Designed for Education: a Python Solution
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The Raspberry Pi Foundation is a registered educational charity (registration number 1129409) based in the UK.

Our Foundation’s goal is to **advance the education of adults and children**, particularly in the field of **computers, computer science and related subjects**.
The **new** Computing Curriculum

“From 5, children will **learn to code and program**, with algorithms, sequencing, selection and repetition;

from 11, how to use at least 2 **programming languages** to solve computational problems; to design ... computational abstractions that model the state and behaviour of **real-world problems** and **physical systems**; and how instructions are stored and executed within a computer system.”

Michael Gove - UK Secretary for Education
Where else?

England
Estonia
Israel
Australia
New Zealand
Why teach computing?

- Children are creative, imaginative, and not afraid of failure.
- Empowering.
- Social mobility.
- Diversity in tech.
- Humans need not apply.
Why Python?

- Used all over the world
- Powerful enough to be used for real development
- Used in the real world
- Simple syntax
- Really strong & helpful community
Education at Conferences

PyCon 2015
Montréal • April 8-16
Barriers

- Transition from visual to text based programming
- Python 2 vs. Python 3
- Syntax / function naming
Naming Problem

```python
from mcpi.minecraft import Minecraft
mc = Minecraft.create()

x = 20
y = 25
z = 21

mc.player.setPos(x, y, z)
```
Naming Problem

```java
mc.player.setPos(x, y, z)
mc_teleport 50, 50, 50
glass = block.GLASS.id
mc.setBlock(x, y, z, glass)
mc_set_block :glass, 40, 50, 60
```
Pygame Zero, a zero-boilerplate game framework for education

Pygame Zero (docs) is a library I’m releasing today. It’s a remastering of Pygame’s APIs, intended first and foremost for use in education. It gives teachers a way to teach programming concepts without having to explain things like game loops and event queues (until later).

Pygame Zero was inspired by conversations with teachers at the Python UK Education Track. Teachers told us that they need to be able to break course material down into tiny steps that can be spoon-fed to their students: our simplest working Pygame programs might be too complicated for their weakest students to grasp in a single lesson.

They also told us to make it Python 3 - so this is Python 3 only. Pygame on Python 3 works already, though there has been no official release as yet.

A Quick Tour

The idea is that rather than asking kids to write a complete Pygame program including an event loop and resource loading, we give them a runtime (pgzrun) that is the game framework, and let them plug handlers into it.

So your first program might be:

```python
def draw():
    screen.fill('pink')
```

That’s the complete program: `screen` is a built-in and doesn’t have to be imported from anywhere. Then you run it with:

```
pgzrun my_script.py
```

Image loading is similarly boilerplate-free; there are a couple of ways to do it but the one we recommend:

```python
# Load images/panda.png (or .jpg) and position its center at (300, 200)
panda = Actor('panda', pos=(300, 200))

def draw():
    screen.clear()
    panda.draw()
```
Barriers

- Transition from visual to text based programming
- Python 2 vs. Python 3
- Syntax / function naming
- Installing extra libraries
Barriers

- Transition from visual to text based programming
- Python 2 vs. Python 3
- Syntax / function naming
- Installing extra libraries
- Python IDE
Online vs. Offline

GROK LEARNING

pythonanywhere

Khan Academy

trinket
Online vs. Offline

PyCharm Educational Edition
Online vs. Offline
# Sonic Pi

```ruby
# Rerezzed
# Coded by Sam Aaron
use_debug false
notes = (scale :e1, :minor_pentatonic, num_octaves: 2).shuffle
live_loop :rerezzed do
  tick_reset
  t = 0.04
  sleep t
  with_fx :bitcrusher do
    s = synth :saw, note: :e3, sustain: 8, note_slide: t, release: 0
  end
end
```

Live Coding

One of the most exciting aspects of Sonic Pi is that it enables you to write and modify code live to make music, just like you might perform live with a guitar. This means that given some practice you can take Sonic Pi on stage and gig with it.

Free your mind

Before we get into the real details of how Sonic Pi works in the rest of this tutorial, I’d like to give you an experience of what it’s like to live code. Don’t worry if you don’t understand much (or any) of this. Just try to hold onto your seats and enjoy...
How you can help

- Meet educators
- Add education tracks to your conferences
- Run special education sessions at local user groups
- Mentor a teacher
- Create and contribute some awesome libraries
Python Edu WG

- Join mail.python.org/mailman/listinfo/pythonedu-wg

- a meeting point for people who want to make practical contributions to Python in education.

- to identify and coordinate projects that deliver specific and measurable results that support our aims.
Your homework

1. Join pythonedu-wg mailing list.

2. Read and contribute to idle reimagined by Al Sweigart [github.com/asweigart/idle-reimagined](https://github.com/asweigart/idle-reimagined)

3. Read Python in Education by Nicolas H. Tollervey

Due: Euro Python 2016
The future?
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