

Game Development with Construct 3.



Objectives.

In this workshop you will learn:

How to create a digital game including:

- Use of libraries
- Drag and drop
- Geometric properties
- Importing assets
- Object and environment properties
- Interactions, events and actions
- Game play controls
- Triggers
- Collisions
- Using algorithms
- Saving and exporting a digital game



Objectives.

By the end of this workshop you will be able to identify:

- ✓ Capabilities and limitations of software applications for creating games
- ✓ Hardware and peripherals required to create and test digital games





Bernie Crumbs.



PlayStation





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Importing assets.



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Importing assets adding elements such as images, sound and animation into the game environment.



Direct instruction.

- Adding objects
 - Audio
 - Sprite
- Importing assets
 - Images
 - Animations
 - Music
- Renaming assets





Sprite a (typically) small image that can be used as a game object or character.





Idle animation an animation triggered when a sprite is not moving.



Summary statement.

Design – students may demonstrate this through the use of an assets table for LO2.

Implementation – students may implement this by importing images, sound and/or animations into Construct 3.

Progression – at it's most basic, students can import their assets, for a more advanced demonstration of importing assets students might create multiple animations for different aspects of their sprite objects.

What do you know about importing assets in Construct 3?







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Geometric properties.



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Geometric properties the settings for size and scale of the objects within the game environment or world.

Direct instruction.

- Resizing objects
- Cropping sprites
- Cropping animations



Summary statement.

Design -

Implementation -

Progression -



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What do you know about geometric properties in Construct 3?







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Use of libraries.



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Libraries a set of pre-built assets such as environments, objects and characters included with the game design software.





Spritefont a grid of every character that can be drawn. By drawing parts of this image in sequence, strings of text can be rendered. This allows complete artistic control over the appearance of text, rather than having to choose from existing fonts

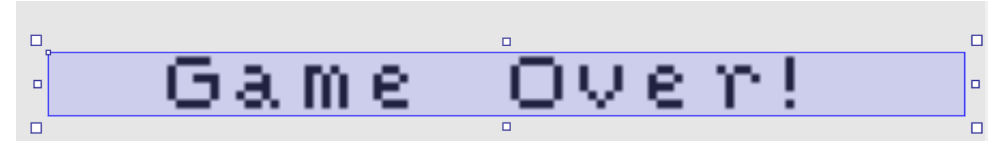


Direct instruction.

- Adding objects
 - Spritefont
- Editing text



Next steps.



- ✓ Create a new object and select fontsprite
- ✓ Add it to your layout
- ✓ Double click and change the text to Game Over!
- ✓ Move the text off the side of the viewport so it cannot be seen when playing the game
- ✓ Centre the text within the object
- ✓ Complete the steps above to create a second piece of text: 'You win!'
- ✓ Give both assets a suitable name





Tilemap a two-dimensional grid made up of rectangular tiles of equal size, each of which can display an image

Direct instruction.

- Adding objects
 - Tilemap
- Importing assets
 - Tilemaps



Next steps.

- ✓ Use the built-in tile map to create a maze for Bernie Crumbs to navigate



Summary statement.

Design -

Implementation -

Progression -



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What do you know about using libraries in Construct 3?







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Game play controls.



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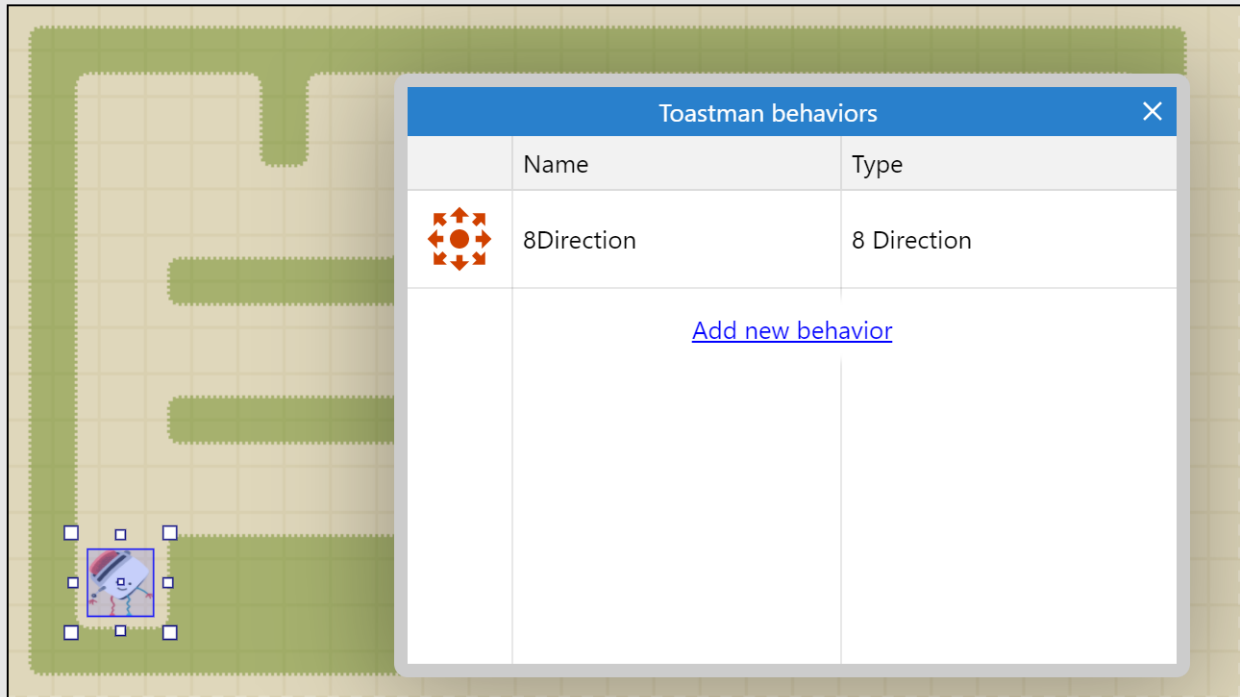
Game play controls the way in which the player interacts with the game.



PlayStation.



