counting.
Votes cast in election	Discrete	Can not be meaningfully divided, you can't have 2.4 votes
Number of windows on a building	Discrete	Can not be meaningfully divided
Average rainfall on Ben Nevis	Continuous	Obtained through measuring rather than counting
Average UK house prices by month	Continuous	Can be divided, e.g. you can have £0.005

2) Select all the discrete data-types below,

	Yes/No	Reason
Number of books in a library	Yes	Can not be meaningfully divided
Number of singers in a choir	Yes	Can not be meaningfully divided
Number of people in a house	Yes	Can not be meaningfully divided
Height of a building	No	Obtained through measuring rather than counting
Length of song (in seconds)	No	Obtained through measuring rather than counting
Time to run 100m	No	Obtained through measuring rather than counting

Section 2.2

3) Explain why the 'speed' of a car is a continuous data- type

Obtained through measuring (speedometer) rather than counting.

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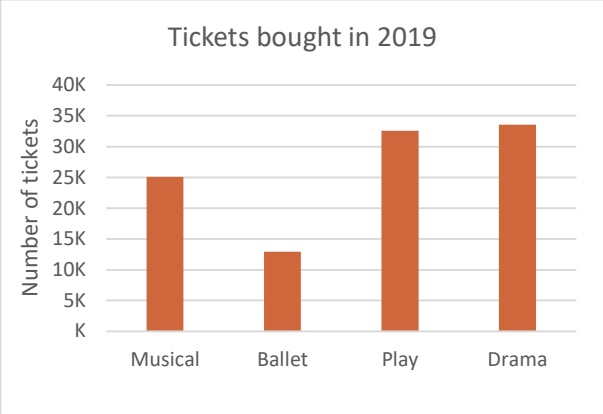
4) Explain why the number of cakes in a shop is a discrete data-type.

Obtained by counting. Can't be meaningfully split, you wouldn't sell 0.649 of a cake.

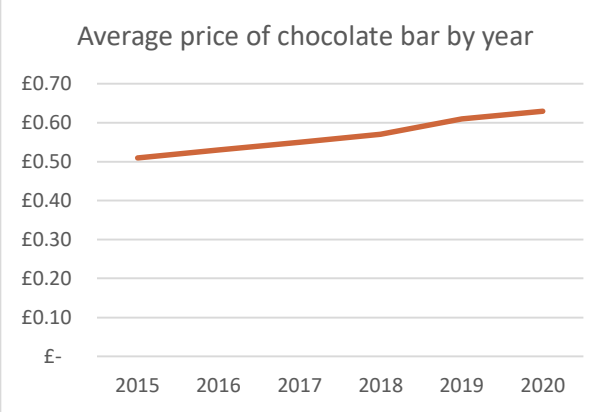
Section 2.3

5) Look at these graphs: are the data types shown in them continuous or discrete?



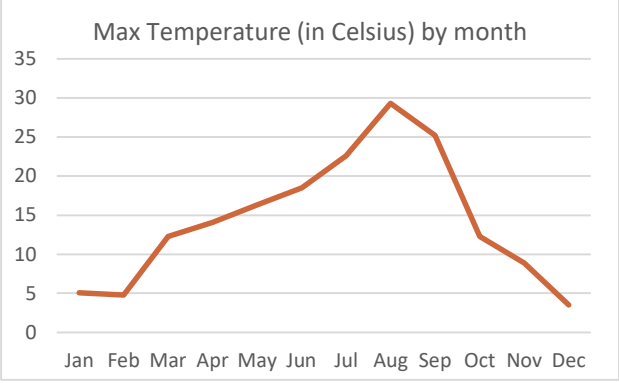
Data Type: Discrete

Reason: Can not be meaningfully divided



Data Type: Continuous

Reason: Obtained through measuring devise rather than counting.



Data Type: Continuous

Reason: Obtained through measuring device rather than counting.

