Scales of measurement

This planning document is intended to support teachers who are delivering the NPA/PDA Data Science or for students who are learning independently. It also aligns with the Data Skills for Work framework.

The lesson has been designed for learners using Microsoft Excel. Most of the information in the lesson will work for other spreadsheets tools. However, if another tool is being used by the learners (such as Google Sheets) the step-by-step instructions will need to be checked.

Contents

Lesson Description

Lesson Overview	Understanding the scales of measurement. Qualitative data - nominal and ordinal. Quantitative data - interval, ratio
Topic	Working with Data
Book Chapter(s)	"4. Working with Data, Data types, formats and structure"

NPA level	5, 6
PDA level	7, 8
Data skills for work level	Analysis

Learning Intentions

We are learning about the scales of measurement, specifically to understand,

- what are the definitions of **interval** and **ratio** for quantitative data

- what are the definitions of **nominal** and **ordinal** for qualitative data

Success Criteria

I can *describe* interval and ratio scales of measurement for quantitative data.

I can *describe* nominal and ordinal scales of measurement for qualitative data.

Knowledge Prerequisites

Learners should know:

- what data is
- data can be used to solve problems and find answers to questions
- data can be categorised as quantitative or qualitative

Lesson Requirements

	PDA	NPA	Data Skills for work
Qualification	Yes	Yes	Yes
Outcome ID(s)	WD7.1b (part)	DS5.2a, DS6.2a (part)	A1.1
Outcome description(s)	WD7. 1b Types of data (categorical and numerical data and their sub-types) *N.B. out of scope of this lesson, "WD7.1b Extract data from different sources"*	DS5.2a Describe common data types and data formats. DS6.2a Describe common data types and data formats. *N.B. out of scope of this lesson, "DS6.2a … including structured and unstructured data."*	A1.1 Data types, quantitative and qualitative
Level	7/8	5/6	Analysis
Software language	N/A	N/A	N/A
Required equipment /software for student	Lesson: PowerPoint, Worksheet: Excel or pdf/printed	Lesson: PowerPoint, Worksheet: Excel or pdf/printed	Lesson: PowerPoint, Worksheet: Excel or pdf/printed

Task-types

In the worksheet for this lesson, there are up to 6 task-types that become increasingly challenging to support the students learning. Based on the student's previous knowledge it is possible to select the task-types that are relevant to their stage.

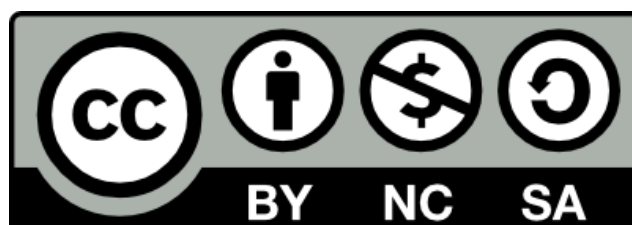| Task-type	Description
1. Recall	To be able to recognise definitions or procedures.
2. Define	To be able to define definitions or procedures.
3. Rephrase	To be able to use their own words to describe definitions or procedures.
4. Apply	To be able to apply definitions or procedures to problem-solving activities.
5. Create	To be able to apply definitions or procedures and create their own solutions to a defined problem.
6. Active	Using knowledge from the lesson which they apply to scenarios they have researched/designed themselves.

Worksheet

The worksheet associated with this lesson is available either in Excel or as a PDF that can be printed. The answer worksheet is available in both formats too.

Worksheet section ID	Description	Task-type	Number of questions
1.1	Scales of measurement	Recall	3
1.2	Scales of measurement	Define	1
1.3	Scales of measurement	Rephrase	1
2.1	Extension	Apply	7
2.2	Extension	Active	1
Total			**13**

How you can use this lesson

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.