

# PhysicsEngine

The PhysicsEngine extension brings simple yet effective physics simulation.

## Events:

### CanvasSizeChanged

```
when PhysicsEngine . CanvasSizeChanged  
    width height  
do
```

Triggered when the Canvas size changes.

Parameter	Type
width	number
height	number

### OnAnimationFrameChanged

```
when PhysicsEngine . OnAnimationFrameChanged  
    objectId imagePath  
do
```

Event triggered when an animation frame changes.

Parameter	Type
objectId	text
imagePath	text

### OnCollision

```
when PhysicsEngine . OnCollision  
    objectId1 objectId2 collisionSide  
do
```

Triggered when two objects collide with the side of collision. collisionSide = "bottom" or "top" or "left" or "right"

Parameter	Type
objectId1	number
objectId2	number
collisionSide	text

### OnDirectionInverted

## OnDirectionInverted

```
when PhysicsEngine . OnDirectionInverted
```

```
objectId collisionSide
```

```
do
```

Event triggered when an object's direction is inverted after a collision.

Parameter	Type
objectId	number
collisionSide	text

## OnPositionChanged

```
when PhysicsEngine . OnPositionChanged
```

```
objectId x y
```

```
do
```

Event triggered when an object's position changes.

Parameter	Type
objectId	number
x	number
y	number

## OnSpriteTouched

```
when PhysicsEngine . OnSpriteTouched
```

```
spriteId
```

```
do
```

Event triggered when a sprite is touched.

Parameter	Type
spriteId	number

## OnUpdate

```
when PhysicsEngine . OnUpdate
```

```
do
```

Evento chamado a cada atualização do ciclo de física.

## ReportError

```
when PhysicsEngine . ReportError
```

errorMessage

do

Report an error with a custom message

Parameter	Type
errorMessage	text

## TimedEvent

when PhysicsEngine . TimedEvent

id

do

Event triggered after a specified delay.

Parameter	Type
id	number

## Methods:

### AddChildToContainer

call PhysicsEngine . AddChildToContainer  
containerId  
childId

Adds a child object to the specified container.

Parameter	Type
containerId	number
childId	number

### AddImageToLayer

call PhysicsEngine . AddImageToLayer  
layerName  
imagePath

Add an image to a specific layer.

Parameter	Type
layerName	text
imagePath	text

## AddObject

```
call PhysicsEngine . AddObject
```

id  
x  
y  
width  
height  
mass  
friction

Adds a physical object to the simulation with specified properties.

Parameter	Type
id	number
x	number
y	number
width	number
height	number
mass	number
friction	number

## ApplyForce

```
call PhysicsEngine . ApplyForce
```

id  
forceX  
forceY  
durationMs

Applies a temporary force to an object identified by its ID.

Parameter	Type
id	number
forceX	number
forceY	number
durationMs	number

## ApplyTorque

```
call PhysicsEngine . ApplyTorque
```

id  
torque

Applies torque to an object.

Parameter	Type
id	number
torque	number

## AreObjectsColliding

```
call PhysicsEngine . AreObjectsColliding
    id1
    id2
```

Checks if two objects are colliding.

Parameter	Type
id1	number
id2	number

Return Type: boolean

## CalculateObjectAngle

```
call PhysicsEngine . CalculateObjectAngle
    objectId
```

Calculates the angle of an object's velocity vector relative to the horizontal axis.

Parameter	Type
objectId	number

Return Type: number

## ClearObjects

```
call PhysicsEngine . ClearObjects
```

Clears all objects from the physics simulation.

## CreateContainer

```
call PhysicsEngine . CreateContainer
    parentId
```

Creates a new container with the specified parent object.

Parameter	Type
parentId	number

## CreateImageSpriteOnLayer

```
call PhysicsEngine . CreateImageSpriteOnLayer  
    layerName  
    originPointStr  
    imagePath  
    objectId  
    x  
    y  
    width  
    height  
    mass  
    friction
```

Creates an ImageSprite on a specified layer with initial configurations.

Parameter	Type
layerName	text
originPointStr	text
imagePath	text
objectId	number
x	number
y	number
width	number
height	number
mass	number
friction	number

## CreateLayer

```
call PhysicsEngine . CreateLayer  
    layerName  
    zIndex
```

Create a new layer.

