

The Hidden Dungeon

Python Game Design

Time: 60 mins

Introduction

In this class, student/s will use helper functions to detect collisions between two objects and iterate through lists to help Zonan collect the treasure and evade the guardians of the dungeon.

Python Commands Introduced

- `remove()` Removes the given item from the list.

Vocabulary

- **Iterate:** Visit each item in a list one by one.
- **Iteration:** A cycle of a loop in which a set of instructions are repeated, usually on the items of a list.
- **Nested Loop:** A loop written inside another loop.

Learning Objectives

Student(s) should be able to:

- **Recall** handling of key controls.
- **Demonstrate** collision of game characters.
- **Describe** how to iterate through a list.
- **Create** a game to help Zonan collect coins or treasure in a dungeon.

Activities

1. Class Narrative: (2 mins)

- Introduce the narrative to the student/s: Zonan fell down into a dungeon full of coins and gems. He can collect them while crossing the dungeon to reach the other side. Zonan can also collect power-ups to tackle the guardians that come his way. Two keys have to be collected to open the gate at the end of the dungeon to reach the next level.

2. Concept Introduction Activity: (2 mins)

- Let the student/s play the explore the activity and observe Zonan's movement in the dungeon to collect coins, keys, and power-ups. Use arrow keys to move Zonan and the space bar to launch the fireballs once power-ups are collected. In the additional activity press on "S" key to launch the ice balls.

3. Activity 1: Collect the keys and coins: (8 mins)

Teacher Activity:

- The teacher shows how to use the `isTouching()` function to detect the collision between Zonan and a key.
- Demonstrate the use of a for loop to iterate through the list of keys to collect each of them.
- Remove the collected coin from the list using the **`remove()`** function.

Student Activity:

- Guide the student/s to help Zonan collect the coins in the dungeon which are stored in a list called `coins`.
- Use the `isTouching()` function to detect Zonan's collision with a coin and use `remove()` to remove the collected coins from the list

4. Activity 2: Collect power-ups : (15 mins)

Student Activity 2.1:

- Guide the student/s to help Zonan collect the power-ups in the dungeon which are stored in a list named `powerUps`. Use **`isTouching()`** function to detect Zonan's collision with a **`fireball`** and use **`remove()`** function to remove the collected **`fireball`** from the list.
- Guide the student/s to observe that even when a powerUp and coin is collected, their count is not updated on the game screen.
Probing Question "What is missing in our code that the powerUps are not increasing?"
Expected Answer: "When a power-up is collected, we have to increase its value by 1."

Student Activity 2.2:

- Guide the student/s to increase the value stored against the key **`powerCount`** and **`coinCount`** in the dictionary named **`zonan`**.

5. Activity 3: Launch the fireballs: (10 mins)

Student Activity:

- Guide the student/s to use an if condition to detect the pressing of the space key. Explain the concept of ASCII key codes.
- Probe the student/s as to why the guardians do not disappear even after writing the code block.

- Guide the students to write a nested for loop to iterate through the list of fireballs and the list of guardians to remove each guardian from the list and make it disappear when a fireball touches a guardian.

Note : Guide the students to indent the code of nested loops properly.

6. Introduce the Post class project: (2 min)

- Complete a game called Fast Runner by writing the code to collect coins if the player touches a coin. If the player touches a noxious plant, and the number of collected coins is less than 10, reset the coin count to zero.

7. Test and Summarize the class learnings: (5 mins)

- Check for understanding through quizzes and summarize learning after respective missions.
- Summarize the overall class learning towards the end of the class.

8. Additional activities:

- Encourage the student/s to collect freezing power and freeze the guardians when it is launched at them.
- Encourage the student/s to collect the gems in the dungeon.

9. State the Next Class Objective: (1 min)

- We will learn to help Zonan travel to the dark wizard's lair.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-14

Links Table		
Activity	Activity Name	Link
Class Presentation	The Hidden Dungeon	https://s3-whjr-curriculum-uploads.whjr.online/209774a3-9c58-46bd-9ce5-2a62448c40d8.html
Explore Activity	The Hidden Dungeon Explore Activity	https://tynker.me/code/view/630871662eca1563d82441c2/
Teacher Activity 1	Collect the Keys	https://tynker.com/code/project/630862167b180a174f12c482
Teacher Activity 1 Solution	Collect the Keys - Solution	https://tynker.com/code/project/

		ct/63085cd400172d1f22224c22
Student Activity 1	Collect the Coins	https://tynker.com/code/project/63091c6049a87d3b913327a2
Teacher Reference: Student Activity 1 Solution	Collect the Coins - Solution	https://tynker.com/code/project/630ca468267829004e018d42
Student Activity 2.1	Collect the Powers-ups	https://tynker.com/code/project/6308661c3cf7432a355352f2
Teacher Reference: Student Activity 2.1 Solution	Collect the Powers-ups - Solution	https://tynker.com/code/project/6308662f7ff9b370a964eb02
Student Activity 2.2	Update the Power Count and Coin Count	https://tynker.com/code/project/630870a8ecea50535d2d1372
Teacher Reference: Student Activity 2.2 Solution	Update the Power Count and Coin Count- Solution	https://tynker.com/code/project/630870bc9ba0a15077735ab2
Teacher Activity 3	Use a Nested For Loop	https://tynker.com/code/project/630862ab5578b04fcb09db82
Teacher Activity 3 Solution	Use a Nested For Loop - Solution	https://tynker.com/code/project/630862b7ba009312ff785882
Student Activity 3.1	Use Nested Loop	https://tynker.com/code/project/6308714faa44bf198f7308c2
Teacher Reference: Student Activity 3.1 Solution	Use Nested Loop - Solution	https://tynker.com/code/project/630871662eca1563d82441c2
Student Activity 3.2	Launch the Fireball	https://tynker.com/code/project/630872978c3f907e4b1c7f32
Teacher Reference: Student Activity 3.2 Solution	Launch the Fireball - Solution	https://tynker.com/code/project/630872a3f502b14625415e72
Student Additional Activity 1	Freeze the Guardians	https://tynker.com/code/project/63087322976d1f3d7262cdc2
Teacher Reference: Student Additional Activity 1 Solution	Freeze the Guardians - Solution	https://tynker.com/code/project/63087334aed3e9413b1a61c2
Student Additional Activity 2	Collect the Gems	https://tynker.com/code/project/630874a79c56706811262782
Teacher Reference: Student Additional Activity 2 Solution	Collect the Gems - Solution	https://tynker.com/code/project/630874badfa9556ba329f022
Post Class Project	The Fast Runner	https://tynker.com/code/project/62fe3ab192f3430a5228cb02

Teacher Reference: Post Class Project Solution	The Fast Runner - Solution	https://tynker.com/code/project/62f5e6e1d83d2811511e58d5
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