Realistic Water Physics

Manual

unity asset store link:
http://u3d.as/xnM

Contact:
http://realisticphysics.com

Youtube Demo/Preview videos:
https://youtu.be/cFLZEwuh2Tg

Web Demo:
http://www.realisticphysics.com/Demo/RealisticWaterPhysicsV2.html

Current version: 2.2
Last update: 9/4/16

[This is not a shader!]

Realistic Water Physics is a buoyancy system to make objects float on water and air.

Using material based system and a easy to use interface.

You can use a static or moving water level that build in.

But we recommend that you get one of the supported assets:

Static Water

Demo: https://youtu.be/ruPxr0TKh3s

Ceto: Ocean System

Link: http://u3d.as/k4J

Demo: https://youtu.be/zVvFtfrzXrE

PlayWay Water System

Link: http://u3d.as/kmC

Demo: https://youtu.be/83eF3kLzj24

AQUAS Water LITE

Link: http://u3d.as/nsq

AQUAS Water/River Set

Link: http://u3d.as/mVN

Dynamic Water System

Link: http://u3d.as/5e2
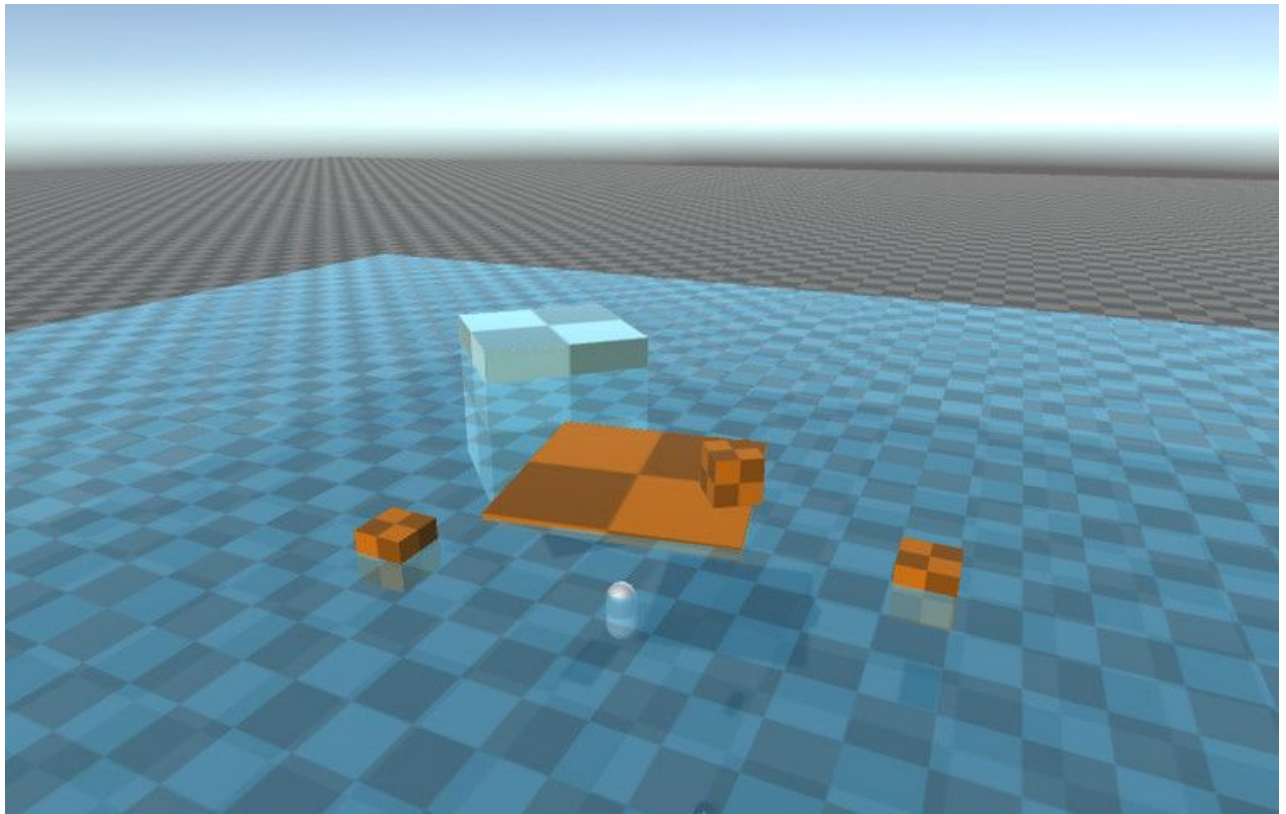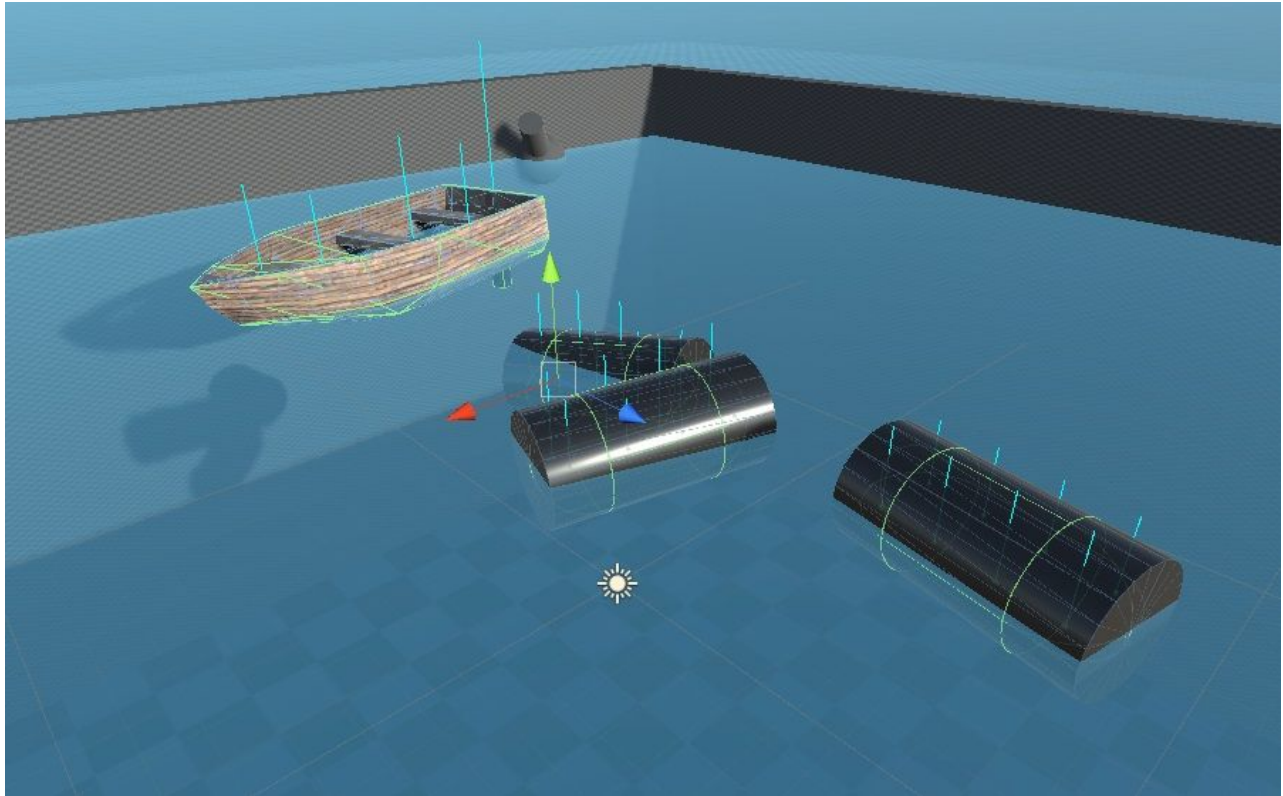
Content

Upgrade from V1.0 & V1.1

If you upgrade from version 1.0 or 1.1, i'm sad to say it but you will have to
recreate all your existing floating objects.
This is due to a fix i had to make to improve some bad code.
The best way to do it is:

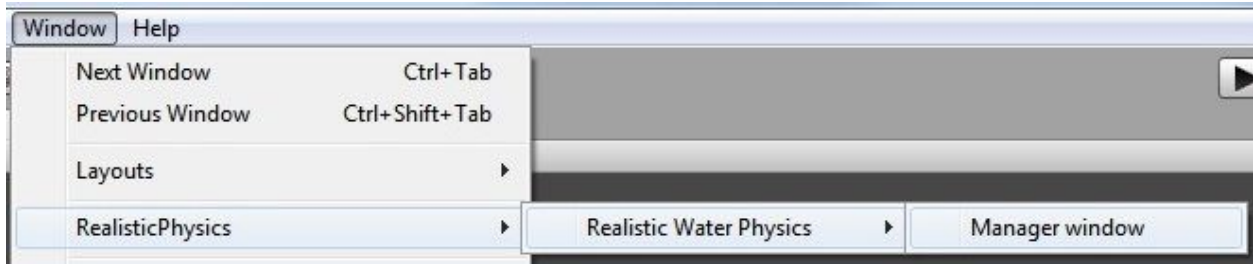**Window > Realistic water physics > Manager window**
The **manage gameobjects** tab, this will filter out existing gameobjects
with realistic water physics.
And one by one, (or multi select) redo the setups.

