

Pivot to Success:

How to Utilize Excel Formulas & Functions to Create a User-Friendly Curricular Map

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Learning Outcomes

1. Identify items in a curricular map.
2. Use a VLOOKUP to look up and retrieve data for a curricular map.
3. Organize data in a pivotable way.
4. Present curricular data to stakeholders using a pivot table.

NEOMED College of Pharmacy



- ▶ Located in Rootstown, Ohio
- ▶ 340 students enrolled in the College of Pharmacy
- ▶ ACPE site visit in 2017
- ▶ 98.6% NAPLEX 1st attempt pass-rate in 2018 (compared to 89.5% nationally & 92% in Ohio)
- ▶ #1 in Ohio, #6 in the nation (out of 129 colleges of pharmacy)
- ▶ Unveiled a new curriculum, “Curriculum 2.0,” for the 2018-19 AY

Curriculum 2.0



Focuses on a semester
schedule, not blocks



New courses



New credit hours and
workload

What is a curricular map?



A visual layout of a subject's (or program's) education standards and the resources used to address those standards (Applied Educational Systems, 2018)



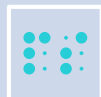
Aligns skills to courses, grade levels, etc.



Demonstrates a comprehensive view of requirements



Assists in identifying gaps in the curriculum



The map is an everchanging living document

College Need: Updated Curricular Map/Process

- ▶ Map existed for Curricular 1.0
 - ▶ Courses and Assessments Mapped to:
 - ▶ CAPE (Center for the Advancement of Pharmacy Education) Outcomes
 - ▶ Appendix 1 (sciences)
 - ▶ Appendix D (Pre-APPE performance domains and abilities)
 - ▶ Data created in a pivotable format in Excel

Levels of the Curriculum 1.0 Map

Block

Course

Year

Assessment

Description (map type)

Outcome (map number)

Curriculum 1.0 Map Data Example

	A	B	C	D	E	
1	Block	Course	Year	Assessment	Description	Outcome
2	1	EBM I	P1	Tertiary Resources Assignment	Appendix D	9.1
3	1	EBM I	P1	Exam	Appendix D	3.8
4	1	PCEUT	P1	Dosage Form Preparation	Appendix D	1.8
5	1	PPCE1	P1	Wasson Medical History Assessment	Appendix D	10.3
6	2	EBM II	P1	Tertiary Resources Assignment Question	Appendix D	3.8
7	2	EBM II	P1	Exam question	Appendix D	9.1
8	2	PPCE2	P1	Wasson Adherence Assessment	Appendix D	7.1
9	2	PPCE2	P1	Wasson Adherence Assessment	Appendix D	7.2
10	4	PPCE4	P1	Wasson Rx/OTC Assessment	Appendix D	3.1
11	4	PPCE4	P1	Top 300 Quiz Results	Appendix D	2.4
12	4	PPCE4	P1	Wasson Rx/OTC Assessment	Appendix D	8.9
13	4	PPCE4	P1	Wasson Rx/OTC Assessment	Appendix D	10.2
14	4	PPCE4	P1	PSA Soap	Appendix D	2.3
15	4	PPCE4	P1	Final Exam: Cumulative Top 300 Meds	Appendix D	3.1
16	5	PPCE5	P2	Immunization Injection Technique	Appendix D	10.1
17	6	PPCE6	P2	Journal Club Assessment Rubrics	Appendix D	8.5
18	6	PPCE6	P2	Journal Club Assessment Rubrics	Appendix D	9.2
19	7	PPCE7	P2	PSA Soap	Appendix D	2.2
20	7	PPCE7	P2	Top 300 Quiz Results	Appendix D	3.2
21	7	PPCE7	P2	MTM Patient Counseling Activity	Appendix D	4.4
22	7	PPCE7	P2	MTM Patient Counseling Activity	Appendix D	11.4

