



Topic	ANIMATION AND SOUND	
Class Description	Students learn to add sound effects and animation effects to the game.	
Class	PRO-C7	
Class time	45 mins	
Goal	<ul style="list-style-type: none"> • Add sound effects in the game: <ul style="list-style-type: none"> - when the ball hits the paddles or the ball. - when one of the players score. • Add animation to convert the game of Pong into a Soccer practice game. 	
Resources Required	<ul style="list-style-type: none"> • Teacher Resources <ul style="list-style-type: none"> ○ Code.org login ○ Laptop with internet connectivity ○ Earphones with mic ○ Notebook and pen • Student Resources <ul style="list-style-type: none"> ○ Code.org login ○ Laptop with internet connectivity ○ Earphones with mic ○ Notebook and pen 	
Class structure	Warm Up Teacher-led Activity Student-led Activity Wrap up	5 mins 10 mins 20 min 5 mins
WARM UP SESSION - 15mins		
<div>  </div> <p>Teacher starts slideshow from slides 1 to 11</p> <p>Refer to speaker notes and follow the instructions on each slide.</p>		

Activity details	Solution/Guidelines
<p><i>Hi, so good to see you again! How have you been?</i></p> <p>Run the presentation from slide 1 to slide 11.</p> <p>Following are the warm up session deliverables:</p> <ul style="list-style-type: none"> Connecting students to the previous class. Explaining sound and animation through real life connections. Definition of sound and animation. 	<p>ESR: Thanks, yes I am excited about it.</p> <p>Click on the slide show tab and present the slides.</p>
QnA Session	
Question	Answer
<p>Which of the following is true regarding gameState?</p> <p>A. gameState is a predefined function that helps us mark different states in a game</p> <p>B. It helps us control action in different states of the game</p> <p>C. It is a variable we create in the game</p> <p>D. It is an invisible sprite object</p>	B
Continue the warm up session	
Activity details	Solution/Guidelines
<p>Run the presentation from slide 12 to slide 15 to set the problem statement.</p> <p>Following are the warm up session deliverables:</p> <ul style="list-style-type: none"> Introduce students to the coding environment - Workspace, blocks and output. Steps to write and run the code. 	<p>Narrate the story by using hand gestures and voice modulation methods to bring in more interest in students.</p>

<div>  </div> <p>Teacher ends slideshow</p>		
TEACHER-LED ACTIVITY - 8mins		
Initiates Screen ShareTeacher		
<p>CHALLENGE</p> <ul style="list-style-type: none"> • Show the student how to add a sound effect to the game. • Show the student how to add animation effects to the game. 		
<p>Step 2: Teacher-led Activity (10 mins)</p>	<p>Teacher opens Teacher Activity Link 1</p> <p>Let's add a "hit" sound if the paddles hit the ball. How do you think we can do that?</p> <p>Can you tell when conditional programming is used?</p>	<p>ESR: Using if / conditional programming.</p> <p>ESR: We use conditional programming when we want the computer to follow some instructions only when certain conditions are met.</p>
	<p>We can tell the computer that if the ball is touching the computer paddle or the player paddle, play some hit sound.</p> <p>Let's first write the if statement:</p> <p>Teacher writes the condition inside the if statement. Teacher reminds the student that " " is used for OR in a program.</p>	<p>The student observes and learns.</p>

```

1 //create the ball, playerPaddle and computerPaddle as sprite objects
2 var ball = createSprite(200,200,10,10);
3 var playerPaddle = createSprite(380,200,10,70);
4 var computerPaddle = createSprite(10,200,10,70);
5
6 //variable to store different state of game
7 var gameState = "serve";
8
9 //variables to keep the score
10 var compScore = 0;
11 var playerScore = 0;
12
13
14 function draw() {
15     //clear the screen
16     background("white");
17     if(ball.isTouching(computerPaddle) || ball.isTouching(playerPaddle)) {
18         //
19     }
20
21     //place info text in the center
22     if (gameState === "serve") {
23         text("Press Space to Serve",150,180);
24     }
25
26     //display scores
27     text(compScore, 170,20);
28     text(playerScore, 230,20);
29
30
31     //make the player paddle move with the mouse's y position

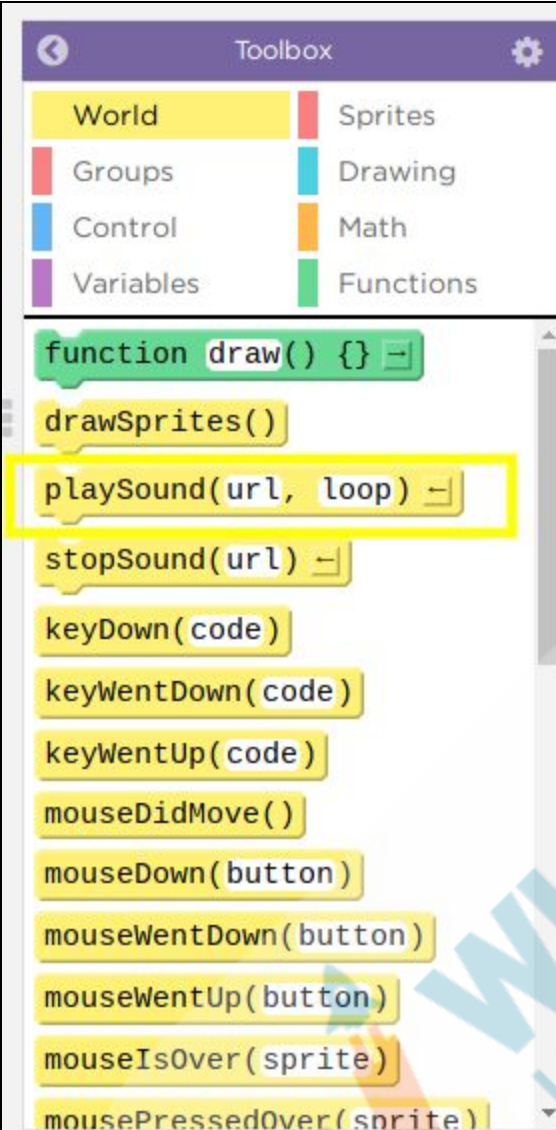
```