In the future it will be avoided.

Setup

In the 'Window' menu at the top you will find the
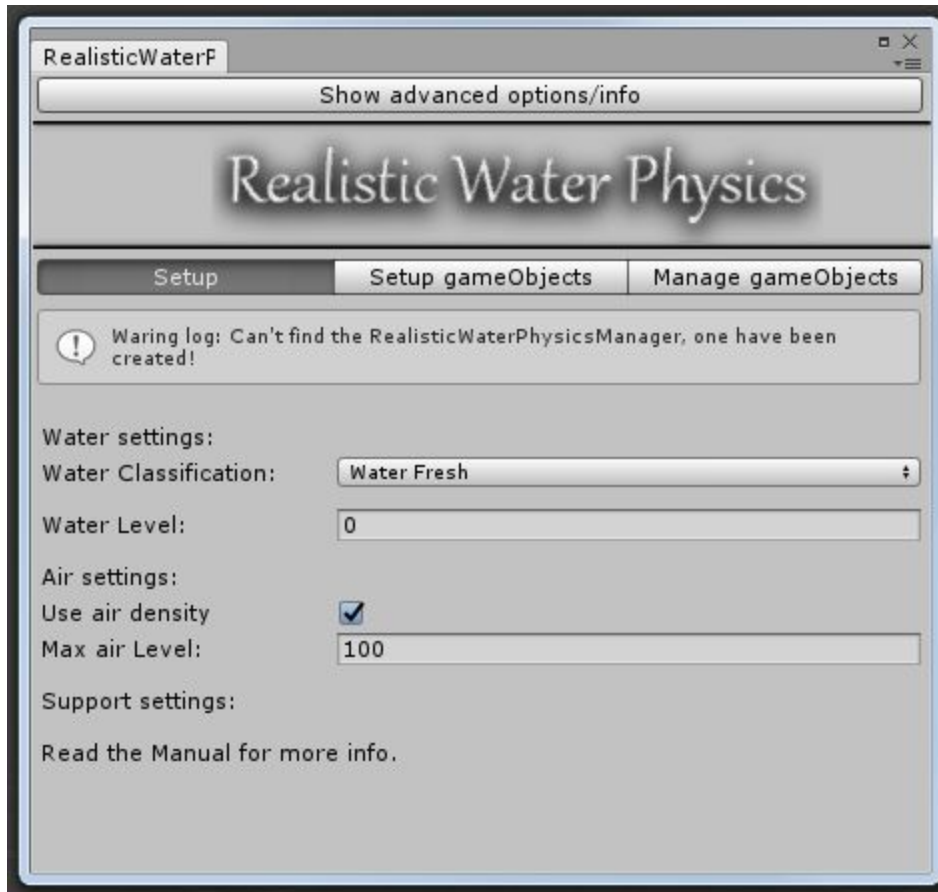'RealisticPhysics' >'Realistic water physics' > 'Manager window' option.

Open that and a gameobject called 'RealisticWaterPhysicsManager' will be created for you.

(This will be hidden by default, and will show up if you enable advanced options)

Manager window

setup options

Water Classification
The type of water is in your game, you can select on of the included 16 Liquid Materials.

