# BlippBuilder manual

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EG0029. Emerging and Innovative Technologies in Education

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Disclaimer. This document was compiled by partially using material (texts and images) available at https://docs.blippar.com/blippbuilder-documentation. The intellectual rights of this material belong to the Blippar company.

Note. Visit https://www.blippar.com/learn/ar-learn/getting-started for a full set of video tutorials on how to use Blippbuilder.

# The basics

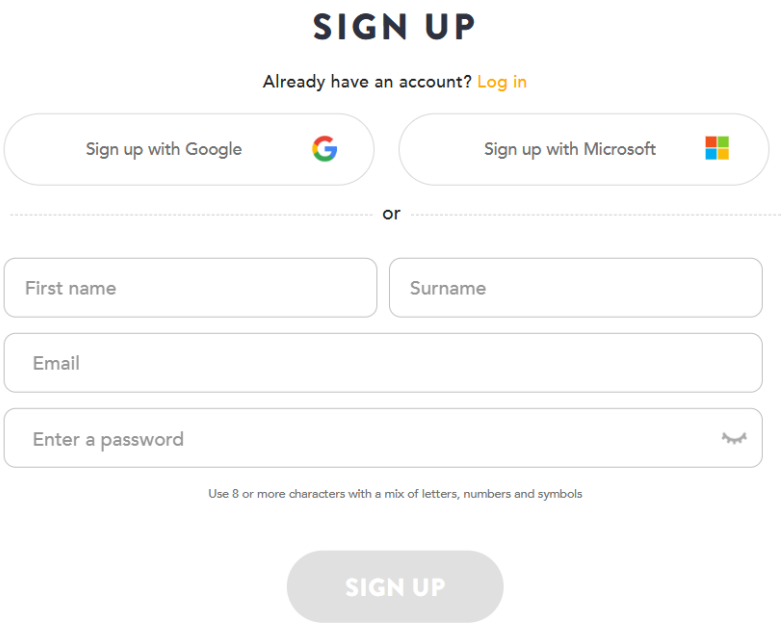
# Introduction

Blippar is a platform that provides augmented reality (AR) solutions, enabling users to unlock interactive experiences from everyday objects and locations. It offers intuitive tools for users to create their own AR content. Blippar's AR experiences can be crafted through two primary methods: Blippbuilder and WEBAR SDK. Blippbuilder is a free AR creation tool that allows for the straightforward creation and publication of AR experiences without requiring any coding skills. Blippar supports two versions of Blippbuilder: Blippbuilder Desktop and Blippbuilder Mobile. The present notes deal with Blippbuilder Desktop.

# Create an account

The first step for creating AR experiences with Blippar is to create an account. Navigate to https://www.blippar.com/ and select "Sign up," located at the top right corner of your screen.


Signing up with your Google account is probably the fastest way to create an account. You can also use your email, provide your first and last name, as well as a password. Nevertheless, in both cases, an email will be sent to you, including a confirmation link.



# First steps

# Blippbuilder Desktop

Blippbuilder is designed to serve a diverse audience, encompassing artists, students, professionals, and educators. This versatile platform significantly simplifies the creation, publication, and dissemination of AR experiences. Blippbuilder requires no prior coding knowledge, allowing users to effortlessly publish their AR experiences to the web and share content across any platform, accessible on both mobile devices and AR headsets.

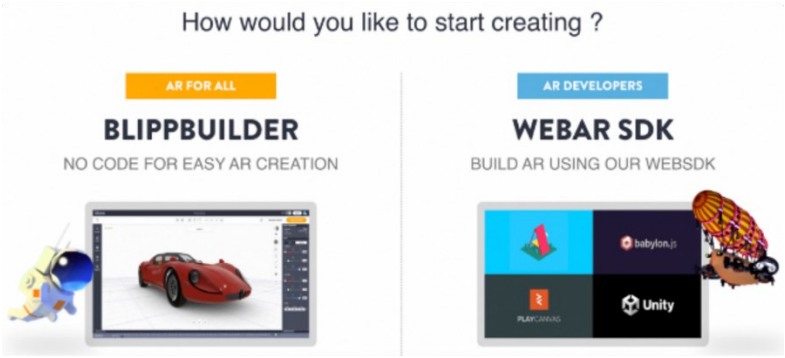
The platform offers free and unlimited access to an extensive repository of AR-ready assets. Users can explore a comprehensive library of 3D environments, objects, and characters, and seamlessly import these models into their projects with a single click. Furthermore, Blippbuilder facilitates the direct publication of AR scenes to the Web or any social media platform, free of cost.

There are four distinct types of AR experiences that can be generated using Blippbuilder:

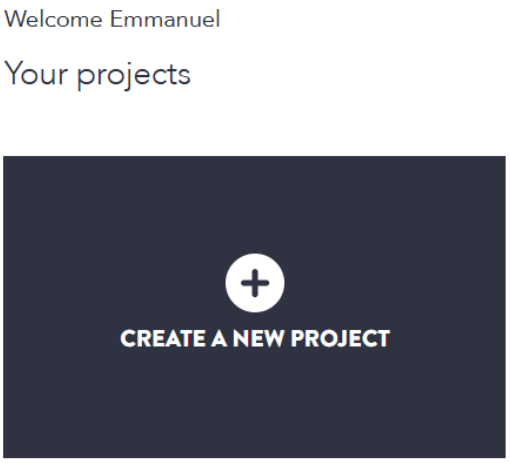
- Surface tracking. Surface tracking experiences are enabled on flat, plain surfaces, allowing the objects to appear seamlessly on the chosen surface.
- Gyro tracking. In a gyro tracking experience, objects appear around the user. Move the smartphone around you to see the entire experience.
- Marker tracking. A marker tracking experience requires a marker image. The experience is enabled when the camera detects that image.
- Face tracking. In this type of project, the AR experience is presented on top of any human face.

# A quick example of creating and previewing an AR experience

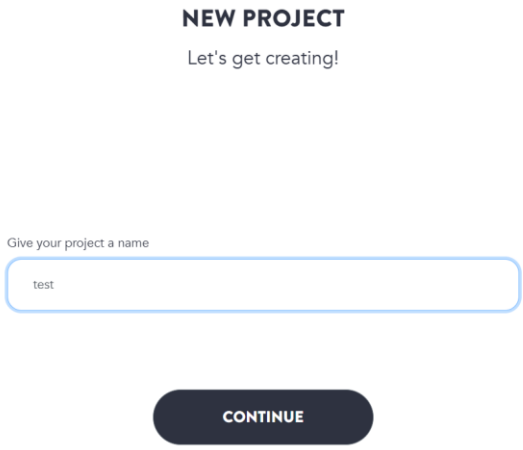
Follow the steps outlined below to create a project in Blippbuilder.
1. Login to Blippar
2. Click on the "Use Blippbuilder" option from the Blippbuilder panel as illustrated below.



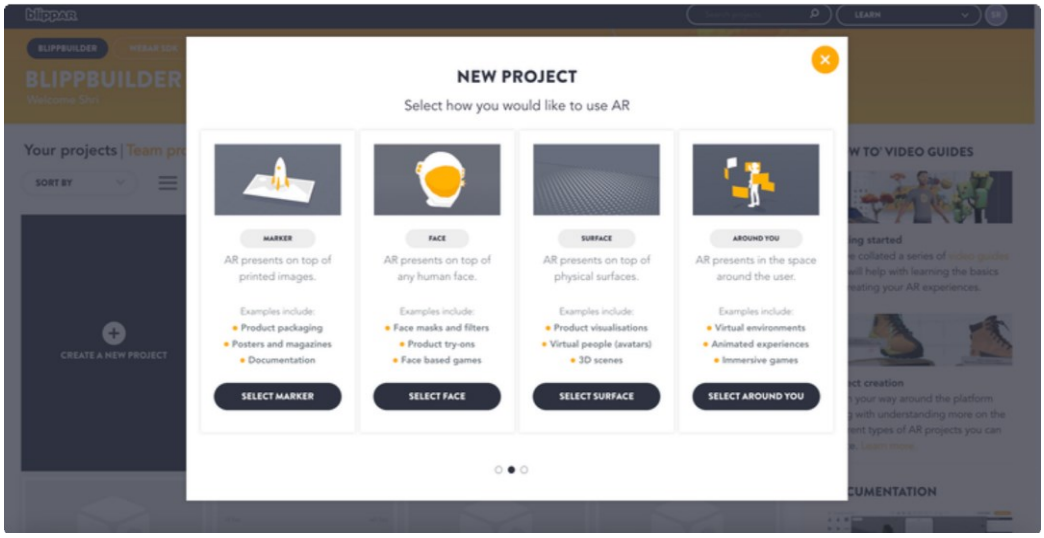

3. You will be redirected to the Blippbuilder Home page.



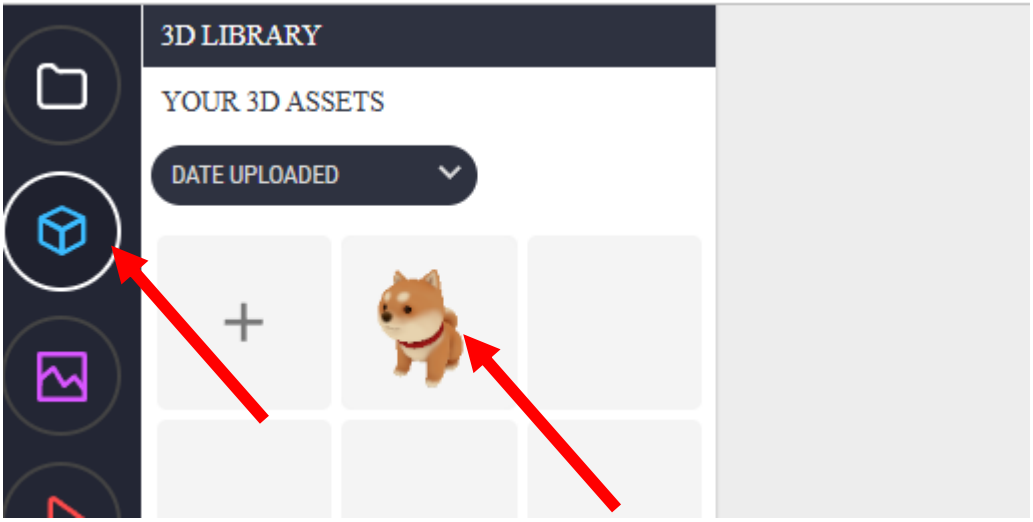

4. Click "Create a New Project" and assign a suitable name to your project. Click "Continue."



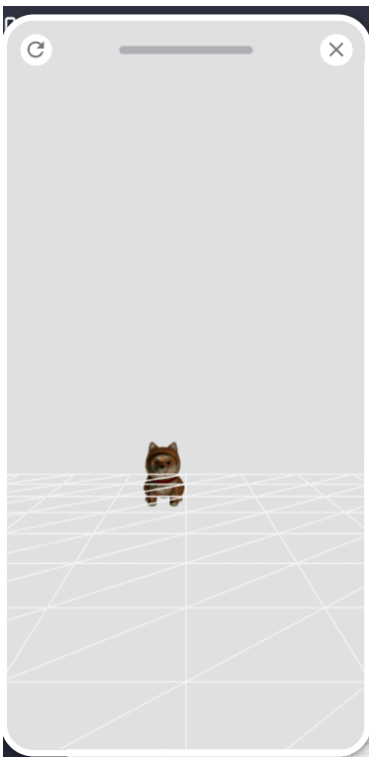
5. Choose the type of experience you wish to create. In this instance, click "Select Surface."