Predict

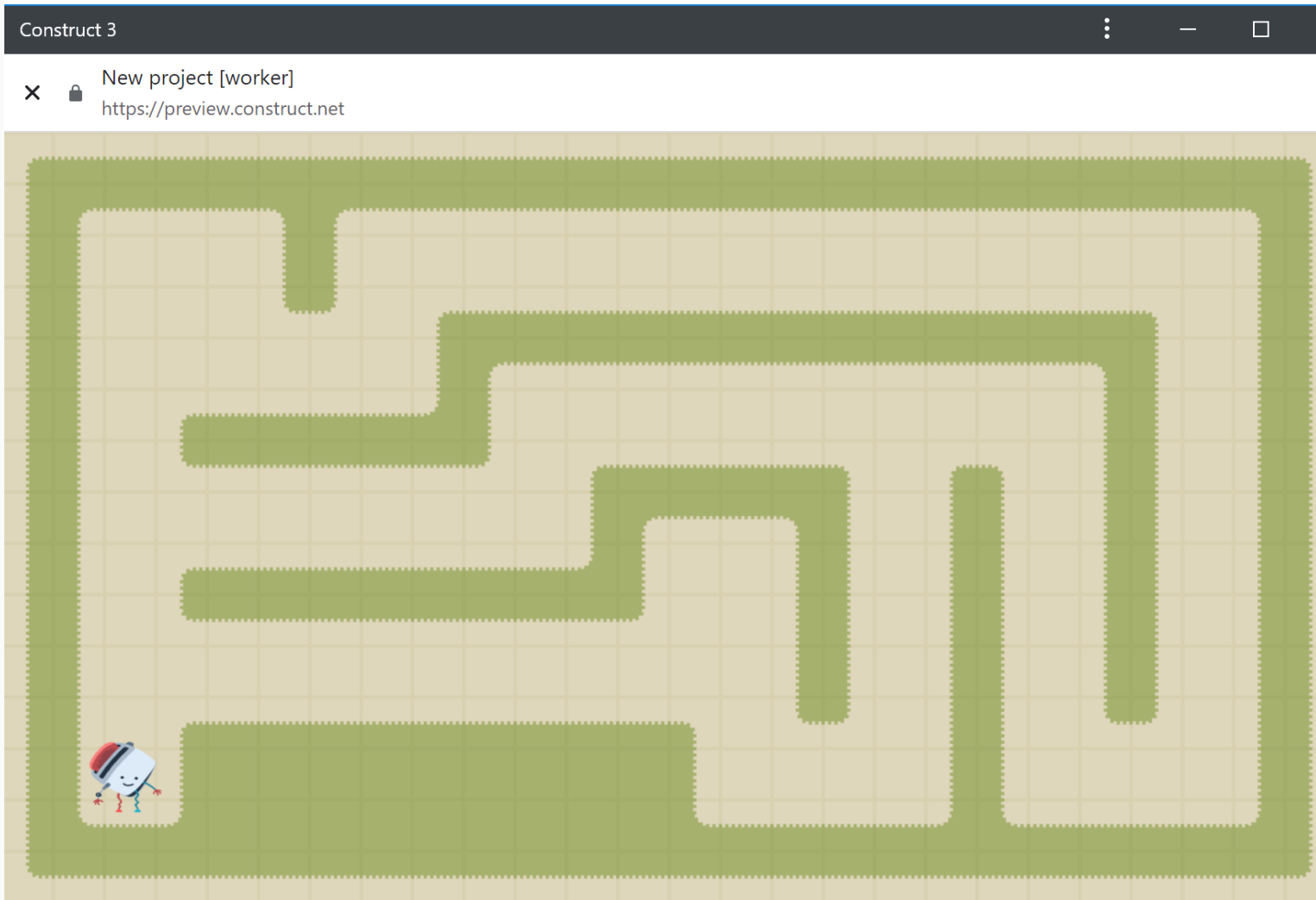


Run



Open **Part-baked_Bernie Crumbs_1.c3p** from your USB and run the game

Investigate



Investigate what happens
when you play the game

Behaviors

8Direction

Max speed 200

Acceleration 600

Deceleration 500

Directions 8 directions ▼

Set angle Smooth ▼

Default controls ☒

Enabled ☒

Add / edit [Behaviors](#)

Effects

Blend mode Normal ▼

Add / edit [Effects](#)

Container

No container [Create](#)



Modify

Change the settings for Bernie Crumbs's 8 direction movement

Bernie Crumbs should not be able to move diagonally or rotate as you move him



8Direction

Max speed	200
Acceleration	600
Deceleration	500
Directions	4 directions ▼
Set angle	No ▼
Default controls	☒

Suggested solution

Your settings should be as shown



Direct instruction.

- Adding objects
 - Keyboard input
 - Sprite
- Adding behaviors
 - 8-direction movement
- Empty object



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about game play controls in Construct 3?







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Drag and drop.



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Drag and drop the ability to add assets to the game environment by dragging them in.

Direct instruction.

- Adding objects
 - Sprite
- Adding assets
 - Image



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about drag and drop in Construct 3?







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Object and environment properties.



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Object and environment properties parameters (defined in the game creation software) that control how each object behaves and appears to the player.



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Instance a copy of an object which shares the same properties as the original object but behaves as a new object in its own right.

Predict



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Menu [Save] [Undo] [Redo] [Play] [Start page x] [Layout 1 x] [Event sheet 1 x]

1 → [Toast] On collision with **Toastman** [Toast] [Fade: start fade] [Add action]

Add event

Toast behaviors

	Name	Type
	Fade	Fade
Add new behavior		



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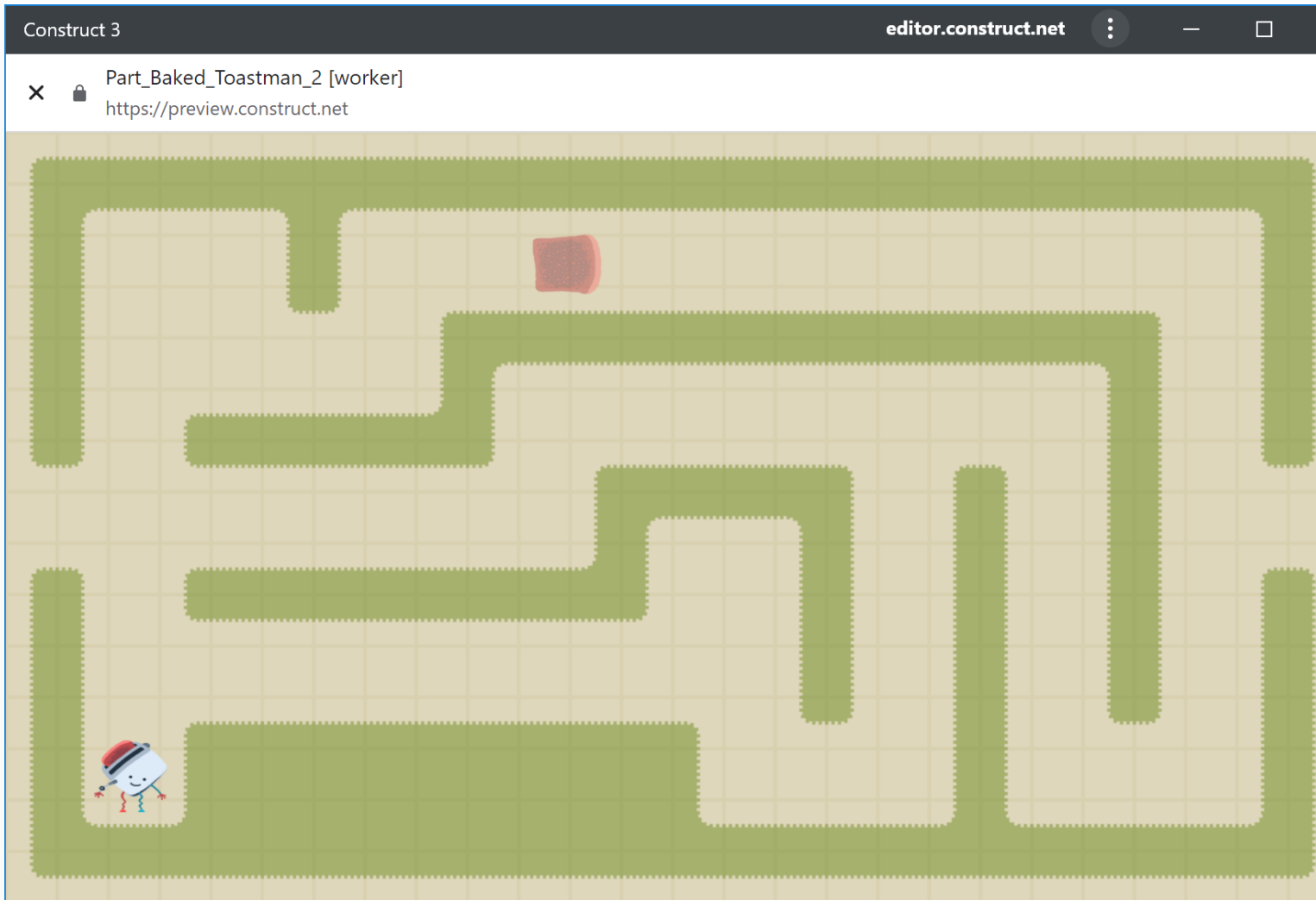


