Creating virtual scenes with A-Frame

A-Frame Course I

Section 3

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doi.org/XXX/zenodo.XXX

This work was supported by the Autonomous Community of Madrid (Spain) with a grant for industrial doctorates (IND2022/SOC-23503) with the collaboration agreement with Prodigioso Volcán S.L; Universidad Rey Juan Carlos (ID 501100007511).

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CREATING VIRTUAL SCENCES WITH A-FRAME | A-FRAME COURSE I

In this course you will learn about A-Frame, an HTML-based framework that allows you to create Virtual Reality scenes and immersive web environments using the tool's own tags and components.

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Section 3

A-Frame. Basic elements - geometries

SECTION OBJECTIVES

- Knowing the basic a-frame elements for the construction of a virtual scene.
- Working with element attributes
- Creation of a virtual museum-room

Section points

1 2 3 4

Section points

Click on each of the points to find out what we will be studying in this module.

1. Introduction to geometries

As we have seen in the previous module, the default code offered by the a-frame platform is configured by means of basic elements in the form of geometries. These basic geometries, which appear in the scene, are a green plane (a-plane), a red sphere (a-sphere), a blue box (a-box) and a yellow cylinder (a-cylinder).

Geometries are basic a-frame elements that help to set up a virtual scene. However, if we want our virtual scene to have valuable content, it is necessary to add other kinds of elements that we will see in the next module.

In this module we will learn all these basic elements and how to work with them to start building our virtual scene.

i We will work with the attributes of each basic geometry.

BASIC A-FRAME SCENE

2. Geometries

2. 1. Basic element a-box

The a-box element is perhaps the most useful element when starting to build our virtual scene. These geometries can be used to create the **walls**, **floor** and **ceiling** of our virtual room. In the practical part of this module we will see how.

Basic line of code to add a box (a-box) to our scene:

```
<!-- Basic box. -->
<a-box color="tomato" depth="2" height="4" width="0.5"></a-box>
```

How to search for documentation?

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How to find for elements?

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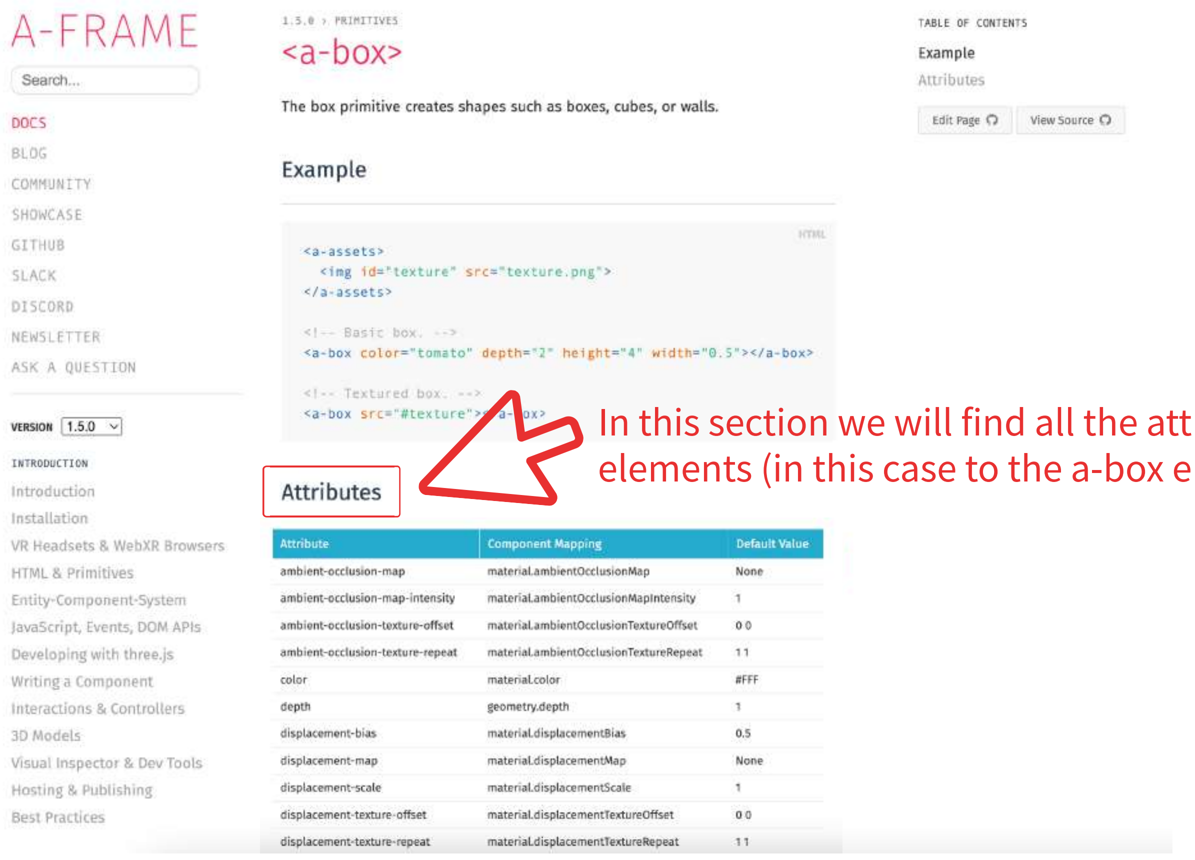
Attributes

A-BOX ELEMENT

In this window we find all the documentation related to the box element.



1.5.0 › PRIMITIVES

<a-box>

The box primitive creates shapes such as boxes, cubes, or walls.

Example

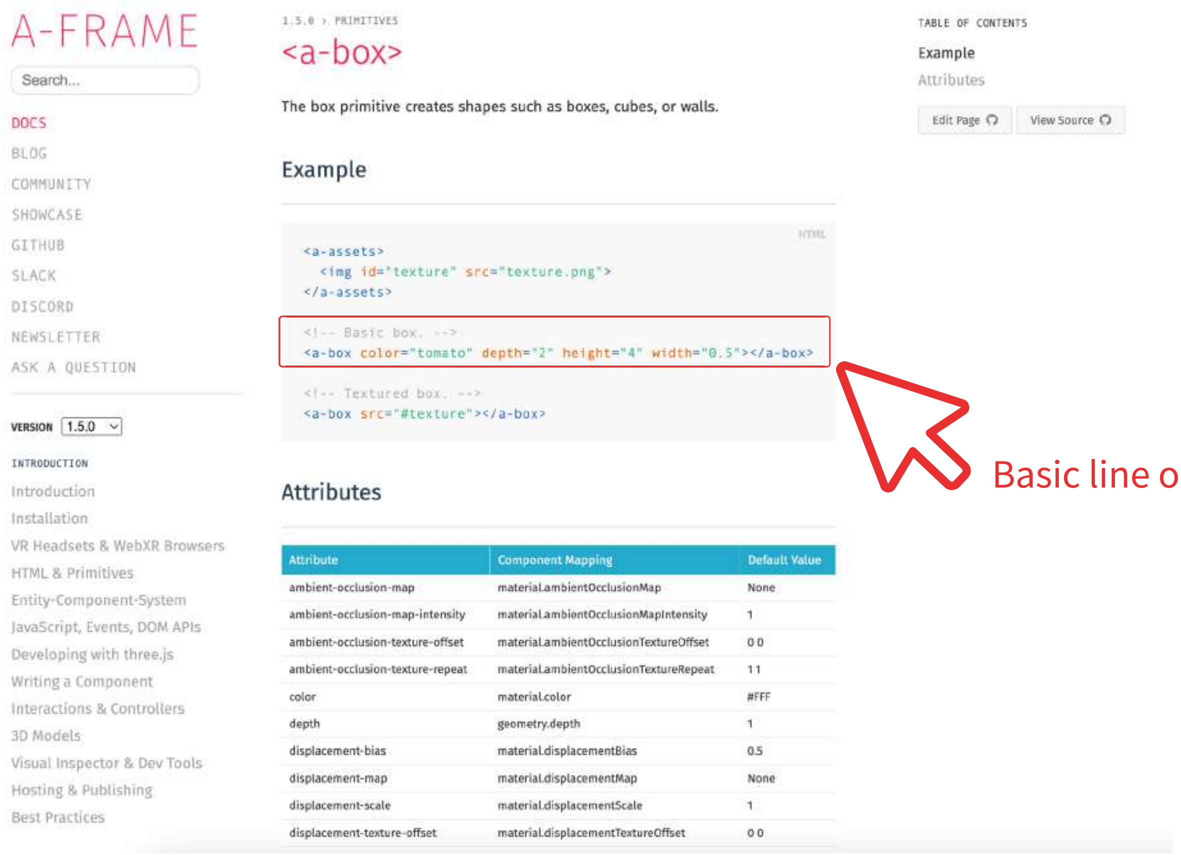
```html
<a-assets>
  <img id="texture" src="texture.png">
</a-assets>

<!-- Basic box. -->
<a-box color="tomato" depth="2" height="4" width="0.5"></a-box>

<!-- Textured box. -->
<a-box src="#texture"></a-box>
```

Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
depth	geometry.depth	1
displacement-bias	material.displacementBias	0.5
displacement-map	material.displacementMap	None
displacement-scale	material.displacementScale	1
displacement-texture-offset	material.displacementTextureOffset	0 0
displacement-texture-repeat	material.displacementTextureRepeat	1 1

In this section we will find all the attributes that we can add to the elements (in this case to the a-box element).

In this window we find all the documentation related to the box element.



1.5.0 › PRIMITIVES

<a-box>

The box primitive creates shapes such as boxes, cubes, or walls.

Example

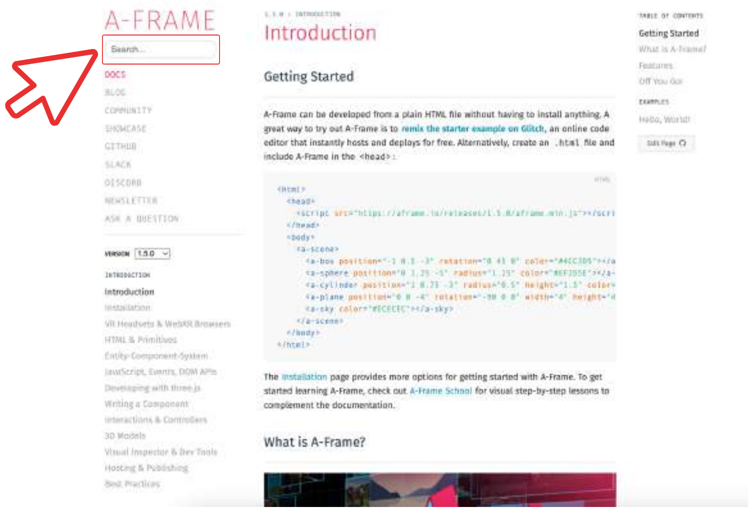
```html
<a-assets>
  <img id="texture" src="texture.png">
</a-assets>

<!-- Basic box. -->
<a-box color="tomato" depth="2" height="4" width="0.5"></a-box>

<!-- Textured box. -->
<a-box src="#texture"></a-box>
```

Basic line of code to add the box

Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
depth	geometry.depth	1
displacement-bias	material.displacementBias	0.5
displacement-map	material.displacementMap	None
displacement-scale	material.displacementScale	1
displacement-texture-offset	material.displacementTextureOffset	0 0

To find the necessary documentation we can do it from the A-Frame web browser or directly from Google.