6. You will be redirected to the Blippbuilder Design Canvas.
7. Incorporate an asset (e.g., drag and drop a 3D model as shown in the example below).




8. Click the "Preview" button on the top panel to access an "In-app Preview" of the experience before publishing your creation.



9. Click "Test on Device" to generate a test project link. A test project will be created, accessible by scanning with your smartphone the QR code displayed on the screen. Select "Open in browser" and follow the instructions to trigger the AR experience on a surface.

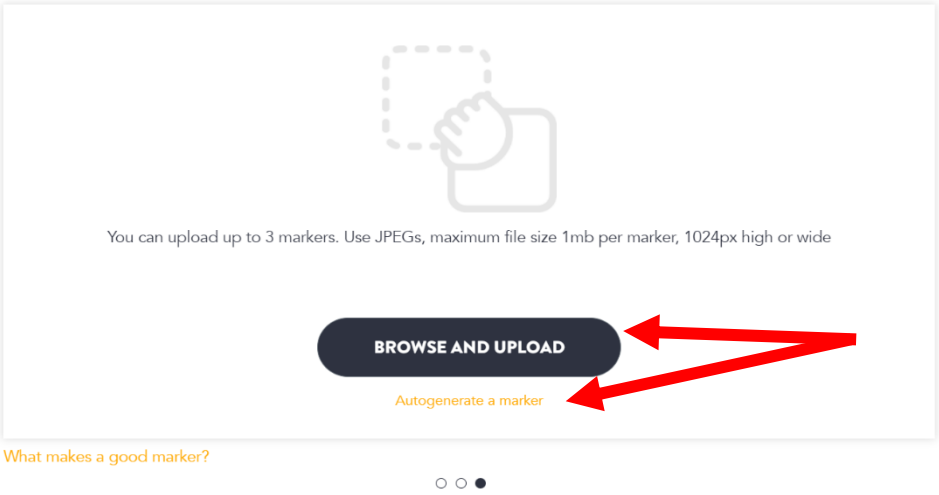

👉🏽 Note. The preview is available only for 20 minutes.

👉🏽 Note. The option to "Publish" your project is not available in the free version.

👉🏽 Note. The same steps apply to creating and previewing a Gyro experience.

# Additional steps for a Marker tracking experience

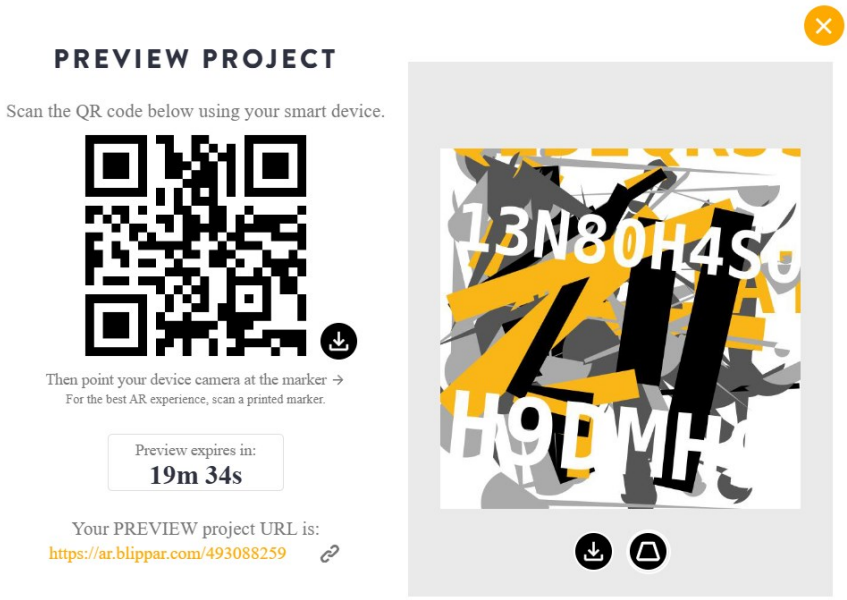
In step 5 of the previous section, click on "Select Marker."
1. You will be presented with two options: upload a marker image or auto-generate one. Click on "Autogenerate a marker."



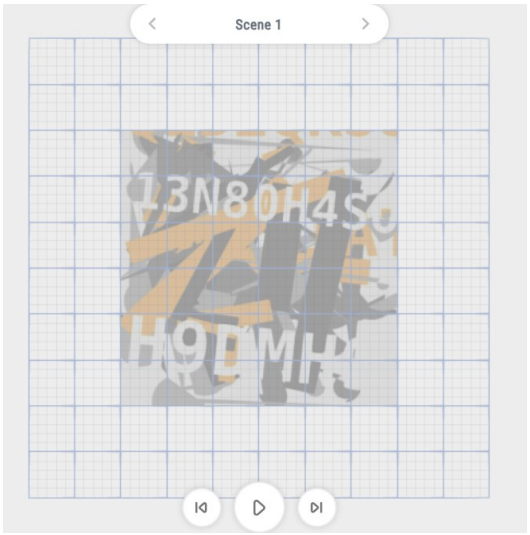

👉 Note. What makes a good Marker image will be discussed in the next section.

2. Click on "Confirm."


3. Follow steps 6 to 9 discussed in the previous section to preview your experience. When you click on "Test on Device," you will be presented with both a QR code and the Marker image. Scan the QR code to trigger the experience and move your smartphone's camera to the Marker image to see your experience.

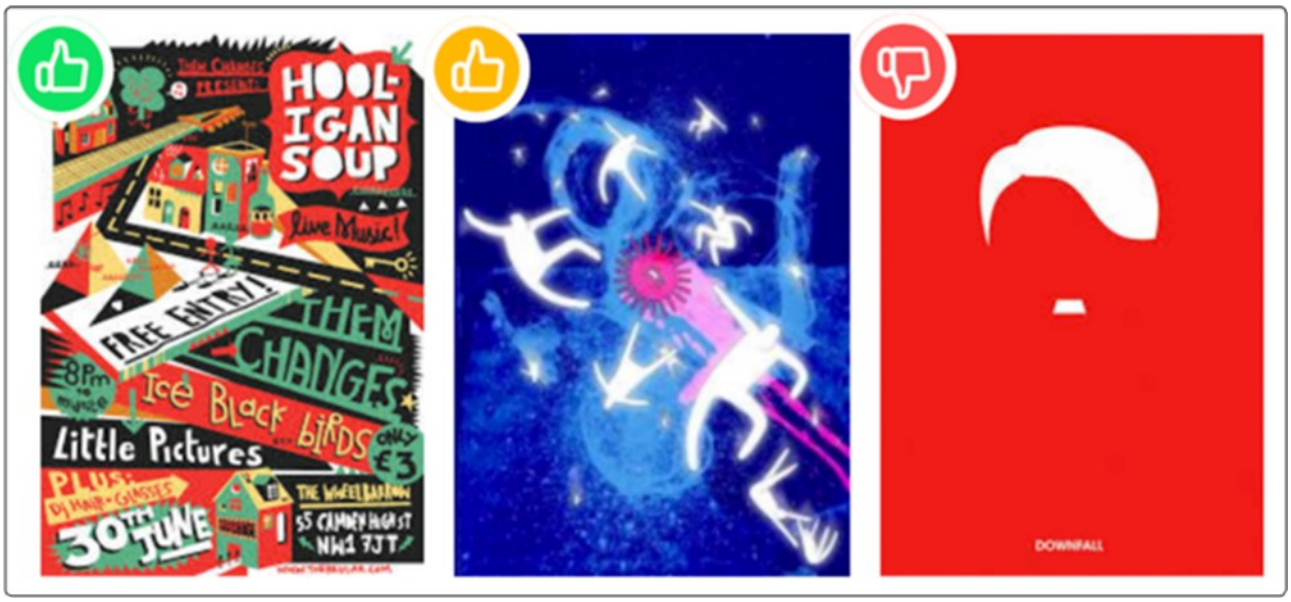



👉🏽 Note. Although you will see the Marker image on the Design Canvas, it will not be displayed when launching your experience.



# What makes a good Marker image

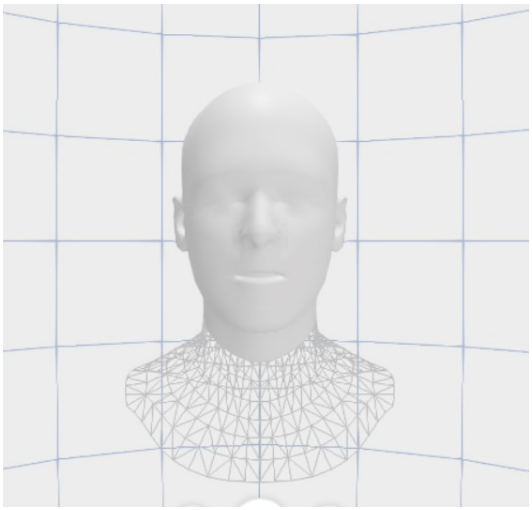
When designing or selecting a Marker image for your projects, it is important to use visually "busy" images for optimal results. Designs that incorporate hard, contrasting edges, colors, and shapes are particularly effective, as they provide multiple visual "anchors" for the camera to accurately detect and interpret. Employing such intricate and visually engaging designs will significantly enhance the efficacy of your project's visual recognition capabilities. On the other hand, it is advisable to avoid images that exhibit minimal visual interest, such as those consisting solely of text or simple outlines.