2. Discrete vs. Continuous

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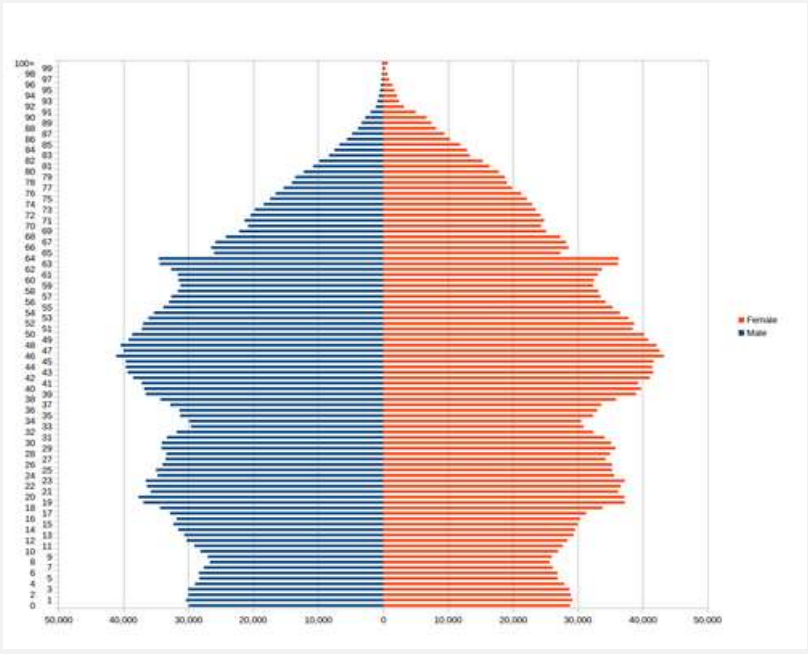
Section 2.4

6) Can you find an example of a graph that contains discrete data, copy the image into the space below.

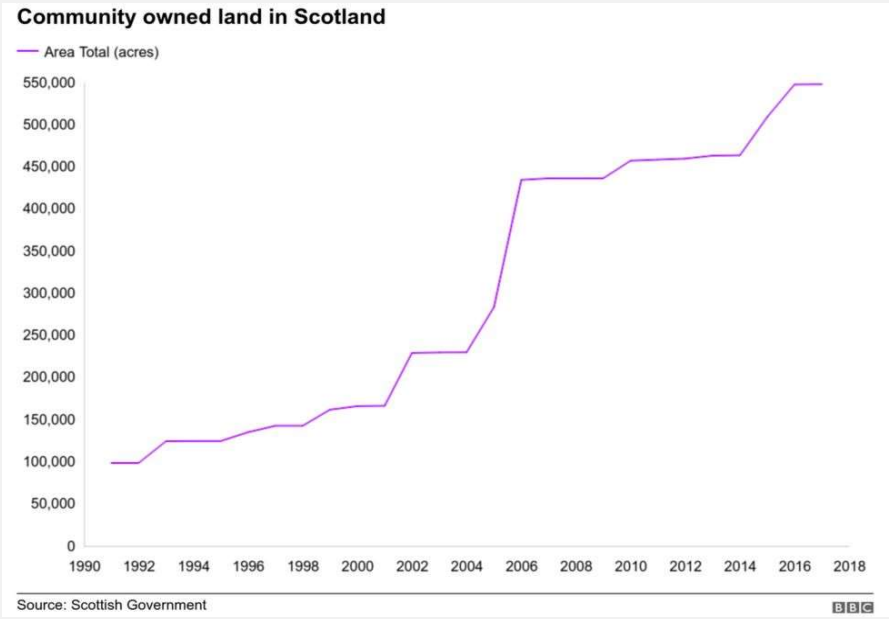


Example of discrete graph.

Population pyramid for Scotland

Source: https://en.wikipedia.org/wiki/Demography_of_Scotland

7) Can you find an example of a graph that contains continuous data, copy the image into the space below.



Example of continuous graph.

Source: https://www.bbc.co.uk/news/uk-scotland-47963208