Water level
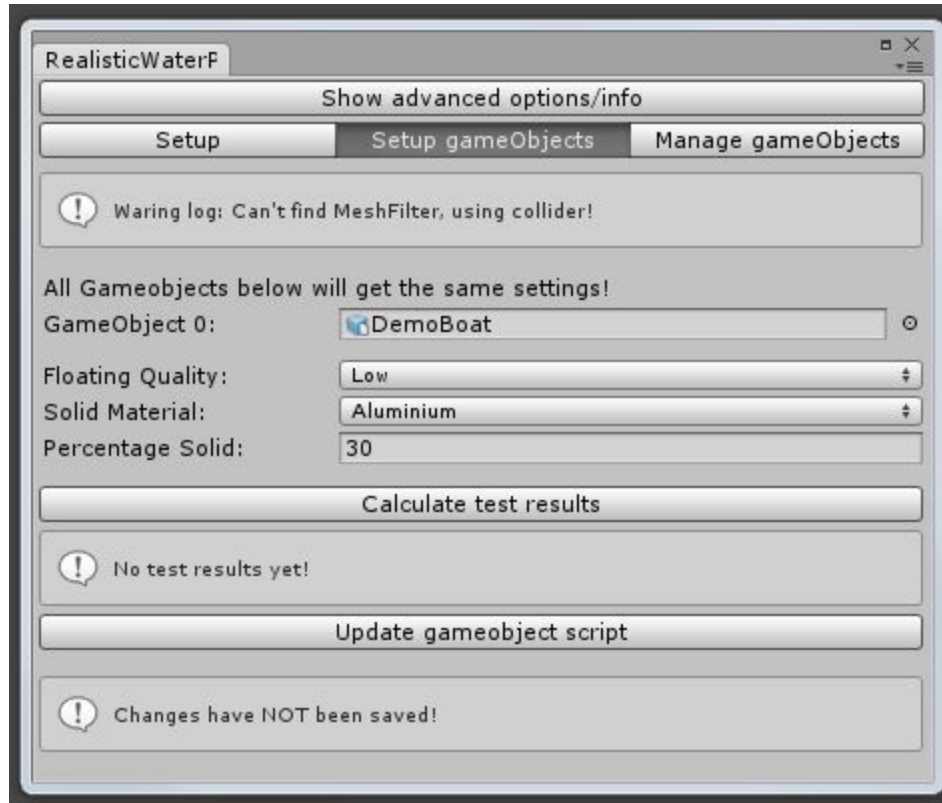In your game scene where is the max water level at (y value)

Use air density
Air has a density of 1.2kg/m3, enable this option and it will be used in calculations.

Air level
this will affect how high objects with a lower density than air will fly to.

setup gameObjects

Click in the 'Hierarchy' on the gameobject.

Floating Quality
The higher this option is set to the more time calculations will take.
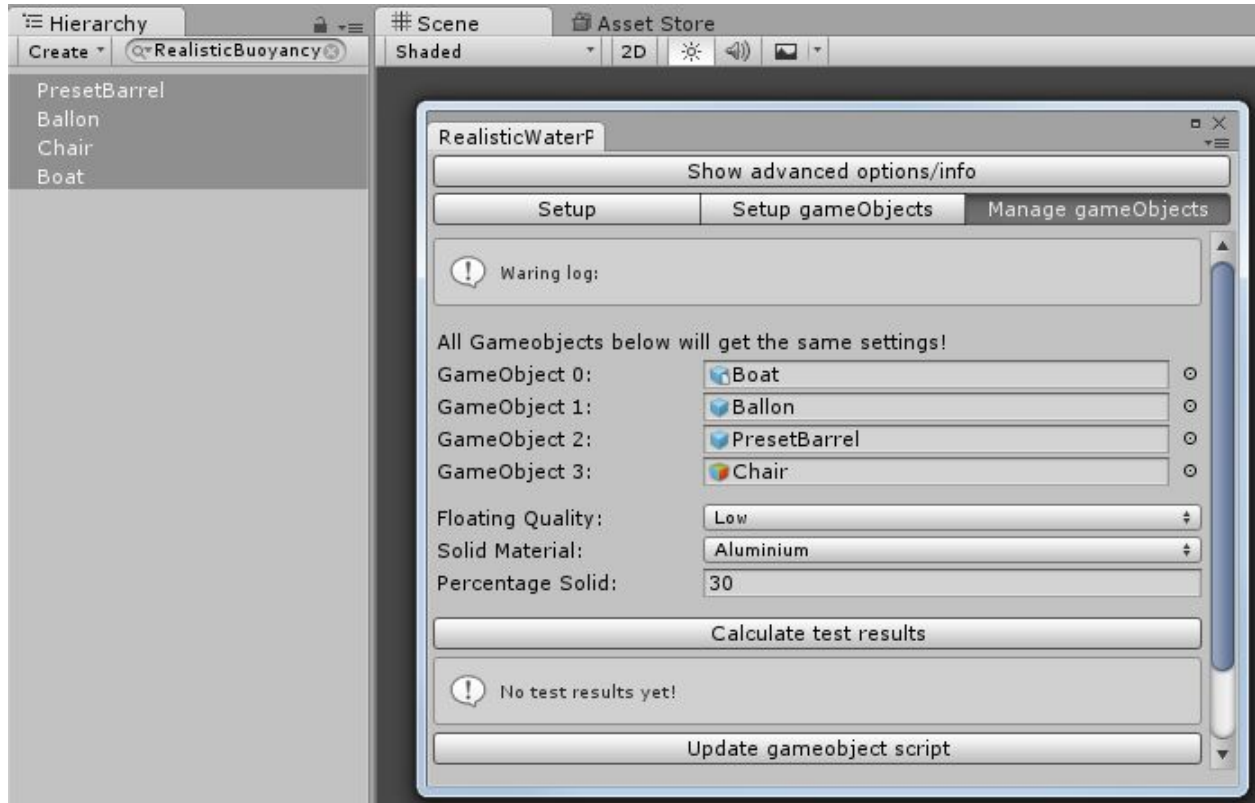But the more realistic it will act.