Pivot Example

Year P1

Count of Appendix 1 Outcomes		Column Labels														
Row Labels	EBM I	EBM II	FNEURO	HDS	HSP	MTC	OTC	PARENT	PBM	PCEUT	PPCE1	PPCE2	PPCE3	PPCE4	PRO	Grand Total
Biomedical Sciences	9	1	9		9	9			32	1				4	2	76
A1BS01			2		2	8			5	1				1		19
A1BS02	9	1	1											1		12
A1BS03			2		3				9					1		15
A1BS04			2		3				9					1		15
A1BS07			2		1	1			9						2	15

New Curriculum = New Map

- ▶ Creation of a “transition map” for Curriculum 2.0
- ▶ Several courses offered during the temporary period later modified for the new curriculum
- ▶ Mapping out new courses and new content
 - ▶ Connecting courses to assessments and new ability-based outcomes (ABOs), CAPE outcomes, and entrustable professional activities (EPAs)
 - ▶ Curricular map assists in identifying gaps when building out new courses and assessments

Utilizing Features in Excel

- ▶ New mapping process uses VLOOKUPs and pivot tables to display and organize data
- ▶ Separate workbook contains descriptions of ABOs, CAPE outcomes, and EPAs
- ▶ VLOOKUP connects the map types to their description for efficiency
- ▶ Data is organized in a pivotable format to compare various contents

Levels of the Curriculum 2.0 Map

Year

Semester

Course

Assessment

Map Type

Map Number

Description

Curriculum 2.0 Map Data Example

	A	B	C	D	G	H	I
1	Year	Semester	Curriculum 2.0 Course	Assessment	Map Type	Map Number	Description
32	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	2.2.a	Pre-APPE & APPE: Use a systematic approach to assure safe and accurate preparation and dispensing of medications
33	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	3.1.a	Pre-APPE: Identify, analyze and prioritize problems
34	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	4.4.a	Pre-APPE & APPE: Demonstrate altruism, integrity, trustworthiness, flexibility, and respect in all interactions
35	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	1.1.b	Pre-APPE: Develop knowledge of foundational sciences (e.g. physiological and biochemical processes) in relation to pharmacological and nonpharmacological therapy for prevention and treatment of disease states
36	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	2.1.b	Pre-APPE & APPE: Assess patient case; formulate and recommend a prioritized patient-centered care plan
37	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	3.1.a	Pre-APPE: Identify, analyze and prioritize problems
38	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	4.4.b	Pre-APPE & APPE: Display preparation, initiative, and accountability consistent with a commitment to excellence

Pivot Example

Map Type CAPE

Curriculum 2.0 Courses	Map Numbers																Grand Total
	1.1	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	3.5	3.6	4.1	4.2	4.3	4.4		
P1	4	3	3	1	1	3	4	2	3	1	4	5	2	3	4	43	
Evidence Based Medicine	1	1	1	1			1	1	1		1		1		1	10	
Experiential Education 1	1	1	1			1	1		1		1			1	1	10	
HAPP 1						1	1					1		1	1	5	
Interprofessional Education 1					1				1	1	1	1	1	1	1	8	
Introduction to Pharmaceutical Sciences	1		1									1				3	
Personal and Professional Development 1													1			1	
Pharmacy Skills 1	1	1				1	1	1			1					6	
P2	8	7	3		2	7	2	4	2	2	3	3	1	2	3	49	
AphA Immunization Certification			1		1			1								3	
Experiential Education 3	1	1	1			1	1	1	1		1	1		1	1	11	
Immunology and Biotechnology	1					1										2	
Interprofessional Education 3					1				1	1	1	1	1		1	7	
Personal and Professional Development 3								1		1		1		1	1	5	
Pharmacotherapeutics: Advanced Cardiology	1	1				1										3	
Pharmacotherapeutics: Endocrine	1	1				1										3	
Pharmacotherapeutics: Intro to Chronic Disease	1	1				1										3	
Pharmacotherapeutics: Nephrology	1	1				1										3	
Pharmacotherapeutics: OTC/Self Care	1	1				1										3	
Pharmacy Skills 3	1	1	1				1	1			1					6	
P3	9	7	1			7	1	1	1		1			3	1	32	
Experiential Education 5	1	1	1			1	1	1	1		1			1	1	10	
Pharmacotherapeutics: Critical Care/Pulmonology	1	1				1										3	
Pharmacotherapeutics: Endocrine	1	1				1										3	
Pharmacotherapeutics: Gastroenterology	1	1				1										3	
Pharmacotherapeutics: Immunology/Oncology	1	1				1										3	
Pharmacotherapeutics: Infectious Disease	1	1				1										3	
Pharmacotherapeutics: Neurology/Psychiatry	1	1				1										3	
Practice Management 2	2													2		4	
P4											1	1	1		1	4	
Personal and Professional Development 7											1	1	1		1	4	
Grand Total	21	17	7	1	3	17	7	7	6	3	9	9	4	8	9	128	

What is a Pivot Table?