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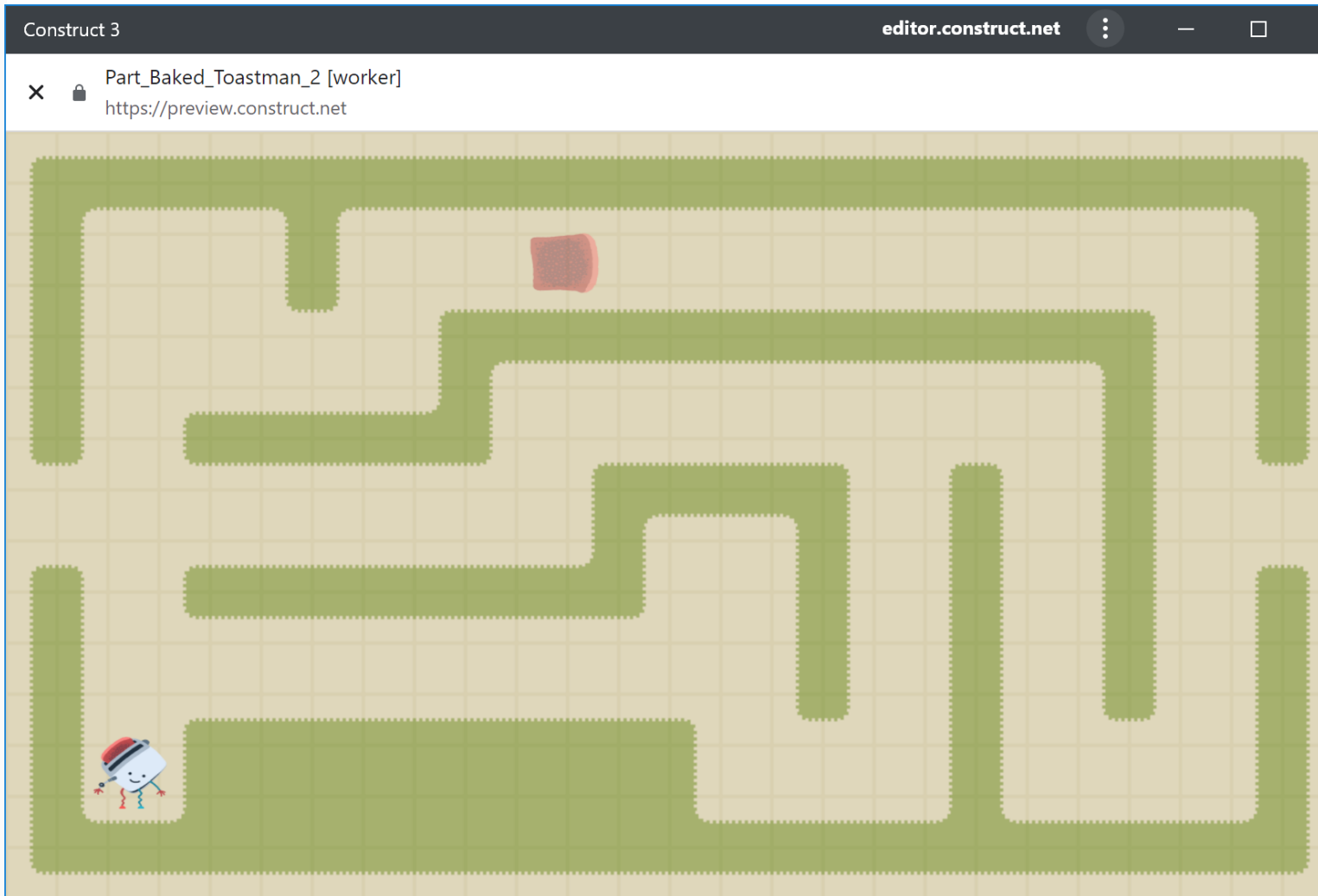


Run



Open **Part-baked_Bernie Crumbs_2.c3p** from your USB and run the game

Investigate



Investigate what happens
when you play the game



Behaviors

Fade ▼

Fade in time	0
Wait time	0
Fade out time	1
Destroy	☒
Enabled	☒
Preview	☐

Add / edit

Behaviors

Modify

Change the settings for
your toasts fade behaviour

The toast should not fade
automatically





Behaviors

Fade

Fade in time 0

Wait time 0

Fade out time 1

Destroy ☒

Enabled ☐

Preview ☐

Add / edit [Behaviors](#)

Effects

Blend mode Normal ▼

Add / edit [Effects](#)

Suggested solution

Your settings might be as shown



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about object and environment properties in Construct 3?





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Interactions, events and actions.



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Interactions, events and actions interactions are the results of how the player relates to the game objects during gameplay. An event is something (or a sequence) of things that happen in the game. Actions are events that happen as a result of an interaction.



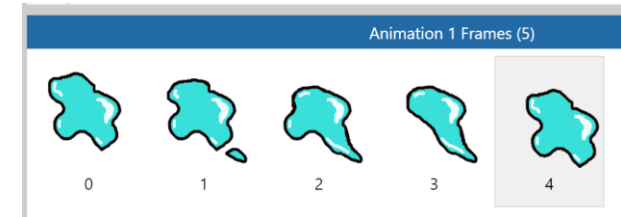
Direct instruction.

- Adding objects
 - Sprite
- Adding assets
 - Drawing your own
 - Animating your own
 - Animation settings

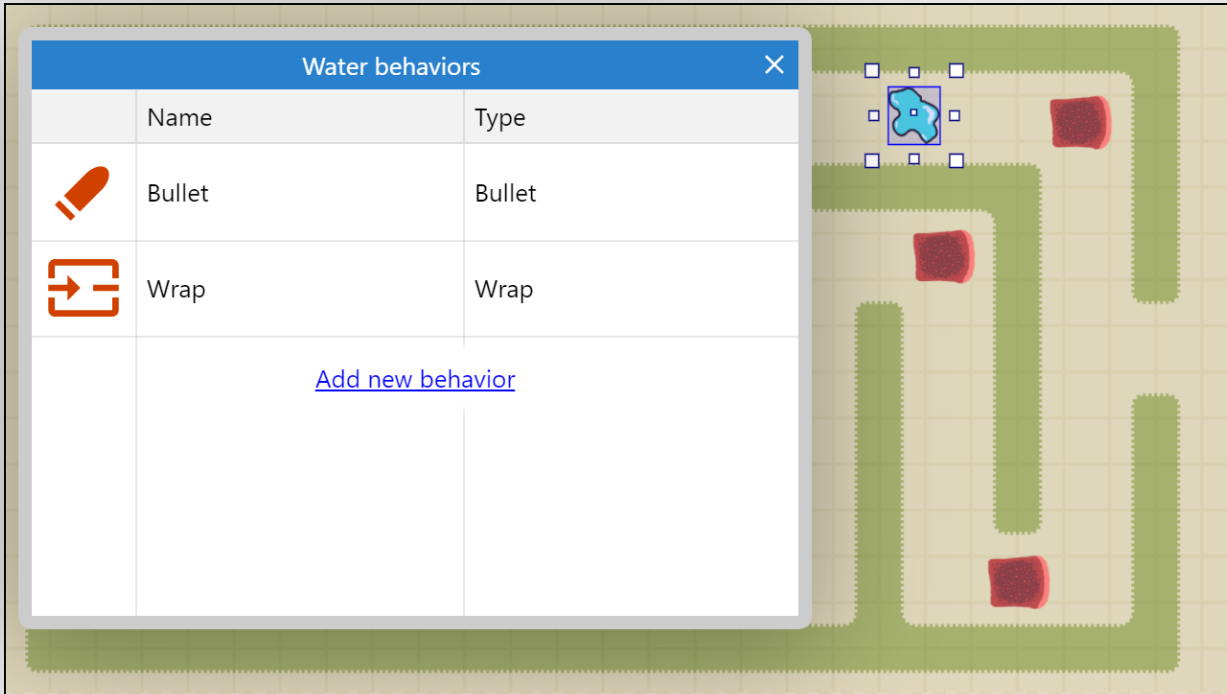


Next steps.