Parameter	Type
layerName	text
zIndex	number

## CreateParallaxEffect

```
call PhysicsEngine . CreateParallaxEffect
```

```
call PhysicsEngine . CreateParallaxEffect
```

layerName

intensity

Apply a parallax effect to a specific layer.

#### Parameter

#### Type

layerName

text

intensity

number

## CreateTileMap

```
call PhysicsEngine . CreateTileMap
```

layerName

imagePath

nx

ny

Creates a tilemap by replicating an image nx by ny times.

#### Parameter

#### Type

layerName

text

imagePath

text

nx

number

ny

number

## GetActiveLayer

```
call PhysicsEngine . GetActiveLayer
```

Get the name of the active layer.

Return Type: text

## GetAngularVelocity

```
call PhysicsEngine . GetAngularVelocity
```

id

Gets the angular velocity of an object.

#### Parameter

#### Type

id

number

Return Type: number

## GetCameraPosition

```
call PhysicsEngine . GetCameraPosition
```

Gets the current camera position as a list [x, y].

Return Type: list

## GetCameraZoom

```
call PhysicsEngine . GetCameraZoom
```

Gets the current camera zoom.

Return Type: number

## GetImage

```
call PhysicsEngine . GetImage  
    imagePath
```

Get a image.

Parameter	Type
imagePath	text

Return Type: text

## GetLayerBitmapAsPath

```
call PhysicsEngine . GetLayerBitmapAsPath  
    layerName
```

Get the bitmap of a specific layer by its name.

Parameter	Type
layerName	text

Return Type: text

## GetObjectForceX

```
call PhysicsEngine . GetObjectForceX  
    id
```

Gets the force applied on an object along the X-axis.

Parameter	Type
id	number

Return Type: number

## GetObjectForceY

```
call PhysicsEngine . GetObjectForceY  
    id
```

Gets the force applied on an object along the Y-axis.

Parameter	Type
id	number

Return Type: number

## GetObjectMass

```
call PhysicsEngine . GetObjectMass  
    id
```

Returns the mass of an object.

Parameter	Type
id	number

Return Type: number

## GetObjectPosition

```
call PhysicsEngine . GetObjectPosition  
    id
```

Returns the position of an object as a list [x, y].

Parameter	Type
id	number

Return Type: list

## GetObjectVelocity

```
call PhysicsEngine . GetObjectVelocity  
    id
```

Returns the velocity of an object as a list [vx, vy].

Parameter	Type
id	number

Return Type: list

## GetResizedImage

```
call PhysicsEngine . GetResizedImage  
    imagePath  
    newWidth  
    newHeight
```

Get and resize an image, returning its file path.

Parameter	Type
imagePath	text

<code>newWidth</code>	number
<code>newHeight</code>	number

Return Type: text

## GetScreenHeight

`call PhysicsEngine . GetScreenHeight`

Returns the height of the device screen in pixels.

Return Type: number

## GetScreenWidth

`call PhysicsEngine . GetScreenWidth`

Returns the width of the device screen in pixels.

Return Type: number

## HandleCollisionAndInvertDirection

`call PhysicsEngine . HandleCollisionAndInvertDirection  
                  objectId1  
                  objectId2`

Handles a collision by automatically detecting the collision side and inverting the object's direction accordingly.

Parameter	Type
<code>objectId1</code>	number
<code>objectId2</code>	number

## InvertObjectDirectionOnCollision

`call PhysicsEngine . InvertObjectDirectionOnCollision  
                  objectId  
                  collisionSide`

Inverts the direction of an object upon collision.

Parameter	Type
<code>objectId</code>	number
<code>collisionSide</code>	text

## IsAnimationActive

`call PhysicsEngine . IsAnimationActive  
                  objectId`

Check if there is an active animation for the specified object ID.

Parameter	Type
objectId	text

Return Type: boolean

### IsJumping

```
call PhysicsEngine . IsJumping  
    id
```

Checks whether the specified object is skipping.

Parameter	Type
id	number

Return Type: boolean

### IsMoving

```
call PhysicsEngine . IsMoving  
    id
```

Checks whether the specified object is moving.

Parameter	Type
id	number

Return Type: boolean

### IsOnPlatform

```
call PhysicsEngine . IsOnPlatform  
    objectId
```

Verifica se o objeto especificado está sobre uma plataforma.

Parameter	Type
objectId	number

Return Type: boolean

### IsStationary

```
call PhysicsEngine . IsStationary  
    id
```

Checks whether the specified object is stopped.