- ▶ A tool built in Excel that can summarize data quickly and easily
- ▶ Can answer questions about the data using minimal effort
- ▶ Reports count, sum, averages, maximum, minimum, and more

Pivot Table Uses



Assist in identifying outcomes mapped to courses and gaps in the curriculum



Show a specific course, assessment, and map type

Course Pivot Example

Curriculum 2.0 Course	Assessment	Map Type	Map Num	Description
HAPP 1	Exam 1	ABOs	1.1.b	Pre-APPE: Develop knowledge of foundational sciences (e.g. physiological and biochemical processes) in relation to pharmacological and nonpharmacological therapy for prevention and treatment of disease states
			1.1.c	Pre-APPE and APPE: Integrate and apply knowledge from foundational sciences to explain how specific drugs or drug classes work, including their potential value in individuals and populations
			3.1.c	Pre-APPE & APPE: Anticipate positive and negative outcomes by reviewing assumptions, inconsistencies, and unintended consequences
	Exam 2	ABOs	1.1.b	Pre-APPE: Develop knowledge of foundational sciences (e.g. physiological and biochemical processes) in relation to pharmacological and nonpharmacological therapy for prevention and treatment of disease states
			1.1.c	Pre-APPE and APPE: Integrate and apply knowledge from foundational sciences to explain how specific drugs or drug classes work, including their potential value in individuals and populations
			3.1.c	Pre-APPE & APPE: Anticipate positive and negative outcomes by reviewing assumptions, inconsistencies, and unintended consequences
	Exam 3	ABOs	1.1.b	Pre-APPE: Develop knowledge of foundational sciences (e.g. physiological and biochemical processes) in relation to pharmacological and nonpharmacological therapy for prevention and treatment of disease states
			1.1.c	Pre-APPE and APPE: Integrate and apply knowledge from foundational sciences to explain how specific drugs or drug classes work, including their potential value in individuals and populations
			3.1.c	Pre-APPE & APPE: Anticipate positive and negative outcomes by reviewing assumptions, inconsistencies, and unintended consequences

Organizing Data in a Pivotable Format

- ▶ Open Microsoft Excel
- ▶ Label preferred headings in the spreadsheet (i.e. year, course, assessment)
- ▶ *Only include one phrase or number per cell*
 - ▶ Multiple items in one cell will cause to pivot table to not work

Curriculum 2.0 Map Data Example

1	Year	Semester	Curriculum 2.0 Course	Assessment	Map Type	Map Number	Description
32	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	2.2.a	Pre-APPE & APPE: Use a systematic approach to assure safe and accurate preparation and dispensing of medications
33	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	3.1.a	Pre-APPE: Identify, analyze and prioritize problems
34	P1	Fall	Experiential Education 1	Requirements of a Legal Prescription	ABOs	4.4.a	Pre-APPE & APPE: Demonstrate altruism, integrity, trustworthiness, flexibility, and respect in all interactions
35	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	1.1.b	Pre-APPE: Develop knowledge of foundational sciences (e.g. physiological and biochemical processes) in relation to pharmacological and nonpharmacological therapy for prevention and treatment of disease states
36	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	2.1.b	Pre-APPE & APPE: Assess patient case; formulate and recommend a prioritized patient-centered care plan
37	P1	Fall	Experiential Education 1	Dosage Forms	ABOs	3.1.a	Pre-APPE: Identify, analyze and prioritize problems
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Creating a Pivot Table



Select your data



Click Insert → PivotTable



A new sheet will appear for the Pivot



Create basic columns



Hierarchical lists

Pivot Table View

PivotTable Analyze Design (New tab options)

