**Lesson Plan - Recycle Marathon**

**Lesson Plan:**

Creating a Recycle Marathon Game using the Pygame library

**Objective:**

Learners will create a game called "Recycle Marathon" using the Pygame library in Python. The game involves controlling a bin to collect recyclable items and avoid plastic items within a given time limit.

**Duration:**

1-2 class sessions (can be adjusted based on the learners' proficiency)

**Materials:**

* Computers with Pygame library installed
* Visual Studio Code (offline editor) or Replit (online editor) available.
* Images for game assets (background, recyclable items, and non-recyclable items)

**Lesson Plan Outline:**

**Introduction**

* Introduce the concept of developing a game to promote awareness about waste management and recycling.
* Show examples of similar games or provide a brief explanation of the game mechanics.
* Explain the objective of the lesson, which is to create the "Recycle Marathon" game using Pygame.

**Game Logic**

**Game Development:**

* Install Pygame library (if not already installed) using the command: `pip install pygame`.
* Import necessary modules: `pygame`, `random`, and `time`.
* Guide learners through the code step-by-step, discussing the functions and their role in the game.

**Drawing and Updating:**

* Create the following sprite classes:

1. `Bin`: Represents the player-controlled bin sprite. It should have an image, a rect, and methods to handle movement.
2. `Recyclable`: Represents the recyclable item sprites. It should have an image, a rect, and a random selection of images.
3. `Non\_recyclable`: Represents the plastic item sprites. It should have an image, a rect, and methods to handle movement.

**Sprite Groups and Initialization:**

* Explain the concept of sprite groups in Pygame and their importance for collision detection and drawing.
* Create sprite groups for `item\_list`, `plastic\_list`, and `allsprites`.
* Initialize multiple instances of recyclable and plastic items, assigning them random positions, and add them to the respective groups.

**Item Generation and Animation:**

* - Discuss the make\_items() function and its purpose in generating recyclable and non-recyclable items.
* - Explain the create\_items() function and how it creates the Actor objects for each item.
* - Discuss the layout\_items() function and how it positions the items on the screen.
* - Explain the animate\_items() function and how it animates the items falling from the top to the bottom of the screen.

**Game Interaction:**

* Call the `changeBackground()` function to display the game background.
* Display the countdown timer on the screen.
* Handle player input to control the bin's movement using arrow keys.
* Check for collisions between the bin and recyclable items or plastic items.
* Update the score and display it on the screen.
* Draw all the sprites on the screen.
* If the time limit has been reached:

1. Display the appropriate message based on the player's score.
2. Call the `changeBackground()` function to display the corresponding win or lose screen.

**Starter Project:**

<https://replit.com/@ShreeaaSaran/Recycle-Paper-Bags-Boilerplate#main.py>

**Finished Project:**

<https://replit.com/@ShreeaaJetlearn/Recycle-Marathon#>

**References:**

- Pygame documentation: <https://www.pygame.org/docs/>

- Python random module documentation: <https://docs.python.org/3/library/random.html>

**Homework:**

Discuss how additional recyclable and non-recyclable items can be added to the game.

Introduce sound effects or background music to enhance the game experience.

Encourage learners to explore and implement their own ideas for improving the game.

**Note:**

The lesson plan can be adjusted based on the learners' prior knowledge and proficiency level in Python. The timings provided are approximate and can be modified as per the classroom requirements.