A-FRAME

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VERSION 1.5.0

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1.5.0 › INTRODUCTION

Introduction

Getting Started

A-Frame can be developed from a plain HTML file without having to install anything. A great way to try out A-Frame is to remix the starter example on Glitch, an online code editor that instantly hosts and deploys for free. Alternatively, create an `.html` file and include A-Frame in the `<head>`:

```
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></scri
  </head>
  <body>
    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a
      <a-sphere position="0 1.25 -5" radius="1.25" color="#EF2D5E"></a-
      <a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color=
      <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

The installation page provides more options for getting started with A-Frame. To get started learning A-Frame, check out A-Frame School for visual step-by-step lessons to complement the documentation.

What is A-Frame?

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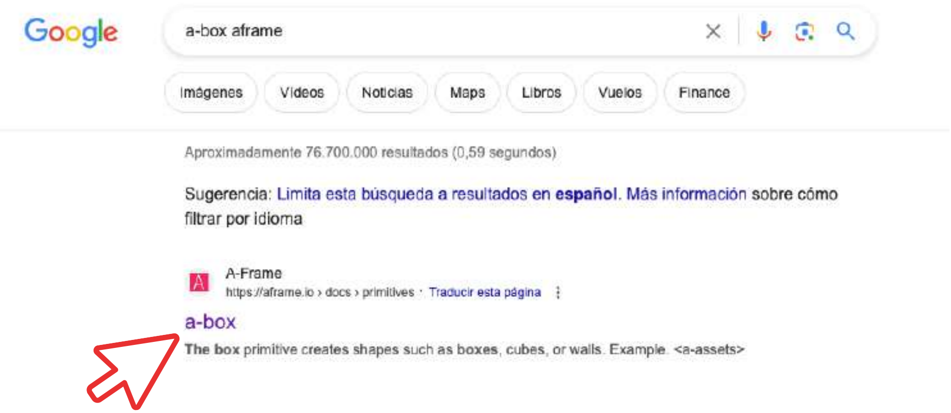

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A-Frame
https://aframe.io › docs › primitives · Traducir esta página

a-box

The box primitive creates shapes such as boxes, cubes, or walls. Example. <a-assets>

2. 2. Basic element a-sphere

The a-sphere element is used to add spherical geometries to the scene. The most useful use is when developing video games with A-Frame to build balls in the scene, in our case, we will use the sphere as a reference point to place ourselves in the scene.

Basic line of code to add a sphere (a-sphere) to our scene:

```
<a-sphere color="yellow" radius="5" ></a-sphere>
```

How to search for documentation?

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How to find for elements?

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Code lines

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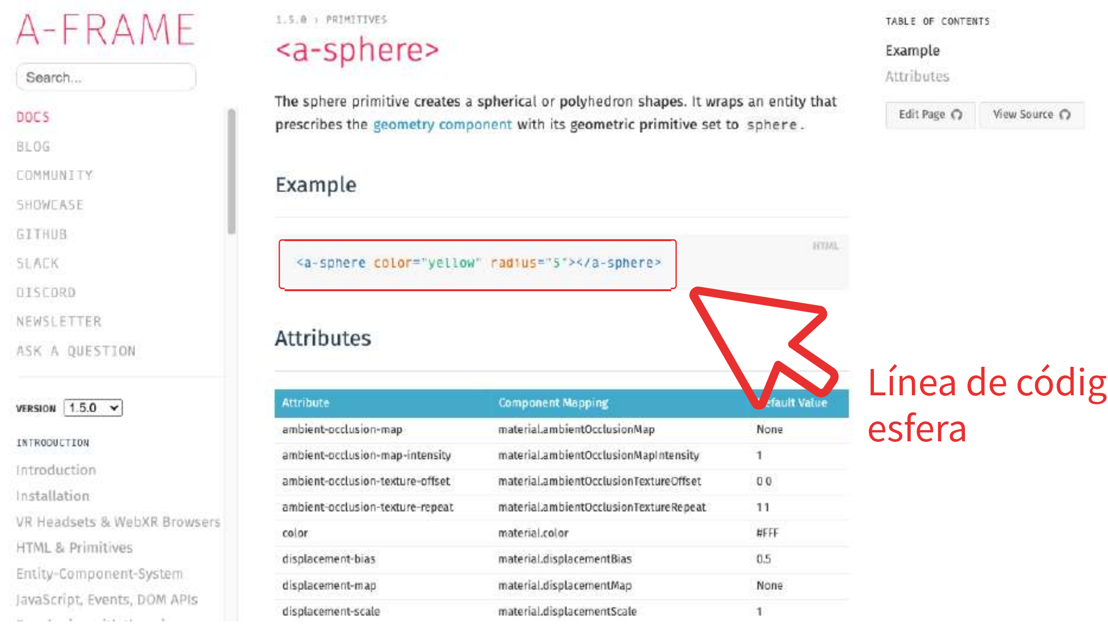
Attributes

A-SPHERE ELEMENT

In this window we find all the documentation related to the sphere element (a-sphere).



1.5.0 › PRIMITIVES

<a-sphere>

The sphere primitive creates a spherical or polyhedron shapes. It wraps an entity that prescribes the geometry component with its geometric primitive set to `sphere`.

Example

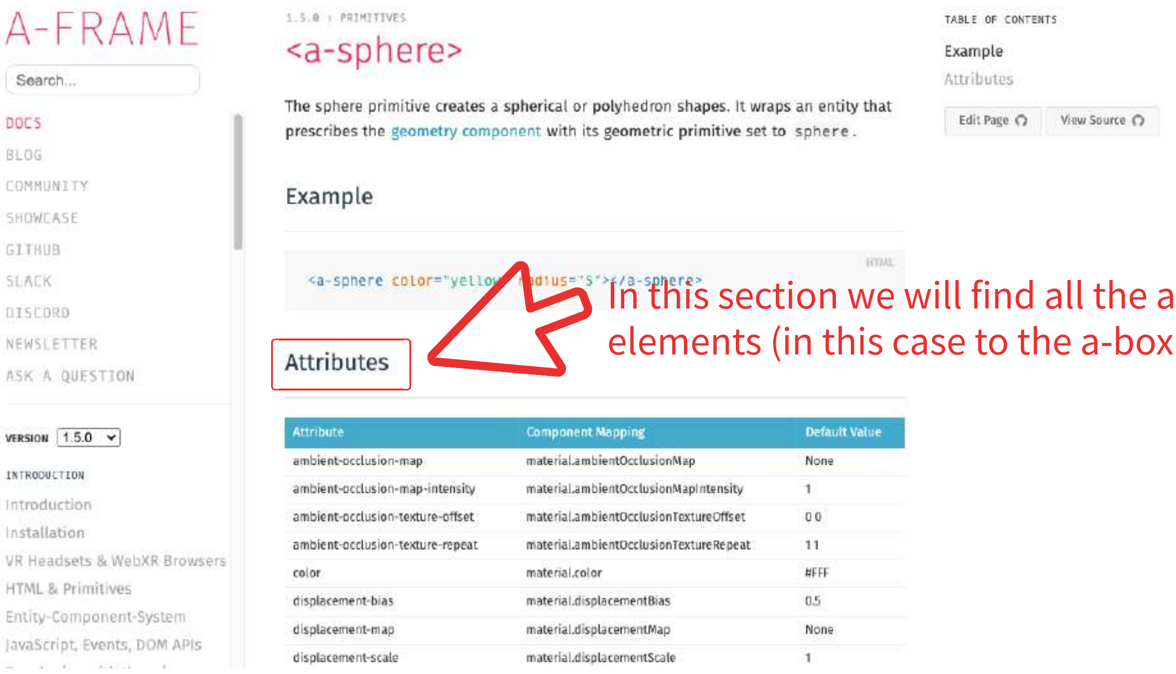
```html
<a-sphere color="yellow" radius="5"></a-sphere>
```

Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
displacement-bias	material.displacementBias	0.5
displacement-map	material.displacementMap	None
displacement-scale	material.displacementScale	1

Línea de código básica para añadir una esfera

In this window we find all the documentation related to the sphere element.



<a-sphere>

The sphere primitive creates a spherical or polyhedron shapes. It wraps an entity that prescribes the geometry component with its geometric primitive set to `sphere`.

Example

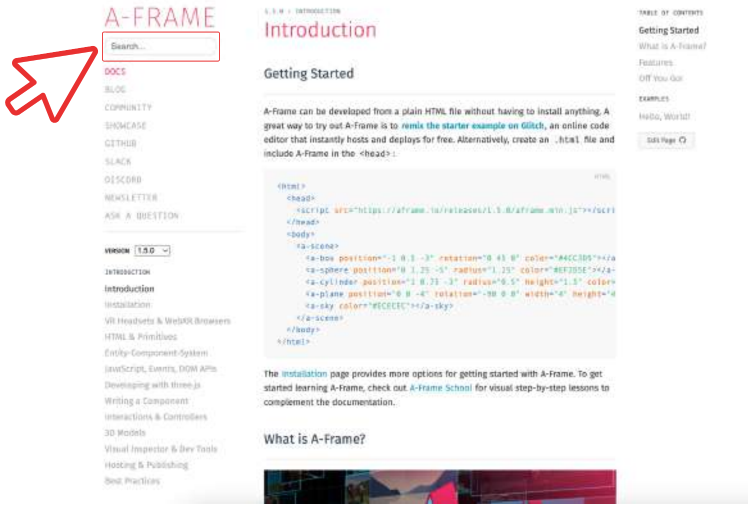
```html
<a-sphere color="yellow" radius="5"></a-sphere>
```

Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
displacement-bias	material.displacementBias	0.5
displacement-map	material.displacementMap	None
displacement-scale	material.displacementScale	1

In this section we will find all the attributes that we can add to the elements (in this case to the a-box element).

To find the necessary documentation we can do it from the A-Frame web browser or directly from Google.



Introduction

Getting Started

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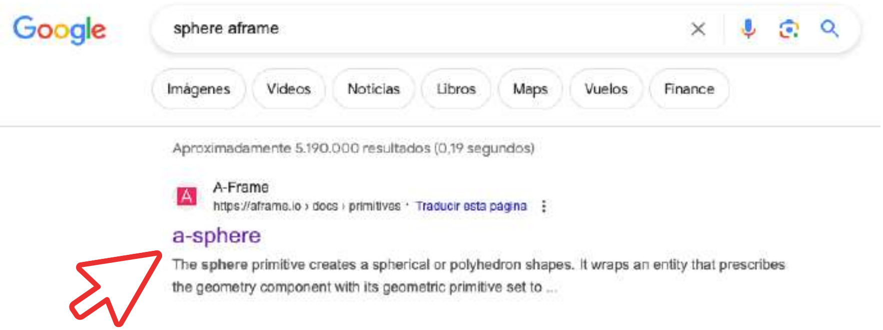
```
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></scri
  </head>
  <body>
    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a
      <a-sphere position="0 1.25 -5" radius="1.25" color="#EF2D5E"></a-
      <a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color=
      <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

The installation page provides more options for getting started with A-Frame. To get started learning A-Frame, check out A-Frame School for visual step-by-step lessons to complement the documentation.