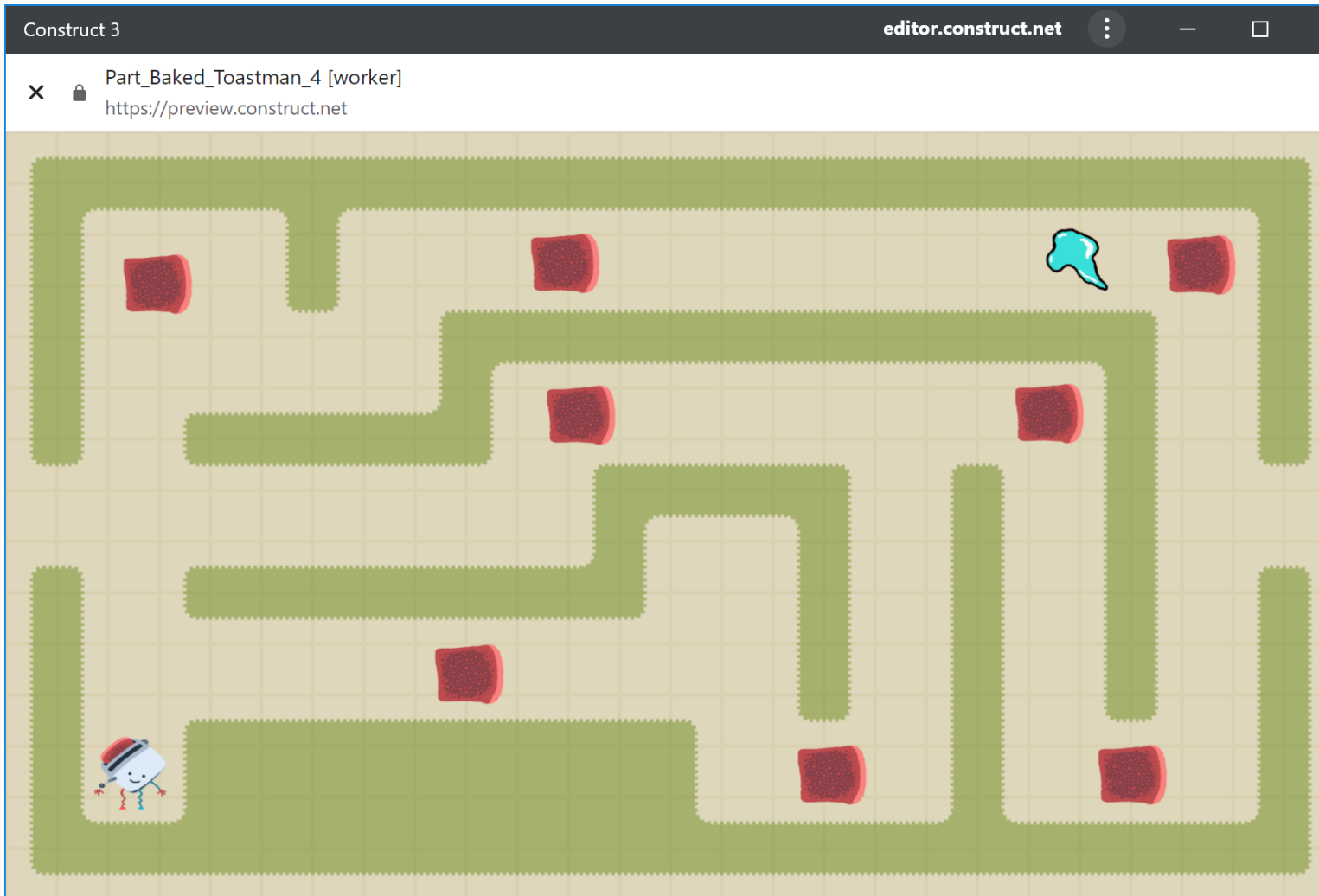
- ✓ Create a new sprite
- ✓ Name it water
- ✓ Design your water sprite using the animations editor
- ✓ Animate your sprite to make your water look like it is moving
- ✓ Experiment with the animation settings until your animation looks right



Predict

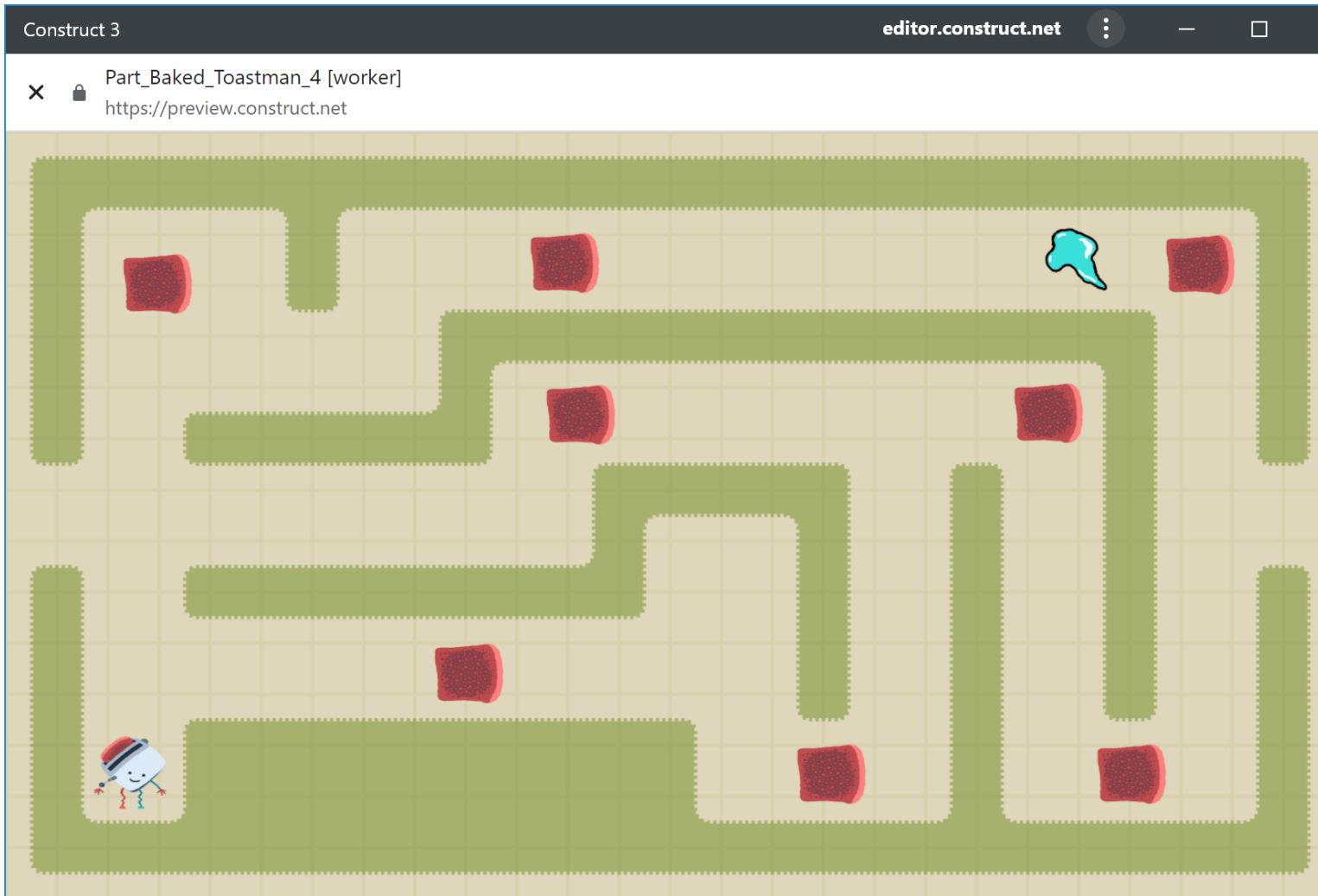


Run



Open **Part-baked_Bernie Crumbs_3.c3p** from your USB and run the game

Investigate



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Investigate what happens
when you play the game



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Behaviors

Bullet

Speed	400
Acceleration	0
Gravity	0
Bounce off solids	☐
Set angle	☒
Step	☐
Enabled	☒

Wrap

Wrap to

Layout ▼

Modify

Change the settings for your water's behaviours

The water should not shoot off the screen, should wrap to the viewport and should move around your maze

Behaviors

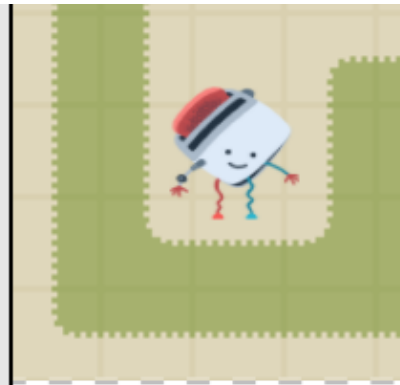
Bullet

Speed	80
Acceleration	0
Gravity	0
Bounce off solids	☒
Set angle	☒
Step	☐
Enabled	☒

Wrap

Wrap to

Viewport



Suggested solution

Your settings could be as shown

Summary statement.

Design -

Implementation -

Progression -



What do you know about interactions, events and actions in Construct 3?







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Collisions.



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Collisions this another form of event which occurs when two sprites or game elements collide during gameplay.



Direct instruction.