Solid Material
Chose a type of material that fits the object, you can select on of the
included 55 Solid Materials.

Percentage Solid
How much of the object is solid, for instance, a cube will be 100% solid,
but a donut shape will not.

Manage gameObjects

The Manage gameObject tab will automatically search for gameobject with existing settings.

You can select one at the time and manage their existing settings.
Or multi-select many at the same time allowing you to create a lot of objects with the same settings at once.

Calculate test results button
Press this button and the script will do a calculation for you without running the game scene.

This can be useful when you are unsure what the result will be.
Recommended to always use this before saving.
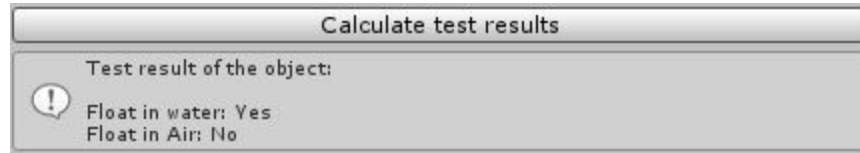
Depending on the state of the window at the bottom you will see one of the following buttons:

First select a gameobject button
This means you still need to select a gameobject from the Hierarchy

Create gameobject script button
Pressing this button will complete the setup for the selected gameobject.
Applying the script and required components.

Update gameobject script button
Pressing this button will update the current selected gameobject, that already got a existing setup installed.

Example Scripts

Included in version 1.2 and above are example scripts
You'r free to use them in your game as you like.

ExternalWaterLevelManager script

Will handle moving water.
Just drag and drop it on the gameobject that acts as you water.

fastUpdates
Switch from fixed to normal update.

MinSeaLevel
Lowest water level.

MaxSeaLevel
Highest water level.

CycleSpeed
How long needs the system to wait before a new water level is picked.

MovementSpeed
How fast is water moving?

RealisticRiverFlow script

Will act as a water current, adding force to a object to move it through the water.

ForceOnWaterLevel
If enabled it will always stay below the water.

GizmosIconMesh
The mesh that's used to draw a direction of the current
This is only in the editor.

currentForce
How much force will be applied to objects within the area

Notes

- This system will force change the mass of riggedbodys, its calculated based on the objects volume and material type selected.

- The object must have any kind of collider!, if none found one will be added!

- Don't manualy add the **RealisticBuoyancy** to an object, as it will miss the settings! Always use the **Manager window**

- To enable debug mode: Open the **RealisticWaterPhysics.cs** file and change the **static bool DebugInfoEnabled = true;**

Q & A

Q: I still don't understand how to create a floating object.
A: A demo video can be found here: https://youtu.be/cFLZEwuh2Tg

Q: How do i get the water level?

A: In any c# script you can get the current water level like:

float waterLeveL = RealisticWaterPhysics.currentWaterLevel;

Q: How do i change the water level in runtime?

A: Like above you can change the water level like:

RealisticWaterPhysics.currentWaterLevel = 10.0f;

Q: I got a script to handle the water level but it gets ignored,
what am i doing wrong?

A: Open the **Realistic water physics > Manager window** and show
Advanced option, now enable the option **Use external water level**

Q: I'm getting a error saying:

There is no MeshFilter or Collider on this object!

What do i do?

A: The object must have at least a collider of any Type, or a Meshfilter,
best is both.