Where the pivot table appears

Columns from dataset

- Filters**: Categorize the pivot
- Columns**: What goes in the columns
- Rows**: What goes in the rows
- Values**: What goes in the body

Manipulating Values

The screenshot displays an Excel spreadsheet with a PivotTable. The PivotTable Fields task pane on the right shows the following configuration:

- Choose fields to add to report: Year, Semester, Curriculum 2.0 Course, Assessment, Measurement Tool, Assessment Type, Map Type, Map Number, Description.
- Drag fields between areas below:
 - Filters: (empty)
 - Columns: (empty)
 - Rows: Year
 - Values: Count of Assessment
- Buttons: Defer Layout Update, Update

The Value Field Settings dialog box is open, showing the following details:

- Source Name: Assessment
- Custom Name: Count of Assessment
- Summarize Values By: Show Values As
- Summarize value field by: Choose the type of calculation that you want to use to summarize data from the selected field. The list includes Sum, Count (selected), Average, Max, Min, and Product.
- Buttons: Number Format, OK, Cancel

A blue arrow points from a speech bubble to the arrow icon in the Value Field Settings dialog box.

Clicking on the arrow will allow you to select “value field setting” to modify values

Hierarchical Lists

Year	Semester	Curriculum 2.0 Course
P1		
	Fall	Evidence Based Medicine
		Experiential Education 1
		HAPP 1
		HAPP 2
		Interprofessional Education 1
		Introduction to Pharmaceutical Sciences
		Personal and Professional Development 1
		Pharmacy Skills 1
	Spring	Health Care Delivery System
		Personal and Professional Development 2
		Pharmacokinetics & Pharmacodynamics
		Pharmacy Skills 2
P2		
	Fall	Experiential Education 3
		Immunology and Biotechnology
		Interprofessional Education 3
		Personal and Professional Development 3
		Pharmacotherapeutics: Intro to Chronic Disease
		Pharmacotherapeutics: OTC/Self Care
		Pharmacy Skills 3
	Header	AphA Immunization Certification
	Spring	Parenteral Products with Laboratory
		Personal and Professional Development 4
		Pharmacotherapeutics: Advanced Cardiology
		Pharmacotherapeutics: Nephrology
		Practice Management 1
P3		
	Fall	Experiential Education 5
		Personal and Professional Development 5
		Pharmacist Patient Care Experience 8
		Pharmacotherapeutics: Endocrine
		Pharmacotherapeutics: Infectious Disease

Stacking values will create a hierarchy in your pivot table to compare different values

PivotTable Fields

Choose fields to add to report:

Search

- Year
- Semester
- Curriculum 2.0 Course
- Assessment
- Measurement Tool
- Assessment Type
- Map Type
- Map Number
- Description

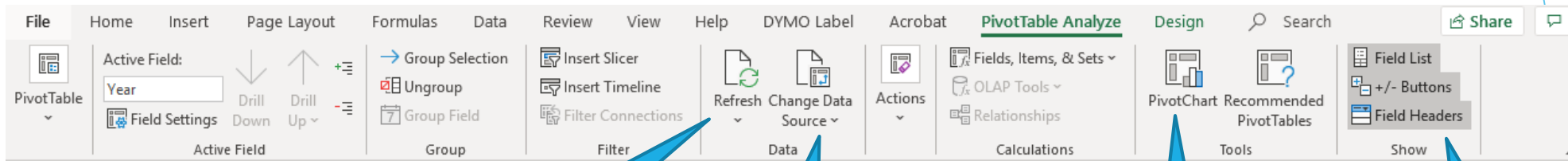
More Tables...

Drag fields between areas below:

Filters	Columns

Rows	Values
Year	
Semester	
Curriculum 2.0 Course	

Additional Tools



If you change values, add columns, etc.