What is A-Frame?



Aproximadamente 5.190.000 resultados (0,19 segundos)

A-Frame
https://aframe.io › docs › primitives · Traducir esta página

a-sphere

The sphere primitive creates a spherical or polyhedron shapes. It wraps an entity that prescribes the geometry component with its geometric primitive set to ...

In this geometry we see the attribute "radius". This attribute indicates the radius of the sphere.

2. 3. Basic element a-plane

This element is mainly used to generate planes such as floors or surfaces. In our virtual scene we will not use it to generate the floor of the museum-room, but we will use a box instead.

Basic line of code to add a plane (a-plane):

```
<!-- Basic plane. -->
<a-plane color="#CCC" height="20" width="20" ></a-plane>
```

How to search for documentation?

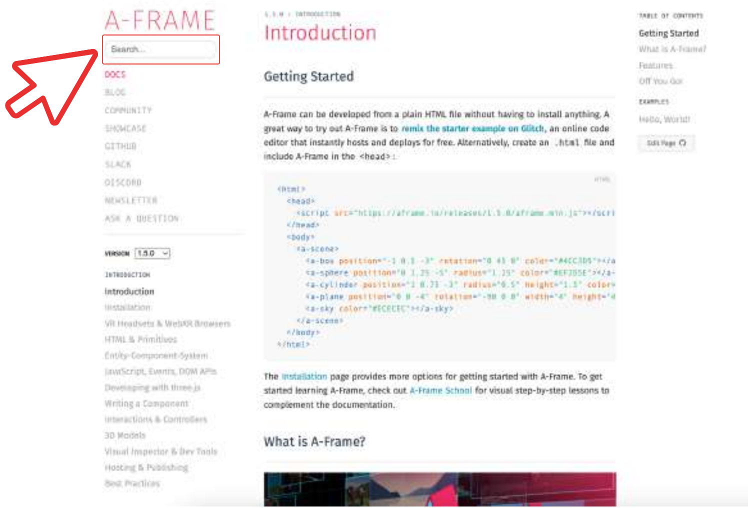
1 How to find for elements?

2 Code lines

3 Attributes

A-PLANE ELEMENT

To find the necessary documentation we can do it from the A-Frame web browser or directly from Google.



1.5.0 › INTRODUCTION

Introduction

Getting Started

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    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a
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      <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

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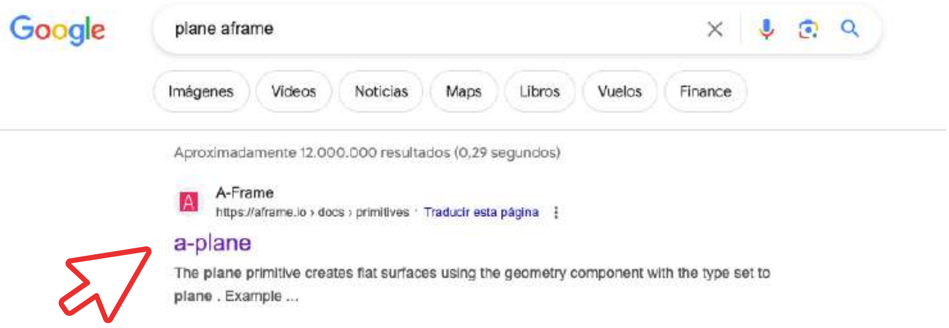
What is A-Frame?



plane aframe

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A-Frame
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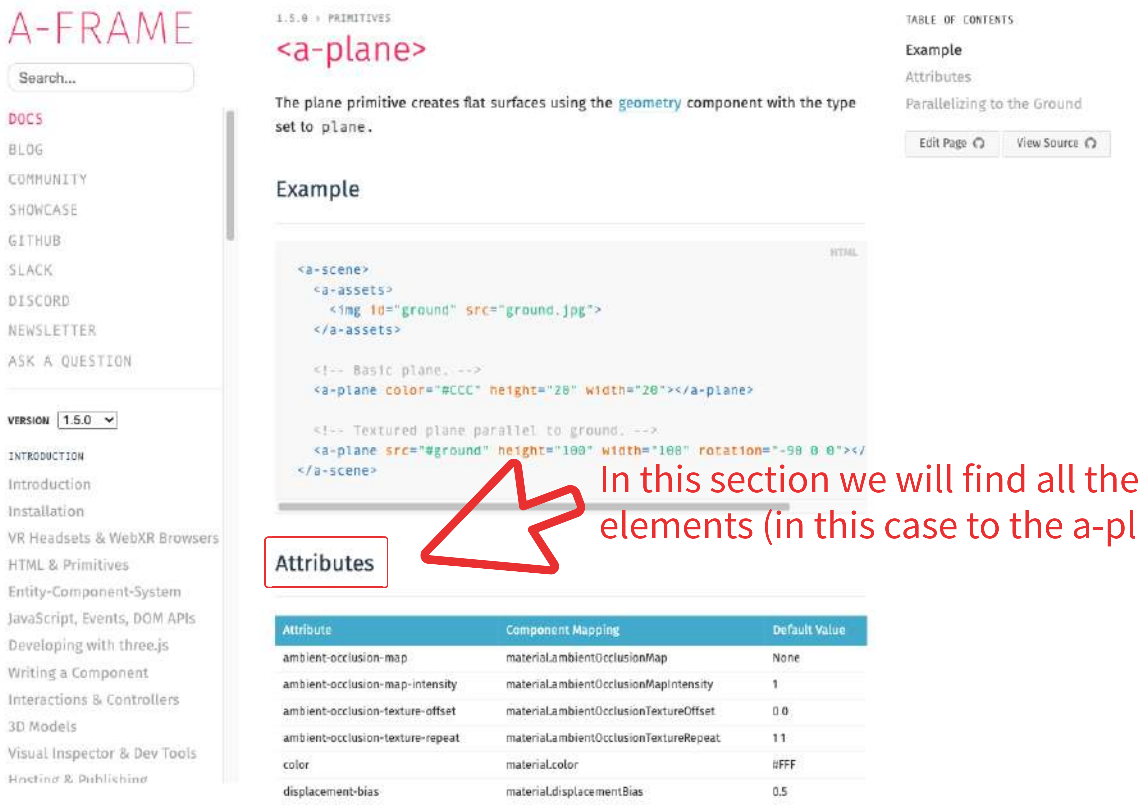
a-plane

The plane primitive creates flat surfaces using the geometry component with the type set to plane . Example ...

In this window we find all the documentation related to the plan element.



<a-plane>

The plane primitive creates flat surfaces using the geometry component with the type set to `plane`.

Example

```
<a-scene>
  <a-assets>
    <img id="ground" src="ground.jpg">
  </a-assets>

  <!-- Basic plane. -->
  <a-plane color="#CCC" height="20" width="20"></a-plane>

  <!-- Textured plane parallel to ground. -->
  <a-plane src="#ground" height="100" width="100" rotation="-90 0 0"></
</a-scene>
```

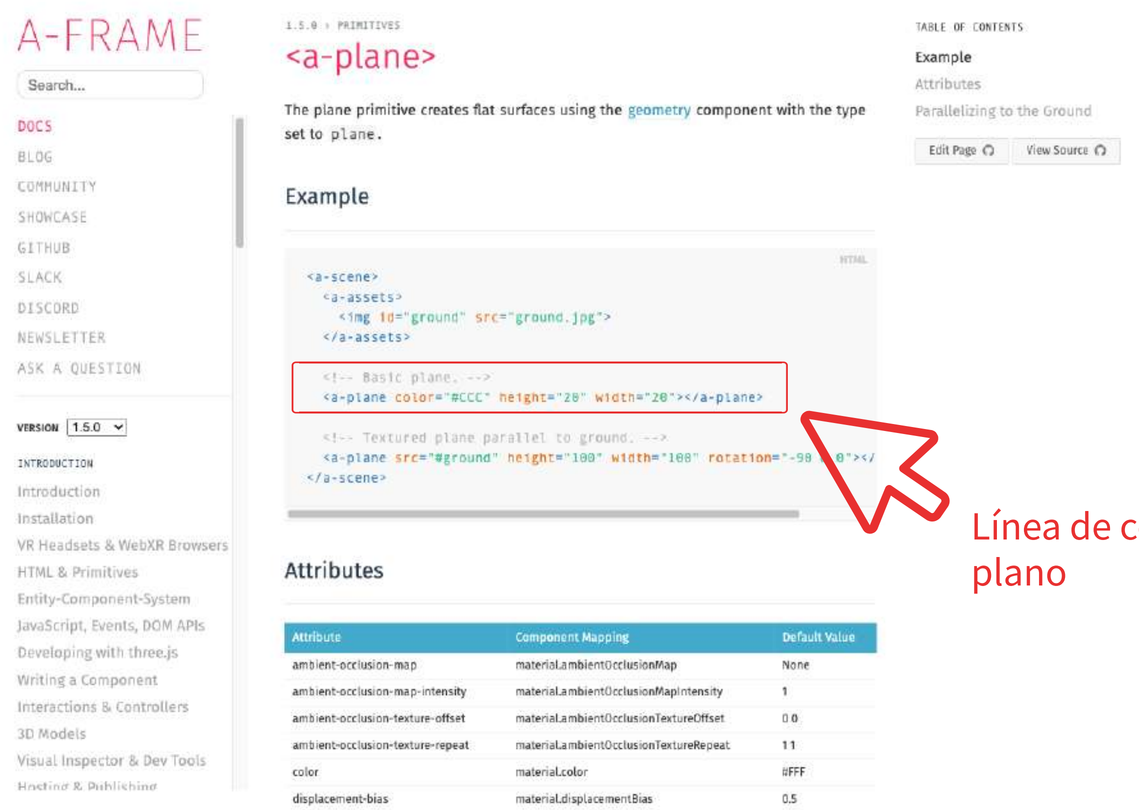
Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
displacement-bias	material.displacementBias	0.5

In this section we will find all the attributes that we can add to the elements (in this case to the a-plane element).

Note that the color attribute can be modified by hexadecimal code (#FFFFFFFF) or by indicating it textually, obviously, the hexadecimal code offers more color possibilities.

In this window we find all the documentation related to the plane element (a-plane).



<a-plane>

The plane primitive creates flat surfaces using the geometry component with the type set to `plane`.

