

Breakout

Part 1

Play the game we are building:
[click](#)

Today's Game

Challenge: Add features to our Breakout game.

Goal: Build a completely playable game

Features:

- Add blocks that move side-to-side
- Accelerate the ball after every time it hits the paddle
- Add a laser to the ball
- Span pacman to eat the blocks

Moving Bricks

- Set up only certain bricks to move
- Thoughts on how we do this?

Moving Bricks

- Add “Sine” behavior to your brick
- Set property “Active on start” to “no” for ALL bricks on ALL levels

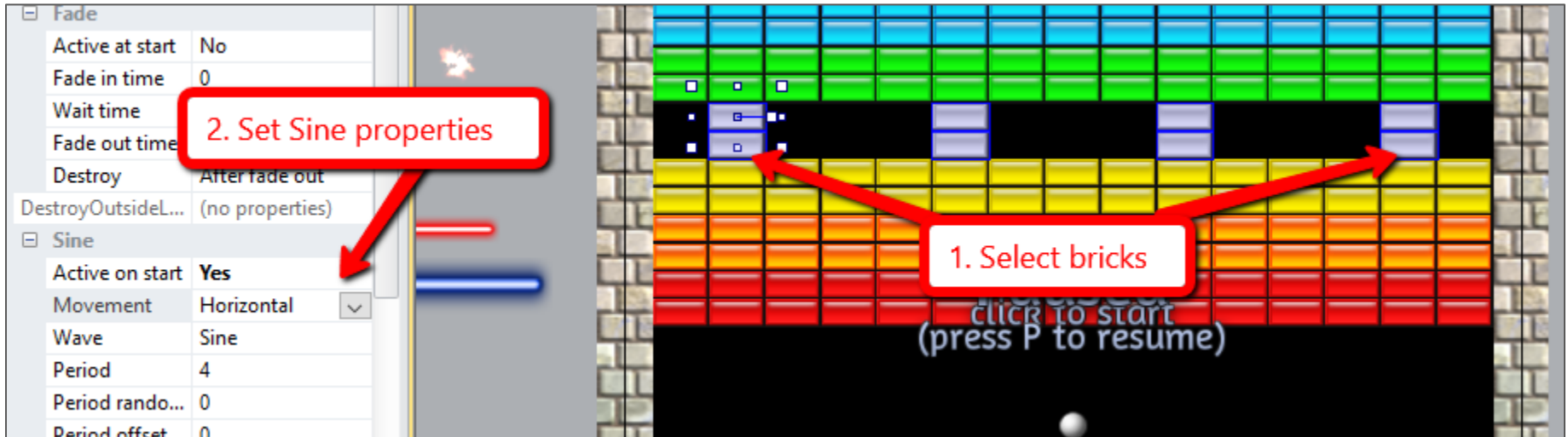
The screenshot shows a game engine interface with a central preview window displaying a brick level. The interface includes a top toolbar with tabs for 'Event sheet 1', 'Layout 1', 'Layout 2', 'Layout 3', 'Layout 4', and 'Final'. On the left, a 'Properties' panel shows settings for a 'Sine' behavior, with 'Active on start' set to 'No'. On the right, a 'Projects' panel shows a hierarchy of 'New project*' containing 'Layouts' (Layout 1-4) and 'Final'. A 'Layers' panel at the bottom right shows 'All 'Layout 1' objects' including 'ball' and 'brick'. A 'Click to start' button is visible in the preview window.

Four red callout boxes with arrows provide instructions:

1. Click to select ALL bricks
2. Notice all blocks are selected
3. Set "Active on start" to "No"
4. REPEAT on all layouts

Moving Bricks

- Now, set specific brick's Sine properties
- Use various "Movement" properties to create challenges
 - Test "Wave" and "Movement" values
- Now ONLY those bricks will move



Accelerate the Ball

- Each time the ball hits the paddle, increase it's speed. Making the game move a lot faster.

- Thoughts on how we do this?