If you add columns or rows to the edges of the dataset

Add a chart using data from the pivot table

Modify content of pivot table

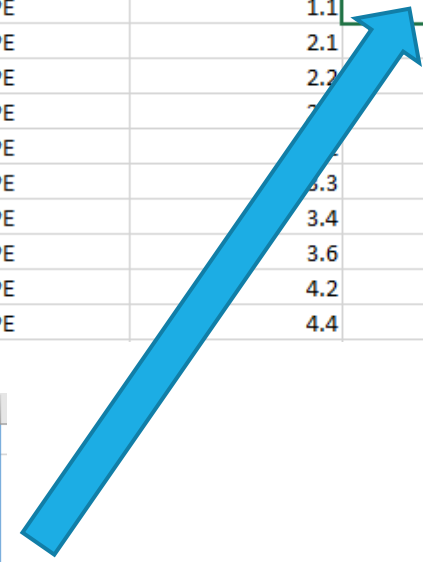
VLOOKUP

- ▶ Use VLOOKUPS when you have a spreadsheet that is incomplete and connect datasets to each other
- ▶ The function says:
 - ▶ “=VLOOKUP(What you want to look up, where you want to look for it, the column number in the range containing the value to return, return an **Approximate or Exact match** – indicated as **1/TRUE**, or **0/FALSE**).” (Office Support, 2019)
- ▶ For example:
 - ▶ =VLOOKUP(map number, Mapping References Spreadsheet, column 3 (description), FALSE (exact match))

VLOOKUP Example

	A	B	C	G	H	I
1	Year	Semester	Curriculum 2.0 Course	Map Type	Map Number	Description
2	P1	Fall	Evidence Based Medicine	CAPE	1.1	
3	P1	Fall	Evidence Based Medicine	CAPE	2.1	
4	P1	Fall	Evidence Based Medicine	CAPE	2.2	
5	P1	Fall	Evidence Based Medicine	CAPE	2.3	
6	P1	Fall	Evidence Based Medicine	CAPE	2.4	
7	P1	Fall	Evidence Based Medicine	CAPE	3.3	
8	P1	Fall	Evidence Based Medicine	CAPE	3.4	
9	P1	Fall	Evidence Based Medicine	CAPE	3.6	
10	P1	Fall	Evidence Based Medicine	CAPE	4.2	
11	P1	Fall	Evidence Based Medicine	CAPE	4.4	

	A	B	C
1	Number	Map Type	Description
61	1.1	CAPE	Develop, integrate, and apply knowledge from the foundational sciences (i.e. pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient-centered care.
62	2.1	CAPE	Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).
63	2.2	CAPE	Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.
64	2.3	CAPE	Design prevention, intervention, and education strategies for individuals and communities to manage chronic disease and improve health and wellness.
65	2.4	CAPE	Describe how population-based care influences patient-centered care and influences the development of practice guidelines and evidence-based best practices.



VLOOKUP Tutorial

1. Before starting, make sure your datasets are sorted and no cells are hidden
2. In the dataset WITH the VLOOKUP, create a column where the function will live
3. Type “=VLOOKUP(“ in the cell
4. Click on the cell that you want to look up (i.e. cell H2, or CAPE 1.1)
5. In the formula, type in a comma after the cell
6. Go to the dataset you are *pulling the data from* and *highlight the entire table OR the cells you need for the VLOOKUP*
7. In the formula, type a comma after the table/rows
8. Count the column number where the data will come from (i.e. column C = 3)
9. In the formula, type a comma after the column number
10. Type “TRUE” or “FALSE,” depending on an approximate match (true) or exact (false)
11. Close the formula with a parenthesis “)” and press enter

Let's Try It 😊
(with a fake dataset)

Live Demo

- ▶ How to:
 - ▶ Organize data in a pivotable format
 - ▶ Utilize a VLOOKUP
 - ▶ Create a pivot table

Live Demo Link

- ▶ <http://bit.ly/DonovanExcelDemo>
- ▶ (link can be downloaded for personal use)

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References

- ▶ Applied Educational Systems. (2018). What is a Curriculum Map? (And How Do You Make One?). Retrieved from: <https://www.aeseducation.com/blog/what-is-a-curriculum-map-and-how-do-you-make-one>
- ▶ Microsoft Office Support. (2019). VLOOKUP function. Retrieved from: <https://support.office.com/en-us/article/vlookup-function-0bbc8083-26fe-4963-8ab8-93a18ad188a1>