

Python Camp — Day 4

Making Games with Pygame

David Pouliot

Southern Oregon University

Today

- The **game loop** — the heartbeat of every game
- The screen's coordinate system
- Drawing and loading images
- Reading the keyboard to move things

Install first: `pip install pygame`

The Game Loop

Coordinates: (0,0) is the top-left

- x grows to the right.
- y grows downward — not like math class!
- A window that is 800×600 : bottom-right corner is (800, 600).

Every game does the same three things, forever

1. **Check events** — did the player press a key or click close?
2. **Update** — move things, check for collisions, change the score.
3. **Draw** — clear the screen and redraw everything in its new spot.

That loop runs about **60 times a second**. Each pass is one frame.

Starter template

```
1 import pygame, sys
2
3 pygame.init()
4 WIDTH, HEIGHT = 800, 600
5 screen = pygame.display.set_mode((WIDTH, HEIGHT))
6 clock = pygame.time.Clock()
7
8 while True:
9     for event in pygame.event.get():
10         if event.type == pygame.QUIT:
11             pygame.quit(); sys.exit()
12
13     screen.fill((0, 0, 0))           # clear to black
14     pygame.display.flip()           # show the frame
15     clock.tick(60)                  # 60 frames per second
```

Sprites & Movement

Draw an image on the screen

Pick a sprite from the Kenney.nl folder.

```
1 player = pygame.image.load("sprites/player.png")
2 player_x, player_y = 400, 500
3
4 # ...inside the loop, after screen.fill():
5 screen.blit(player, (player_x, player_y))
```

blit means "draw this image at this spot."

Move with the arrow keys

```
1 keys = pygame.key.get_pressed()
2 if keys[pygame.K_LEFT]:
3     player_x = player_x - 5
4 if keys[pygame.K_RIGHT]:
5     player_x = player_x + 5
```

Put this inside the loop. Bigger number = faster.

Project: Catch the Falling Objects

Build: Catch the Falling Objects

- Player moves left/right along the bottom.
- Objects fall from the top (increase their y each frame).
- Catch one → score up. Miss it → lose a life.

Have your own game idea (Pong, Snake, Dodger)? Build that instead.

Choose your game — pick any

All reuse the starter template. Variety makes Day 5's gallery walk fun.

Starter

- Dodger (avoid, don't catch)
- Whack-a-Mole / aim trainer

Standard

- Pong
- Flappy-style tap game

Boss challenge

- Snake (grid + growing tail)
- Maze / top-down collector

Whack-a-Mole uses the **mouse** instead of the arrow keys.

Descriptions and starter tips for each are on the camp website.

Stretch goals

- Show a score counter on screen
- Multiple objects falling at once
- Speed up as the score climbs
- A second object to **avoid**
- Sound effects with `pygame.mixer`