# Steps for creating and previewing a Face tracking experience

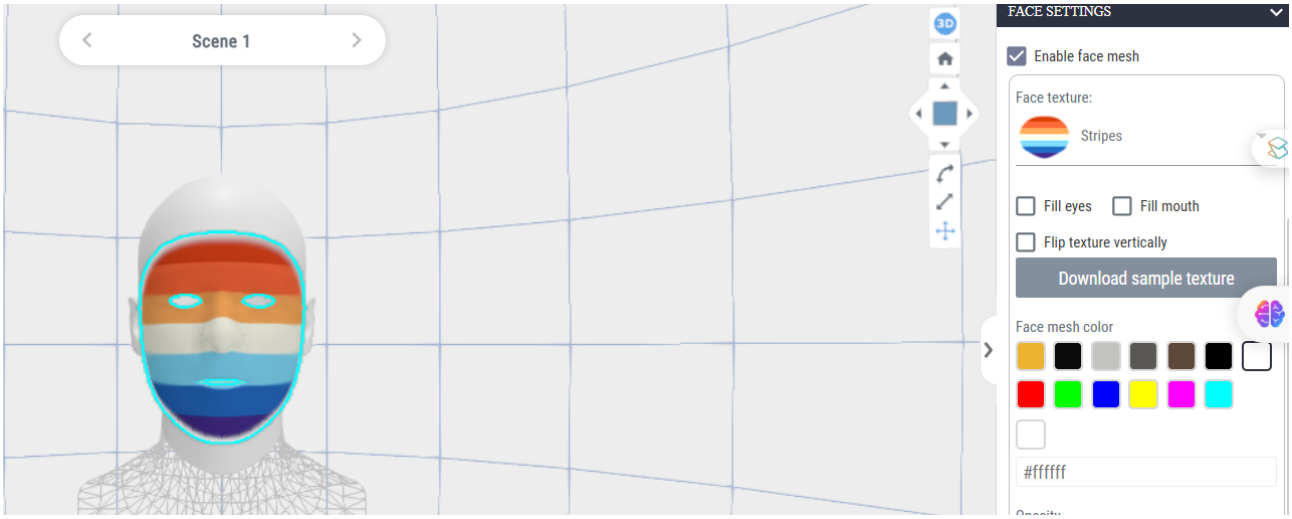
As in the previous two examples, start by creating a new project and click on "Select Face" to create a Face tracking experience.

In the Design Canvas, a 3D face model will be displayed. This model serves as a platform upon which various basic elements, layouts, and models can be incorporated to create a dynamic and interactive face-tracking experience.



The following face settings should be enabled and customized according to the specific requirements of the intended experience:

- Face Mesh. A default face mask is generated and will be applied to the user's face. Additional options include "Fill Eyes," "Fill Mouth," and "Flip Texture Vertically," which can be selected if necessary.
- Blippbuilder provides a variety of built-in face textures that can be applied. Alternatively, customized textures can be utilized by selecting "Add Texture."

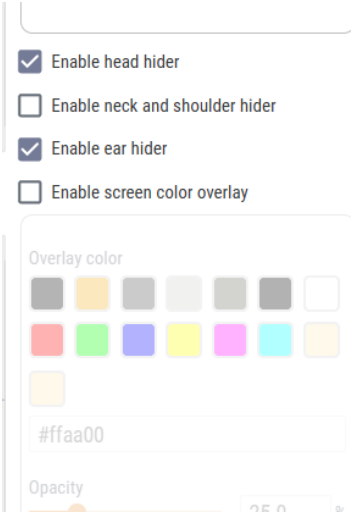



👉🏽 Note. In case the texture is an animated .gif, the animation will not appear on the face.

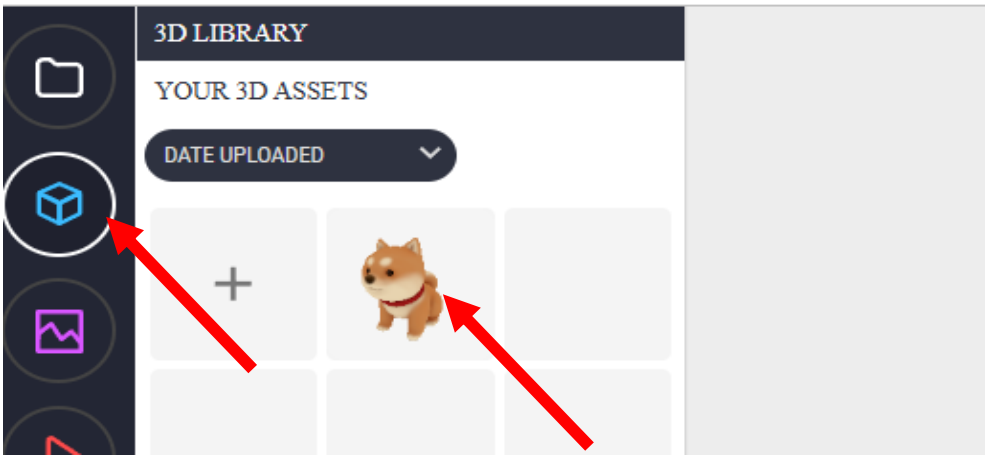
**Additional settings:**

- Enable Head Hider. This option allows for the concealment of the head if an object is positioned behind the user's head.
- Neck and Shoulder Hider. This setting hides the neck and shoulders of the user when objects are placed in these regions.

- Enable Ear Hider. This function conceals the user's ears if an object is placed over them.
- Enable Screen Color Overlay. This feature modifies the background screen color.

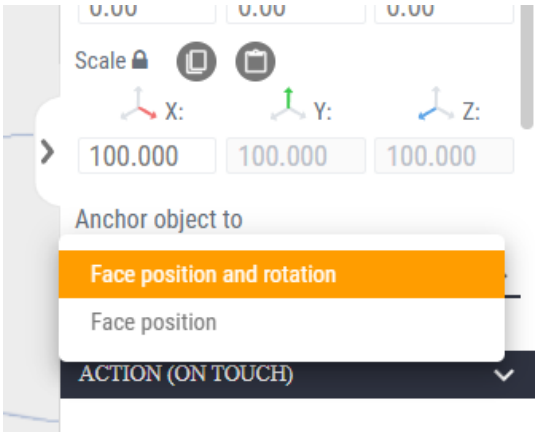



To enrich the design, any 3D object can be added. For example, drag and drop a 3D model as shown below:




Specific anchoring settings can be applied to this model, from the properties panel on the right side of the screen:

- Anchor Object to "Face Position and Rotation." This ensures that the 3D object is anchored to both the face position and rotation, allowing the object to move and rotate in sync with the face.
- Anchor Object to "Face Position." This option anchors the 3D object solely to the face position, ensuring that the object remains fixed despite any rotation of the face.

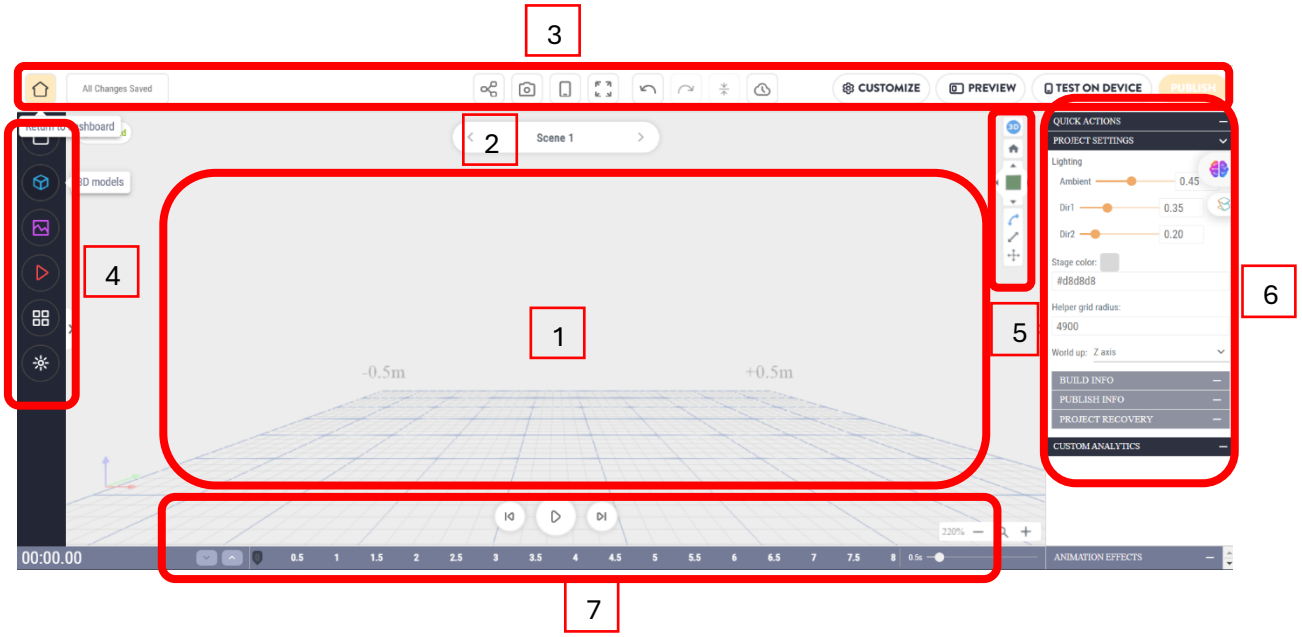


# Adding content

# BlippBuilder's interface

Now that you have some understanding of BlippBuilder's potential, it is time to delve deeper into its interface. There are seven areas in the interface:

1. The Design Canvas.
2. The Scene selection button.
3. The top toolbar.
4. The Media Library panel.
5. The asset manipulation toolbar.
6. The Properties panel.
7. The animation panel.

