Data types and storage

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.

Contents

Lesson Description

Lesson Overview	Different structures for holding data. Difference between stored and display formats
Topic	Working with Data
Book Chapter(s)	"4. Working with Data, Data types, formats and structure"

NPA level	4, 5, 6
PDA level	7, 8
Data skills for work level	Core, Analysis

Lesson Contents

This lesson consists of:

- A lesson plan (this document)
- A PowerPoint/PDF presentation, 'Data types and storage'
- Excel/PDF Question workbook on 'Data types and storage' (for learners)
- Excel/PDF Answers workbook on 'Data types and storage' (for teachers)

Note: if the learners are using the Excel versions of the Question-and-Answer workbooks in other software packages (such as Google sheets) the document may need to be adjusted.

Learning Intentions

We will be learning about the structure of data, specifically to,

- the **types and structure of data** that a computer can store
- understand the difference between the **stored type and the displayed format**

Note: in the Date Types section of the PowerPoint and the workbook, 'Boolean' and 'epoch date' are introduced. These are not essential for NPA Level 4 learners and can be skipped.

Success Criteria

I can *describe* common stored data types and understand that they can be different from the displayed format.

I can *describe* the structures data can be held in.

Knowledge Prerequisites

Learners should know:

- data can be used to solve problems and find answers to questions
- data is stored in a computer

Lesson Requirements

	PDA	NPA	Data Skills for work
Qualification	Yes	Yes	Yes
Outcome ID(s)	CD7.1c, CD8.1e, WD7.3c,	DS4.2a, DS5.2a, DS6.2a	A1.1, C2.1
Outcome description(s)	CD7.1c Types of data CD8.1e Data types WD7.3c Data structures including lists and tables *N.B. out of scope of this lesson, "WD7.1c Extract data from different sources"* *"WD8.2c Extract data from a variety of sources."*	DS4.2a Describe common data types and data formats 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 scope "DS6.2a … including structured and unstructured data."*	A1.1 Data types C2.1 Vocabulary used in data science and analytics *N.B. out of scope of this lesson "A1.1….quantitative and qualitative"*
Level	7, 8	4, 5, 6	Core, 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 to 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	Data types	Recall	1
1.2	Data types	Define	1
1.3	Data types	Rephrase	2
2.1	Data structures	Recall	1
2.2	Data structures	Define	2
2.3	Data structures	Rephase	2
3.1	Extension	Apply	6
Total			**15**

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.