What do we want the computer to do if the ball touches the paddles?

Yes! and there seems to be an instruction to do just that! It is called - **playSound()**

ESR:

We want to play some sound.

	<p>When we write the instruction <code>playSound()</code>, you will get an option to choose the sounds.</p> <p>You can choose the sounds from the library of sounds already there OR you can make new sounds by uploading a file or recording some sound.</p>		<p>ESR: <i>The student observes and learns.</i></p>
--	---	--	---

```

1 //create the ball, playerPaddle and computerPaddle as sprite o
2 var ball = createSprite(200,200,10,10);
3 var playerPaddle = createSprite(380,200,10,70);
4 var computerPaddle = createSprite(10,200,10,70);
5
6 //variable to store different state of game
7 var gameState = "serve";
8
9 //variables to keep the score
10 var compScore = 0;
11 var playerScore = 0;
12
13

```

playSound(url, loop)

The URL to a sound file. Can be a project asset name or external URL.

[Choose...](#)

[See examples](#)

```

18 if(ball.isTouching(computerPaddle) || ball.isTouching(player
19   playSound(p;
20 }

```

Choose Sounds

Sound Library Make new sounds

All categories

Search for a sound...

Accent

Achievements

Alerts

Animals

App

Background

Bell

Board games

Collect

Digital

Explosion

Female voiceovers

Hits

Human

Instrumental

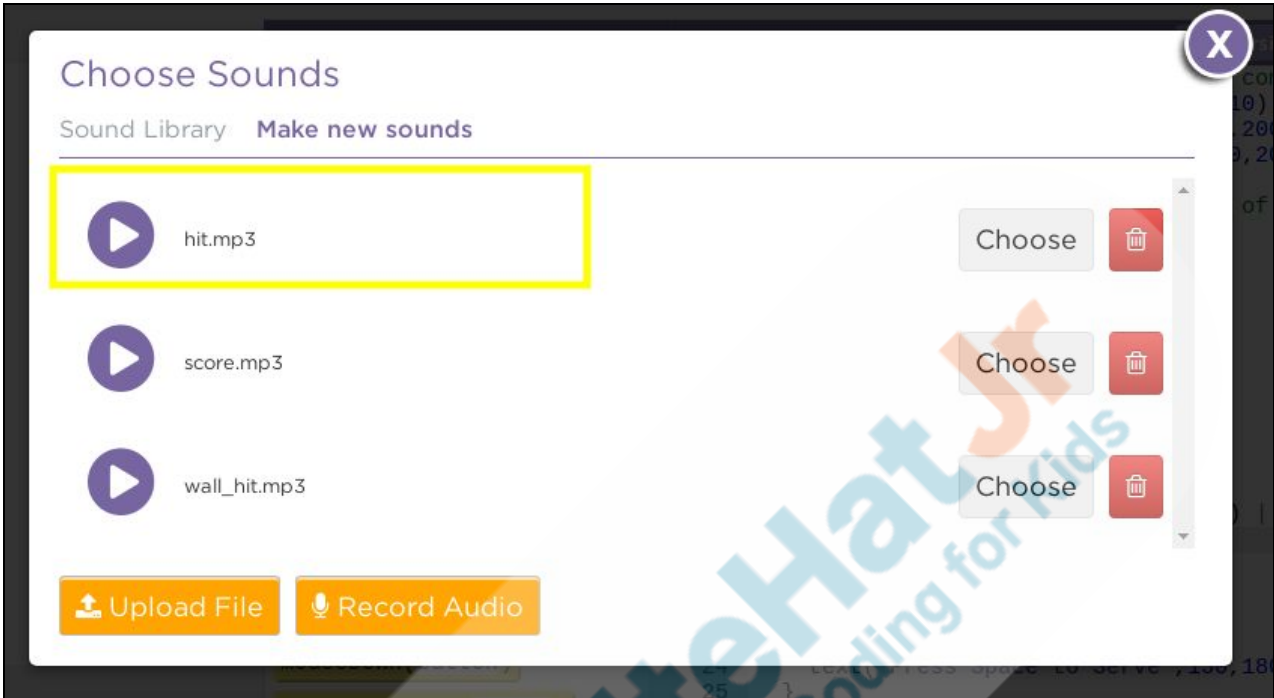
Jump

Loops

Male voiceovers

I have uploaded some sounds in this game.