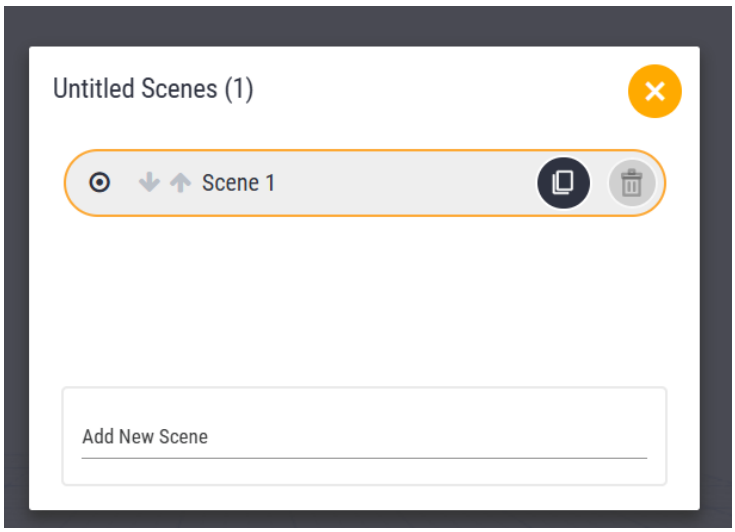



1. The Design Canvas

The design canvas represents the core section of the Blippbuilder interface. It provides a comprehensive 360° view of the experience you aim to create. Within this canvas, you can integrate elements, including 3D shapes, animation layers, and miscellaneous components such as text, sphere maps, and empty sprites. When creating a project utilizing a marker image, the selected marker will also appear on the canvas, allowing you to add various assets on top of it.

2. Scene selection button

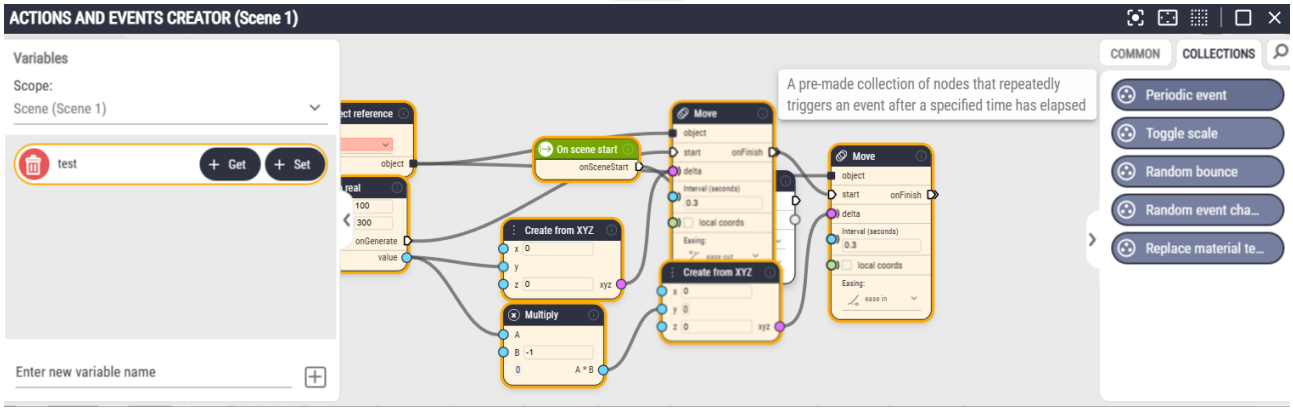
An experience usually consists of more than one scene (similar to the pages of a book, or the slides of a PowerPoint presentation). It is possible to assign a specific name to each scene you create, and you can incorporate as many scenes as needed to complete your project. To add a scene, simply click on "Scene 1." You can also rearrange the scenes' order.




3. Top toolbar

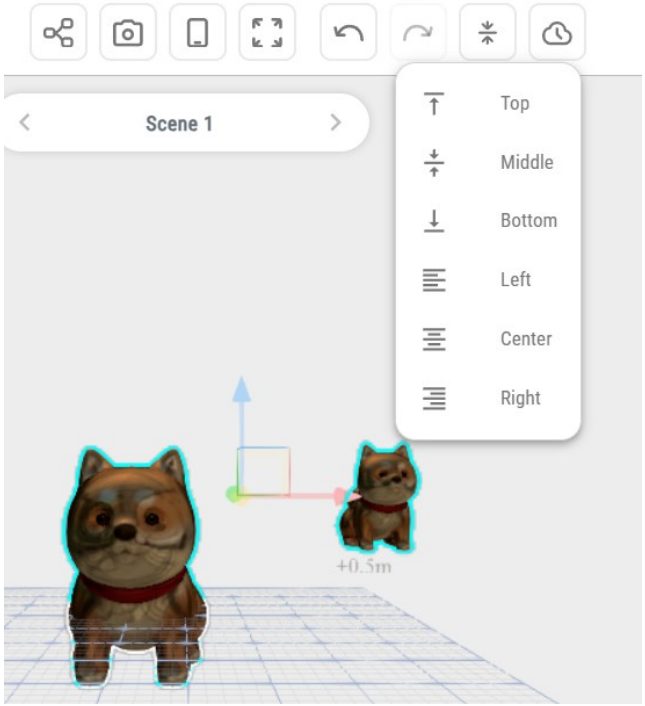
This toolbar provides the following features/functions:

- By clicking on the "Home" icon, you will leave BlippBuilder and return to your project's overview.
- The "Toggle Actions and Events Creator" button, opens the Actions and Events Creator (refer to the section "Actions and Events" for further details).

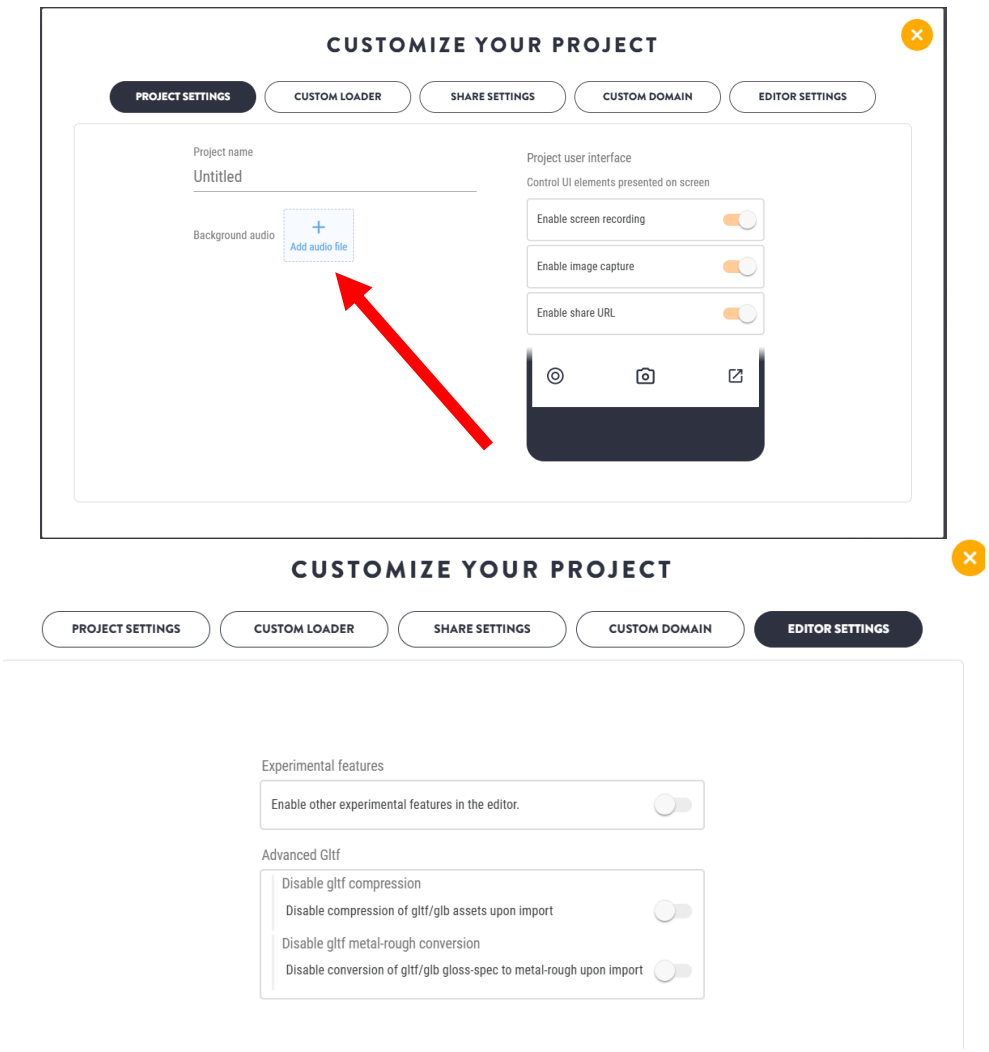



- The "Camera" icon takes a screenshot of your current view.
- The "Smartphone" icon is designed to preview how your project appears on a smartphone, both in vertical and horizontal orientations.


- The next button switches to full-screen view.
- Next, are the "Undo" and "Redo" buttons.
- You can select multiple assets by pressing the "Control/CTRL" key on your keyboard and by clicking on the assets you want to select. The "Align" button allows you to change the alignment of several assets at once.




- The "Cloud" button allows the versioning of your project.
- The "Gear" button is for customizing some settings of your project, several of which are not available in BlippBuilder's free version. In the "Project Settings" tab you can enable screen recording, image capture, and URL sharing. Moreover, you can add an audio file that plays continuously in the background. In the "Editor Settings" tab, you can enable some experimental features and also disable some functions related to the method 3D assets are imported to BlippBuilder (it is not advisable to do that).