- Adding events
 - Collisions
- Adding actions
 - Fade



Predict



Menu

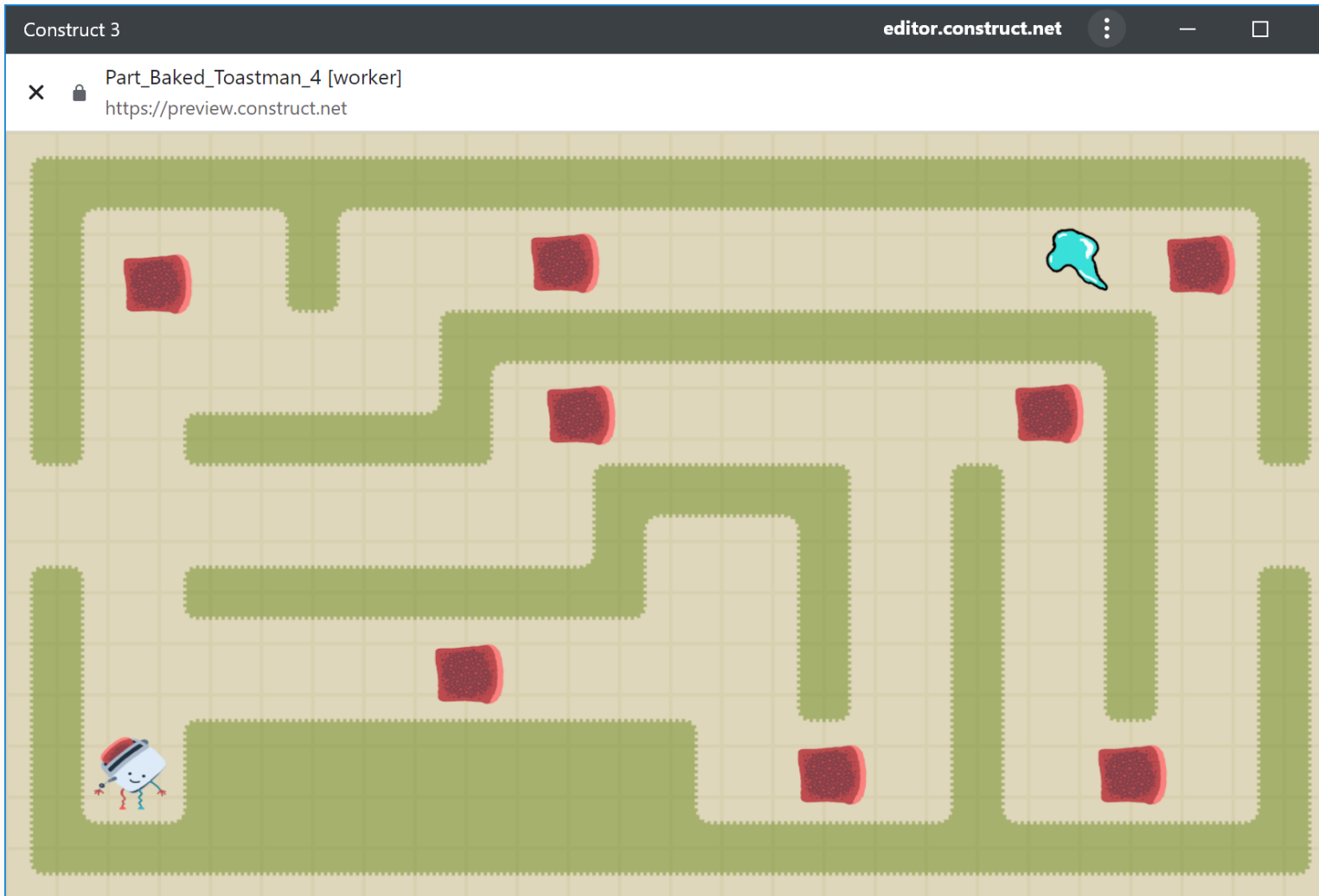
Start page × Layout 1 × Event sheet 1 ×

1	Toast	On collision with Toastman	Toast	Fade: start fade
			Add action	
2	Water	On collision with Toastman	Toastman	Destroy
			Add action	

Add event

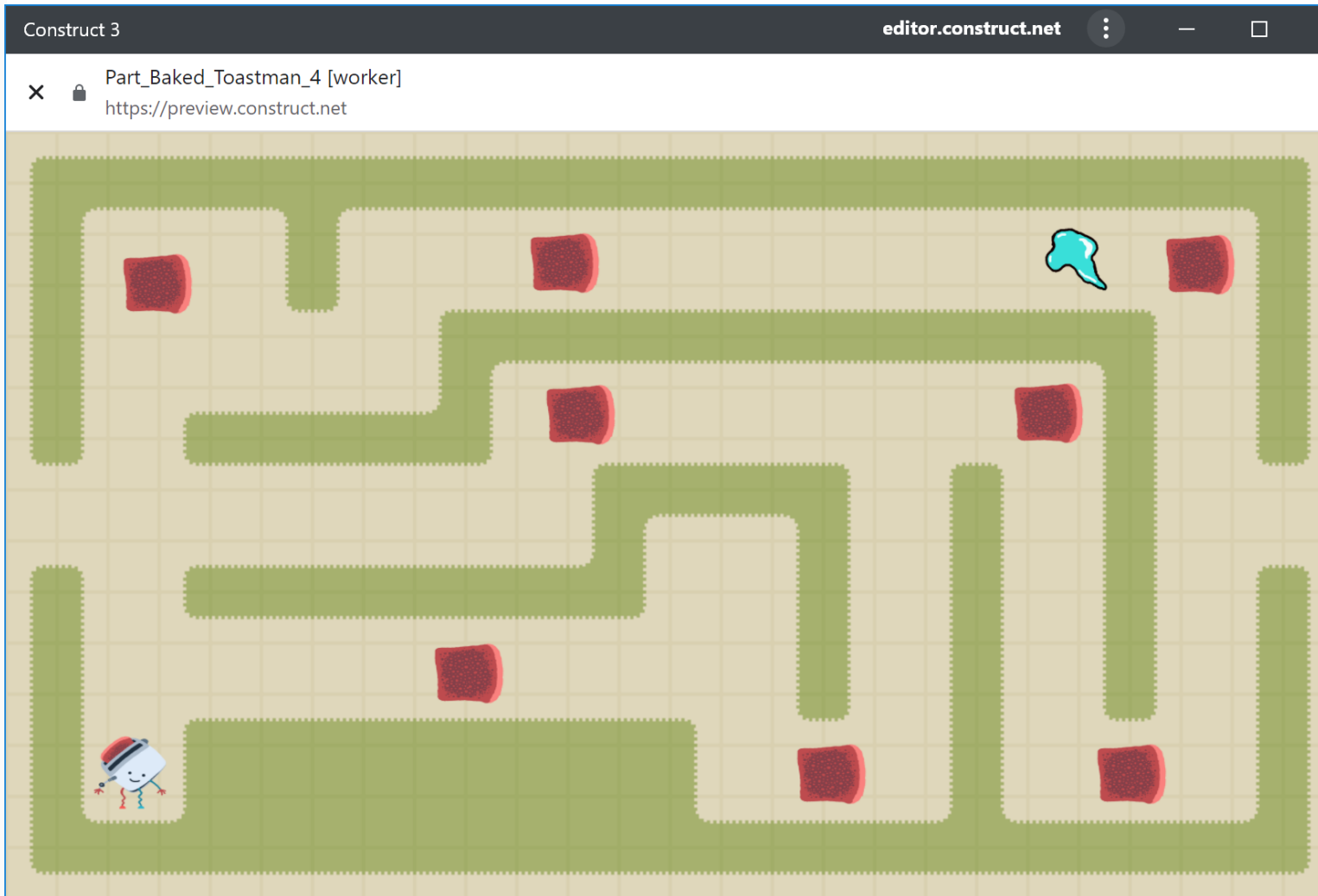


Run



Open **Part-baked_Bernie Crumbs_4.c3p** from your USB and run the game

Investigate



Investigate what happens
when you play the game



Menu



Start page ×Layout 1 ×Event sheet 1 ×

1	  Toast	On collision with  Toastman	 Toast	 Fade: start fade
			Add action	
2	  Water	On collision with  Toastman	 Toastman	Destroy
			Add action	

Add event

Modify

Extend the actions that happen as a result of water touching Bernie Crumbs

The Game Over! sprite should also be shown in the middle of the viewport

Suggested solution

The screenshot shows a game development software interface with a menu bar at the top containing 'Menu', a save icon, undo/redo arrows, a play button, and three tabs: 'Start page x', 'Layout 1 x', and 'Event sheet 1 x'. Below the menu, there are two event triggers listed on the left, numbered 1 and 2. Event 1 is triggered by 'Toast' (represented by a red square icon) and Event 2 is triggered by 'Water' (represented by a blue cloud icon). Both events are set to trigger 'On collision with Toastman' (represented by a character icon). The actions for each event are listed on the right. For Event 1, the actions are 'Toast' (red square icon) and 'Fade: start fade' (fade icon). For Event 2, the actions are 'Toastman' (character icon) and 'SpriteFont' (text icon) with the specific action 'Set position to (2, 210.5)'. Below the event list, there is an 'Add event' button and an 'Add action' button.

Event Number	Trigger	Condition	Action 1	Action 2
1	Toast	On collision with Toastman	Toast	Fade: start fade
2	Water	On collision with Toastman	Toastman	SpriteFont: Set position to (2, 210.5)

Your settings could be as shown

Next steps.

