

Scales of measurement



Worksheet section	Contents
1	Scales of measurements
2	Extension

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.

© 2021. This work is licensed under a [CC BY-NC-SA 4.0 license](#).



You are free to:

Share – copy and redistribute the material in any medium or format

Adapt – remix, transform and build upon the material

Under the following terms:

Attribution — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

NonCommercial — You may not use the material for [commercial purposes](#).

ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the [same license](#) as the original.

1. Scales of measurement

Reminder

Nominal - Has no meaningful order

Interval - Has no true zero (can be negative or positive)

Ordinal - Has an implicit order

Ratio - Has a true zero

Section 1.1

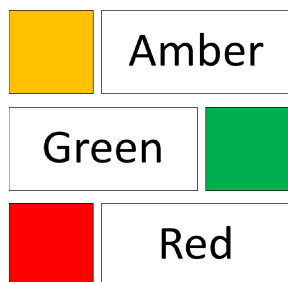
1) For each of these qualitative data types, decide if they are nominal.

Data	Nominal?
Colour of hats in a shop	
Days of the week	
Types of cheese	
Images of tartan patterns	
Year group in school (e.g. P4,P7,S2)	

2) Place these ordinal data types into a meaningful order.



Seasons of the year
Winter



Traffic light colours
Red



--	--	--

1. Scales of measurement

Reminder

Nominal - Has no meaningful order

Ordinal - Has an implicit order

Interval - Has no true zero (can be negative or positive)

Ratio - Has a true zero

3) Can you decide if these data types are interval or ratio measurements?

Age of a person,

Time,

Temperature in Celsius,

Distance between Edinburgh and Glasgow

Interval	Ratio

Section 1.2

4) Are these qualitative data types, nominal or ordinal? Describe why?

Example	Data Type	Describe why?
Days of the week		
Types of trees		
True/False answer to a question		
NATO phonetic alphabet		

Section 1.3

5) Can you explain why length of a song (in seconds) is 'interval' whereas time in general is 'ratio'.

--

2. Extension

This extension section will cover,
Data categories and Scales of measurements

Section 2.1

- 1) Here is a list of possible survey questions for visitors to a museum for each question state whether the data type and the scale of measurement.

Question	Data Type (qualitative or quantitative)	Scale of measurement
Which day of the week did you visit the museum?		
How many people were with you when you visited?		
Did you buy anything from the cafe during your visit? (yes/no)		
How likely are you to visit the museum again? (Likely/Unlikely)		
Is there anything we could do improve your visit?		

- 2) Now create your own question for this survey that fits with **at least one of these data types**,

Question	Data Type	Sub-Type	Scale of measurement
	Quantitative	Discrete	Ratio
	Qualitative	Raw text	n/a

2. Extension

*This extension section will cover,
Data categories and Scales of measurements*

- 3) A charity is looking to become more environmentally friendly. Can you think of 5 questions it could ask its staff or customers to help with its planning?

Possible answers to this question.

Question	Data Type (qualitative or quantitative)	Sub-Type of quantitative data (discrete or continuous)	Scale of measurement
<i>Example: Do you own an electric car? (yes/no)</i>	<i>Qualitative</i>	<i>n/a</i>	<i>Nominal</i>

- 4) Describe an issue that could arise when analysing shoe size data if you were not aware that it is discrete data type.

- 5) Why is it important to understand the types of data you are analysing?

2. Extension

This extension section will cover,
Data categories and Scales of measurements

- 6) You are asking clothes manufacturers to provide you with the sizes of the clothes they produce, below are some examples of the data you receive back.
What do you need to think about in terms of the categories of data before you could start analysing the information?



4 small blue tops

Some 4-5yr old leggings

Small children's tops

6 XL coats

32" waist trousers

Two size 10 dresses

One size hat

XXL trousers (black)

- 7) Design 3 questions that you could ask the clothes manufacturers to allow you overcome some of these issues from question 6? State the data type, sub-type and scale of measurement for each question.

Question	Data Type (qualitative or quantitative)	Sub-Type of quantitative data (discrete or continuous)	Scale of measurement
Example: How long (in cm) is your coat?	Quantitative	Continuous	Ratio

2. Extension

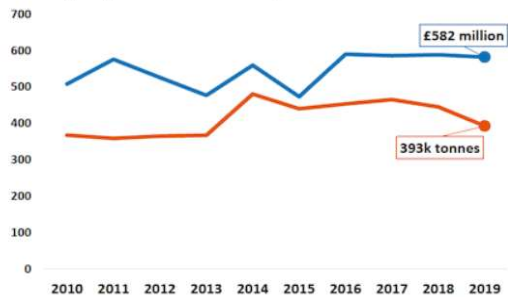
This extension section will cover,
Data categories and Scales of measurements

Section 2.2

- 8) Go online and find 2 graphs on a subjects you are interested in.
For each graph, decide if the data is quantitative or qualitative? What are the scales of measurements?

Example

Chart 1. Total tonnage and value (adjusted to 2019 prices) of all landings by Scottish vessels, 2010 to 2019



The data is quantitative.

The value and amount in tonnes are ratio as they have a meaningful zero point.

<https://www.gov.scot/publications/scottish-sea-fisheries-statistics-2019/pages/2/>