Q: I'm Getting a error saying:

[Realistic Water Physics] Object is missing a mesh filter or collider.

What do i do?

A: Same as above.

Q: I'm getting a error saying:

Not allowed to access vertices on mesh

What do i do?

A: To fix this error message you need to go to the raw model and goto
Import > Meshes > Read/Write Enable' > True

Q: I did the setup and the setup gameobjects, but my objects won't float.

What do i do?

A: Please check if there are no errors, And check if the percentage solid is not set to 0.

Q: How do i create my own new material type?

A: In the **PhysicsMaterialsList.cs** Go to the type you want to add example:

you want to add Dirt, Go to **SolidsMaterialList**

Add the name of your new material there, (**Dirt**)

and then go to the **getSolidMaterialValue** and add:

case SolidsMaterialList.Dirt: return 800f;
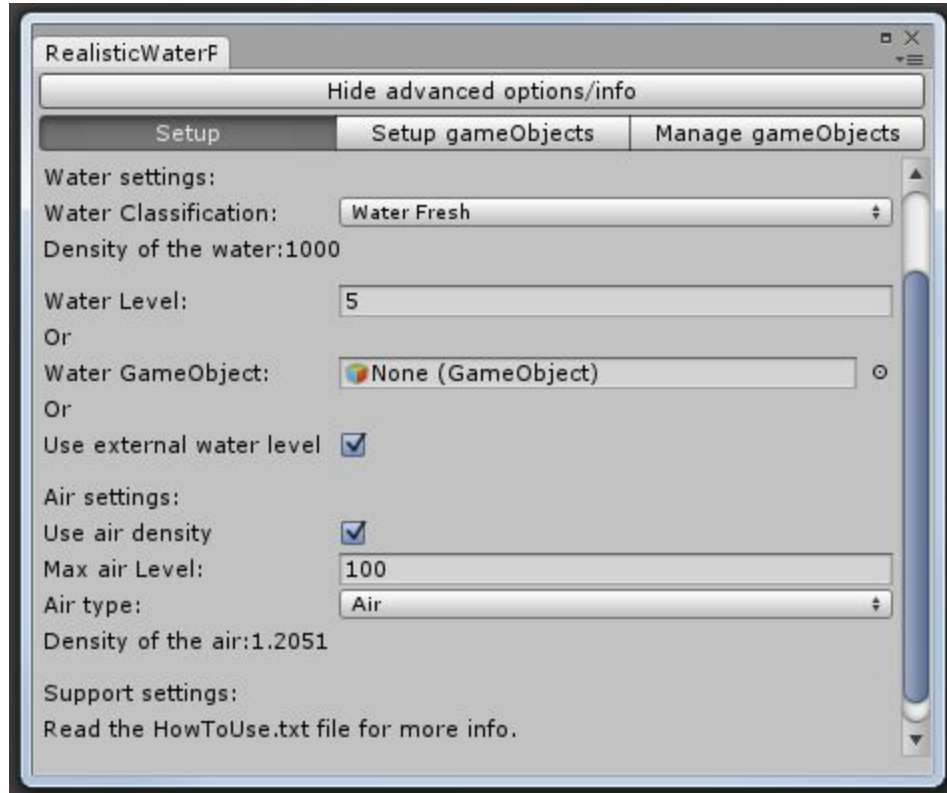
The return value will be the density of Dirt)

Q: If i move a object with Rigidbody.MovePosition()

The object flips over, what do i do?

A: Use This.GetComponent <RealisticBouyancy>().MovePosition() instead.

This will limit the possibility that it will flip over.

setup options - Advanced options

Water Gameobject

You can select a gameobject as water level.