- ✓ Add the toaster_pop sound effect
- ✓ Make the toaster_pop sound play when Bernie Crumbs collides with toast



Summary statement.

Design -

Implementation -

Progression -



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What do you know about collisions in Construct 3?







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Using algorithms.



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Algorithms a series of steps in a sequence with a defined end point.



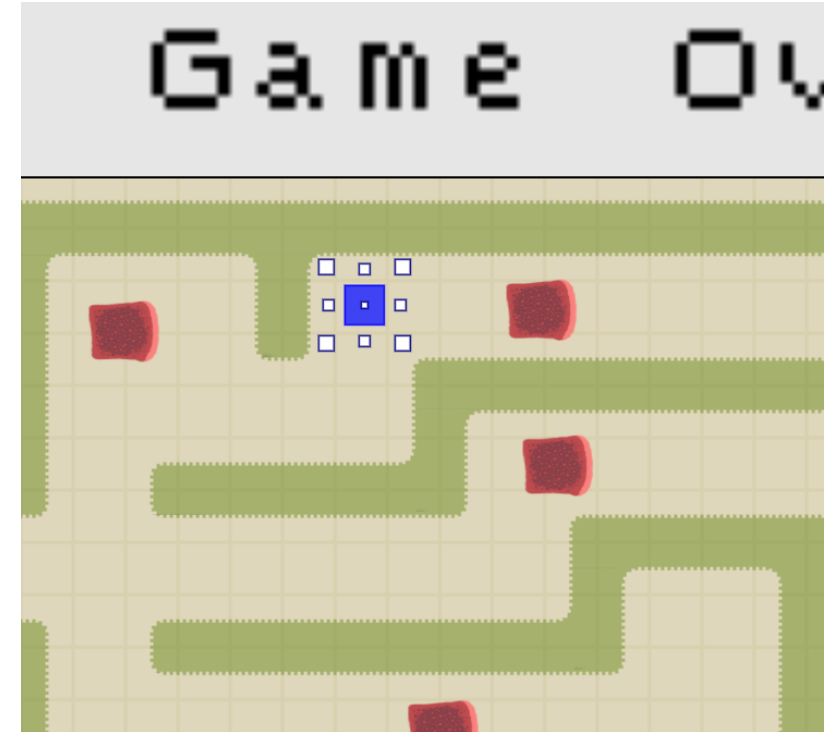
Direct instruction.

- Creating instance variables
- Adding to an instance variable
- Using variables and concatenation in spritefonts
- Using 'every tick'



Next steps.

- ✓ Add a new sprite object
- ✓ Create a single coloured square
- ✓ Add it to your layout
- ✓ Name the sprite waypointBlue

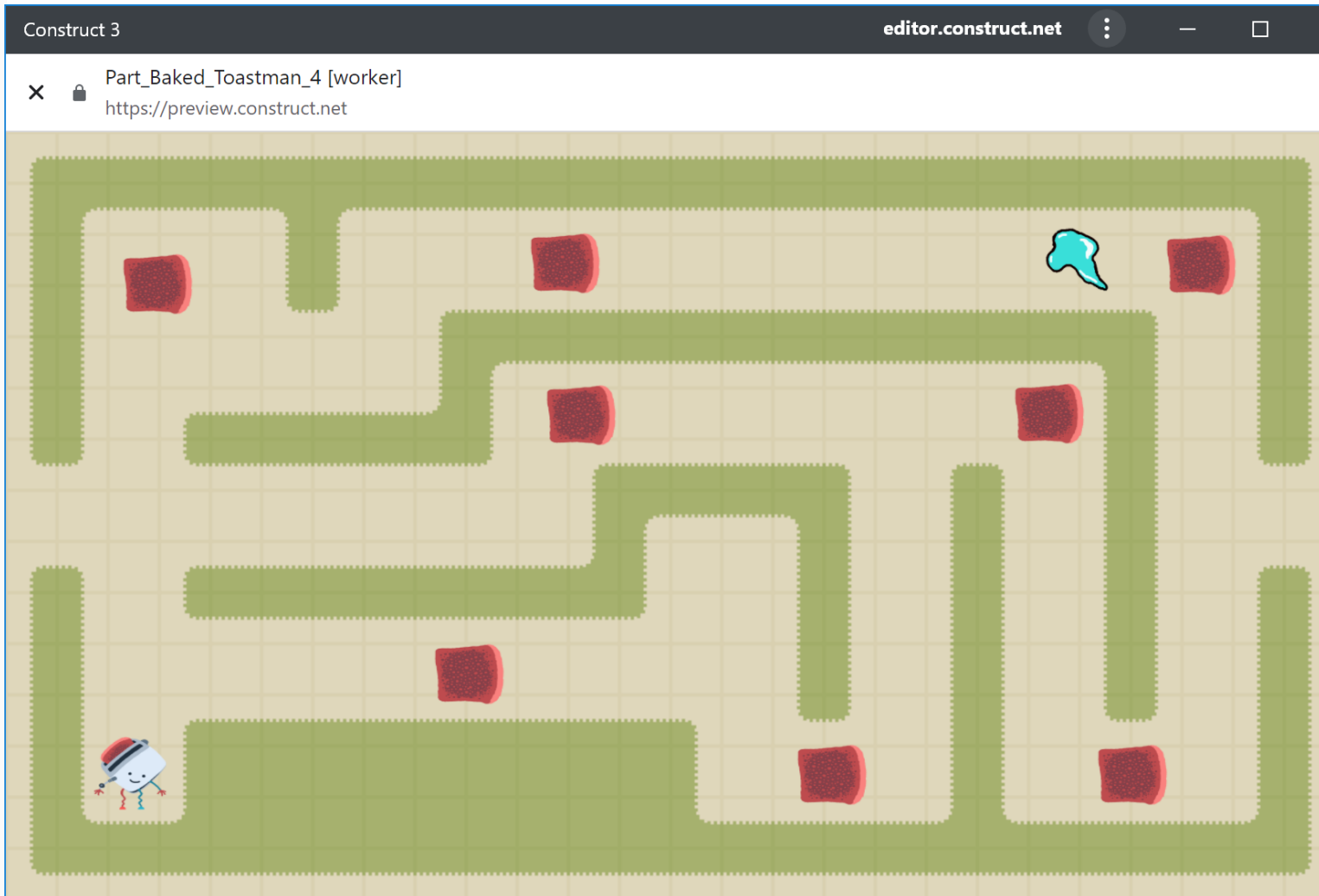


Predict

waypoin...	ID = Water.targetID	 Water	Set  Bullet angle of motion to <i>angle (water.X, water.Y, waypointBlue.X, waypointBlue.Y)</i> degrees
		Add action	Add...
→  Water	On collision with waypointBlue	 Water	Set targetID to <i>waypointBlue.nextID</i>
		Add action	Add...
waypoin...	ID = Water.targetID		
Id event		Add...	



