



F1.6 Variables, constants and assignment

Programming basics · GCSE · OCR J277 2.2.1, AQA 8525 3.2.2, Edexcel
1CP2 6.3.2 · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Storing, changing and naming values, and constants that never change.

- Giving a value a name
- Using a variable
- Naming
- Variables can hold the robot's answers
- Changing a variable
- Constants: values that should never change

Questions

8 marks in all

1. What does this program print?

[1 mark]

```
count = 0
count = count + 1
count = count + 1
print(count)
```

2. What does the `=` in `speed = 60` mean?

[1 mark]

- ☐ A Store the value 60 under the name speed
- ☐ B speed is equal to 60, as in maths
- ☐ C Check whether speed is 60
- ☐ D Print speed

3. Which of these are allowed as variable names?

[1 mark]

Tick every answer that is true.

- ☐ A `leg_length`
- ☐ B `speed2`
- ☐ C `2speed`
- ☐ D `leg length`

4. `speed = 60` then `print(Speed)`. What happens?

[1 mark]

- ☐ A `NameError: Speed is a different name from speed`
- ☐ B It prints 60
- ☐ C It prints Speed
- ☐ D It prints 0

5. What does this program print?

[1 mark]

```
leg = 24
half = leg / 2
print(leg, half)
```

6. Why store `before = distance()` before driving?

[1 mark]

- ☐ A So the first reading can be compared with one taken later
- ☐ B Because `distance()` only works once
- ☐ C To make the robot drive further
- ☐ D It makes no difference

7. What is the difference between a variable and a constant?

[1 mark]

- ☐ A A variable's value can change while the program runs; a constant's does not
- ☐ B A constant can hold text and a variable cannot
- ☐ C A variable is faster
- ☐ D There is no difference in Python

8. Four drives all use `MAX_SPEED`. Why is that better than typing 40 four times?

[1 mark]

- ☐ A The speed only has to be changed in one place
- ☐ B It makes the robot drive further
- ☐ C Python runs constants faster
- ☐ D Numbers are not allowed as arguments

The task: speed report

Store `70` in a variable called `speed`. Print `speed: 70` and `half: 35`, both **using the variable** (the number `70` appears only on the first line, and `35` nowhere). Dividing with `/` prints `35.0`, which is not `35 : //` divides and keeps a whole number, and lesson F1.9 explains the difference. Then drive 20 cm at that speed.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

speed = 70
print("speed:", speed)
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f1-6-variables-and-constants/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Store the battery in a variable at the start, drive around a bit, and print how much battery the drive used.
2. Add a constant `NOTE = 440` to a program and use it for three short beeps with `tone`.
3. What happens if you use a variable before giving it a value? Try it and read the error. Which of the three kinds of error is it?