**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.

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# 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.

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Description automatically generated

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