Run

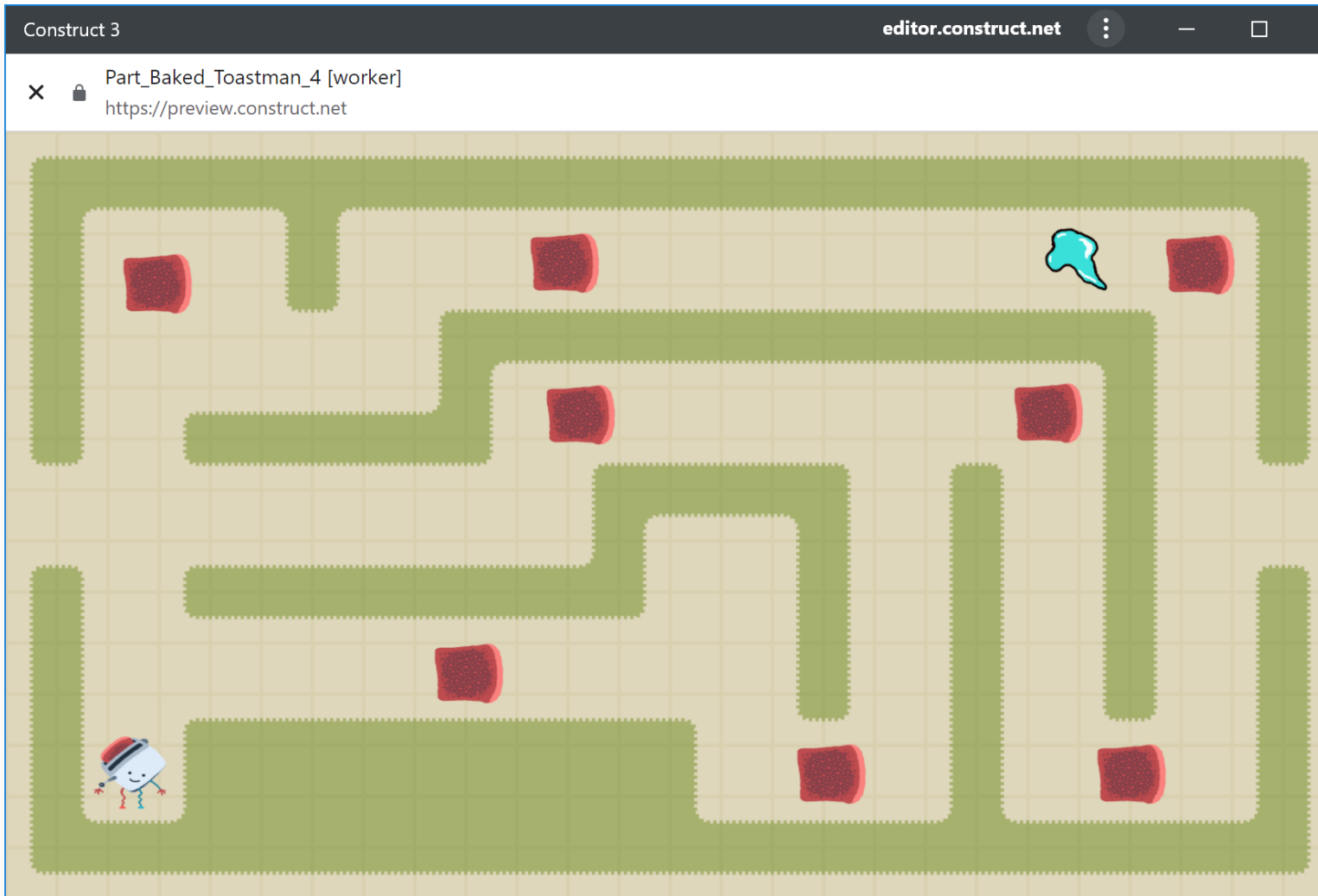


Open **Part-baked_Bernie Crumbs_5.c3p** from your USB and run the game

Investigate



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Investigate what happens
when you play the game



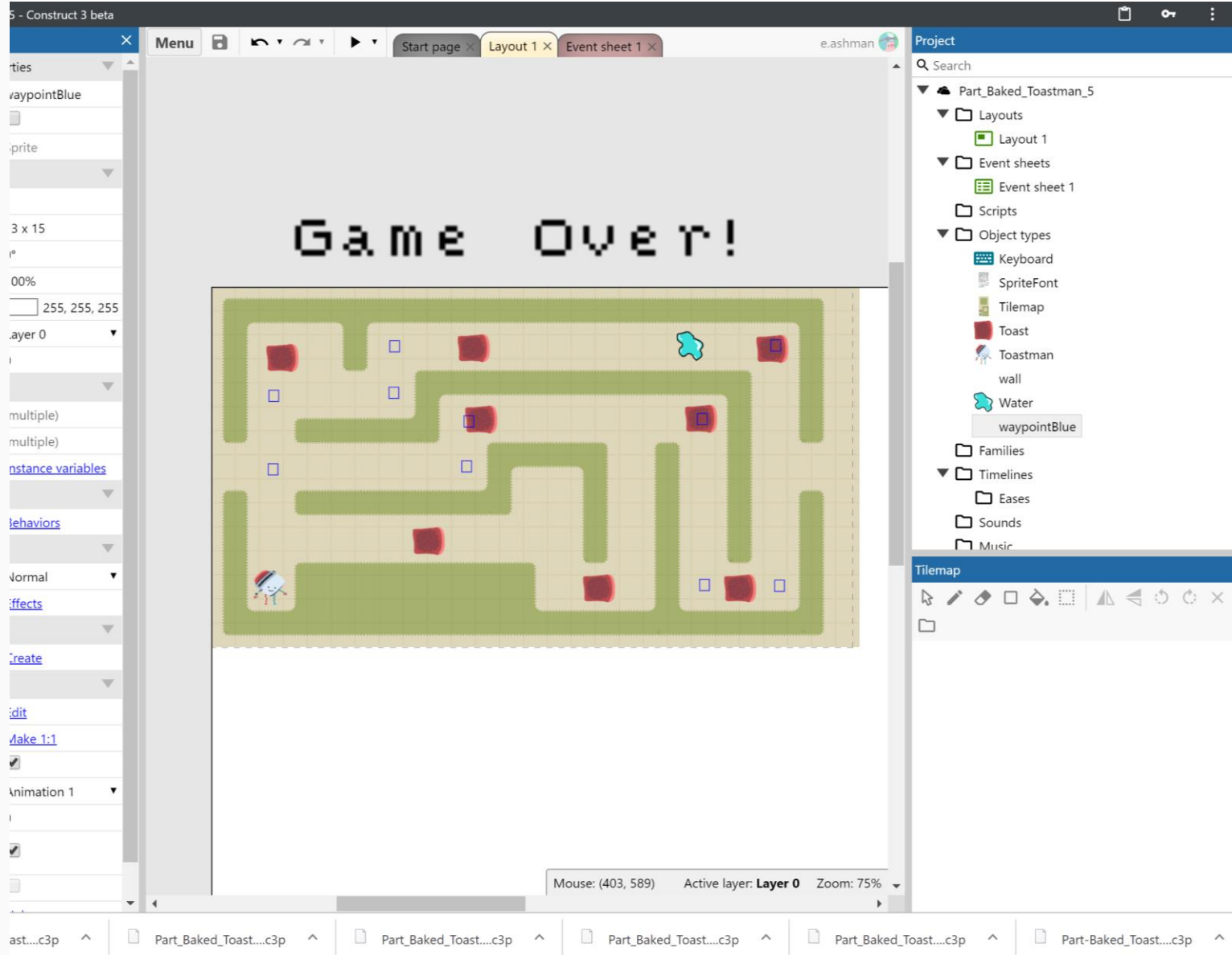
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Modify

Select the waypointBlue
sprite in the project bar to
make the waypoints
appear in the layout

Experiment with moving
the waypoints around to
make a different path

Direct instruction.

- Adding instance variables
- Using linked lists



Make



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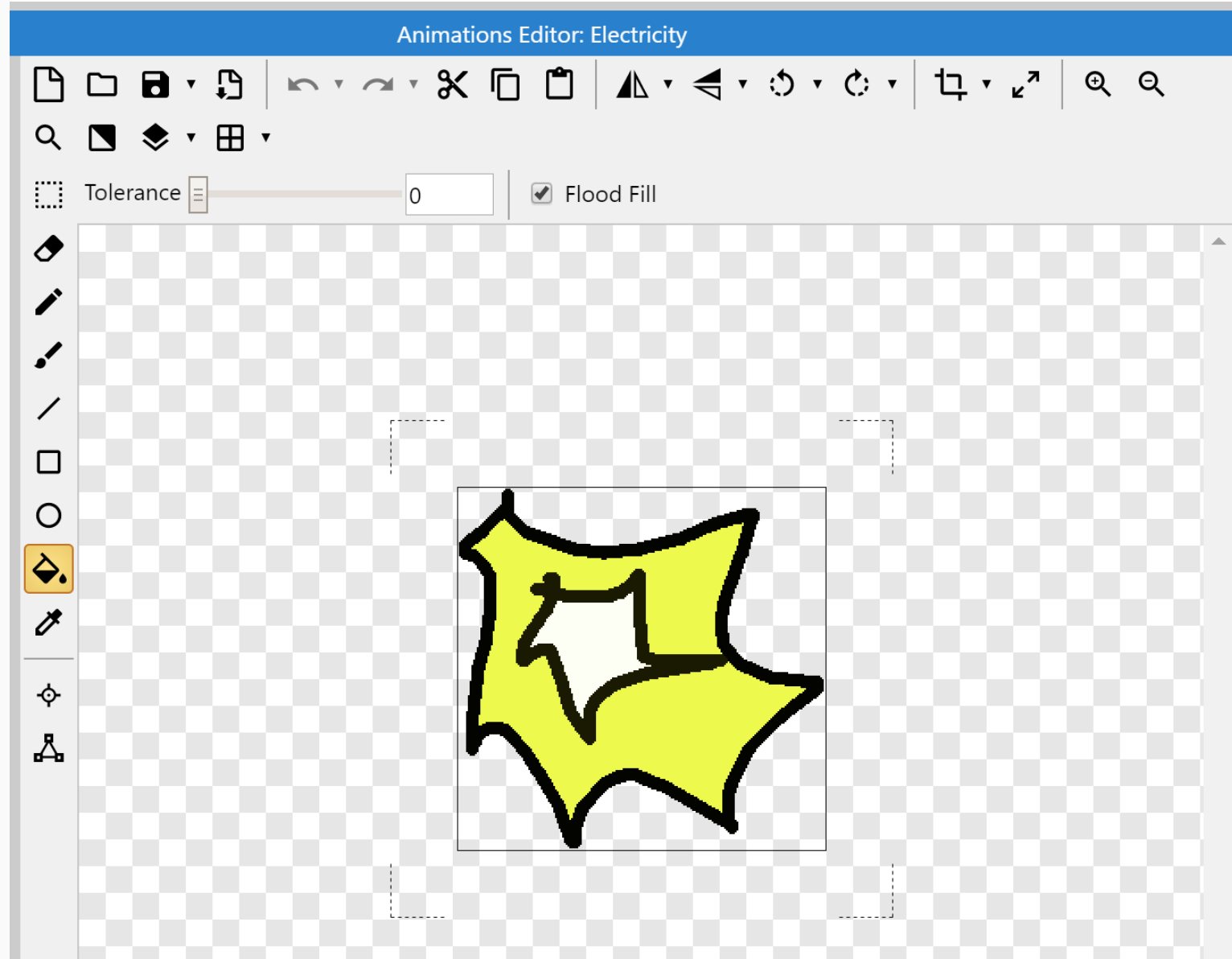
waypoin...	ID = Water.targetID	 Water	Set  Bullet angle of motion to <i>angle (water.X, water.Y, waypointBlue.X, waypointBlue.Y)</i> degrees
		Add action	Add...
→  Water	On collision with waypointBlue	 Water	Set targetID to <i>waypointBlue.nextID</i>
		Add action	Add...
waypoin...	ID = Water.targetID		
Id event		Add...	