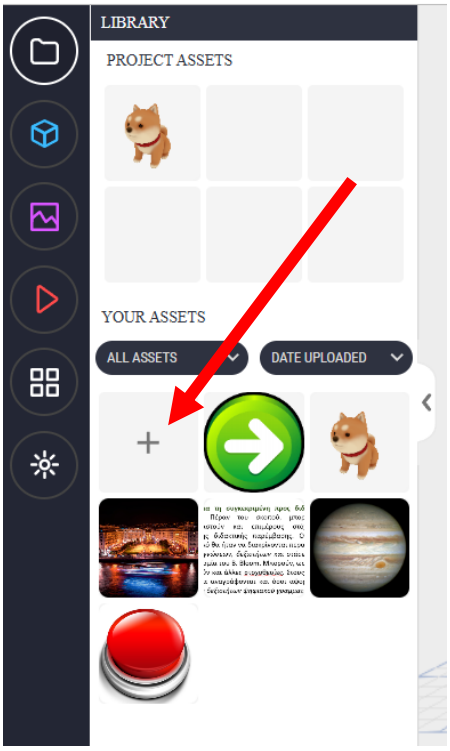



- The use of the "Preview" and "Test on Device" buttons was discussed in a previous section.

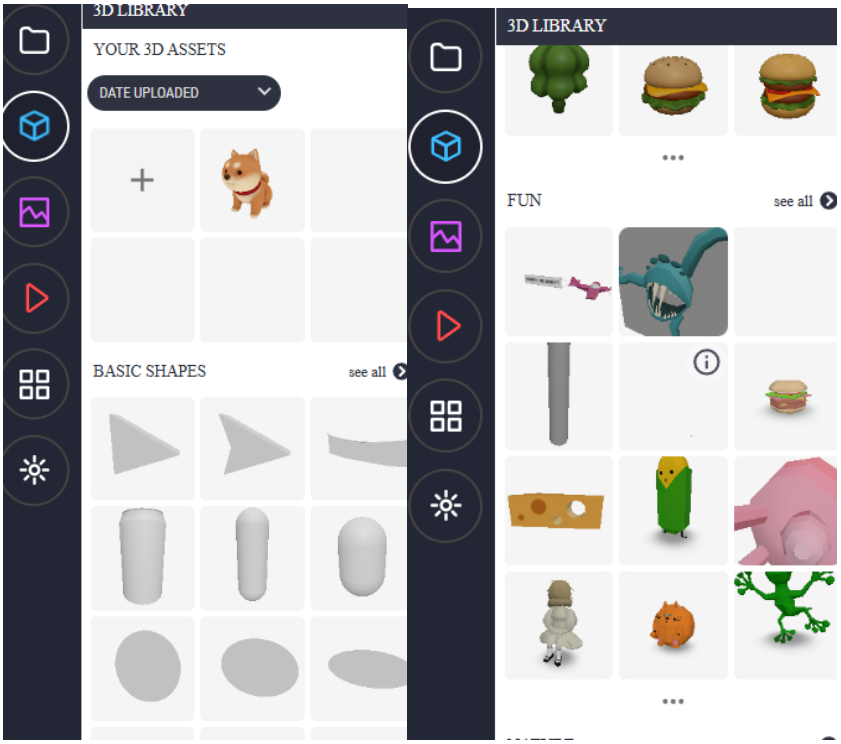
4. The Media Library
In the left panel, all the types of assets you can add to your project are available.

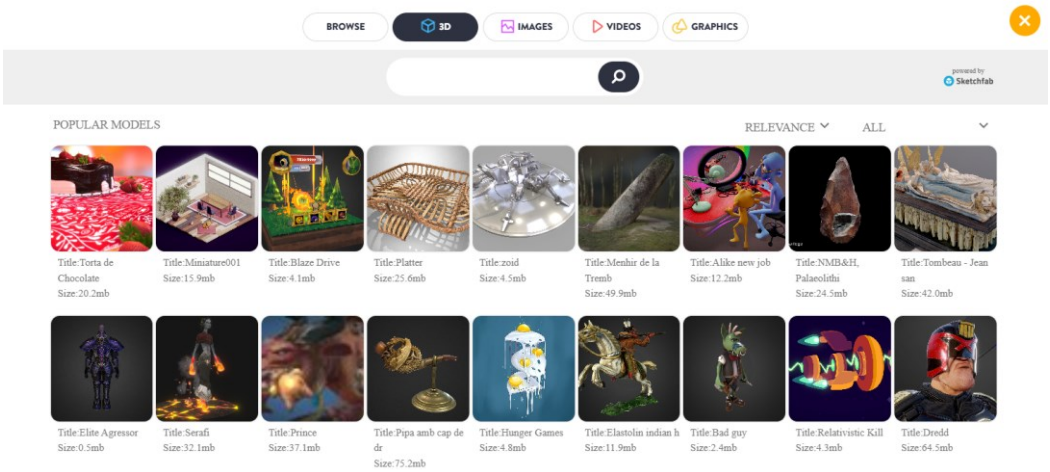
👉 Note. You bring an asset to the Design Canvas by dragging and dropping it.

- The "Folder" icon lists all the assets you have uploaded. You can upload new ones by clicking on the big "+" button.

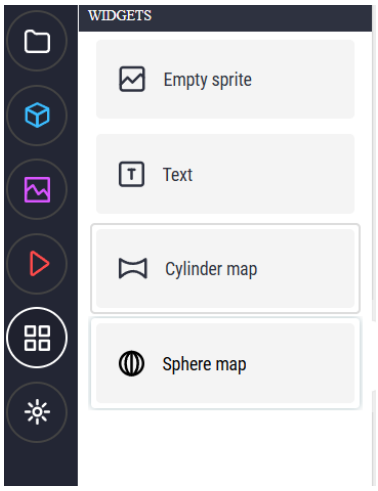



- The "Cube" button is used for inserting 3D objects. You can upload your own from Sketchfab by clicking on the big "+" button (refer to the section "Importing 3D models from Sketchfab" for further details) or use one of the already available.

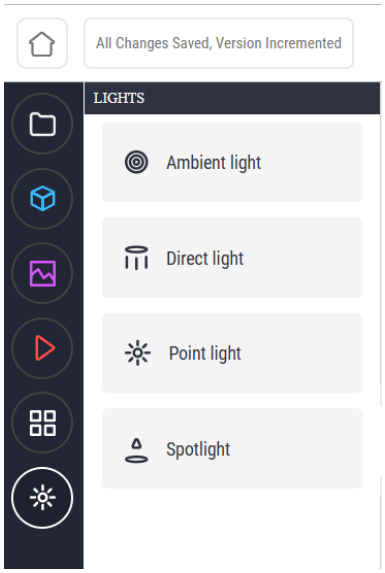





- The "Image" and "Play" buttons are used for inserting images and videos.
- The next button is for inserting widgets. It includes the option for inserting text.



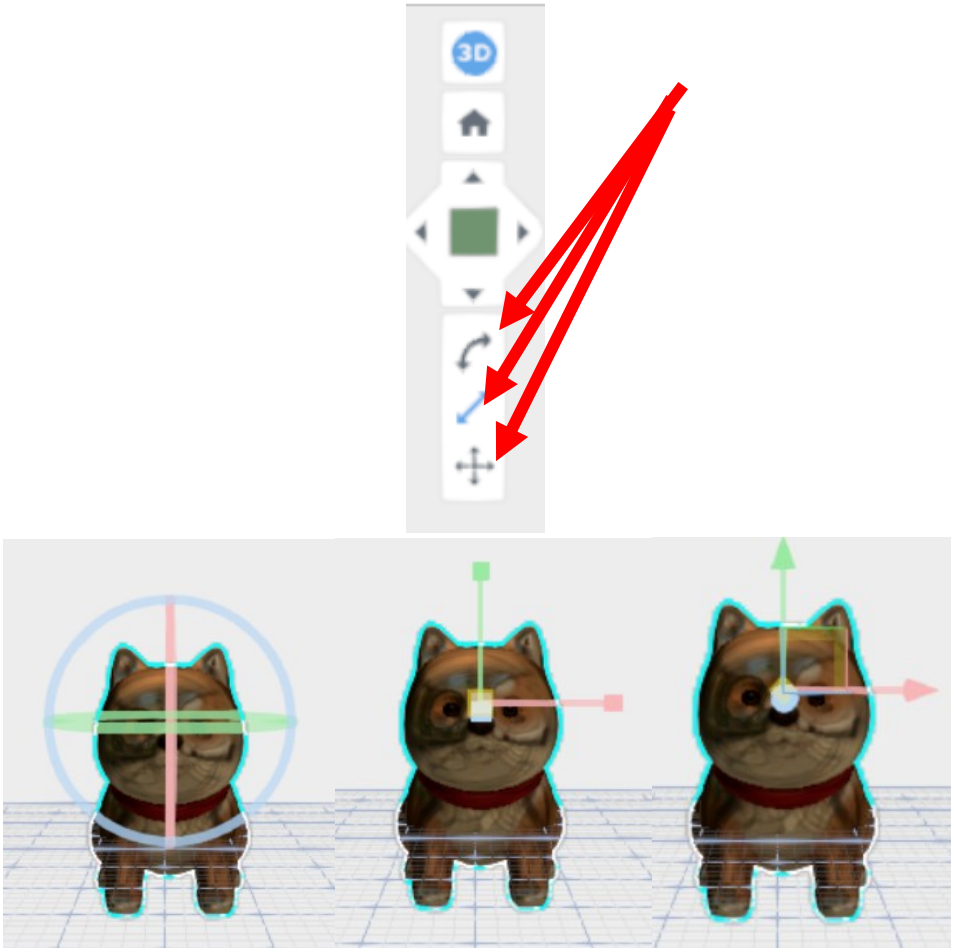

- The "Light" button is used for inserting various types of lights into your experience.




5. The Asset manipulation toolbar

- When inserting an asset into the Design Canvas, you can rotate, resize, and move it by clicking the corresponding buttons in the toolbar, specifically the bottom three. Depending on the selected function,

three axes will appear, representing the x, y, and z coordinates. By clicking on an axis and moving your mouse, you can adjust the rotation, scale, and positioning of the asset along that specific axis.



