MINECRAFT
EDUCATION EDITION

Educator Guide

Minecraft Python Course - Lesson 1
45 minutes

All That Syntax

PYTHON COMMAND STRUCTURE AND SYNTAX

EDUCATION.MINECRAFT.NET

LESSON OBJECTIVES:

In this lesson the students will learn:

- what a computer language is.
- what an algorithm is.
- Minecraft Python command syntax structure.
- differences in syntax when declaring strings or numbers.
- to correct syntax errors.

LESSON INTRODUCTION: 10 minutes

Theme:

Tell the students that they need to help a software development company called CodingMine by finding and fixing all the bugs in the software they create. The CEO of the company really needs the students' help, as it seems that the problem has become widespread in many pieces of code that they write. The students need to write down Minecraft Python commands using the correct syntax and find and correct errors in other already existing pieces of code.

Coding Concepts:

Computer languages

Tell the students that to instruct a computer to do something, you need to talk to it in a language it understands, just like people. There are many computer languages; some of the ones used the most, that they may have heard of, are C++, Python and JavaScript. Most computer languages, although they are all slightly different, use the same coding concepts.

Algorithms: how a computer thinks.

Tell the students that when computers read code written in a computer language, they read it as an algorithm. An algorithm is a list of commands that the computer reads and carries out one after the other. The order in which the commands are given to the computer is important. For example, in real life, when making a cake, if you have a recipe and you follow it in the correct order, you will make a delicious cake but if you make it in the wrong order it wouldn't come out correctly even though all the ingredients are the same. An algorithm is like a recipe and can seem complicated, but it is just a set of small steps being carried out in the right order.

What is Python, and what version of Python will be used?

Tell the students that they will be using the Python programming language to complete activities in this course. Python is a language that is used to communicate with a computer to make it carry out certain tasks. Python is a powerful programming language that can be used in many situations, from making web applications and data analysis to programming artificial intelligence. More specifically, in this course the students will be using a modified version of Python, Minecraft Python, created so that it can be used within Minecraft.

Syntax

Tell the students that syntax in a programming language is a set of rules that are used to create the programming language structure, in a similar way that grammar is used to create the structure of sentences in normal language. A software developer must follow this structure to make his or her code run correctly. Minecraft Python also has a defined set of rules (the syntax) that the students will have to follow.

Minecraft Python command structure

Tell the students that every command while programming using Minecraft Python is made from specific parts. Let us take one command as an example:

```
player.say()
```

Here we can see that the command is made from two parts. The first part is the player part, and the second part is the say part. The player part is commonly called a class in Python; however, in Minecraft Python in this course, we will be calling it the **command group**. This is because it can be thought of as a box where many different commands are kept. The say part is one of the actual commands, in that specific box, and is commonly called a method or function in Python. In Minecraft Python we will be calling it **command name**. The general structure of a command in Minecraft Python would be the **command group** followed by the **command name**, separated by a dot. At the end of every command there is a pair of parenthases where we input parameters to make the command do exactly what we want.

```
command_group.command_name()
```

String

Explain to the students that a string is a piece of text in quotes “ “, an example of this would be:
“Hello”
You can use other characters such as numbers inside the quotes. However, these numbers would not have any mathematical value, and would just be read by Python as text.

User Interface:

In this lesson the students will:

- use the coding window by pressing [c].
- use commands by dragging and dropping them into the coding window.
- edit commands placed in the coding window.

Syntax / Operators:

Tell the students in this lesson they will learn about:

Parentheses ():

Parentheses are used in a variety of situations in Minecraft Python. After the command name there is a pair of **parentheses**. The **parenthesis** can have parameters placed in them to set the command’s settings, to make the command do exactly what is wanted.

Quotes “ ”:

Quotes are used in Minecraft Python to define a string. Any characters between the quotes will be seen by Python as text.

Syntax Error:

A Syntax Error is the computer's way to say that it cannot run a piece of code because the syntax structure is not correct, and it should be corrected before being run.

CODING ACTIVITIES: 30 minutes

Activity 1: What is right?

(Hint: The students will have to talk, by right clicking, on the non-player-character (NPC) to start an activity).