Example

```html
<a-scene>
  <a-assets>
    <img id="ground" src="ground.jpg">
  </a-assets>

  <!-- Basic plane. -->
  <a-plane color="#CCC" height="20" width="20"></a-plane>

  <!-- Textured plane parallel to ground. -->
  <a-plane src="#ground" height="100" width="100" rotation="-90 0 0"></
</a-scene>
```

Attributes

Attribute	Component Mapping	Default Value
ambient-occlusion-map	material.ambientOcclusionMap	None
ambient-occlusion-map-intensity	material.ambientOcclusionMapIntensity	1
ambient-occlusion-texture-offset	material.ambientOcclusionTextureOffset	0 0
ambient-occlusion-texture-repeat	material.ambientOcclusionTextureRepeat	1 1
color	material.color	#FFF
displacement-bias	material.displacementBias	0.5

Línea de código básica para añadir un plano

2. 3. Basic element a-sky

This element sets the environment/background of the scene, it can be a color or a 360° image.

Basic line of code to add a background (a-sky):

```
<a-sky color="#6EBAA7"></a-sky>
```

If we want to add a 360 image, we will have to use the src attribute.

```
<a-sky src="url"></a-sky>
```

How to search for documentation?

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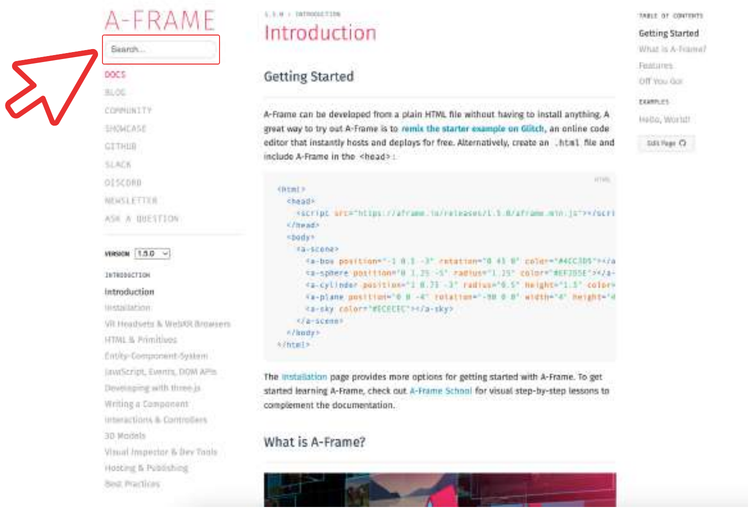
ELEMENTO A-SKY

The example uses:

```
<a-sky src="https://cdn.glitch.global/6129616c-d685-405f-9e5a-3869316b8be0/entorno_universidad0001.jpg?v=1655202508267"></a-sky>
```

Check the link: https://cdn.glitch.global/6129616c-d685-405f-9e5a-3869316b8be0/entorno_universidad0001.jpg?v=1655202508267

To find the necessary documentation we can do it from the A-Frame web browser or directly from Google.



1.5.0 › INTRODUCTION

Introduction

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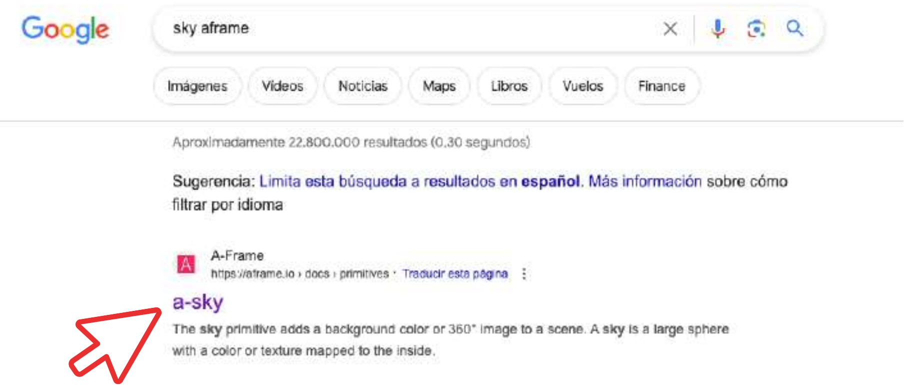
```html
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></scri
  </head>
  <body>
    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a
      <a-sphere position="0 1.25 -5" radius="1.25" color="#EF2D5E"></a-
      <a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color=
      <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

The installation page provides more options for getting started with A-Frame. To get started learning A-Frame, check out A-Frame School for visual step-by-step lessons to complement the documentation.

What is A-Frame?



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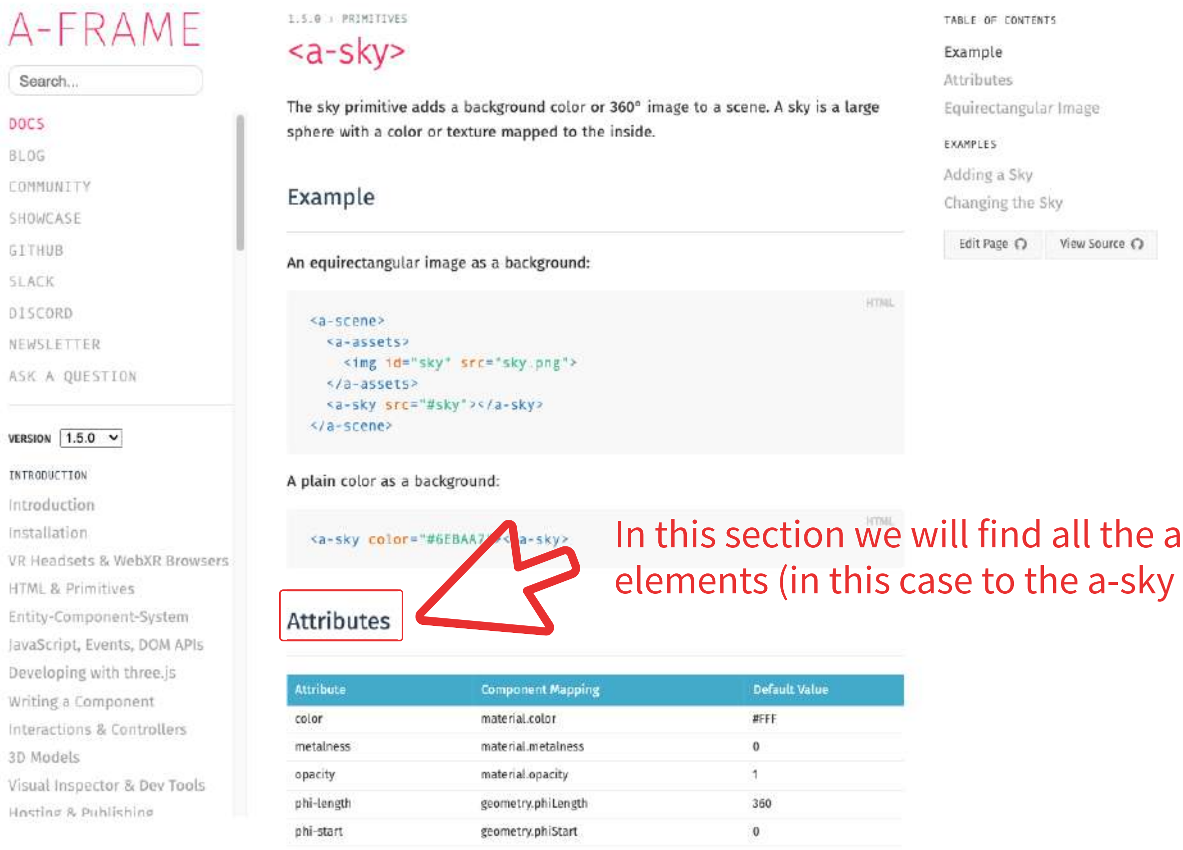
A-Frame
https://aframe.io › docs › primitives · Traducir esta página

a-sky

The sky primitive adds a background color or 360° image to a scene. A sky is a large sphere with a color or texture mapped to the inside.

In this window we find all the documentation related to the plan element.



<a-sky>

The sky primitive adds a background color or 360° image to a scene. A sky is a large sphere with a color or texture mapped to the inside.

Example

An equirectangular image as a background:

```html
<a-scene>
  <a-assets>
    <img id="sky" src="sky.png">
  </a-assets>
  <a-sky src="#sky"></a-sky>
</a-scene>
```

A plain color as a background:

```html
<a-sky color="#6EBAA7"></a-sky>
```

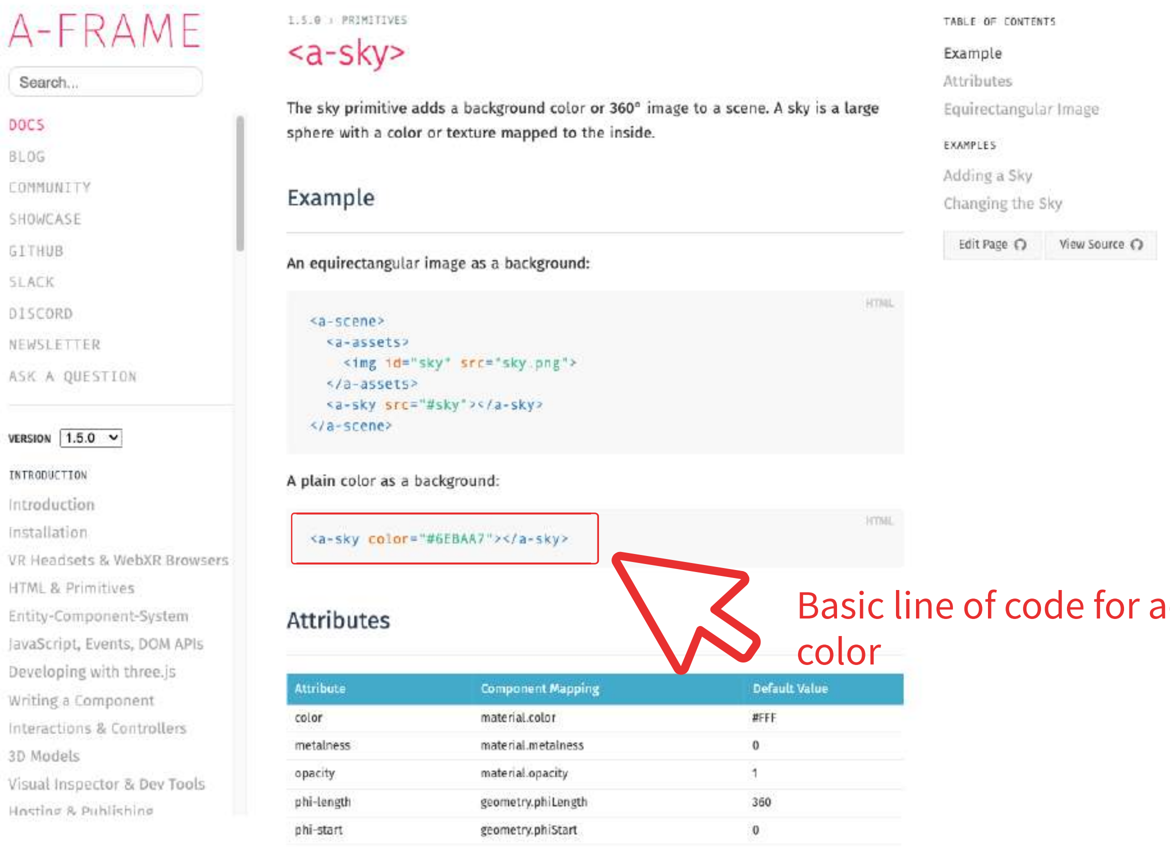
Attributes

Attribute	Component Mapping	Default Value
color	material.color	#FFF
metalness	material.metalness	0
opacity	material.opacity	1
phi-length	geometry.phiLength	360
phi-start	geometry.phiStart	0

In this section we will find all the attributes that we can add to the elements (in this case to the a-sky element).

By adding a 360 image, the user will be able to explore the environment only visually, but will not be able to move through it as if it were a recreation of reality.

In this window we find all the documentation concerning the a-sky element:



<a-sky>

The sky primitive adds a background color or 360° image to a scene. A sky is a large sphere with a color or texture mapped to the inside.

Example

An equirectangular image as a background:

```html
<a-scene>
  <a-assets>
    <img id="sky" src="sky.png">
  </a-assets>
  <a-sky src="#sky"></a-sky>
</a-scene>
```

A plain color as a background:

```html
<a-sky color="#6EBAA7"></a-sky>
```

Attributes

Attribute	Component Mapping	Default Value
color	material.color	#FFF
metalness	material.metalness	0
opacity	material.opacity	1
phi-length	geometry.phiLength	360
phi-start	geometry.phiStart	0

Basic line of code for adding an a-sky with flat color

3. Attributes

The attributes that we will see in this section are common to all the elements that are integrated in A-Frame. That is, they are not only attributes of the basic geometries we have just seen.

3. 1. Position

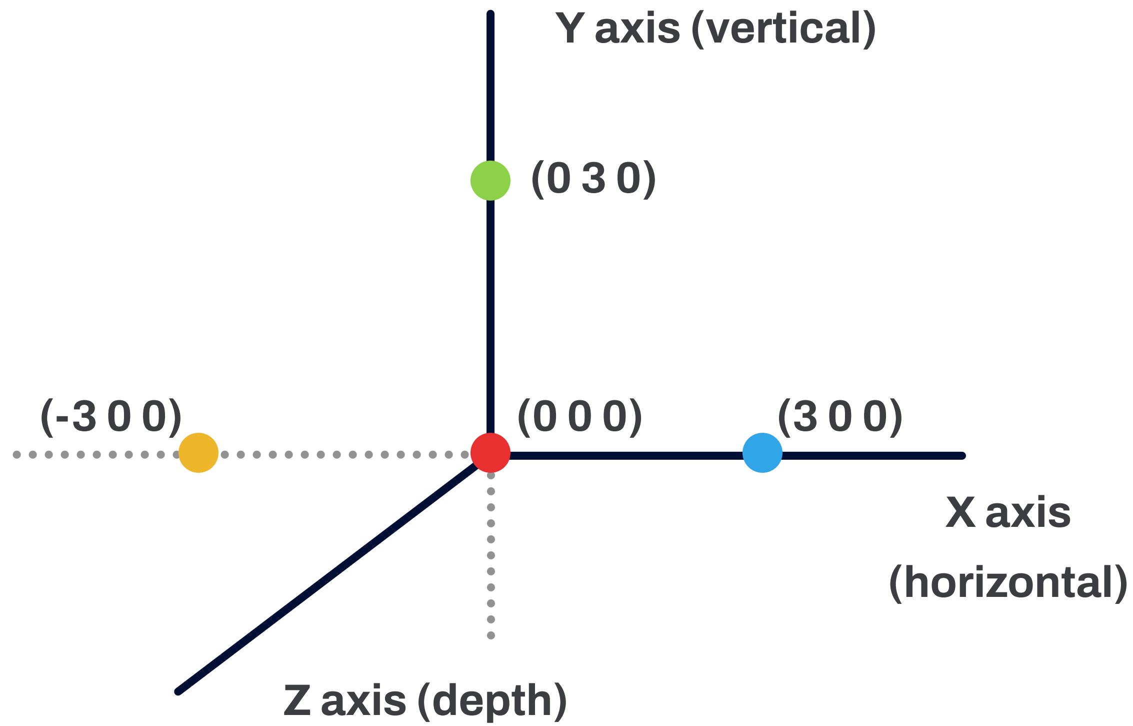
This attribute is used to position an element within the scene. When working in a 3D virtual space, there are three axes: X or horizontal axis, Y or vertical axis and Z or depth axis.
The code line is structured as follows:

```
<a-box position="0 0 0"></a-box>
```

By default, if no value is set or no position attribute is specified, the element will appear at position (0 0 0). The first number corresponds to the X axis, the second to the Y axis and the third to the Z axis (X Y Z).

By default, the point of view from which the scene starts (i.e. our initial position), is also at the point (0 0 0), so it will be necessary to set the position attribute to each of the elements of the scene to be able to visualize them.

Coordinate axis



3.2. Scale

The scale attribute is used to increase or decrease the size of the elements proportionally, and values for the X and Z axes are also associated to this attribute. In the code line it appears as:

```
<a-box scale="1 1 1"></a-box>
```

By default, if no value is set or no scale attribute is specified, the element will have values (1 1 1).

It is not necessary that the values of the axes are the same. For example, you can scale only the value for the X-axis (2 1 1).

If the values are changed to (2 2 2), the element doubles its size on the X Y and Z axis, respectively.

EXAMPLE

Scene code:

```
<!DOCTYPE html>
    <html>
        <head>
            <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
        </head>
        <body>
            <a-scene>
                <a-sky color="#ECECEC"></a-sky>
                <a-sphere position="-1 1 -3" radius="0.5" color="yellow"></a-sphere>
                <a-sphere position="1 1 -3" radius="0.5" color="yellow" scale="2 2 2"></a-sphere>
            </a-scene>
        </body>
    </html>
```

3.3. Rotation

This attribute allows to rotate the elements on any of the axes. On this occasion, values for the X and Z axes are also associated, but numerical values corresponding to **sexagesimal degrees** will be set. In the code line it appears as:

```
<a-box rotation="0 45 0"></a-box>
```

By default, if no value is set or no rotation attribute is specified, the element will not rotate on any of the axes.

Usually only one axis is rotated, but it is possible to rotate on all axes at the same time.

Let's see what a box looks like when we rotate it 45° on each axis.

X AXIS ROTATION

Y AXIS ROTATION

Z AXIS ROTATION

3.4. src

The src attribute (source) is used to specify the location of the source or media resource that we want to display in the scene.

As we work on the creation of our virtual scene, we will use this attribute to add textures, external resources, images or any other external multimedia element.

In the practical exercise of this module, we will use the src attribute on the <a-box> element to add texture to the walls and floor. How to do this is detailed in the practice.

```
<a-box src="url" position="0 0 -2" width="12" height="0.1" depth="12"></a-box>
```

For image (<img>), audio (<audio>) and video (<video>) tags, the src attribute is used to specify the location of the media file.

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Prodigioso Volcán

Exercise

Construction of a virtual museum-room

In this exercise we will create our first virtual room with boxes (a-box) in Glitch.

During the development of the course we will design step by step, in the practical exercises of each module, a virtual museum room to which we will integrate elements such as images, videos, 3D objects...

Creation of a basic room

At this point we will develop a virtual museum-room using boxes (a-box). To do this, we will open a new project in Glitch as we learned in the previous module (point 2 of the section "Start working"). We will copy again the basic code of a-frame (point 6 section "Start working" of the practice of module 2) and we will modify the elements.

1. Modification of basic elements
2. Floor Creation
3. Floor Visualisation
4. Walls Creation
5. Process
6. Lateral walls creation
7. Construction completion

For the creation of the walls, we will also use the basic element a-box.

First, we will create the back wall:

1. We copy and paste the line of code from our floor

```
<!--Suelo-->
<a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC3D9"></a-box>
```

2. We modify the measures of the box (depth, height and width attributes) to give a height of 3 metres to the walls. As the back wall must be 12 metres wide (width) and 0.1 metres deep (depth), we will position it in the correct place by modifying the values of the position attribute. We will change the colour to differentiate it from the floor.

```
<!--Pared del fondo-->
<a-box position="0 1.5 -6"  depth="0.1" height="3" width="12" color="#FFCC89"></a-box>
```

To complete the construction of the museum hall, all that remains is to build the back wall and the roof.

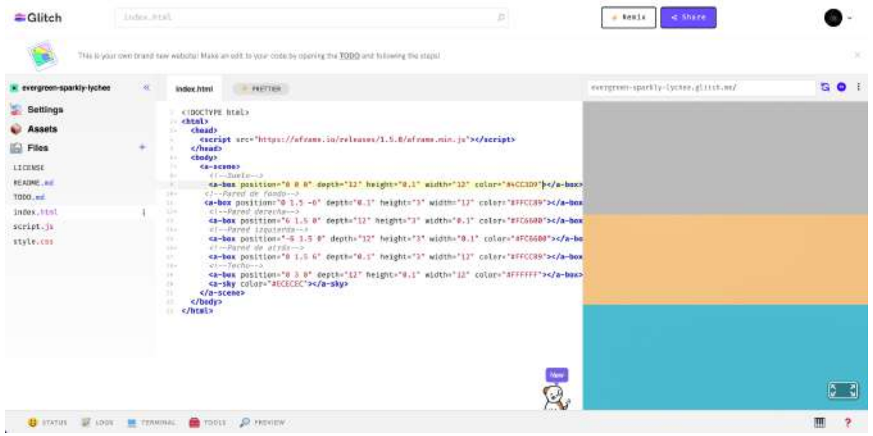
For the back wall we copy the line of code of the back wall and only change the position (Z-axis):

```
<!--Pared de atrás-->
<a-box position="0 1.5 6"  depth="0.1" height="3" width="12" color="#FFCC89"></a-box>
```

For the ceiling we copy the code line from the floor and change the position (Y axis) and the colour:

