SAFARI ANIMALS

Objective

Students will be able to reverse engineer a game by planning, programming and debugging.

Prepared By

Zatna

Grade Level

K-2

Materials Required

Projector with HDMI, iPad, Lightning Digital AV Adapter, ScratchJr Planning Sheet, ScratchJr Scene Planner Sheet, ScratchJr Character List Sheet, Pencils, Erasers

Additional Resources

Visit http://scratchjr.zatna.com for additional downloads and links.

Additional Notes

None

Overview

In this lesson, students will make a game in which the players will have to tap on only the safari animals to win the game. There will be various animals that will be shown but not all will be safari animals. When a non-safari animal is tapped, the game will be over. Please view the game video at https://youtu.be/OkVoS_3lnbU.

Sample Schedule

Demonstration of the finished project and discussion

Assumption: Students are familiar with ScratchJr and most of the programming blocks.

The teacher should play the game in Presentation Mode, without showing the code blocks used in the game, in front of the class for the students either by projecting it on the screen or showing them in small groups depending on the class size. The teacher should play the game at least twice so that he/she gets to the You Win screen and the Game Over screen.

The project demonstration should be followed by the discussion of what the game is about and how it might have been programmed (reverse engineered).

Sample questions to discuss:

- How many screens do you think we need to create this game?
- How do you think we can make the animals appear and then disappear after a few seconds?
- Anyone notice anything moving on the screen?
- When do we win the game? When do we lose the game?

- Do you notice the balloons moving up in the YouWin screen and they never stop? Which block do you think we use so that they never stop?

Planning

The teacher should specify that students will be creating a similar game but they can pick any sprite or theme they want. For example, they can do a game on Farm animals, Rain Forest animals or other topics using any sprite in the library as long as there is a group of sprites with the same property that can be picked out from among other sprites. Let them explore the sprite library and pick out sprites for their game. The teacher can give suggestions to students who cannot come up with game ideas of their own.

Students should use the provided planning sheets to organize their thoughts and think about what specific instructions they should give to each sprite in their game. They can write what behaviors each sprite will exhibit as well instead of what instructions or code blocks to use first.

The Teacher should go around the room and ask questions while students are planning so that their plans have details and are clearer to themselves and to the reader. The teacher should let the students move on to iPads to start programming only after the plans have been approved.

Programming

When the students start programming on iPads, the teacher should model/discuss how to make the first sprite/animal appear and disappear after a few seconds. Start with only one screen and make sure all the animals/sprites appears and disappears at appropriate times first.

It will be best if the teacher starts a new project with the students. She/he should start a project with just one animal/sprite on it and make it disappear at beginning of the game and show up after a few seconds and then disappear again after a few seconds. Ask the students to reverse engineer the behavior. Depending on the students' skill level the teacher can scaffold how to code the first sprite.

Then, show the students how to copy the code to other sprites by dragging and dropping. Ask the students to figure out how to make changes so that the animals/sprites appears and disappears at different time so that the player has a chance to tap them.

After the students have done the first screen with animals, they can create two screens: YouWin screen and GameOver screen. The teacher should discuss with the students when YouWin or GameOver screen should show up. Replay the demo game for the students and let them figure out how to code the GameOver screen.

In the demo game, to be able to get to the YouWin screen, the player should tap four safari animals. This means that we need to count or keep track of how many animals the player has tapped. The teacher should demonstrate how Progress Dot and Progress Goal Bar is keeping track of the numbers of animals tapped by playing the game for the students again. The teacher should review the idea of sending and receiving messages and discuss how to make use of it to implement the progress bar idea for the YouWin screen. Show the students or ask the students how to turn on the grid so that they can figure out how many cells the Progress Dot should be away from the Progress Goal Bar since the Progress Dot is to move 1 unit towards the Progress Goal Bar every time the player taps a Safari animal. Determine what the Progress Dot and the Goal are supposed to do together with the students and guide them how to code those sprites.
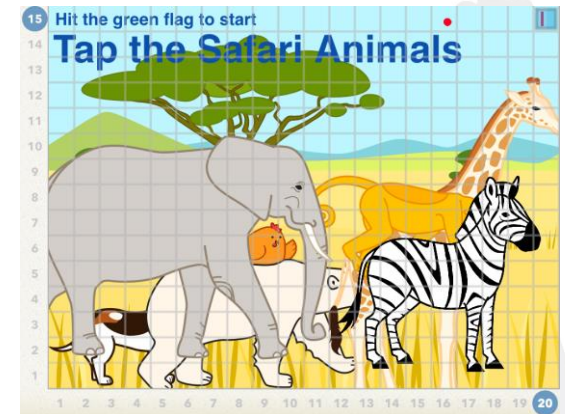
Students can animate the balloons in the YouWin screen as the final touch to their game.

Sample questions to ask:

- Which animal/sprite should trigger the GameOver screen?

- Do we need to use different color messages to make the Progress Dot move? Can we use the same color message for all Safari animals? Why or why not?
- Which sprite should trigger the YouWin screen and why?
- Can we use any sprite for the Progress Dot and the Goal? Why?

Challenges

1. The demo game sends the player to GameOver screen once you tap a non-safari animal. How can you modify it so that you can make at least two mistakes before GameOver screen shows up?

2. On the YouWin and GameOver screen, can you make a TRY AGAIN? sprite that would take the player back to the start screen and play the game again?

3. Can you make a timer that triggers the GameOver screen after a certain period? For example, the player starts the game but never really tap any of the animals/sprite, then the GameOver screen should show up after a certain period.

SCENES

BLOCKS

Progress
Dot

Goal Bar

zatna