Parameter	Type
id	number

Return Type: boolean

## MakeObjectJump

```
call PhysicsEngine . MakeObjectJump  
    id  
    jumpStrength  
    durationMs
```

Makes an object jump by applying an upward force for a short duration.

Parameter	Type
id	number
jumpStrength	number
durationMs	number

## MirrorImageHorizontally

```
call PhysicsEngine . MirrorImageHorizontally  
    imagePath
```

Mirror an image horizontally.

Parameter	Type
imagePath	text

Return Type: text

## MirrorImageVertically

```
call PhysicsEngine . MirrorImageVertically  
    imagePath
```

Mirror an image vertically.

Parameter	Type
imagePath	text

Return Type: text

## MoveLayerDown

```
call PhysicsEngine . MoveLayerDown  
    layerName
```

Move a layer down in the order of stacking.

Parameter	Type
layerName	text

## MoveLayerUp

```
call PhysicsEngine . MoveLayerUp
```

layerName

Move a layer up in the order of stacking.

Parameter	Type
layerName	text

## OscillateObjectHorizontally

```
call PhysicsEngine . OscillateObjectHorizontally
```

objectId

amplitude

oscillationTime

Oscillates an object horizontally.

Parameter	Type
objectId	number
amplitude	number
oscillationTime	number

## OscillateObjectVertically

```
call PhysicsEngine . OscillateObjectVertically
```

objectId

amplitude

oscillationTime

Oscillates an object vertically.

Parameter	Type
objectId	number
amplitude	number
oscillationTime	number

## PredictFinalPositions

```
call PhysicsEngine . PredictFinalPositions
```

timeInterval

Predicts the final positions of all objects after a given time interval.

Parameter	Type
-----------	------

timeInterval

number

Return Type: list

## PredictFinalVelocity

```
call PhysicsEngine . PredictFinalVelocity
    objectId
    timeInterval
```

Predicts the velocity of an object after a given time interval.

Parameter	Type
objectId	number
timeInterval	number

Return Type: list

## RegisterTouchAndDisplayInfo

```
call PhysicsEngine . RegisterTouchAndDisplayInfo
    touchX
    touchY
```

Registers a touch event on the canvas and displays touch coordinates and FPS.

Parameter	Type
touchX	number
touchY	number

## RegisterTouchEvent

```
call PhysicsEngine . RegisterTouchEvent
    touchX
    touchY
    showTouches
```

Intercepts touches on Sprites and optionally shows touch bounds in Dev mode.

Parameter	Type
touchX	number
touchY	number
showTouches	boolean

## RemoveChildFromContainer

```
call PhysicsEngine . RemoveChildFromContainer
```

containerId

childId

Removes a child object from the specified container.

Parameter	Type
containerId	number
childId	number

## RemoveObject

```
call PhysicsEngine . RemoveObject  
    id
```

Removes an object from the simulation based on its ID.

Parameter	Type
id	number

## RemoveSprite

```
call PhysicsEngine . RemoveSprite  
    spriteId
```

Removes and destroys a sprite by its ID and updates the canvas.

Parameter	Type
spriteId	number

## ReplaceImageInLayer

```
call PhysicsEngine . ReplaceImageInLayer  
    layerName  
    imagePath
```

Replace an image in a specific layer.

Parameter	Type
layerName	text
imagePath	text

## SetActiveLayer

```
call PhysicsEngine . SetActiveLayer  
    layerName
```

Set an active layer by its name.

Parameter	Type
layerName	text

## SetCameraAndFollowObject

call PhysicsEngine . SetCameraAndFollowObject

objectId  
x  
y

Sets the camera position and follows an object by its ID.

Parameter	Type
objectId	number
x	number
y	number

## SetCameraPosition

call PhysicsEngine . SetCameraPosition

x  
y

Sets the camera position.

Parameter	Type
x	number
y	number

## SetCameraZoom

call PhysicsEngine . SetCameraZoom

zoom

Sets the camera zoom.

Parameter	Type
zoom	number

## SetCanvasSize

call PhysicsEngine . SetCanvasSize

newWidth

newHeight

layerName

Set canvas dimensions.

Parameter	Type
newWidth	number
newHeight	number
layerName	text

## SetGlobalGravity

call PhysicsEngine . SetGlobalGravity

x  
y

Sets the global gravity.