ESR:
Student observes and learns

	I am going to choose "hit.mp3" for the sound when the ball hits the paddles.	
		
	<p>Let's run the game and see if there is a sound when the ball hits the paddles.</p> <p><i>Teacher runs the code.</i></p>	<p><i>Student observes the output.</i></p>

```

1 //create the ball, playerPaddle and computerPaddle as sprite objects
2 var ball = createSprite(200,200,10,10);
3 var playerPaddle = createSprite(380,200,10,70);
4 var computerPaddle = createSprite(10,200,10,70);
5
6 //variable to store different state of game
7 var gameState = "serve";
8
9 //variables to keep the score
10 var compScore = 0;
11 var playerScore = 0;
12
13
14 function draw() {
15     //clear the screen
16     background("white");
17
18     if(ball.isTouching(computerPaddle) || ball.isTouching(playerPaddle)) {
19         playSound("hit.mp3");
20     }
21
22     //place info text in the center
23     if (gameState === "serve") {
24         text("Press Space to Serve",150,180);
25     }
26
27     //display scores
28     text(compScore, 170,20);
29     text(playerScore, 230,20);
30
31     //make the player paddle move with the mouse's y position

```

We have the hit sound now!

Let's learn to add some graphics to our game.

Student listens.

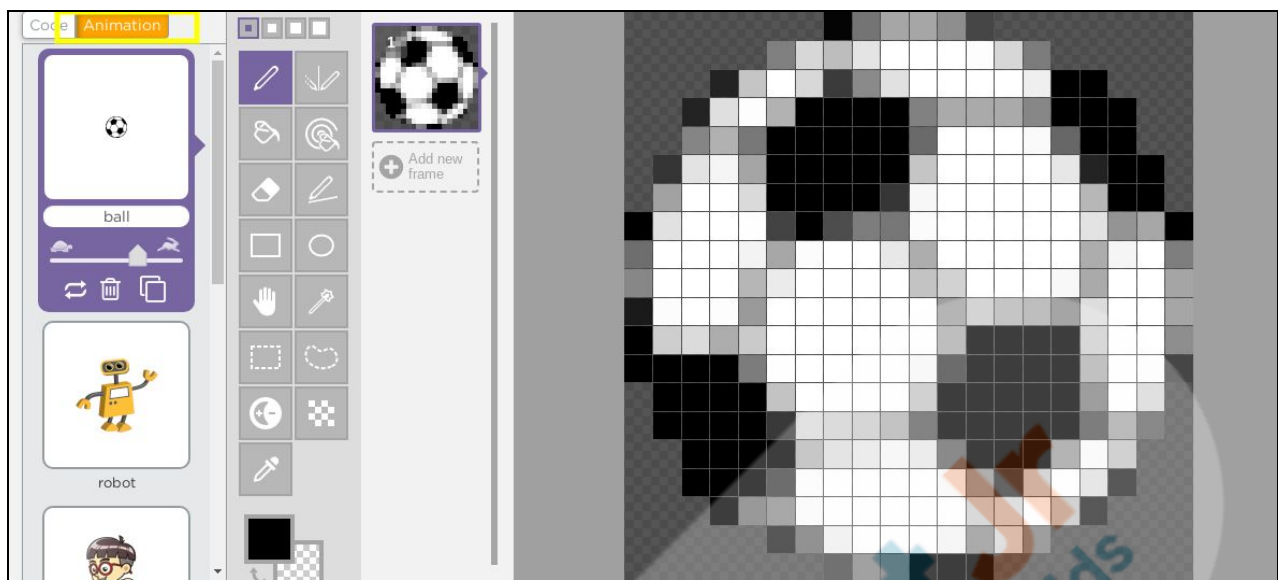
I have added some pictures and given them some names. Let's set the ball in our game to be a soccer ball.

We can do that using ball.setAnimation() instruction.

Inside, we can write the name of the animation we want for our ball object. Let's add the name for our ball here.

Teacher runs the code to see the ball change to the soccer ball graphics.