```
<!--Techo-->
<a-box position="0 3 0"  depth="12" height="0.1" width="12" color="#FFFFFF"></a-box>
```

This is what we will see if we have followed the steps correctly.



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC3D9"></a-box>
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12" color="#FFCC89"></a-box
      <!--Pared derecha-->
      <a-box position="6 1.5 0" depth="12" height="3" width="0.1" color="#FC6600"></a-box
      <!--Pared izquierda-->
      <a-box position="-6 1.5 0" depth="12" height="3" width="0.1" color="#FC6600"></a-bo
      <!--Pared de atrás-->
      <a-box position="0 1.5 6" depth="0.1" height="3" width="12" color="#FFCC89"></a-box
      <!--Techo-->
      <a-box position="0 3 0" depth="12" height="0.1" width="12" color="#FFFFFF"></a-box>
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

To create the floor we have to modify the attributes and values of the default box.

Default a-box code line:

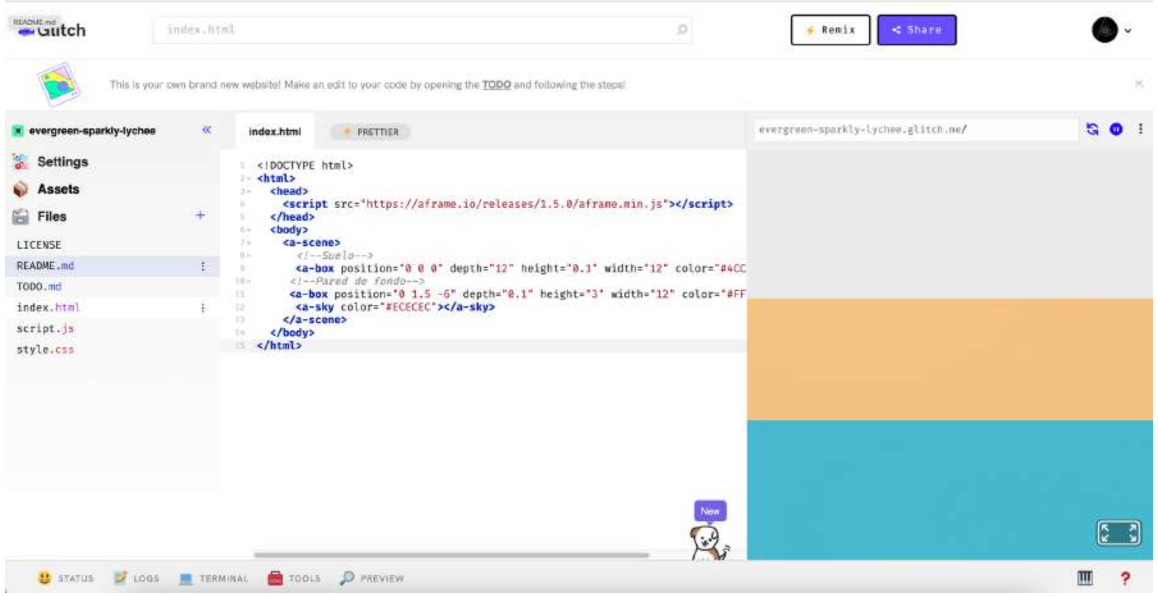
```
<a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a-box>
```

We change the attributes to generate the floor of a 12x12 room:

```
<!--Suelo-->
<a-box position="0 0 0"  depth="12" height="0.1" width="12" color="#4CC3D9"></a-box>
```

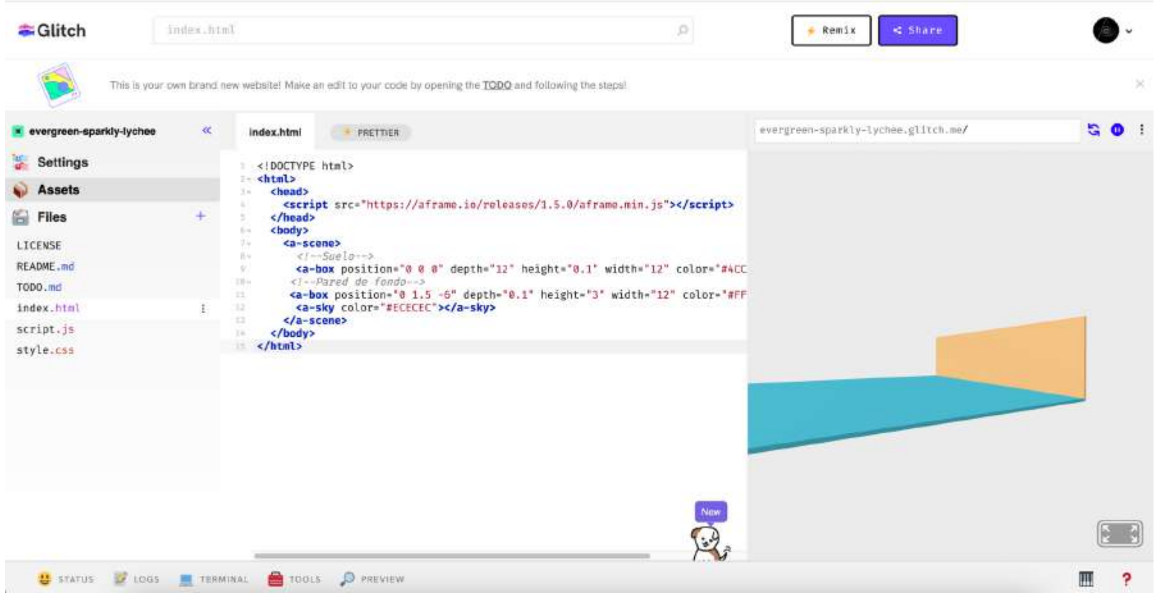
First, we will change the position to centre the room (0 0 0) in the environment. The second step is to remove the rotation, we won't need it now. Finally, we have to give the measurements of the floor, for this, we will add the basic attributes of a-box depth, height and width. Being 12x12, we have to add 12 metres to the width of the floor (width, X axis); 12 metres to the depth (depth, Z axis) and as the floor has no height, we will give the height attribute a value of 0.1.

So far, we have this environment:



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12" color="#FF
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12" color="#FF
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

1 Initial point of view

2 Visualisation of the room by scrolling through the environment

Do not copy and paste the lines of code shown in this presentation into your Glitch project.

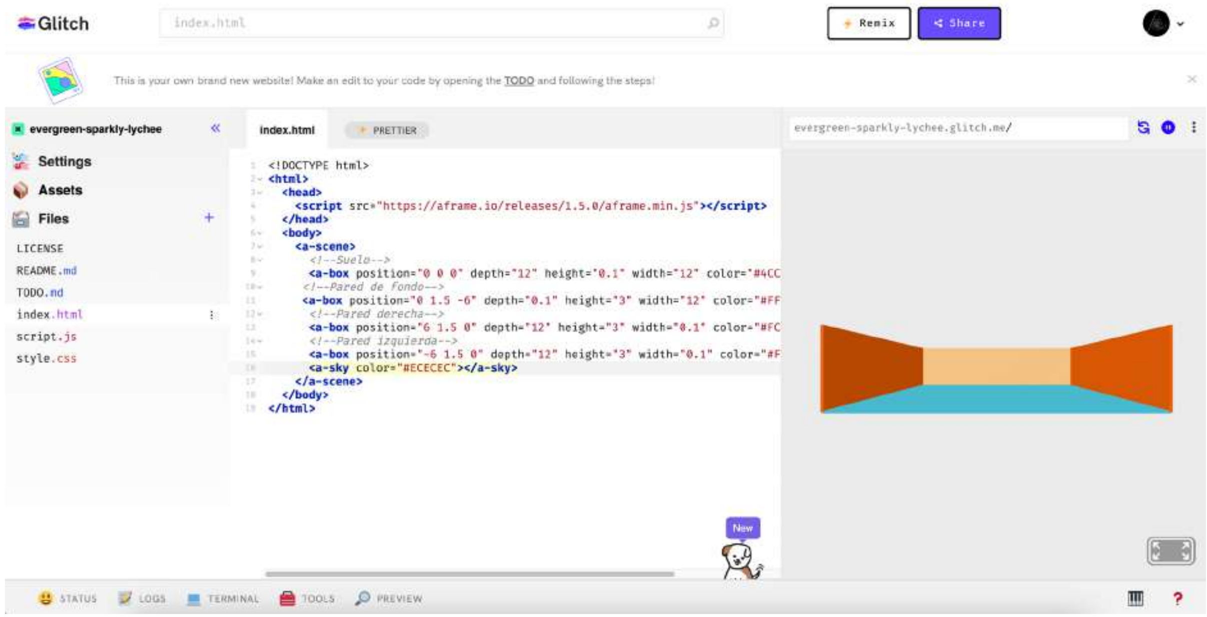
You have to write them in the Glitch code editor so that it recognizes the tags.

To create the side walls, copy and paste the line of code of the back wall and change the values of the attributes:

```
<!--Pared derecha-->
<a-box position="6 1.5 0" depth="12" height="3" width="0.1" color="#FC6600"></a-box>

