

INTRODUCTION TO CODING USING JUPYTER

TEACHER NOTES

DESCRIPTION

First in a series, this activity enables students to develop basic skills in coding and the Python programming language, and familiarizes them with the Jupyter platform. This activity introduces basic coding rules using Python to solve simple mathematical questions and to format Python results for more stylish presentations.

STANDARDS ADDRESSED

Next Generation Science Standards

Science Practices

1. Asking questions
2. Developing and using models
4. Analyzing and interpreting data

Crosscutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity

Common Core Literacy Standards

Reading

- 9-12.4 Determine the meaning of symbols, key terms . . .
- 9-12.7 Translate quantitative or technical information . . .

Common Core Mathematics Standards

- MP7. Look for and make use of structure.

IB Physics Standard 1: The Scientific Endeavor

- 1.6 Mathematics as a powerful tool

ENDURING UNDERSTANDING

Scientists can use data to develop models based on patterns in the data.

LEARNING OBJECTIVES

The students will be able to:

- Place Python lines in the correct order.
- Run and edit Python code.
- Read and write comments in Python.
- Import software modules

PRIOR KNOWLEDGE

Students should be familiar with basic algebraic functions and order of operations.

RESOURCES

Student Page: [Intro to Jupyter](#)

[Teacher Answer Key](#)

IMPLEMENTATION

We suggest that before you use this activity with students, open the Student Page, **Copy to Drive** and work through the lesson. This will help you overcome hurdles and make it easier to lead your students through the activity. Do not worry, you cannot break the Student Page.

When implementing this activity with students, be sure that as soon as the Student Page is opened, the students click on the **Copy to Drive** button just below the menu bar. The students proceed to follow the instructions to practice Python basics.

Key Pointers for this Activity:

- Finding notebook copies. Go to the My Drive section of Google Drive. There will be a Colab Notebook folder. Open the folder to find your notebook copy. Be sure the students change the name of the file to something unique and easy to keep organized. For example, your students can put their initials in front and the date at the end of the name.

PART 2:

- To move coding cells, click on the cell and use the up and down arrow on the right to move the cell.
- To insert a coding or text cell, use the Google Colab menu *Insert*, select *code cell* or *text cell*. The new cell will appear in the space below the cursor position.

The teacher key contains one possible solution to the questions on the student page.

QUESTIONS

- Were you able to run the Python code? For example, could you add or multiply numbers and see the answer?
- Could you edit the code to produce different output?
- Did you find the comments? They start with # and are messages to people reading the code.
- Can you explain what's wrong with running "c=2" then "c+d"?
- Can you name two Python software modules? Hint: you imported them.
- Could you edit a markdown cell and do some formatting, like a bulleted list, **bold**, or *italics*?

ASSESSMENT

This activity lends itself to formative assessment. You can visit each group and ask them to answer one of the questions. Another approach is to develop a short quiz by using the questions above and change the values or symbols.