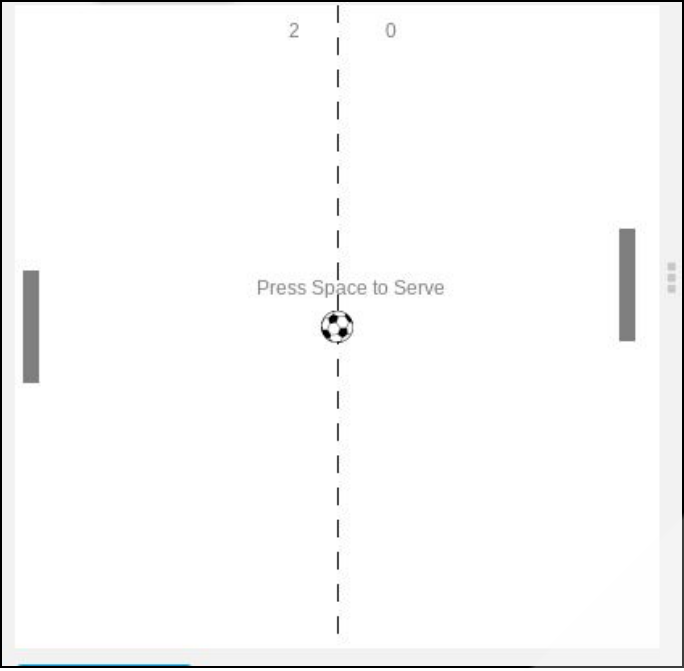

The student observes and learns.




```

1 //create the ball, playerPaddle and computerPaddle as sprite objects
2 var ball = createSprite(200, 200, 10, 10);
3 ball.setAnimation("ball");
4
5 var playerPaddle = createSprite(30, 200, 10, 70);
6 var computerPaddle = createSprite(10, 200, 10, 70);
7
8 //variable to store different state of game
9 var gameState = "serve";
10
11 //variables to keep the score
12 var compScore = 0;
13 var playerScore = 0;
14
15
16 function draw() {
17   //clear the screen
18   background("white");
19
20   if(ball.isTouching(computerPaddle) || ball.isTouching(playerPaddle)) {
21     playSound("hit.mp3");
22   }
23
24   //place info text in the center
25   if (gameState === "serve") {
26     text("Press Space to Serve", 150, 180);
27   }
28

```

		
	<p>Alright! You now know how to add sound effects to the game and how to add animations. It is your turn to add more sound effects and animation in this game.</p>	-
<p>Teacher starts slideshow  :Slide 16-19</p>		
<p>Run the presentation for slide16-19 to set the student activity context.</p>		
<p>As a challenge, why don't you create another Paddle Object for the computerPaddle?</p> <p>What would you need to do to create a new computerPaddle object?</p>		<p>ESR:</p> <ul style="list-style-type: none"> - Call new Paddle(). - Store it in a variable called computerPaddle(). - Set the xPosition and yPosition to display itself. - Call the computerPaddle() to display itself.
		<p><i>The student shares his/her screen.</i></p>

Why don't you share your screen and try creating the computerPaddle object?		Opens the Student Activity, remixes the code and adds more code to it.
<div>Teacher ends slideshow</div> 		
Teacher Stops Screen Share		
	Now it's your turn. Please share your screen with me.	
<ul style="list-style-type: none"> Ask Student to press ESC key to come back to panel Guide Student to start Screen Share Teacher gets into Fullscreen 		
<p style="text-align: center;">ACTIVITY</p> <ul style="list-style-type: none"> Invite the student to choose the sound and animation effects for the soccer practice game. 		
Step 3: Student-Led Activity (20 min)	<p>Guide the student to add sound effects when the ball hits the topEdge and the bottomEdge.</p> <p>Observe the student code for any typos and errors</p> <p>NOTE: Student must add the condition only after the edges have been created using createEdgeSprites(). Write the conditions to play sound before the bounceoff.</p>	<p>Student open Student Activity Link 1</p> <p>The student adds code to create sound effects when the ball hits the edges.</p> <p>Student runs the code to see the output.</p>

```

40
41
42 //create edge boundaries
43 //make the ball bounce with the top and the bottom edges
44 createEdgeSprites();
45
46
47 if(ball.isTouching(topEdge) || ball.isTouching(bottomEdge)){
48     playSound("wall_hit.mp3");
49 }
50
51
52 ball.bounceOff(topEdge);
53 ball.bounceOff(bottomEdge);
54 ball.bounceOff(playerPaddle);
55 ball.bounceOff(computerPaddle);
56
57
58 //serve the ball when space is pressed
59 if (keyDown("space") && gameState === "serve") {
60     serve();

```

Guide the student to add sound effects when the ball goes off the screen and another player scores.

Observe the student for any typos and errors.

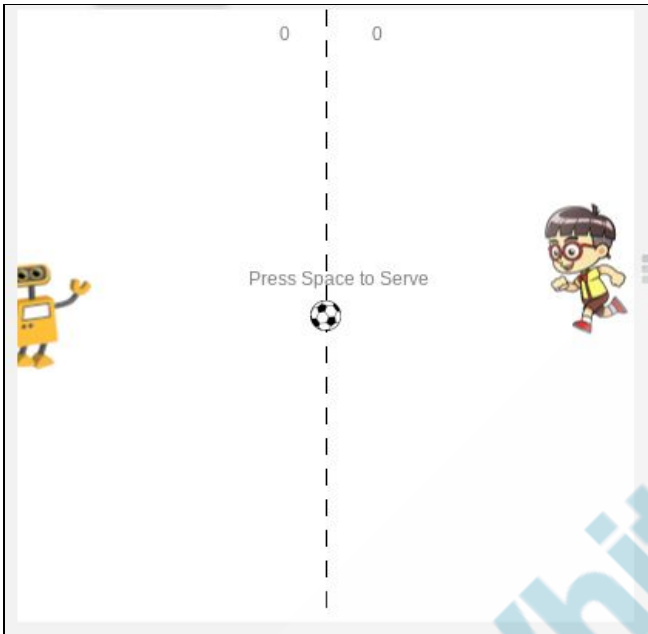
The student adds code to create the sound effects when the player misses the ball.