Objective: Tell the students that the developer needs their help to figure out which one of the commands on the computer monitors is written correctly. They will have to do this by checking each of the commands in the coding window [c] to find the one that works. When they find the correct one, they need to press the mouse button on the right side of the small computer monitor where that command is shown. Explain to the students that there should be no syntax errors shown when a correct piece of code is run, and the command should show the word "Hi" in the chat.

Tell the students to go over to the first computer, the one by the entrance with the blue flower on the desk. Write out the code that is written on the monitor in the coding window: `player(say)Hi` They should then run the code, by clicking on the big green arrow button, to check if it is correct. If it is, press the mouse button. If it is not, they should close the coding window by clicking on the 'x' in the top right-hand corner and try the other 3 pieces of code on the remaining monitors. When the students try out the code on computer monitor number 3, the monitor where there is a lamp on the table, they will see that it is the correct one. By pressing the mouse button next to this monitor they will then have completed Activity 1 and the door to the next Activity will open. If they press the mouse button next to any other computer monitor, bugs will appear and they should keep trying until they find the correct code.

Code snippets:

Monitor 1: `player(say)Hi`

Monitor 2: `player.say"Hi"`

Monitor 3: `player.say("Hi")` (correct)

Monitor 4: `say()`

Activity 2: What is missing?

Objective: Tell the students that the programmer has asked for their help as he cannot find out what syntax blocks are missing from the commands on the monitors. There are syntax blocks in the chest in the middle of the room. The students will have to use these blocks to fill in the missing syntax of the commands. The students can also check different solutions for each of the commands on the monitors by running them in the coding window.

Tell the students that they should check if the commands on the monitors work correctly by using the say command from the player group on the left side of the coding window. Once the students have correctly placed each syntax block, they will have completed Activity 2 and the door to the next Activity will open.

Code snippets:

Monitor 1: `player.say“To show”)`

Correct: `player.say(“To show”)`

Monitor 2: `player.say(“text on)`

Correct: `player.say(“text on”)`

Monitor 3: `player.say(the screen)`

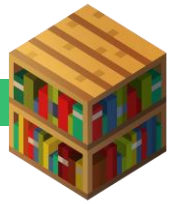
Correct: `player.say(“the screen”)`

Monitor 4: `player.say“we use quotes”`

Correct: `player.say(“we use quotes”)`

Monitor 5: `player.say2`

Correct: `player.say(“2”)`



Monitor 6: `player.say2`

Correct: `player.say(2)`

Activity 3: What is the correct number?

Additional Exercise:

Tell the students to try and solve the sum below in their heads and see how long it takes them: (2+6) *(4-2)
Doing this will demonstrate the advantage of using a computer when they solve the same sum using code.

Objective: Explain to the students that the data scientist has asked for their help to find out what the correct answer for three sums is. Once they find the correct answer, they should choose it from one of three given possibilities, under each monitor, by pressing the correct button.

Tell the students to use the say command to calculate the sums on the monitors and show them in chat. Tell the students to select the answer under the monitors. When the students have selected each answer correctly, Activity 3 and the lesson is complete.

Code snippets:

```
player.say(45+2505)
```

Answer: 2550

```
player.say(255/15)
```

Answer: 17

```
player.say((27+4)*(55-52))
```

Answer: 93

LESSON CONCLUSION: 5 minutes

Ask the students about the skills that they have learned during the lesson, to reinforce the concepts.

1. Q. What command do we use if we want to show a piece of text or a mathematical value in the chat?
   A. The player.say() command
2. Q. Do we use quotes when we want to show a piece of text in the chat?
   A. Yes
3 Q. Are numbers used with or without quotes if we want to use their numerical value?
   A. Without
4. Q. What syntax do we place around the parameters of a command?
   A. Parenthesis.

EDUCATION STANDARDS:

CSTA K-12	
1B-AP-15	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
2-AP-17	Systematically test and refine programs using a range of test cases.
ISTE	
7A	Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.
3B	Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media

	fluency.
6B	Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.

COMMANDS:

Say

```
player.say(message)
```

description: Shows something in the chat, in the game.

message: The message that the player wants to display in the chat. This message can be either a piece of text (string) or a mathematical value.