<!--Pared izquierda-->
<a-box position="-6 1.5 0" depth="12" height="3" width="0.1" color="#FC6600"></a-box>
```

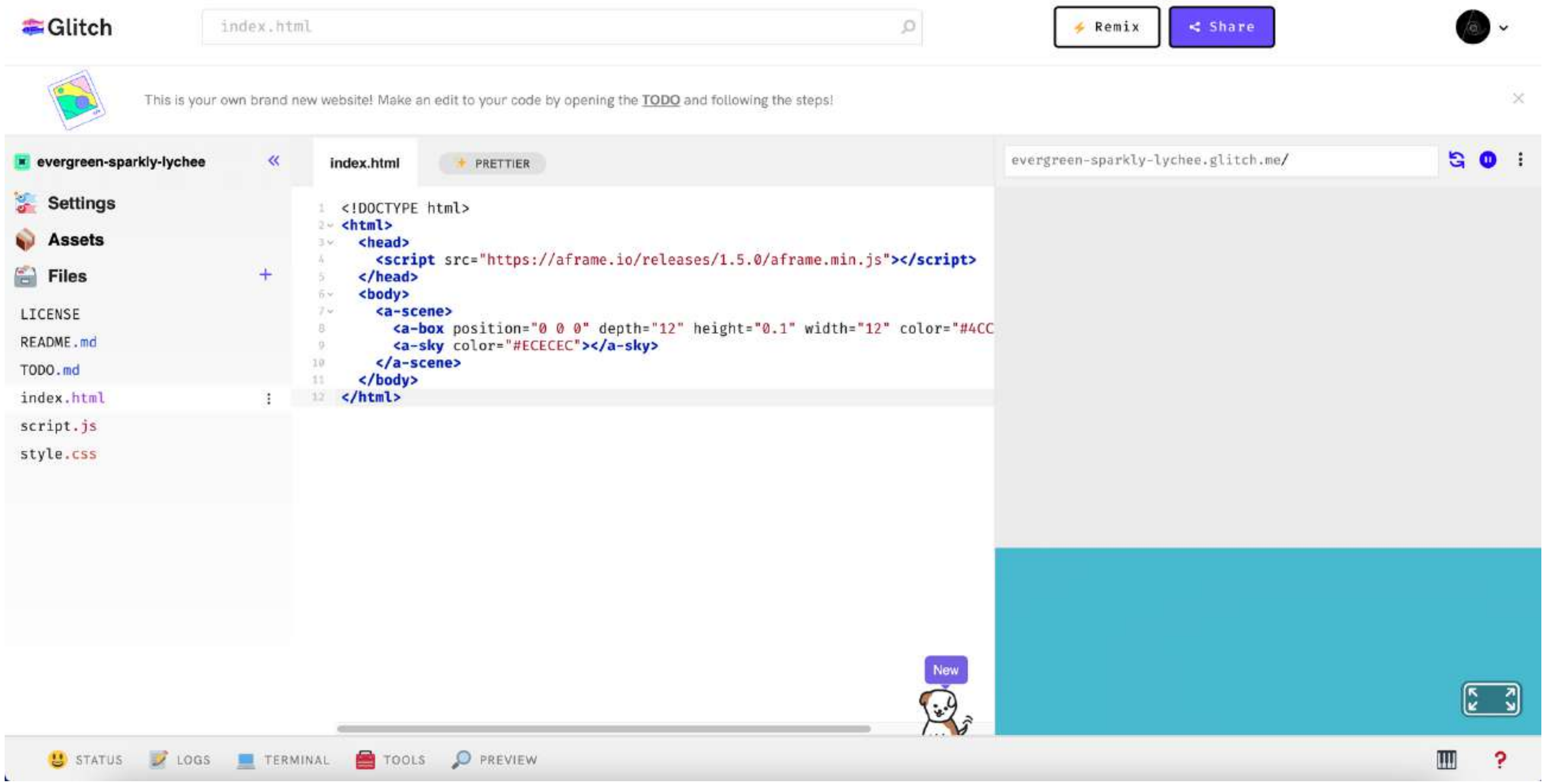
If we move away from the initial point of view we can see the side walls in place.



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12" color="#FF
      <!--Pared derecha-->
      <a-box position="6 1.5 0" depth="12" height="3" width="0.1" color="#FC
      <!--Pared izquierda-->
      <a-box position="-6 1.5 0" depth="12" height="3" width="0.1" color="#F
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

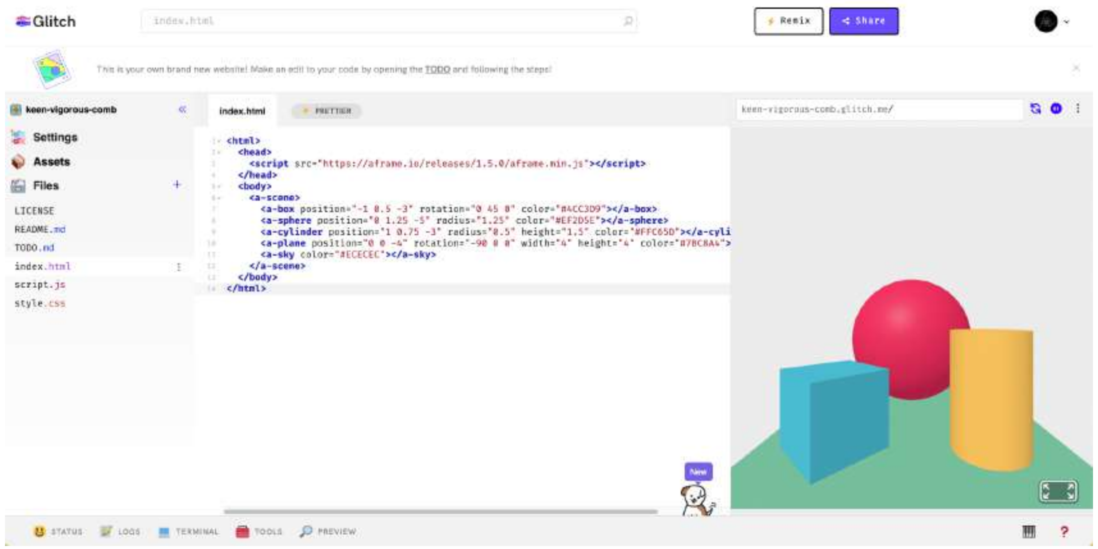
Our floor will look like this:



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```html
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <a-box position="0 0 0" depth="12" height="0.1" width="12" color="#4CC
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

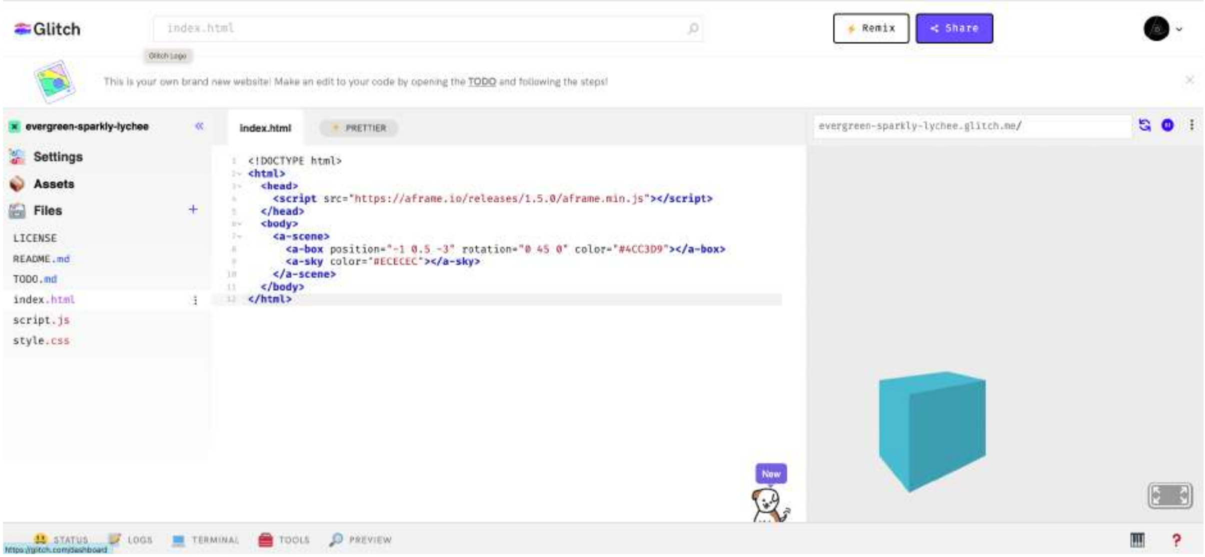
From the code of the basic a-frame scene we want to keep only the box, so we will delete the cylinder, the sphere and the plane. We can leave the background color (a-sky).



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```html
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a-box>
      <a-sphere position="0 1.25 -5" radius="1.25" color="#EF2D5E"></a-sphere>
      <a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color="#FFC65D"></a-cyli
      <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4" color="#7BC8A4">
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

1 Basic scene code A-Frame



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

```html
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a-box>
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

2 Eliminate all elements except the box and the a-sky

Add textures to the room

To give a realistic look to our room, we are going to add textures to the boxes. To do this we will use the src attribute, in which we will add, from an external link, an image that generates the texture effect.

1. Remove colour attribute
2. src attribute
3. Attribute floor texture value
4. Floor visualisation
5. Walls textures
6. Final results

Floor texture:

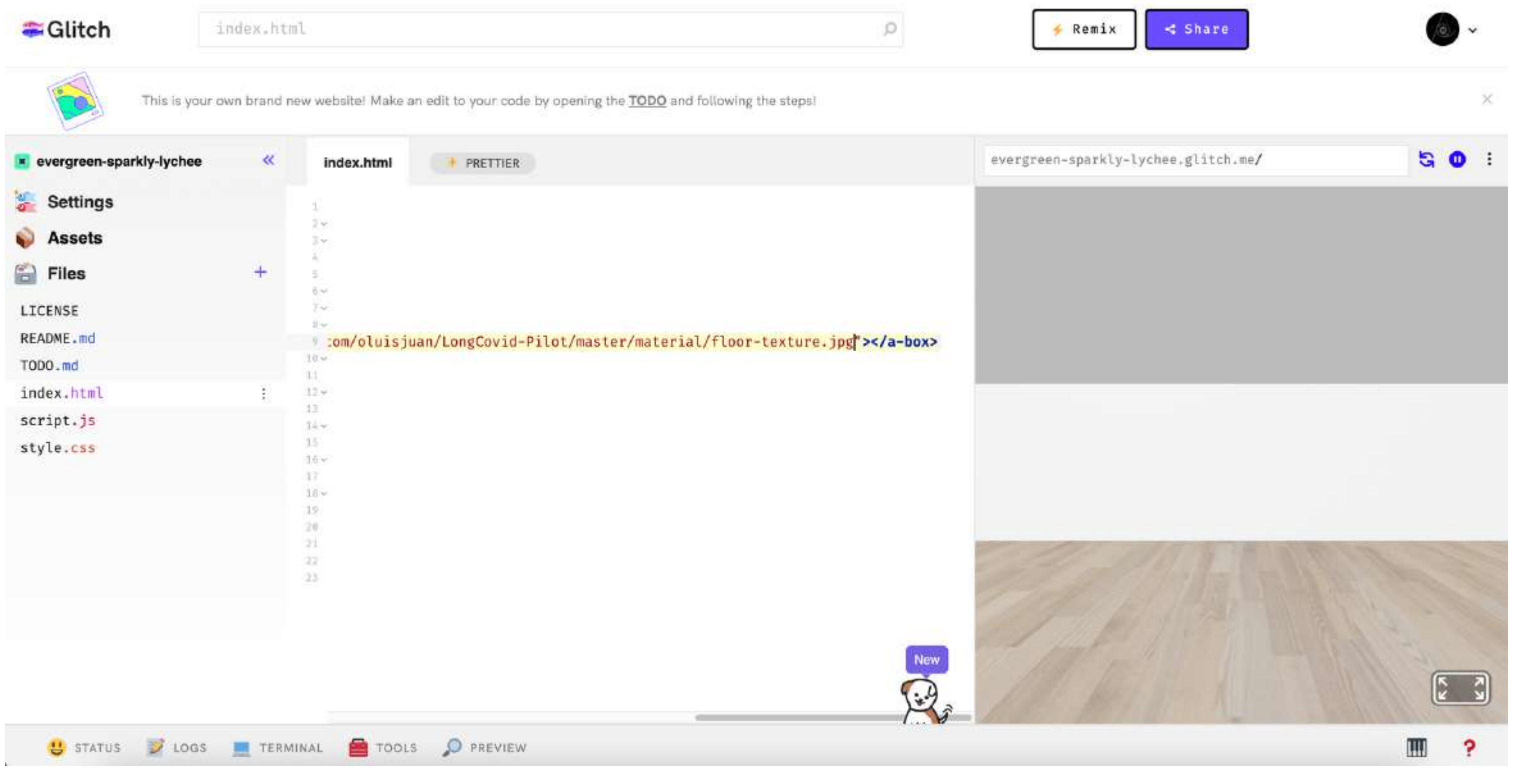
Walls textures:

Once the colour attribute is removed, we can replace the colour attribute with the src attribute. The lines of code would look like this:

```
<!--Suelo-->
<a-box position="0 0 0"  depth="12" height="0.1" width="12" src=""></a-box>
<!--Pared de fondo-->
<a-box position="0 1.5 -6"  depth="0.1" height="3" width="12" src=""></a-box>
<!--Pared derecha-->
<a-box position="6 1.5 0"  depth="12" height="3" width="0.1" src=""></a-box>
<!--Pared izquierda-->
<a-box position="-6 1.5 0"  depth="12" height="3" width="0.1" src=""></a-box>
<!--Pared de atrás-->
<a-box position="0 1.5 6"  depth="0.1" height="3" width="12" src=""></a-box>
<!--Techo-->
<a-box position="0 3 0"  depth="12" height="0.1" width="12" src=""></a-box>
```