Student runs the code to see the output.

```

65
66
67 //reset the ball to the centre if it crosses the screen
68 if(ball.x > 400 || ball.x < 0) {
69     playSound("score.mp3");
70 }
71 if(ball.x > 400) {
72     compScore = compScore + 1;
73 }
74
75 if(ball.x < 0) {
76     playerScore = playerScore + 1;
77 }
78
79 reset();
80 gameState = "serve";
81 }
82
83 if (playerScore === 5 || compScore === 5){
84     gameState = "over";
85     text("Game Over!",170,160);
86     text("Press 'R' to Restart",150,180);
87 }

```

	<p>Awesome! We have all the sound effects now. You can experiment with more sound effects later.</p> <p>Let's add the animation for the player paddle and the computerPaddle.</p>	<p><i>Student listens.</i></p>
		
	<p><i>Guide the student to add animation for the computerPaddle and the playerPaddle.</i></p>	<p><i>The student adds code to set animation graphics for the player and the computer players.</i></p> <p><i>The student runs code to see the output.</i></p>
	<p><i>Guide the student to change the x values for the player and the computer paddle to make it completely visible on the screen.</i></p>	<p><i>Student modifies the x positions for the computer and the player paddles.</i></p>

```

1 //create the ball, playerPaddle and computerPaddle as sprite objects
2 var ball = createSprite(200,200,10,10);
3 ball.setAnimation("ball");
4
5 var playerPaddle = createSprite(370,200,10,70);
6 playerPaddle.setAnimation("player");
7
8 var computerPaddle = createSprite(35,200,10,70);
9 computerPaddle.setAnimation("robot");
10
11 //variable to store different state of game
12 var gameState = "serve";
13
14 //variables to keep the score
15 var compScore = 0;
16 var playerScore = 0;
17
18
19 function draw() {
20   //clear the screen
21   background("white");
22
23   if(ball.isTouching(computerPaddle) || ball.isTouching(playerPaddle)) {
24     playSound("hit.mp3");
25   }
26
27   //place info text in the center
28

```

Let us add some extra animation:

Add animation so that when 'k' key is pressed down, the player animation is set to kick the ball. But when we leave the pressed key, the player returns to normal.

Which command should we use to do this?

Give a hint to the student about the two instructions - **keyWentDown()** and **keyWentUp()**

*The student uses the **keyWentDown()** and **keyWentUp()** to set different animations for the player when key 'k' is pressed.*

Student runs the code to verify the output.


```

16 var playerScore = 0;
17
18
19 function draw() {
20   //clear the screen
21   background("white");
22
23   if(ball.isTouching(computerPaddle) || ball.isTouching(player
24     playSound("hit.mp3");
25   }
26
27   if (keyWentDown("k")){
28     playerPaddle.setAnimation("player_kick");
29   }
30
31   if (keyWentUp("k")){
32     playerPaddle.setAnimation("player");
33   }
34
35   //place info text in the center
36   if (gameState === "serve") {
37     text("Press Space to Serve",150,180);
38   }
39
40   //display scores
41   text(compScore, 170,20);
42   text(playerScore, 230,20);
43

```

Can we add another animation when the player misses the ball.

Remember, we need to make the player stand up again when the ball is served.

Guide the student to write code for this and observe the student code for any typos.

The student writes code to add a falling animation for the player.

Student runs the code to verify the output.

```

74     gameState = "play";
75 }
76
77
78 //reset the ball to the centre if it crosses the screen
79 if(ball.x > 400 || ball.x < 0) {
80     playSound("score.mp3");
81
82     if(ball.x > 400) {
83         compScore = compScore + 1;
84         playerPaddle.setAnimation("player_fall");
85     }
86
87     if(ball.x < 0) {
88         playerScore = playerScore + 1;
89     }
90
91     reset();
92     gameState = "serve";
93 }
94
95 if (playerScore === 5 || compScore === 5){
96     gameState = "over";
97     text("Game Over!",170,160);
98     text("Press 'R' to Restart",150,180);
99 }
100
101

```

```


58 //make the ball bounce with the top and the bottom edges
59 createEdgeSprites();
60 ball.bounceOff(topEdge);
61 ball.bounceOff(bottomEdge);
62 ball.bounceOff(playerPaddle);
63 ball.bounceOff(computerPaddle);
64
65
66 if(ball.isTouching(topEdge) || ball.isTouching(bottomEdge))
67     playSound("wall_hit.mp3");
68 }
69
70 //serve the ball when space is pressed
71 if (keyDown("space") && gameState === "serve") {
72     serve();
73     playerPaddle.setAnimation("player");
74     gameState = "play";
75 }
76
77
78 //reset the ball to the centre if it crosses the screen
79 if(ball.x > 400 || ball.x < 0) {
80     playSound("score.mp3");
81
82     if(ball.x > 400) {
83         compScore = compScore + 1;
84         playerPaddle.setAnimation("player_fall");
85


```

Teacher Guides Student to Stop Screen Share

Quiz time - Click on in-class quiz

Question	Answer
<p>Identify the correct syntax to move the player paddle on mouse move</p> <p>A. playerPaddle.y = World.mouseY; B. playerPaddle.y = World.mousey C. playerPaddle.Y = World.mousey D. All of the above</p>	A
<p>In the following snippet, when you release the "k" key, the player will</p>	D

