

Creating new variables by extracting and combining in Excel

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 adjusted.

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Lesson Description

Lesson Overview	Creating new calculated variables
Topic	Data manipulation
Book Chapter(s)	“Data transformation and Manipulation”

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 presentation, 'Creating new variables by extracting and combining in Excel'
- Question worksheet (for learners) on 'Creating new variables by extracting and combining in Excel' in Excel
- Answers worksheet (for teachers) on 'Creating new variables by extracting and combining in Excel' in Excel

Learning Intentions

We will be learning how to create new variables in Excel, specifically,

- understand what it means to **extract data to create a new variable**
- how to create simple new variables by extracting data in Excel
- understand what it means to **combine data to create a new variable**
- how to create simple new variables by combining data in Excel.

Success Criteria

I can *describe* how to create a new variable by extracting data.

I can *create* new variables in Excel by extracting data.

I can *describe* how to create a new variable by combining data.

I can *create* new variables in Excel by combining data.

Knowledge Prerequisites

Learners should know:

- How to open/save an Excel file
- That Excel documents have worksheets and use rows/columns
- To be able to enter data into cells
- To be able to select/highlight sections of data
- Headers on worksheet (e.g. A,B,C,D and rows 1,2,3,4)
- Excel has ribbons at the top for Home, Data, Formulas etc
- To be able to right-click on cells to see options

Lesson Requirements

	PDA	NPA	Data Skills for work
Qualification	Yes	Yes	Yes
Outcome ID(s)	WD8.3b, WD8.3c, CD8.1g, WD7.2a, WD7.2b, CD7.3a	DS4.2c, DS4.3a, DS5.2c, DS5.3c, DS6.2b, DS6.3c	C2.1, A1.2, A2.1, A2.3
Outcome description(s)	<p>WD8.3b Types of data transformation</p> <p>WD8.3c Transformations</p> <p>CD8.1g Preparing data for visualisation</p> <p>WD7.2a Types of data transformation</p> <p>WD7.2b Common transformations including filtering, sorting</p> <p>CD7.3a Preparing data for visualisation</p> <p><i>N.B. out of scope of this lesson,</i></p> <p><i>“WD8.3c ... including joins”</i></p> <p><i>“WD7.2b ...including filtering, sorting.... and grouping”</i></p>	<p>DS4.2c Describe simple methods of cleaning and transforming data</p> <p>DS4.3a Perform simple data cleaning and structuring</p> <p>DS5.2c Describe methods of cleaning and transforming data</p> <p>DS5.3c Perform routine data cleaning and structuring.</p> <p>DS6.2b Explain techniques for data capture, cleaning and transformation including data modelling</p> <p>DS6.3c Perform data transformation to complete, correct and structure data</p> <p><i>N.B. out of scope of this lesson,</i></p> <p><i>“DS4.3b ... including sort, filter, group and summarise.”</i></p> <p><i>“DS5.3d ...including sort, filter..., group and summarise.”</i></p>	<p>C2.1 Vocabulary used in data science and analytics</p> <p>A1.2 Data quality</p> <p>A2.1 Use of tools to analyse data</p> <p>A2.3 Data calculation and manipulation</p> <p><i>N.B. out of scope of this lesson “A1.1....quantitative and qualitative”</i></p>

Level	7, 8	4, 5, 6	Core, Analysis
Software language	Excel	Excel	Excel
Required equipment /software for student	Lesson: PowerPoint, Worksheet: Excel	Lesson: PowerPoint, Worksheet: Excel	Lesson: PowerPoint, Worksheet: Excel

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

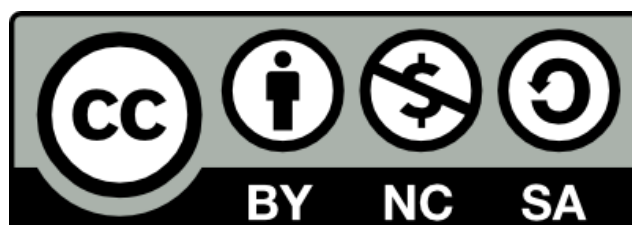
The worksheet associated with this lesson is available either in Excel or as a PDF that can be printed. The answer worksheet is available in both formats too.

Worksheet section ID	Description	Task-type	Number of questions
1.1	Extract	Recall	2
1.2	Extract	Rephrase	1
1.3	Extract	Apply	6
1.4	Extract	Active	1
2.1	Combining	Recall	2
2.2	Combining	Apply	5
2.3	Combining	Active	2
3.1	Extension	Apply	1
Total			20

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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