In the next step we will attribute the corresponding values to the src attribute

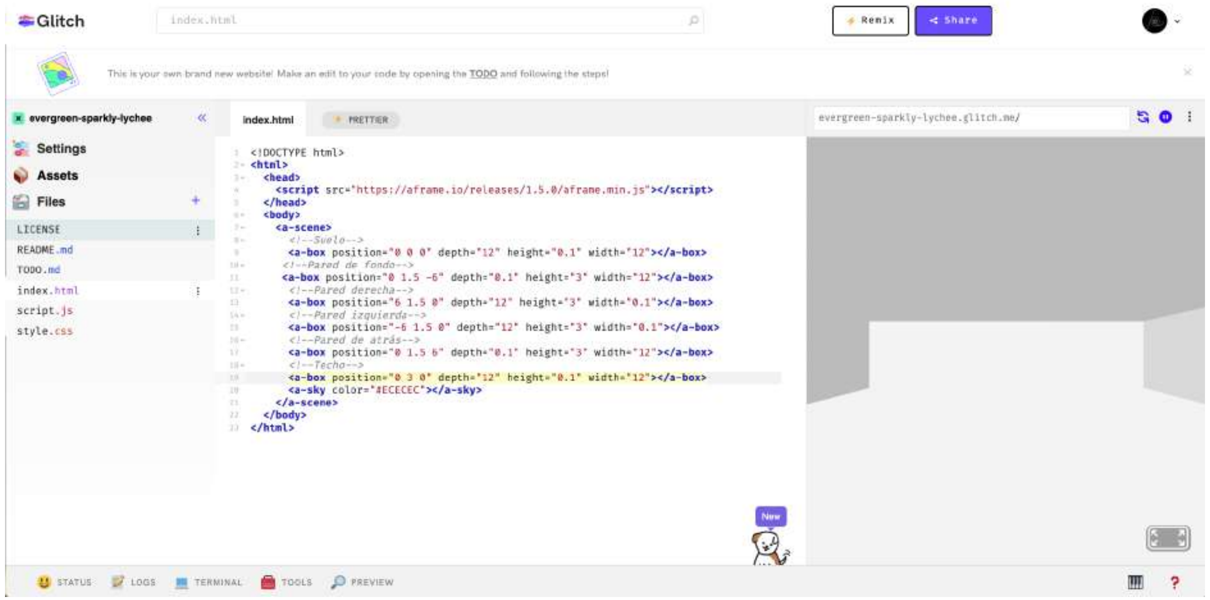
Once you have copied the path to add texture to the ground, the scene should look like this:



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

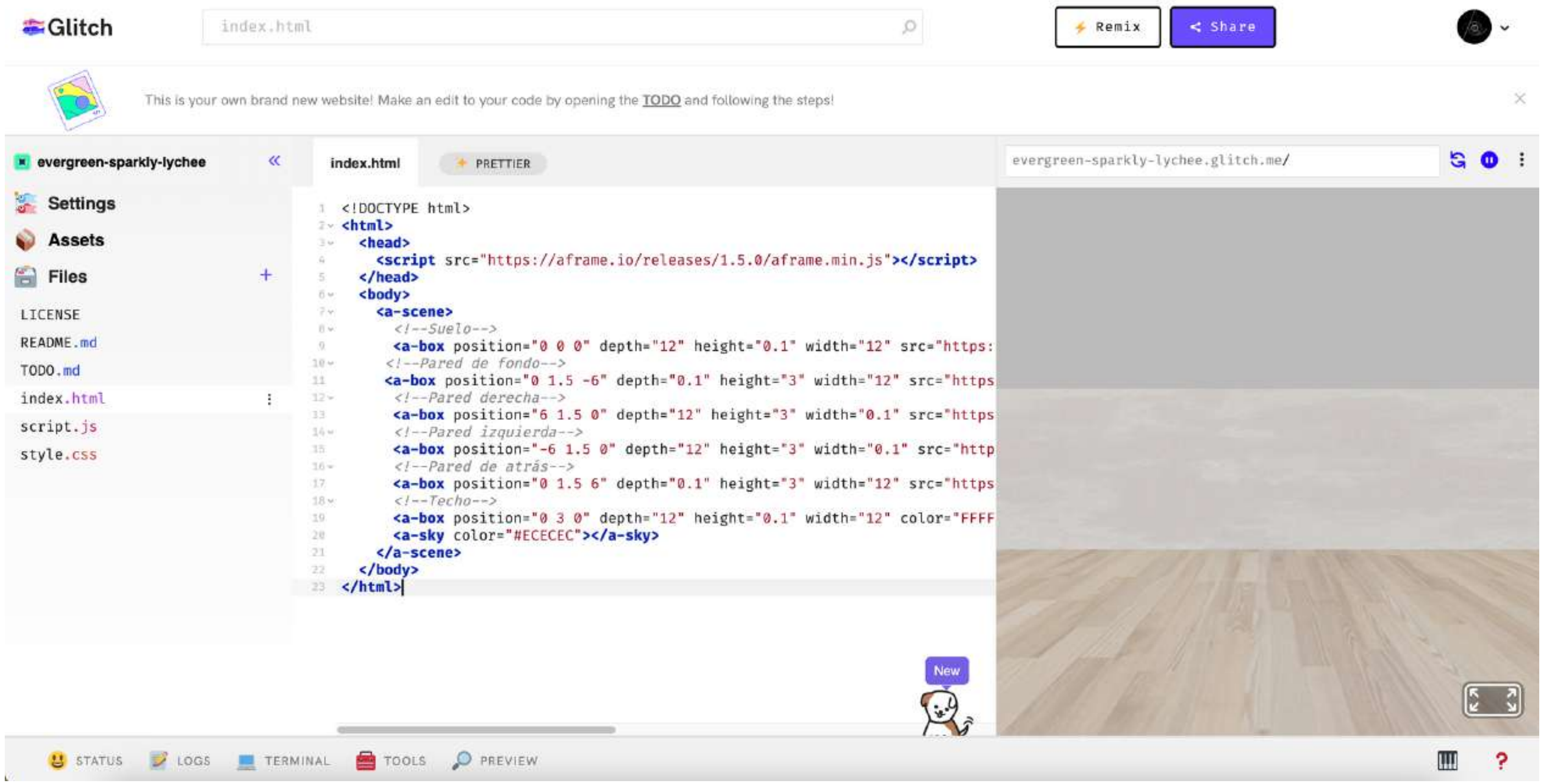
```
:om/oluisjuan/LongCovid-Pilot/master/material/floor-texture.jpg"></a-box>
```

To give texture to the boxes, the first thing we have to do is to remove the colour attribute from all the boxes. So:



```
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12"></a-box>
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12"></a-box>
      <!--Pared derecha-->
      <a-box position="6 1.5 0" depth="12" height="3" width="0.1"></a-box>
      <!--Pared izquierda-->
      <a-box position="-6 1.5 0" depth="12" height="3" width="0.1"></a-box>
      <!--Pared de atrás-->
      <a-box position="0 1.5 6" depth="0.1" height="3" width="12"></a-box>
      <!--Techo-->
      <a-box position="0 3 0" depth="12" height="0.1" width="12"></a-box>
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

Once we have added all the textures to the walls and floor, the final result of our room will be as follows:



This is your own brand new website! Make an edit to your code by opening the TODO and following the steps!

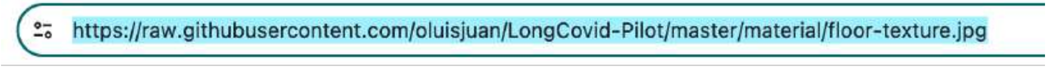
```html
<!DOCTYPE html>
<html>
  <head>
    <script src="https://aframe.io/releases/1.5.0/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <!--Suelo-->
      <a-box position="0 0 0" depth="12" height="0.1" width="12" src="https:
     <!--Pared de fondo-->
     <a-box position="0 1.5 -6" depth="0.1" height="3" width="12" src="https
      <!--Pared derecha-->
      <a-box position="6 1.5 0" depth="12" height="3" width="0.1" src="https
      <!--Pared izquierda-->
      <a-box position="-6 1.5 0" depth="12" height="3" width="0.1" src="http
      <!--Pared de atrás-->
      <a-box position="0 1.5 6" depth="0.1" height="3" width="12" src="https
      <!--Techo-->
      <a-box position="0 3 0" depth="12" height="0.1" width="12" color="FFFF
      <a-sky color="#ECECEC"></a-sky>
    </a-scene>
  </body>
</html>
```

At this point we will attribute the corresponding value to give texture to the soil.

Floor texture:

Once we click on the icon to access the resource, we have to copy and paste the link into our line of code:

1 *Copy the route:*



https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/floor-texture.jpg

2 *We paste it into our line of code in the value of the src attribute as follows:*

```
<!--Suelo-->
<a-box position="0 0 0"  depth="12" height="0.1" width="12"
src="https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/floor-texture.jpg">
</a-box>
```

If you got lost in any step, in the following link you can find the complete code so you can copy and paste it into your scene:

As we have done with the floor, we will copy and paste the texture path of the walls:

Walls texture:

```
<!--Pared de fondo-->
<a-box position="0 1.5 -6"  depth="0.1" height="3" width="12" src="https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/plaster_wall.jpg"></a-box>

<!--Pared derecha-->
<a-box position="6 1.5 0"  depth="12" height="3" width="0.1" src="https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/plaster_wall.jpg"></a-box>

<!--Pared izquierda-->
<a-box position="-6 1.5 0"  depth="12" height="3" width="0.1" src="https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/plaster_wall.jpg"></a-box>

<!--Pared de atrás-->
<a-box position="0 1.5 6"  depth="0.1" height="3" width="12" src="https://raw.githubusercontent.com/oluisjuan/LongCovid-Pilot/master/material/plaster_wall.jpg"></a-box>
```

Next steps

In the next module we will add images, videos and 3D objects, among others, to our scene.

Bibliography

and useful resources

A-Frame (2015). A web framework for building 3D/AR/VR experiences. Disponible en: https://aframe.io/

Sánchez-Acedo, A. (2023). Guía básica para crear un entorno inmersivo con A-Frame. Disponible en: https://ciberimaginario.es/2023/02/17/guia-basica-para-crear-un-entorno-inmersivo-con-a-frame/

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Comunidad de Madrid

COMCIENCIA COMUNICACIÓN CIENTÍFICA PARA IMPULSAR LA ECONOMÍA CIRCULAR DESDE LA ESCUELA

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN

This work was supported by the Autonomous Community of Madrid (Spain) with a grant for industrial doctorates (IND2022/SOC-23503) with the collaboration agreement with Prodigioso Volcán S.L; Universidad Rey Juan Carlos (ID 501100007511)