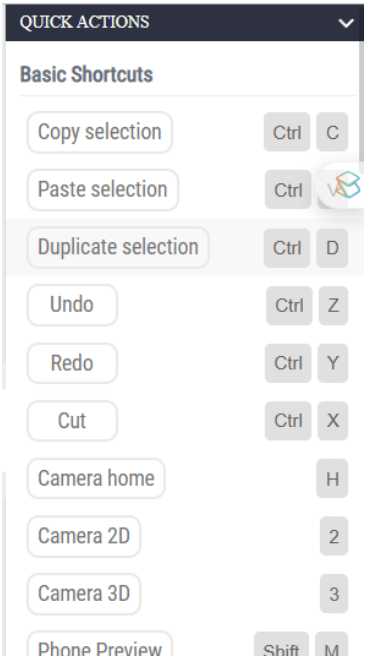

- The "3D" button switches between 2D and 3D viewing mode.
- The "Home" button repositions the camera to the center of the Design Canvas, a useful function in case you have accidentally moved the camera far away from the area in which you build your experience.
- The "Square with four arrows" button positions the camera in the corresponding directions so as to view your experience from different angles.

6. The Properties panel

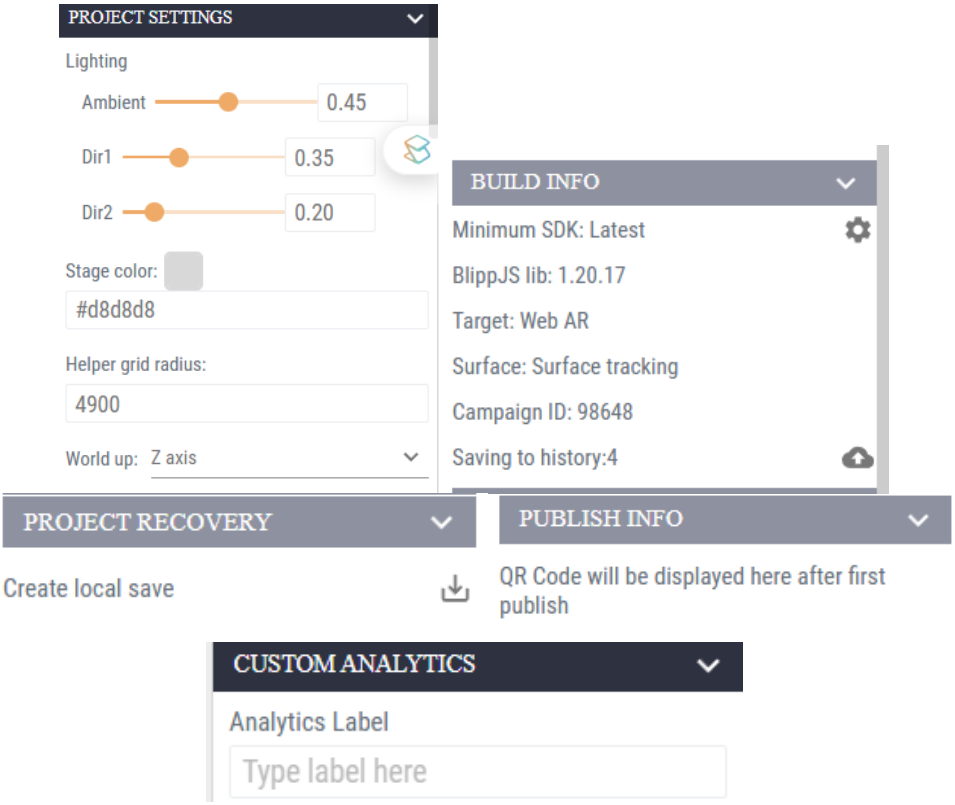
The right panel of the Design Canvas includes several crucial elements.

👉🏽 Note. Click on the "-" button to expand each section.

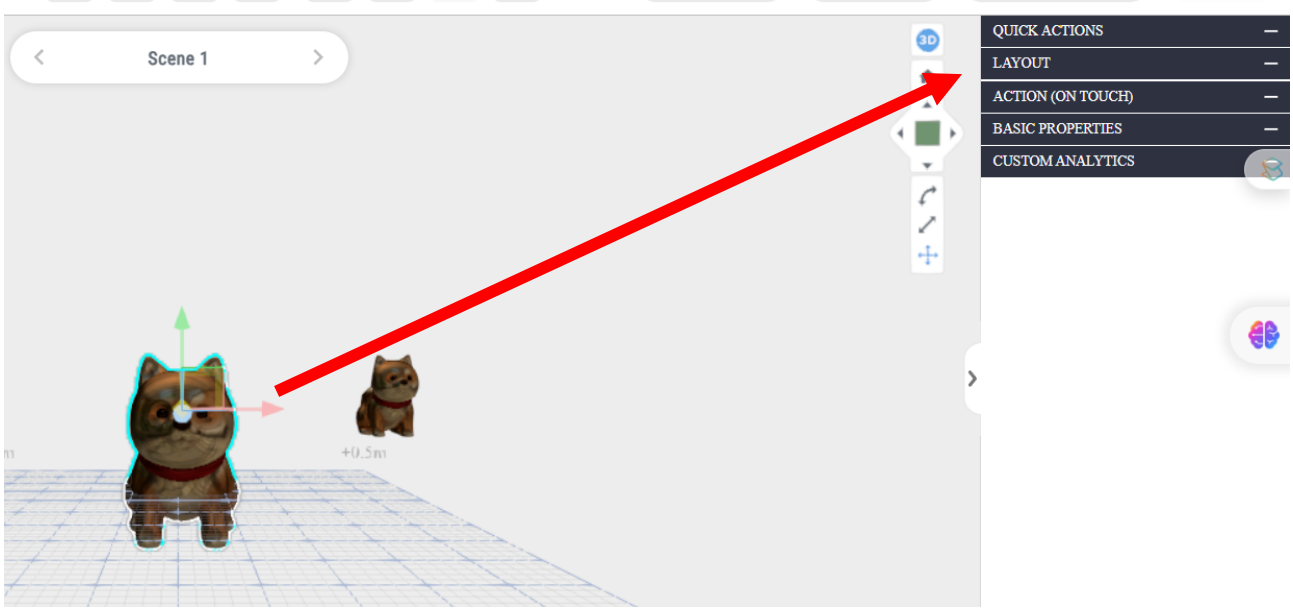
- Quick Actions: Expand this tab to access various keyboard shortcuts.



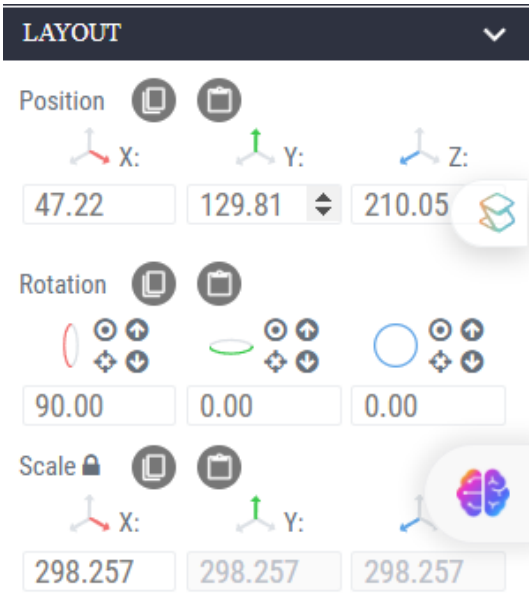

- Project Settings: Expand this tab to manage various project settings, including lighting and color. This tab also provides information on build and publishing options and allows you to download a copy of the project. It also includes a "Custom Analytics" section to facilitate the analysis of the project's performance post-publication.



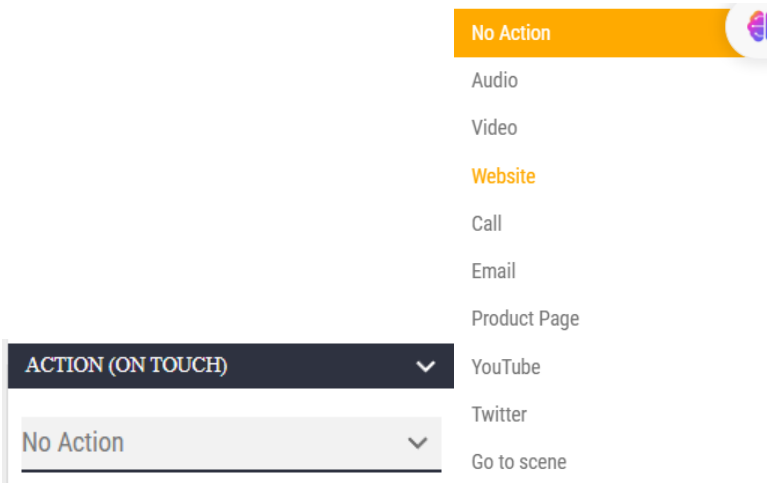
Each asset or 3D shape inserted on the Design Canvas can be customized with various properties, including layout, actions, animations, and basic properties like texture, opacity, and color. For that matter, when an asset is selected, the Properties panel offers a whole new set of options.



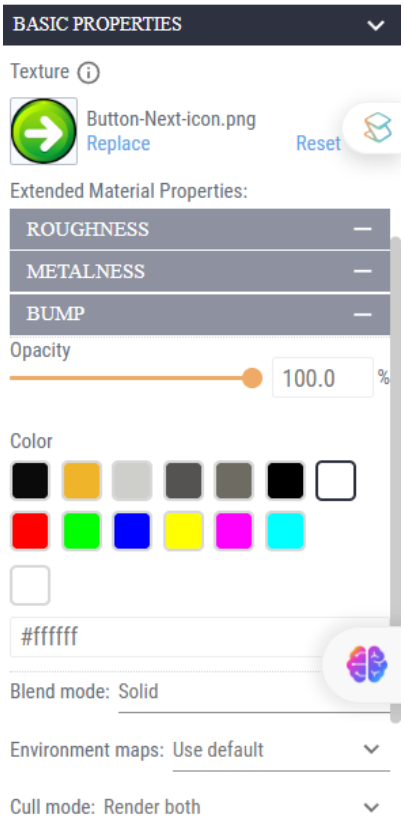

- Layout: Allows for the precise manipulation of the asset's scale, rotation, and position.




- Action: You can assign actions to an asset to make it interactive (refer to the section "All about actions on assets" for further details).