Use External water level

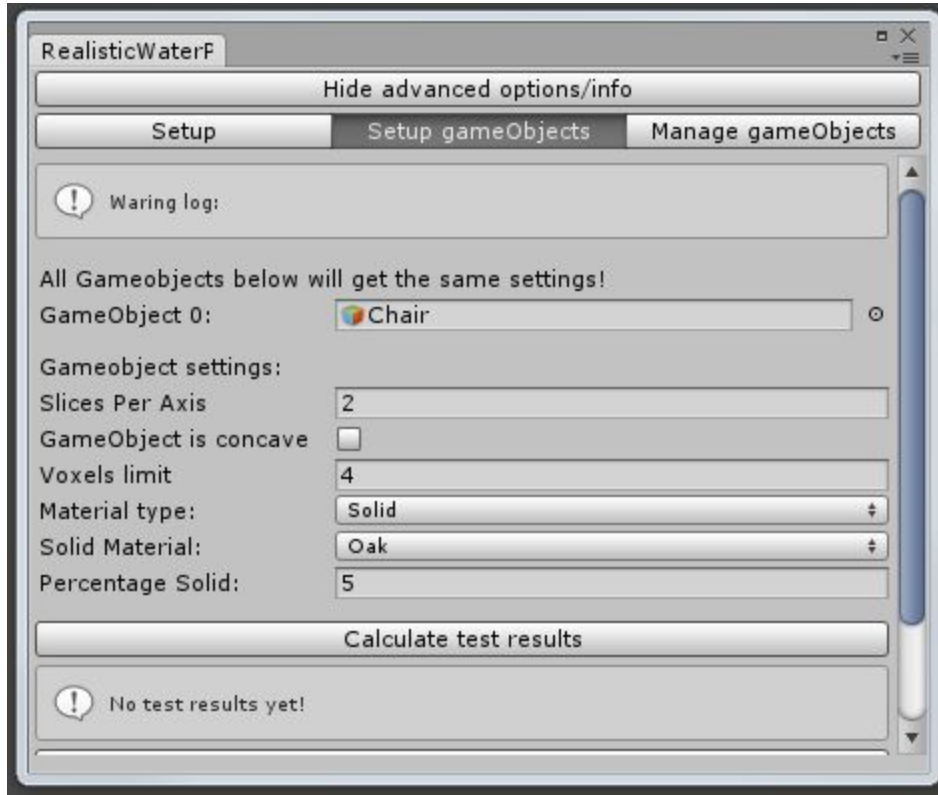Allow you to change the water level in runtime with a script.

For more info read the '**Examples**' above..

Air type

Here you can select the type of air that's in the game.

You can select one of the included 22 Gas Materials.

setup gameObjects - Advanced options

Slices Per Axis
The amount of point to check per axes (x,y,z)

GameObject is concave
Does the object have a shape like the inside of a bowl (curving inward)
then set it to true.   *(Will not always work)*

Voxels limit
The max number of center points.
Each **Slices Per Axis** will count for 3 **Voxels.**

Material Type

This will allow you to not only use solids as materials but also liquids and gases materials, allowing you to select one of the included 96 materials!

Liquids Material
Chose a Liquid Material that fits the object.

Gases Material
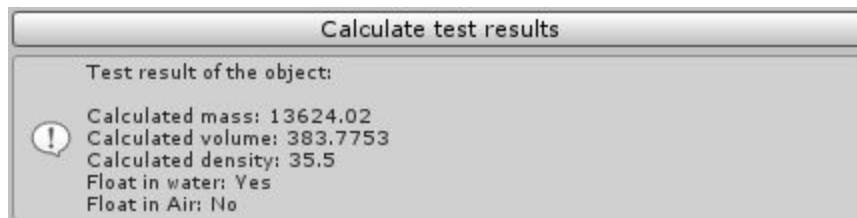Chose a Gas Material that fits the object.

Solids Material
Chose a Solid Material that fits the object.

Calculate test results button
Press this button and the script will do a calculation for you without running the game scene.
This can be useful when you are unsure what the result will be.
Recommended to always use this before saving.

Calculate test results

Test result of the object:

Calculated mass: 13624.02
Calculated volume: 383.7753
Calculated density: 35.5
Float in water: Yes
Float in Air: No

How to use Support

To enable support for another asset, you need to go to:
Edit >Project Setting >Player >Other Settings >Scripting Define Symbols

And add one or more of the following codes:

Asset name	Code
Ceto: Ocean System	**CETO;**
PlayWay Water System	**PW;**
AQUAS Water Lite	**AQUAS;**
AQUAS Water/River Set	**AQUAS;**
Dynamic Water System	**DW;**

[If you don't do this, support options will be hidden.]

Known issues

- **Changing the settings on a objects using the manager that's also a prefab will not overwrite prefab settings.**
  You need to break the instance first!

- **Hiding the advanced settings sometimes ignores later changes on some settings.**

- **Changing the scale of the object will not update the volume the correct way.**

- **A imported mesh where the center is outside the model will sometimes try to flip the object around.**

If you're a developer of a water system or other asset that wants support build into Realistic Water Physics.

Contact us at: contact@realisticphysics.com