Accelerate the Ball

- Add another action to “ball is overlapping paddle” event
- Roughly line 13

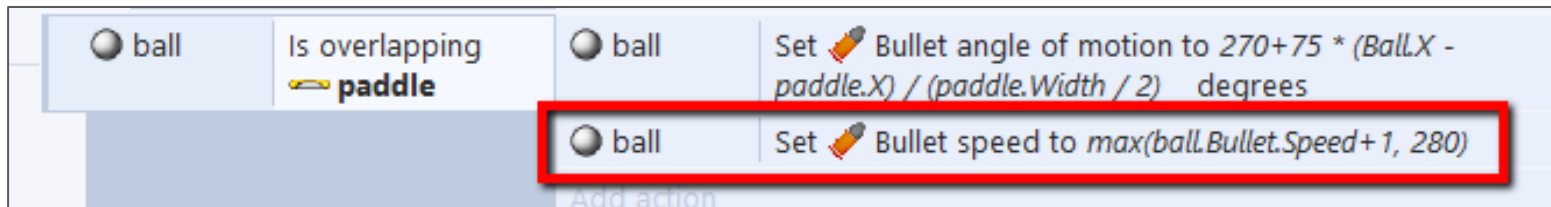
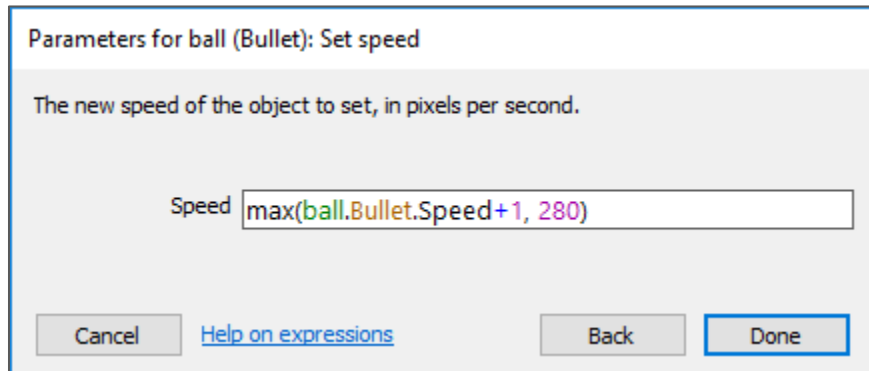
The screenshot displays an event editor interface with two lines of code:

- Line 13:**
 - Event: **ball** Is overlapping **paddle**
 - Action: **ball** Set **Bullet angle of motion** to $270 + 75 * (Ball.X - paddle.X) / (paddle.Width / 2)$ degrees
- Line 14:**
 - Event: **Powerballs**

- Hint: Ball is using “Bullet” behavior. What should that action be?

Accelerate the Ball

- Increase the “bullet” speed each time by 1, up to 280
- “ball.Bullet.Speed” is the current speed
- Increase by “1”
- Use this value:
 - $\max(\text{ball.Bullet.Speed}+1, 280)$



Accelerate the Ball

- Two other minor tweaks
 - Make sure the ball is **NOT** touching your paddle when the game starts
 - Adjust the ball's initial "**angle of motion**" so it goes UP initially
 - (Add action to Event # 7)

The screenshot shows a software interface for creating an animation. On the left, a vertical timeline is labeled with the number '7'. The main area displays a sequence of actions for a 'ball' object. The actions are:

- Set Bullet speed to 200
- Set bullet gravity to 5
- Set Bullet angle of motion to 270 degrees (highlighted with a red box)
- clickToSt... Destroy

The interface includes 'Add action' buttons at the top and bottom. The highlighted action is 'Set Bullet angle of motion to 270 degrees'.

Shoot More Lasers

- Change the “small ball” power up to allow the ball to shoot a laser.

- Thoughts on how we do this?

Shoot More Lasers

1. Add a new **sub-event** when the “click” occurs
2. Check to see if “**small**” ball animation is playing
3. Spawn “**redLazer**”
4. Set **random angle**

(remember random?)