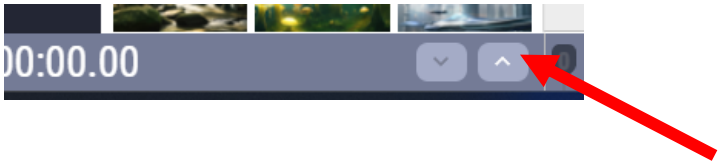

- Basic properties: Depending on the type of the selected asset, you can change some of its properties, such as its color and texture.




7. Animation panel

Customize animations for objects from the Animation panel (refer to the section "More about the Animation panel" for further details about this feature).

👉🏽 Note. Click on the "^" button to expand the panel.

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ANIMATION EFFECTS
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ROTATE
SCALE
FADE IN
FADE OUT
OPACITY
BOUNCE
ANIM CLIP

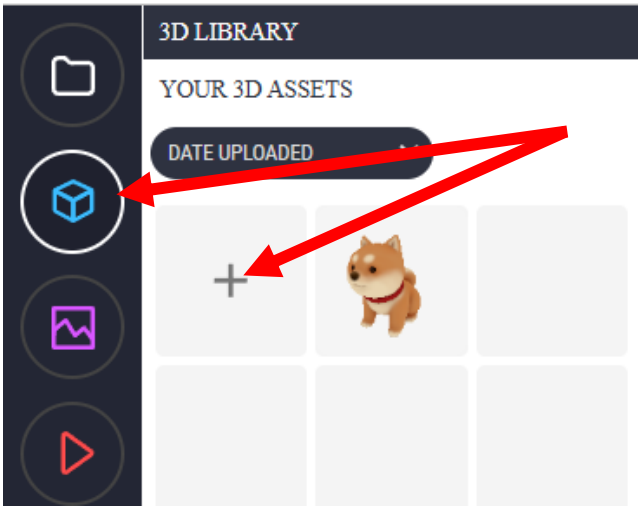
# Importing 3D models from Sketchfab

Sketchfab is an online platform that allows users to publish, share, and discover 3D content, including models, animations, and digital scans. It caters to creators in the 3D, Virtual Reality (VR), and Augmented Reality (AR) fields and has a large community of millions of users. It has an extensive library of hundreds of thousands, if not millions, of available 3D models, many of which are freely available to download and use for your projects. Access to Sketchfab is integrated into BlippBuilder.

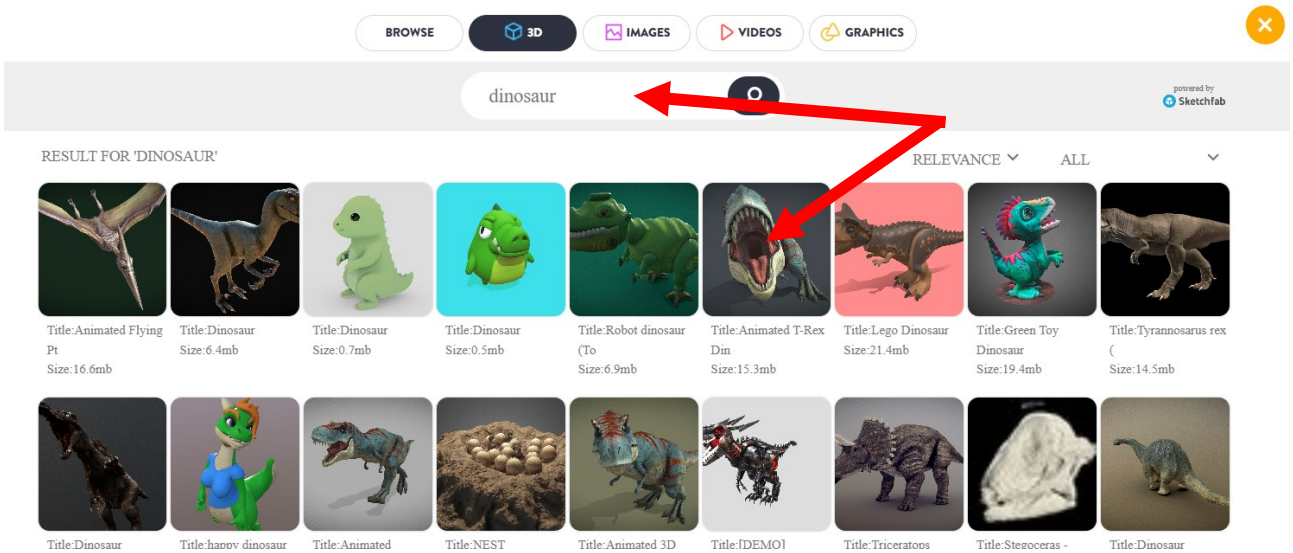
👉🏽 Note. Before proceeding, go to https://sketchfab.com/ and create an account.

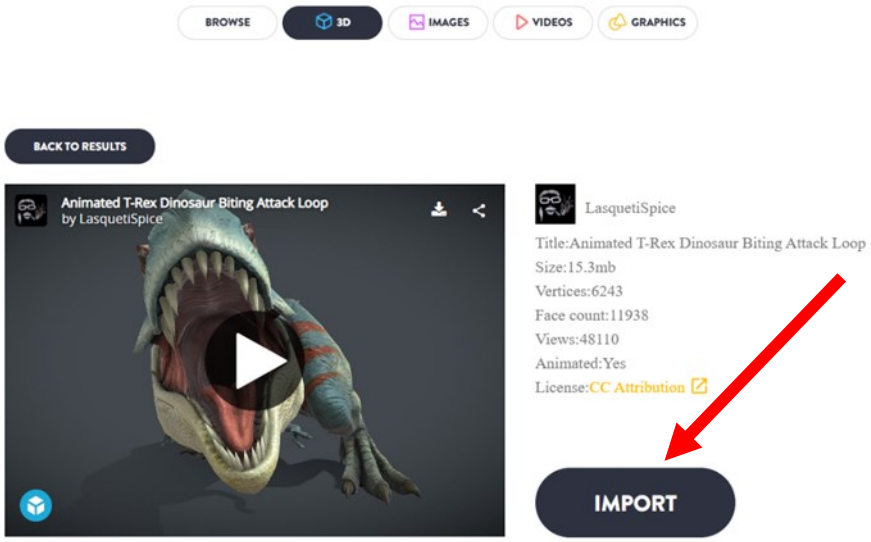
The process of inserting a 3D model from Sketchfab to your experience is rather straightforward:

- On the Media Library, click on the "Cube" button. Then, click on the big "+" button.

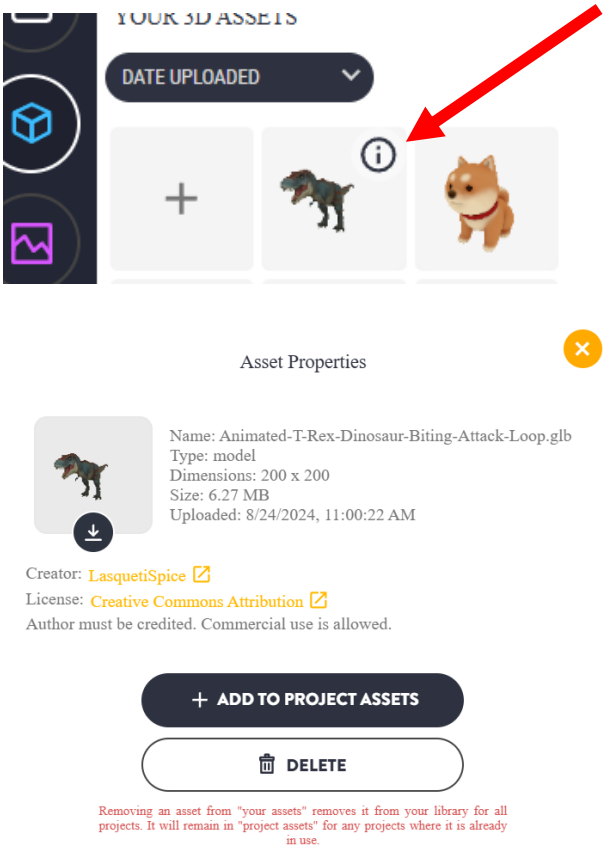



- On the window that opens, search for the desired model and click on it. On the next screen, click on "Import." You will be asked to "Accept" the terms and conditions.





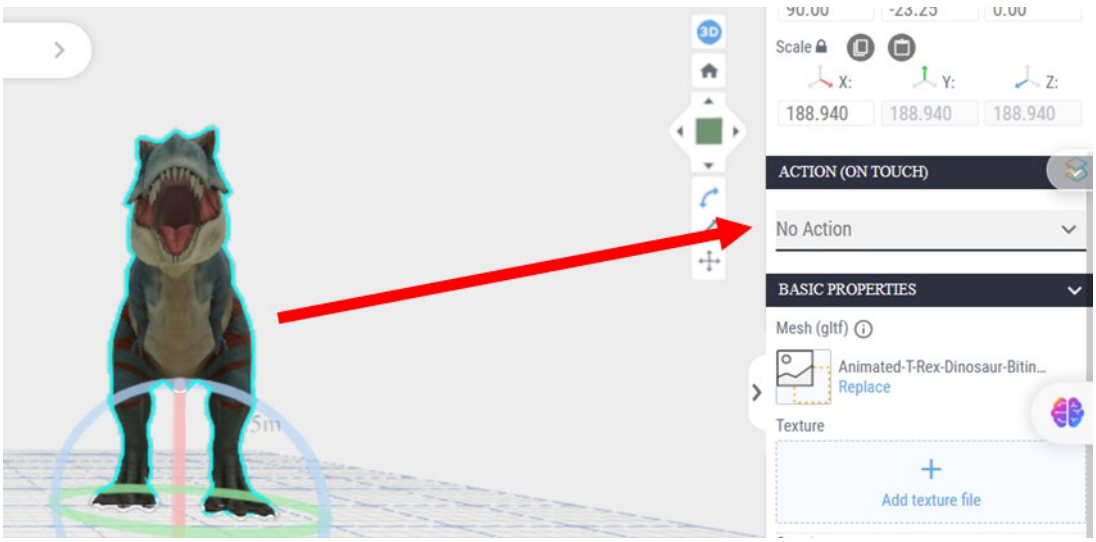

- That's it! The 3D model is added to your Media Library. You can add it to your project's library or delete it if you do not need it.



