

Programming Section 03: APIs & Data Storage Teacher Page

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Storyline

This section begins with a brief discussion of how data is obtained and what might be done with said data. The teacher will then lead the students into the lecture about APIs and data storage. The lecture focuses on three core parts: what is an API, how to access APIs, and data storage and organization. A MATLAB live script will be provided as a teaching aid and resource for the students to follow along. With the conclusion of the lecture content, the students will practice accessing and working with APIs, specifically a Spotify API. Once the students have completed the activity, they will form groups to reflect on their experience and answer a few questions. The groups will post their thoughts and answers on a discussion board.

Main Learning Goal

Students will learn what APIs are and how they play a pivotal role in obtaining data. They will gain hands-on experience working with APIs by using the Spotify API. Students will also learn the basics of sorting and data storage in MATLAB.

Focus Question

How do computers obtain data?

Elicit: “Gathering and Organizing Data”

How will I engage students and elicit their ideas?

Activity Name and Description	Teacher Moves	Student Moves	Resources
<ul style="list-style-type: none">• 10 minutes• A brief small group discussion about data storage.	<ul style="list-style-type: none">• Teacher will help students form groups of four.• The teacher will provide the students the following questions to discuss:<ul style="list-style-type: none">– How do data scientists gather large amounts of data?	<ul style="list-style-type: none">• Students should form groups of four.• Students should consider the questions provided and discuss their thoughts	<ul style="list-style-type: none">• Popular Data Science Tools• Data Gathering

Activity Name and Description	Teacher Moves	Student Moves	Resources
	<ul style="list-style-type: none"> – How do you think that apps on your smartphone get data? – Why must data be organized and sorted? • Teacher should allow a few minutes to discuss each question. • Teacher should encourage students to share their group answers with the class. 	with their group.	

Develop: “Collecting and Managing Big Data”

How will I get students to explore, explain, and develop ideas?

Activity Name and Description	Teacher Moves	Student Moves	Resources
<ul style="list-style-type: none"> • 35 minutes • This is the lecture for the section and it covers the following three parts: <ul style="list-style-type: none"> – What is an API? – Accessing an API – Spotify – Storing and Sorting Data 	<ul style="list-style-type: none"> • The teacher will ensure and provide the live script for students to follow along. • The teacher will lecture on data storage and APIs using the live script as an aid. • Teacher should encourage and answer questions as needed. 	<ul style="list-style-type: none"> • Students will open live script to follow along during the lecture. • Students should ask questions as needed. 	<ul style="list-style-type: none"> • What is an API? – IBM • Spotify Web API • Data Organization - MathWorks

Activity Name and Description	Teacher Moves	Student Moves	Resources
<ul style="list-style-type: none"> The live script for the section can be found at this link: MATLAB_Section03_Livescript 			

Deploy: “Spotify API Practice”

How will I get students to use and apply their ideas to what they’ve learned?

Activity Name and Description	Teacher Moves	Student Moves	Resources
<ul style="list-style-type: none"> 35 minutes This is a coding assignment with a shell code provided. This is intended to provide the students with a chance to work with an API and to practice storing and manipulating data. The assignment can be accessed at this link: Programming Section 03 Assignment The live script for the assignment can be 	<ul style="list-style-type: none"> Teacher will ensure each student has accessed the assignment and all necessary files. Teacher will encourage independent work. Teacher should encourage and answer questions as needed. 	<ul style="list-style-type: none"> Students will access the assignment and open necessary live scripts and files. Students will independently complete the tasks listed in the assignment. Once finished, students should submit their live scripts to the assignment page. 	<ul style="list-style-type: none"> What is an API? – IBM Spotify Web API Data Organization - MathWorks

Activity Name and Description	Teacher Moves	Student Moves	Resources
accessed here: MATLAB_Section03_Practice			

Refine: “Benefits of APIs”

How will I get students to extend, elaborate, and change their ideas based on what we now understand?

Activity Name and Description	Teacher Moves	Student Moves	Resources
<ul style="list-style-type: none"> • 5 minutes • This is a discussion board post with two reflection questions for the students. • The discussion board can be accessed at this link: Programming Section 3 Discussion 	<ul style="list-style-type: none"> • Teacher will help the students form groups of four. • Teacher will make sure the groups have access to the discussion board post. • Teacher should give the students a few minutes to consider the following questions and post their responses: <ul style="list-style-type: none"> – Discuss the benefits of using an API to retrieve data versus directly uploading files with data into MATLAB. – Reflect on any challenges faced when working with Spotify API in the practice activity. 	<ul style="list-style-type: none"> • Student will form groups of four and pull up the discussion board. • Students will consider the two discussion questions and discuss amongst their group. • Groups will submit their ideas and thoughts as a post on the discussion board. • Students should be sure to read other responses as well. 	<ul style="list-style-type: none"> • How are APIs Beneficial • What is an API? – IBM