The screenshot shows a software interface for creating animations, titled "Lasers and Beams". The interface features a vertical timeline on the left with markers for time 26, 27, 28, 29, and 30. The main area displays a sequence of events and actions:

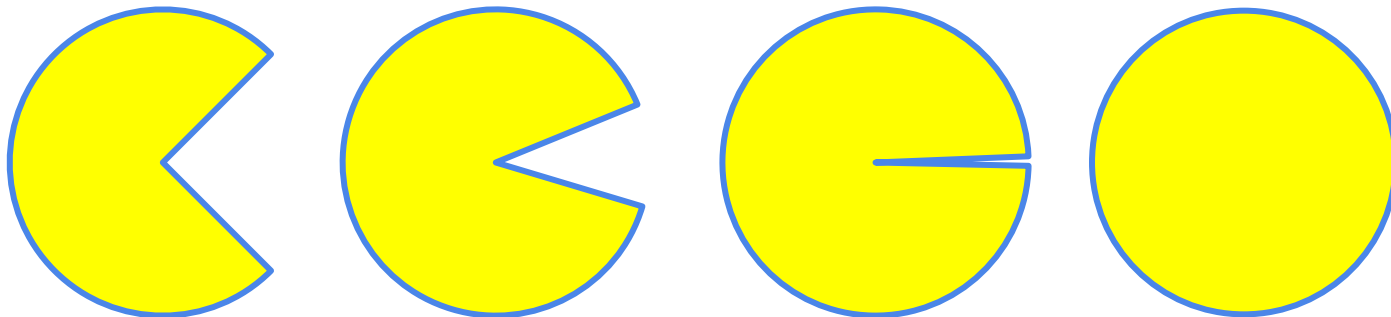
- Event 26:** Keyboard - On Space pressed. Action: Add action.
- Event 27:** Mouse - On Left button Clicked. Action: Add action.
- Event 28:** paddle - Is animation. Action: Spawn redLazer on layer 1 (image point).
- Event 29:** System - Is animation. Action: Set bullet angle of motion to 270 degree, Move to bottom of layer, Add action.
- Event 29 (continued):** paddle - Is animation. Action: Set animation to "normal" (play from beginn), Spawn blueLazer on layer 1 (image point), blueLazer - Rotate 270 degrees clockwise, blueLazer - Move to bottom of layer.
- Event 30:** ball - Is animation "small" playing. Action: Spawn redLazer on layer 0 (image point), redLazer - Set angle to random(0,360) degrees.

Red annotations highlight key steps:

- A red arrow points from the "Mouse" event at 27 to a red-bordered box containing the text: "1. Right-click and 'Add' then 'Add Subevent'".
- A red-bordered box containing the text: "Add this event and actions" has a red arrow pointing to the "ball" event at 30.
- A large red-bordered box encloses the "ball" event at 30.

Spawn Pac-man

- A power-up that turns your ball into Pac-man and let's the player use the keyboard to eat the bricks.
- Thoughts on how we do this?










Spawn Pac-man

- Here's what Will would do it
 1. Change the "large" ball Power-up to spawn Pac-man
 2. Add keyboard events to change bullet direction while "pacman"
 3. Add "pacman" behavior to the "thru" ball behavior
 4. Celebrate!














- **Want to try it?**

Spawn Pac-man

- Add Pac-man animation to the **“ball”**
- Change animation on **“largeBall”** power up (roughly row 17)

17	 powerup	On collision with  paddle	 ball	Set animation to “large” (play from beginning)
	 powerup	Is animation “largeBall” playing	 ball	Set animation to “pacman” (play from beginning)
	 powerup		 powerup	Destroy

- Add keyboard Events to change direction

54	 ball	Is animation “pacman” playing	Add action
55	 Keyboard	Up arrow is down	 ball Set  Bullet angle of motion to 270 degrees
	Add action		
56	 Keyboard	Right arrow is down	 ball Set  Bullet angle of motion to 0 degrees
	Add action		
57	 Keyboard	Down arrow is down	 ball Set  Bullet angle of motion to 90 degrees
	Add action		
58	 Keyboard	Left arrow is down	 ball Set  Bullet angle of motion to 180 degrees
	Add action		

Spawn Pac-man

- Add an **“or”** condition to the **“thur”** ball action for **“pacman”** animation

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ball	Is animation "thru" playing	brick	Spawn explosion on layer 2 (image point 0)
- or -		explosion	Set animation to "blue" (play from beginning)
ball	Is animation "pacman" playing	explosion	Rotate random(360) degrees clockwise
		brick	Destroy
		ball	Set Bullet angle of motion to <i>ball.direction</i> degrees

- Fix cheat code!

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Keyboard	On 2 pressed	ball	Set animation to "large" (play from beginning)
		ball	Set animation to "pacman" (play from beginning)
		ball	Set Bullet speed to 200