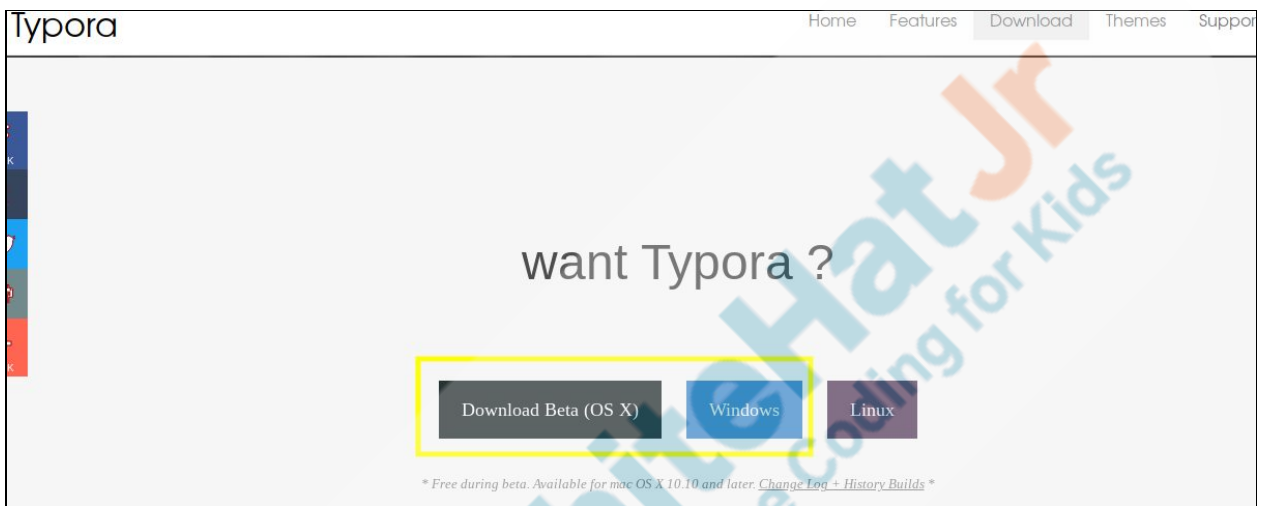
<pre> if(KeyWentDown("k")){ userPaddle.setAnimation("player_kick") } if(KeyWentUp("k")){ userPaddle.setAnimation("player") } </pre> <p>A. fall down B. return to kicking animation C. Move up D. return to running animation</p>	
<p>Animation can be used using the syntax</p> <p>A. setAnimation(sprite); B. sprite.addPicture(label); C. sprite.setAnimation(label); D. None of the above</p>	C
End the quiz panel	
WRAP UP SESSION - 5 Mins	
<div>  </div> <p>Teacher starts slideshow Slide 20-24</p>	
A. Activity details	Solution/Guidelines
<p>Run the presentation from slide 20 to slide 24.</p> <p>Following are the warm up session deliverables:</p> <ul style="list-style-type: none"> ● Explain the facts and trivias ● Next class challenge ● Project for the day 	<p>Guide the student to develop the project and share with us.</p>

<ul style="list-style-type: none"> Additional Activity 		
<div>  </div>		
Project Overview	<p>Note: This is a tiered project with multiple tasks. All students must do the main task. The main task is very similar to the projects that are already live. Each tiered project has two or more additional tasks which are optional.</p> <p>VEGETABLE GARDEN - 2</p> <p>Goal of the Project: In today's you learned to use the <code>setAnimation()</code> function to set an image for a sprite.</p> <p>In this project, you will have to practice and apply what you have learnt in the class and apply the images of the vegetables.</p> <p>** This is a continuation of Project 5. So make sure to complete that project before you attempt this one. **</p> <p>Story: Richard is a hardworking and dedicated farmer. He is always experimenting with new farming methods and now he wants to grow new crops on his farm.</p> <p>Help Richard plan which plants to grow in which row. Here is what the</p>	<p><i>Students engage with the teacher over the project.</i></p>

	<p>scientist from the Agriculture Institute in his country has told him.</p> <ul style="list-style-type: none"> • Tomatoes should not be planted next to Carrots. • Brinjals should not be planted next to Onions. • Carrots should not be planted next to Onions. • Tomatoes should not be planted next to Brinjals. • Capsicums can be grown next to any other plant. <p>I am very excited to see your project solution and I know you will do really well.</p> <p>Bye Bye!</p>	
<div>Teacher Clicks</div> <div>✕ End Class</div>		

ADDITIONAL ACTIVITY	<p>Since we are learning so much, it is important for us to keep a learning journal where we can note down what we have learned. Why do you think keeping a learning journal is important?</p>	<p>ESR:</p> <ul style="list-style-type: none"> - Refer to the information in the future. - Information can be shared with others. - Writing down information and reflecting on it boosts retention of information.
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	<p>Great, so we understand why writing down what we are learning is important. Where do you write down information on your computer?</p> <p>Programmers generally use a simple language called markdown to write their notes. We are going to learn a little about that and you are then going to write down how we learned to make the game of Pong - day by day - using Markdown.</p> <p>We will need to install another editor which supports Markdown.</p>	<p>ESR:</p> <p>- Word, Notepad etc.</p>
	<p><i>Teacher opens typora.io and scrolls down to the bottom where install instructions are present.</i></p> <p><i>Teacher gives instructions to install the MacOS (for Mac users) or Windows (for windows users)</i></p>	<p><i>Student listens to the instructions and installs the typora editor.</i></p>



Teacher opens the typora editor after installation.