Create a second enemy for Bernie Crumbs and use waypoints to move the enemy around the layout



PlayStation.





Make

Create an 'electricity' sprite which, when collided with makes Bernie Crumbs speed up and plays a suitable sound effect



Suggested solution



→ Electricity	On collision with 	 Electricity	Destroy
	Toastman	 Audio	Play electricity not looping at volume 0 dB (tag "")
		 Toastman	Set  8Direction maximum speed to 300
		Add action	Add...

Create an 'electricity' sprite which, when collided with makes Bernie Crumbs speed up and plays a suitable sound effect



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about using algorithms in Construct 3?







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Triggers.



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Triggers an event that takes place in order to make another process happen.



Direct instruction.

- Creating events
 - On start layout
- Looping music



Predict



→  Keyboard	On  pressed	 Toastman	Set animation to "Walking" (play from beginning)
		Add action	Add...
→  Keyboard	On any key released	 Toastman	Set animation to "Idle" (play from beginning)
		Add action	Add...



Run



Open **Part-baked_Bernie Crumbs_6.c3p** from your USB and run the game

Investigate



Investigate what happens when you play the game

Modify

→ Keyboard	On ↑ pressed	Toastman	Set animation to "Walking" (play from beginning)	Add action	Add...
→ Keyboard	On ↓ pressed	Toastman	Set animation to "Walking" (play from beginning)	Add action	Add...
→ Keyboard	On → pressed		Add action	Add...	Add...
→ Keyboard	On ← pressed		Add action	Add...	Add...
→ Keyboard	On any key released	Toastman	Set animation to "Idle" (play from beginning)	Add action	Add...
Add event					

Add events for each of your other arrows

Investigate how you might get Bernie Crumbs to face in the correct direction as he moves



→	Keyboard	On ↑ pressed	Toastman	Set animation to "Walking" (play from beginning)
			Add action	Add...
→	Keyboard	On ↓ pressed	Toastman	Set animation to "Walking" (play from beginning)
			Add action	Add...
→	Keyboard	On → pressed	Toastman	Set animation to "Walking" (play from beginning)
			Toastman	Set Not mirrored
			Add action	Add...
→	Keyboard	On ← pressed	Toastman	Set animation to "Walking" (play from beginning)
			Toastman	Set Mirrored
			Add action	Add...
→	Keyboard	On any key released	Toastman	Set animation to "Idle" (play from beginning)
			Add action	Add...
			Add event	Add...

Suggested solution





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Make

Using the Toaster Shoot animation from your assets pack, create an event that is triggered when you collide with a piece of toast



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Suggested solution



→ Toast	On collision with Toastman	Toast	Fade: start fade
		Toastman	Set animation to "EatToast" (play from beginning)
		Audio	Play toaster_pop not looping at volume 0 dB (tag "")
		Toastman	Add 1 to score
		Add action	Add...

Using the Toaster Shoot animation from your assets pack, create an animation that is triggered when you collide with a piece of toast

Investigate



→ Toast	On collision with 	 Toast	 Fade: start fade
		 Toasterman	Set animation to "EatToast" (play from beginning)
		 Audio	Play toaster_pop not looping at volume 0 dB (tag "")
		 Toasterman	Add 1 to score
		Add action	Add...

The animation for Toasterman eating the toast doesn't always play in full

Investigate how you can make sure the animation plays in full

Modify



→  Toast	On collision with  Toastman	 Toast	 Fade: start fade
		 Toastman	Set animation to "EatToast" (play from beginning)
		 Audio	Play toaster_pop not looping at volume 0 dB (tag "")
		 Toastman	Add 1 to score
		Add action	Add...

Make the changes needed
to make your eat toast
animation play in full



2	→ Water	On collision with Toastman	Toastman Destroy	SpriteFont Set position to (2, 210.5)
			Add action	Add...
3	waypoin...	ID = Water.targetID	Water	Set Bullet angle of motion to <i>angle (water.X, water.Y, waypointBlue.X, waypointBlue.Y) degrees</i>
			Add action	Add...
4	→ Water	On collision with waypointBlue	Water	Set targetID to <i>waypointBlue.nextID</i>
	waypoin...	ID = Water.targetID	Add action	Add...
5	→ Keyboard	On pressed	Toastman	Set animation to "Walking" (play from beginning)
	Toastman	Is overlapping Toast	Add action	Add...
6	→ Keyboard	On pressed	Toastman	Set animation to "Walking" (play from beginning)
	Toastman	Is overlapping Toast	Add action	Add...
7	→ Keyboard	On pressed	Toastman	Set animation to "Walking" (play from beginning)
	Toastman	Is overlapping Toast	Toastman Set Not mirrored	Add...
8	→ Keyboard	On pressed	Toastman	Set animation to "Walking" (play from beginning)
	Toastman	Is overlapping Toast	Toastman Set Mirrored	Add...
9	→ Keyboard	On any key released	Toastman	Set animation to "Idle" (play from beginning)
	Toastman	Is overlapping Toast	Add action	Add...
	Add event			Add...

Suggested solution



Make



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Using your score variable make the text 'You win!' appear on screen if you have collected all of the pieces of toast



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Suggested solution



3	 Toastman	score = 8	 YouWin	Set position to (2, 210.5)
			 Toastman	Start ignoring  8Direction user input
			 Water	Set  Bullet speed to 0
			Add action	Add

Using your score variable make the text 'You win!' appear on screen if you have collected all of the pieces of toast



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about triggers in Construct 3?







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Saving and exporting a digital game.



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Saving and exporting a digital game saving refers to saving the game in its native format to allow for further modification, exporting refers to exporting the game in a format which would allow it to be played on different computer systems or platforms.



Direct instruction.

- Exporting as HTML5
- Exporting as playable Ad
- Exporting as NW.js
 - Creating an exe file



Summary statement.

Design -

Implementation -

Progression -



PlayStation.



What do you know about saving and exporting a digital game in Construct 3?





Review.

Can you identify:

- ✓ Capabilities and limitations of software applications for creating games
- ✓ Hardware and peripherals required to create and test digital games



Review.

In this workshop you have learnt:
How to create a digital game including:

- Use of libraries
- Drag and drop
- Geometric properties
- Importing assets
- Object and environment properties
- Interactions, events and actions
- Game play controls
- Triggers
- Collisions
- Using algorithms
- Saving and exporting a digital game



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**Username, your name and
school name**

DSHTeacherOctober2019