Parameter	Type
x	number
y	number

## SetGravity

call PhysicsEngine . SetGravity

x  
y

Sets the global gravity affecting all objects.

Parameter	Type
x	number
y	number

## SetObjectAsPlatform

call PhysicsEngine . SetObjectAsPlatform

id  
isPlatform

Sets an object as a platform.

Parameter	Type
id	number
isPlatform	boolean

## SetObjectCollisionBoxPosition

```
call PhysicsEngine . SetObjectCollisionBoxPosition  
          objectId  
          newX  
          newY
```

Sets the position of a specific object's collision box in the active layer.

Parameter	Type
objectId	number
newX	number
newY	number

## SetObjectForceX

```
call PhysicsEngine . SetObjectForceX  
          id  
          forceX
```

Sets the force applied on an object along the X-axis.

Parameter	Type
id	number
forceX	number

## SetObjectForceY

```
call PhysicsEngine . SetObjectForceY  
          id  
          forceY
```

Sets the force applied on an object along the Y-axis.

Parameter	Type
id	number
forceY	number

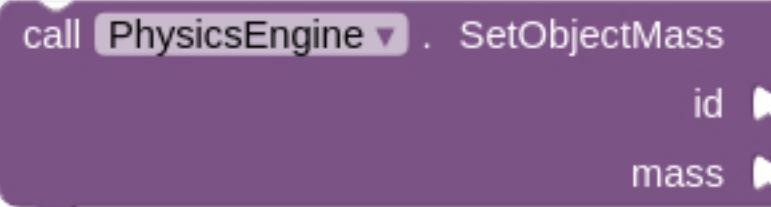
## SetObjectHeight

```
call PhysicsEngine . SetObjectHeight  
          id  
          height
```

Sets the height of an object.

Parameter	Type
id	number
height	number

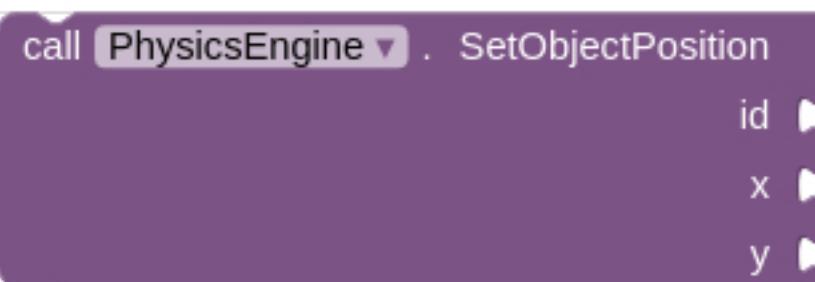
## SetObjectMass



Sets the mass of an object.

Parameter	Type
id	number
mass	number

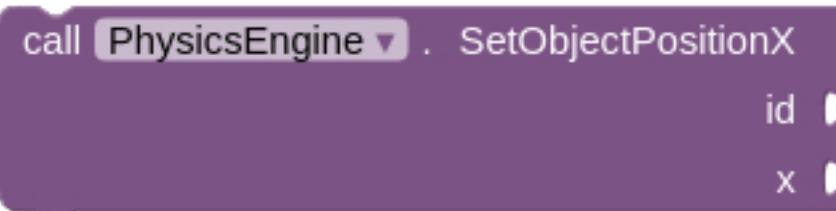
## SetObjectPosition



Sets the position of an object.

Parameter	Type
id	number
x	number
y	number

## SetObjectPositionX



Sets the X position of an object.

Parameter	Type
id	number
x	number

## SetObjectPositionY

call PhysicsEngine . SetObjectPositionY

id

y

Sets the Y position of an object.

#### Parameter

id

#### Type

number

y

number

## SetObjectProperties

call PhysicsEngine . SetObjectProperties

id

x

y

width

height

mass

friction

Updates the properties of an existing object.

#### Parameter

id

#### Type

number

x

number

y

number

width

number

height

number

mass

number

friction

number

## SetObjectSize

call PhysicsEngine . SetObjectSize

id

width

height

Sets the size of an object.

#### Parameter

id

#### Type

number

width

number

height

number

## SetObjectVelocity

```
call PhysicsEngine . SetObjectVelocity  
    id  
    velocityX  
    velocityY
```

Sets the velocity of an object.

Parameter	Type
id	number
velocityX	number
velocityY	number

## SetObjectVelocityX

```
call PhysicsEngine . SetObjectVelocityX  
    id  
    velocityX
```

Sets the X velocity of an object.