Teacher shares the markdown reference link with the student
[Typora Reference Link](#)

Student opens the link for reference.

Let's see how to add the heading in our notes.

Teacher shows the section in the reference link for headers.

Student observes

Headers

Headers use 1-6 hash (#) characters at the start of the line, corresponding to header levels 1-6. For example:

```
# This is an H1  
## This is an H2  
##### This is an H6
```

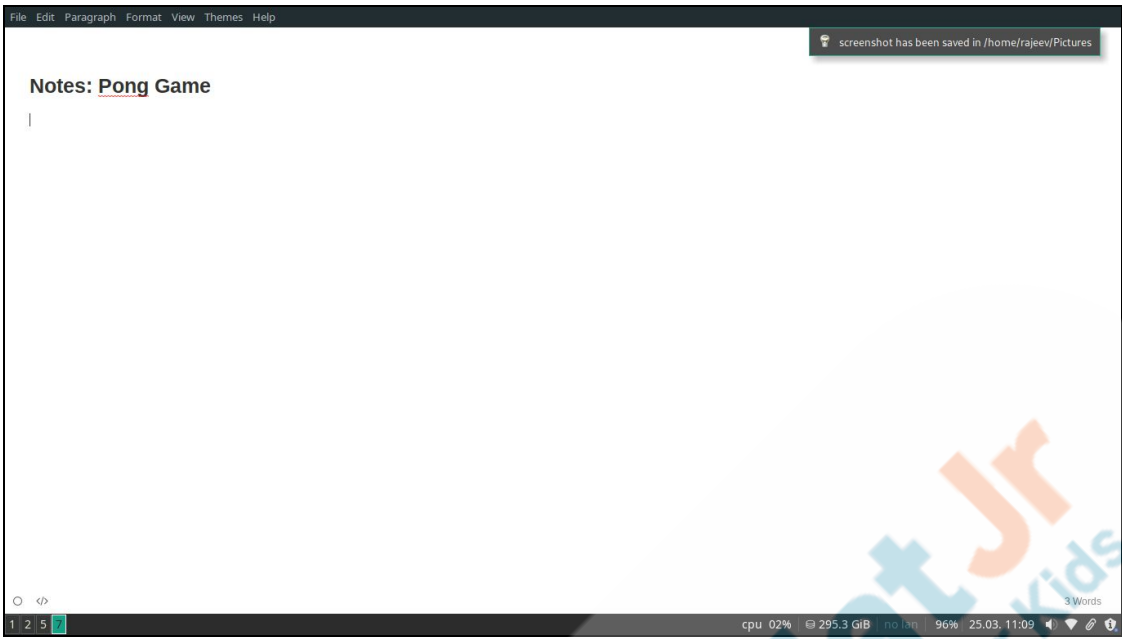

Let's quickly add a heading to our notes.

Teacher adds the heading "Notes: Pong Game"

```
## Notes: Pong Game
```

Student observes and tries it on his computer.

