

Lesson Topic:

Programs That Make Decisions (**if** statements)

Lesson Sequence:

5/8

Lesson Link:

<https://csinschools.io/intro/5>

Lesson Overview:

This lesson covers **if** statements, and the concepts of **True** and **False**. It's important that students understand that **True** and **False** are the coding equivalent of Yes and No (or Right and Wrong, or ...).

You'll find this lesson has a significant number of slides, and that the slide to activity ratio is higher than usual. We've put a fun classroom exercise at the start to break things up, but you'll need the class to be settled to get across the significant theory in this lesson.

The lesson then introduces flowcharts as a way of organising and visualising the students' procedural thinking. Flowcharts were popular in the 1970s and 1980s, and they are an excellent way for students to visually understand the concept of control flow using **if** statements.

It's critical that students understand control flow as a basic building block, and we recommend using flowcharts as a tool to help them learn (even if they feel a bit old-school!). There's a [worksheet \(MS\)](#), where students are asked to draw a flowchart for a simple program with one branching statement. Don't worry too much if they mess up on choosing the right shape – what's important is that they understand the concept of branching (the diamond shape).

Also, it's often helpful to emphasise that what's written in the flowchart isn't typically what you'd type in Python - so, for example, it's common in a flowchart to say "Display", but the statement you'd use when you write Python code is **print()**. Don't worry too much if students use different words in their flowcharts.

Once flowcharts have been introduced, there's examples comparing flowcharts to code. The explanations carefully introduce indenting, which is a concept that many students

will take time to understand (and a frequent source of errors). You'll also find that missing colons at the end of **if** statements are a common error.

The inequality **!=** operator is not introduced in this lesson, but it is introduced in [Lesson 6](#) when introductory loops are explained.

You'll find at the beginning of this lesson that the "Gates of Doom" activity includes **!=** to check for the case where the password is incorrect. If you have time in class, consider going back to this exercise and explaining how it works. It's not critical to do this, but it will make the following lesson easier.

Learning notes:

- Watch for single **=** vs **==** in **if** statements, a very common error.
- Be careful about indenting and inconsistently spaced indenting!
- Missing colons (**:**) after **if** are also very common

Logistics notes:

- Please print hard copies of the flowchart worksheet [here \(MS\)](#), students will draw on it.
- Slides ideally to be presented to the class via a projector or screen, etc.
- Students can also follow along using the slides on their devices / computer
- Slides contain all the links to activities and worksheets which students need to click on

Suggested Breakdown for Topics and Timings:

Time (mins)	Topic covered	Student Activities	Resources
3	Roll and settle class		
5	Revision		Slides MS
5	Gates of Doom exercise		Demo - Gates of Doom
2	Learning objectives		Slides MS
15	Flowchart introduction		Slides MS
15	Drawing a flowchart	Worksheet	Slides MS Worksheet MS
10	if statements and equality using == in Python		
10		Activity: Favourite Subject!	Activity - 05.01
10		Activity: Are we Twins?	Activity - 05.02
10		Activity: A Quiz!	Activity - 05.03 Video guide
5	Summarisation and reflection		Slides MS

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