Parameter	Type
id	number
velocityX	number

## SetObjectVelocityY

```
call PhysicsEngine . SetObjectVelocityY  
    id  
    velocityY
```

Sets the Y velocity of an object.

Parameter	Type
id	number
velocityY	number

## SetObjectWidth

```
call PhysicsEngine . SetObjectWidth  
    id
```

width

Sets the width of an object.

Parameter	Type
id	number
width	number

## SetParallaxEnabled

```
call PhysicsEngine . SetParallaxEnabled
    enabled
```

Enable or disable the parallax effect.

Parameter	Type
enabled	boolean

## SetSpriteImage

```
call PhysicsEngine . SetSpriteImage
    spriteId
    imagePath
```

Changes the image of a sprite based on its ID.

Parameter	Type
spritId	number
imagePath	text

## SetSpriteOriginPoint

```
call PhysicsEngine . SetSpriteOriginPoint
    spriteId
    originPointStr
    customX
    customY
```

Sets the origin point for a specific sprite.

Parameter	Type
spritId	number
originPointStr	text
customX	number
customY	number

## Shutdown

```
call PhysicsEngine . Shutdown
```

Clean up resources and shut down the physics simulation.

## StartAnimation

```
call PhysicsEngine . StartAnimation  
    imagePathsList  
    frameDurationMs  
    objectId
```

Start animating a sequence of images on a canvas object.

Parameter	Type
imagePathsList	list
frameDurationMs	number
objectId	text

## StartFollowing

```
call PhysicsEngine . StartFollowing  
    followerId  
    leaderId  
    maxFollowDistance  
    stopFollowDistance
```

Make an object follow another object within a specific distance.

Parameter	Type
followerId	number
leaderId	number
maxFollowDistance	number
stopFollowDistance	number

## StartUpdates

```
call PhysicsEngine . StartUpdates  
    updateTimeMs
```

Starts periodic updates for the physics simulation.

Parameter	Type

updateTimeMs

number

## StopAnimation

```
call PhysicsEngine . StopAnimation
    objectId
```

Stop the animation with the specified ID.

Parameter	Type
objectId	text

## StopUpdates

```
call PhysicsEngine . StopUpdates
```

Stops periodic updates for the physics simulation.

## ToggleCollisionBoxesVisibility

```
call PhysicsEngine . ToggleCollisionBoxesVisibility
    showBox
```

Toggle the visibility of collision boxes for all objects.

Parameter	Type
showBox	boolean

## TriggerTimedEvent

```
call PhysicsEngine . TriggerTimedEvent
    id
    triggerTimeMs
```

Triggers a timed event after a delay.

Parameter	Type
id	number
triggerTimeMs	number

## UpdateAngularVelocity

```
call PhysicsEngine . UpdateAngularVelocity
    id
    angularVelocity
```

Updates the angular velocity of an object.

Parameter	Type

<code>id</code>	number
<code>angularVelocity</code>	number

## Properties:

### GetCanvasHeight

 PhysicsEngine . GetCanvasHeight

Property for GetCanvasHeight

### GetCanvasWidth

 PhysicsEngine . GetCanvasWidth

Property for GetCanvasWidth

### SetCanvas

 set PhysicsEngine . SetCanvas to

Sets the Canvas component used for drawing.

### SetCanvasHeight

 set PhysicsEngine . SetCanvasHeight to

Property for SetCanvasHeight

### SetCanvasWidth

 set PhysicsEngine . SetCanvasWidth to

Property for SetCanvasWidth

## Helper:

### TOP\_LEFT

 OriginPoint TOP\_LEFT

Option for TOP\_LEFT

**Returns:** TopLeft

**Deprecated:** *false*

### TOP\_RIGHT

 OriginPoint TOP\_RIGHT

Option for TOP\_RIGHT

**Returns:** TopRight

**Deprecated:** *false*

## BOTTOM\_RIGHT



Option for BOTTOM\_RIGHT

**Returns:** BottomRight

**Deprecated:** *false*

## BOTTOM\_LEFT



Option for BOTTOM\_LEFT

**Returns:** BottomLeft

**Deprecated:** *false*

## CENTER



Option for CENTER

**Returns:** Center

**Deprecated:** *false*

## CUSTOM



Option for CUSTOM

**Returns:** Custom

**Deprecated:** *false*