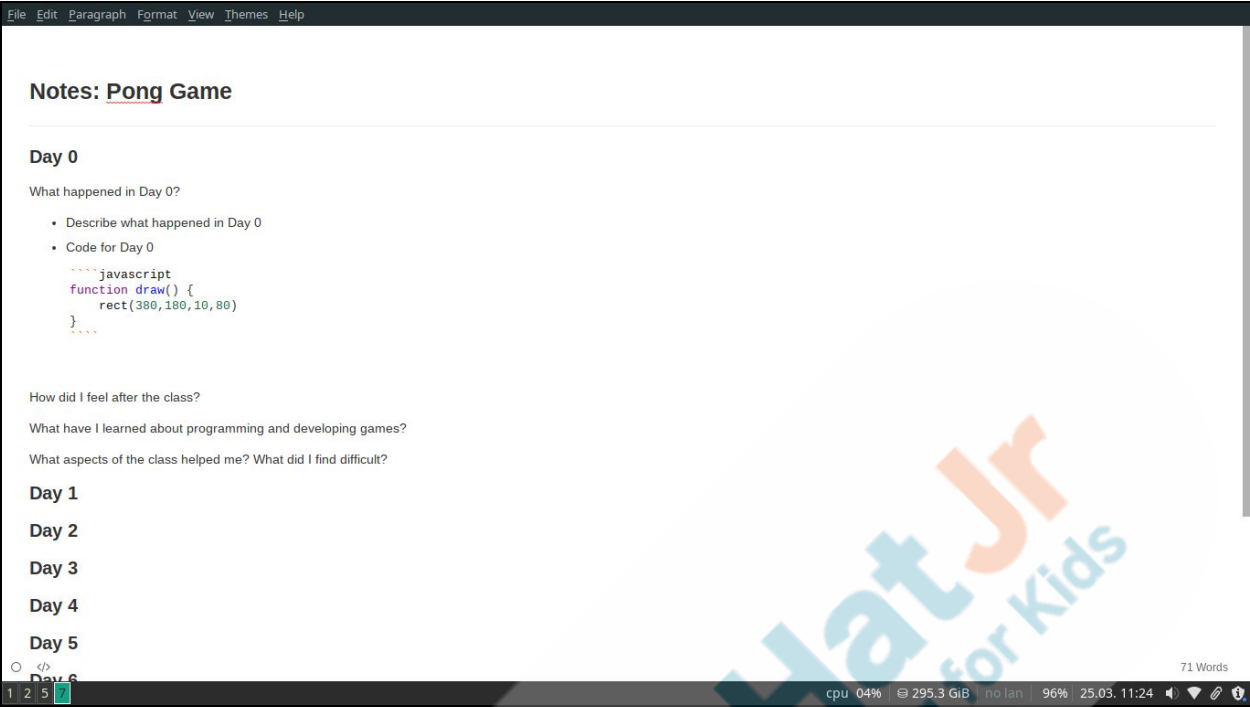


		
	<p>We can add a horizontal rule after the heading by giving "-----" below the heading.</p> <p>## Notes: Pong Game</p> <p>-----</p>	<p><i>Student follows the instructions</i></p>
		

	<p>Notes: <u>Pong Game</u></p> <p> </p>	<p>screenshot has been saved in /home/rajeev/Pictures</p>
	<p>Let's add some sub-headings for Day 0 to Day 7 , the 8 classes where we Learned about the Pong Game.</p> <p>## Notes: Pong Game</p> <p>-----</p> <p>##### Day 0</p> <p>##### Day 1</p> <p>##### Day 2</p> <p>##### Day 3</p> <p>##### Day 4</p> <p>##### Day 5</p> <p>##### Day 6</p> <p>##### Day 7</p> <p><i>Teacher adds sub-headings.</i></p>	<p><i>The student follows the instructions.</i></p>

<div><div>Notes: <u>Pong</u> Game</div><div>#### Day 0 </div><div><div>1257</div><div>cpu 02% 295.3 GiB no lan 96% 25.03. 11:14</div><div>5 Words</div></div></div>		
<div><div>Notes: <u>Pong</u> Game</div><div>Day 0 Day 1 Day 2 Day 3 Day 4 Day 5 Day 6 Day 7</div><div><div>1257</div><div>cpu 06% 295.3 GiB no lan 96% 25.03. 11:15</div><div>19 Words</div></div></div>		
	Let's answer these questions for ourselves for each class.	<i>The student listens and observes.</i>

	<p><i>Teacher points out the place in the reference link which talks about adding lists</i></p> <ul style="list-style-type: none"> • What happened on Day 0? • Describe what happened in Day 0 • Code I wrote in Day 0 • How did I feel after the class? • What have I learned about programming and developing games? • What aspects of the class helped me? What did I find difficult? 	
	<p>You can add code in markdown using</p> <pre> **** Write code here **** </pre> <p>We can write the language we are using - which is javascript.</p> <pre> ****javascript **** </pre> <p><i>Teacher shows an example of how to write code.</i></p>	<p><i>Student listens, observes and tries it on his computer.</i></p>

		
	<p>We can place [TOC] at the top to index all the headings in our notes. Isn't that amazing!!</p> <p>You can refer to the reference link provided to you to learn syntax to do other cool stuff - like adding links.</p> <p>The advantage of markdown is that it can be directly published on websites in html format. Let's save our file. Teacher saves the file using File> Save As.</p> <p>Markdown files are saved as .md files. You need to finish writing your learning journal for each of the days and keep doing it for each class as a record of what you are learning.</p>	<p><i>Student tries it on his computer.</i></p> <p>ESR: varied.</p>

Learning journals help in retention and will help you recall the concepts you have learned later.

[\[TOC\]](#)

Notes: Pong Game

Day 0

What happened in Day 0?

- Describe what happened in Day 0
- Code for Day 0

```
javascript
function draw() {
  rect(380,180,10,80)
}
```

How did I feel after the class?

What have I learned about programming and developing games?

What aspects of the class helped me? What did I find difficult?

Day 1

Day 2

Day 3

Day 4

Day 5

1 2 5

72 Words

cpu 04% 295.3 GiB no lan 96% 25.03.11:26

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Day 7

screenshot has been saved in /home/rajeev/Pictures

Notes: Pong Game

Day 0

What happened in Day 0?

- Describe what happened in Day 0
- Code for Day 0

```
javascript
function draw() {
  rect(380,180,10,80)
}
```

How did I feel after the class?

What have I learned about programming and developing games?

What aspects of the class helped me? What did I find difficult?

Day 1

1 2 5

72 Words

cpu 04% 295.3 GiB no lan 96% 25.03.11:26

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	I will be looking forward to reading your reflections.	
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Activity	Activity Name	Links
Teacher Activity 1	Pong Stage 3.5	https://studio.code.org/projects/gamelab/5N5ULtE9PN00jHsCmAK8RvovitmbGXX7QPvRAPFSDBk/edit
Student Activity 1	Pong Stage 3.7	https://studio.code.org/projects/gamelab/5N5ULtE9PN00jHsCmAK8RulKqrZHpCJJ_LD1ux2zkYg/edit
Additional Activity	Typora	https://typora.io/
Teacher Reference visual aid link	Visual aid link	https://curriculum.whitehatjr.com/Visual+Project+Asset/PRO_VD/c7with+clue.html
Teacher Reference In-class quiz	In-class quiz	https://curriculum.whitehatjr.com/Visual+Project+Asset/PRO_VD/PRO-C7_Jayshree.docx.pdf