# All about actions on assets

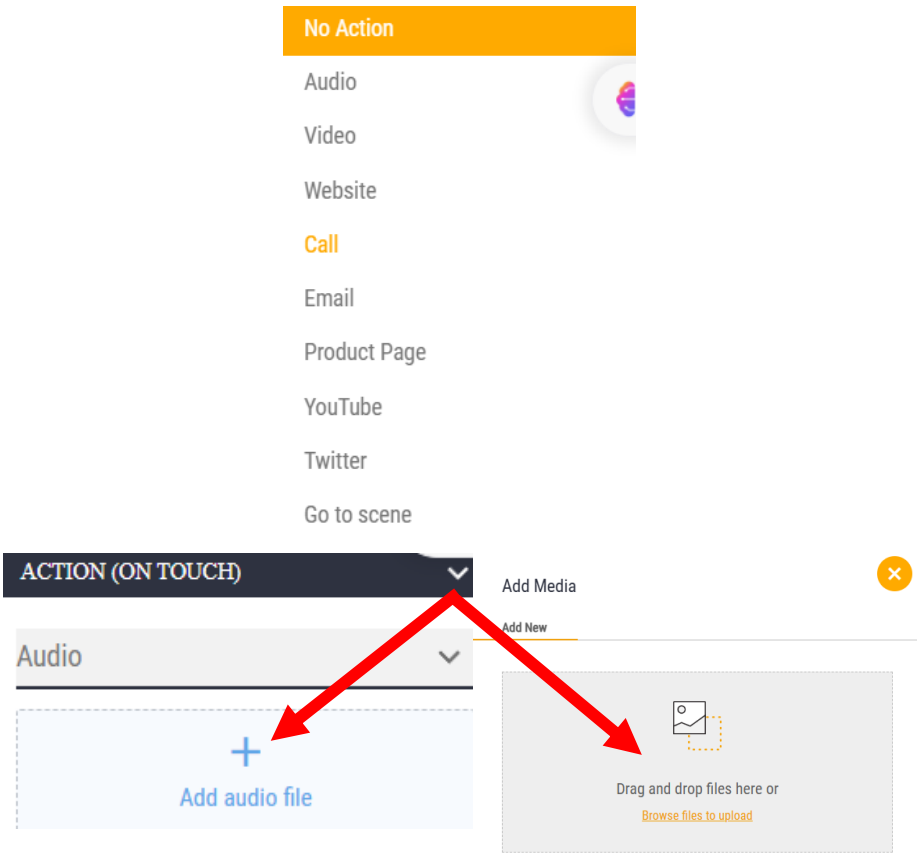
All assets in a project can become interactive when assigning actions to them. The actions are triggered by tapping on the asset when viewing your experience.

- Select an asset and open the "Action" tab in the Properties panel.

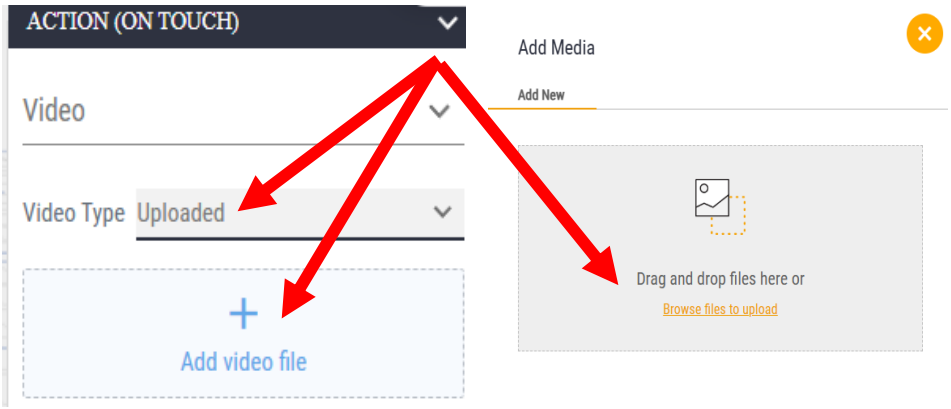


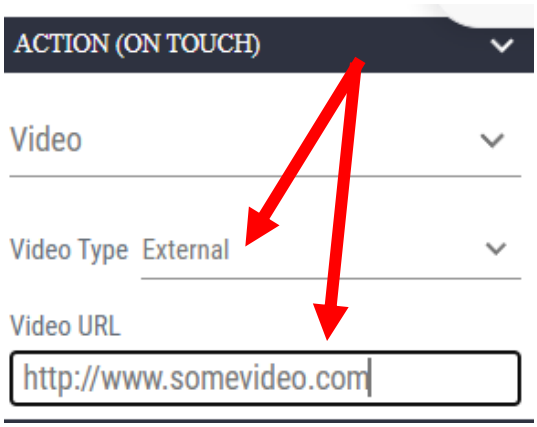

- Select the desired action. The asset can play an audio or video file (you have to upload it first), open a web page, make a telephone call, send an email, redirect to a product web page, play a YouTube video, open a specific Tweet, and load another Scene in your experience. The images below demonstrate each of the above options.

    - Audio.

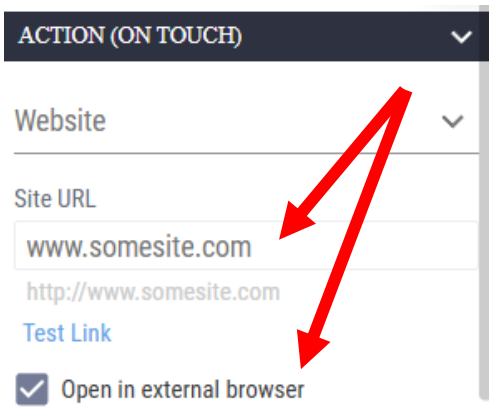


- Video.

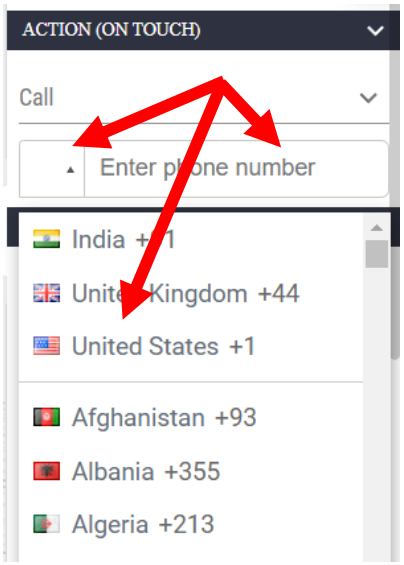


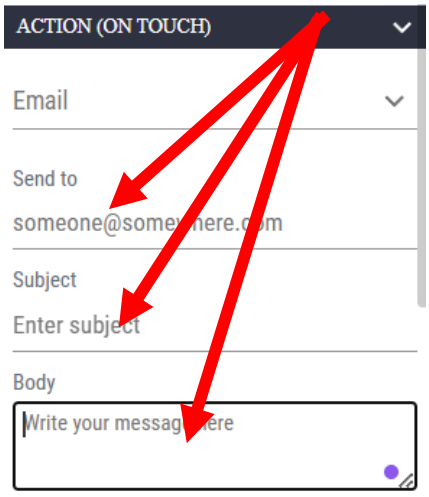

- Website.



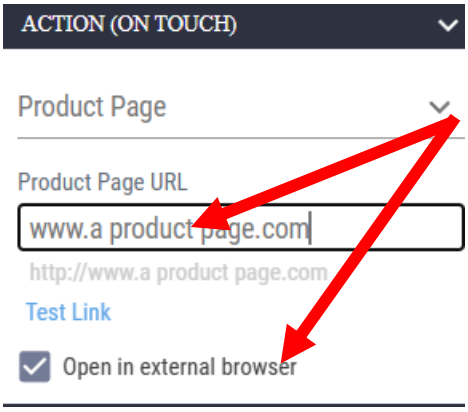
- Telephone call.



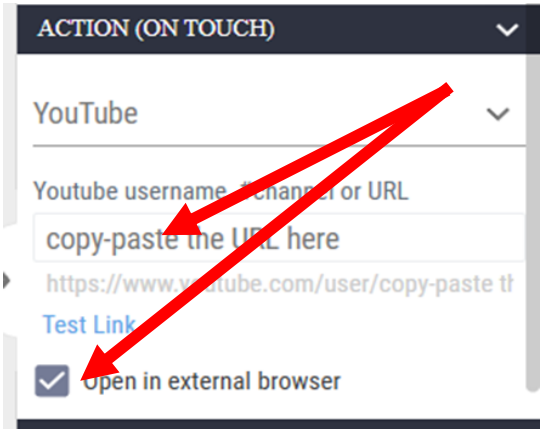

- Email.



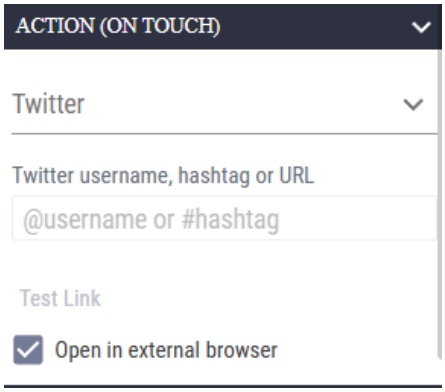

- Product page.



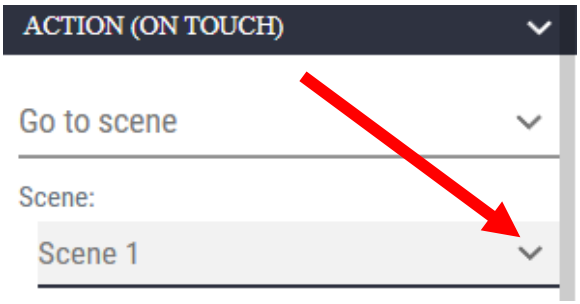
- YouTube.




- Twitter.




- Go to Scene (click on the drop-down menu to select a Scene).



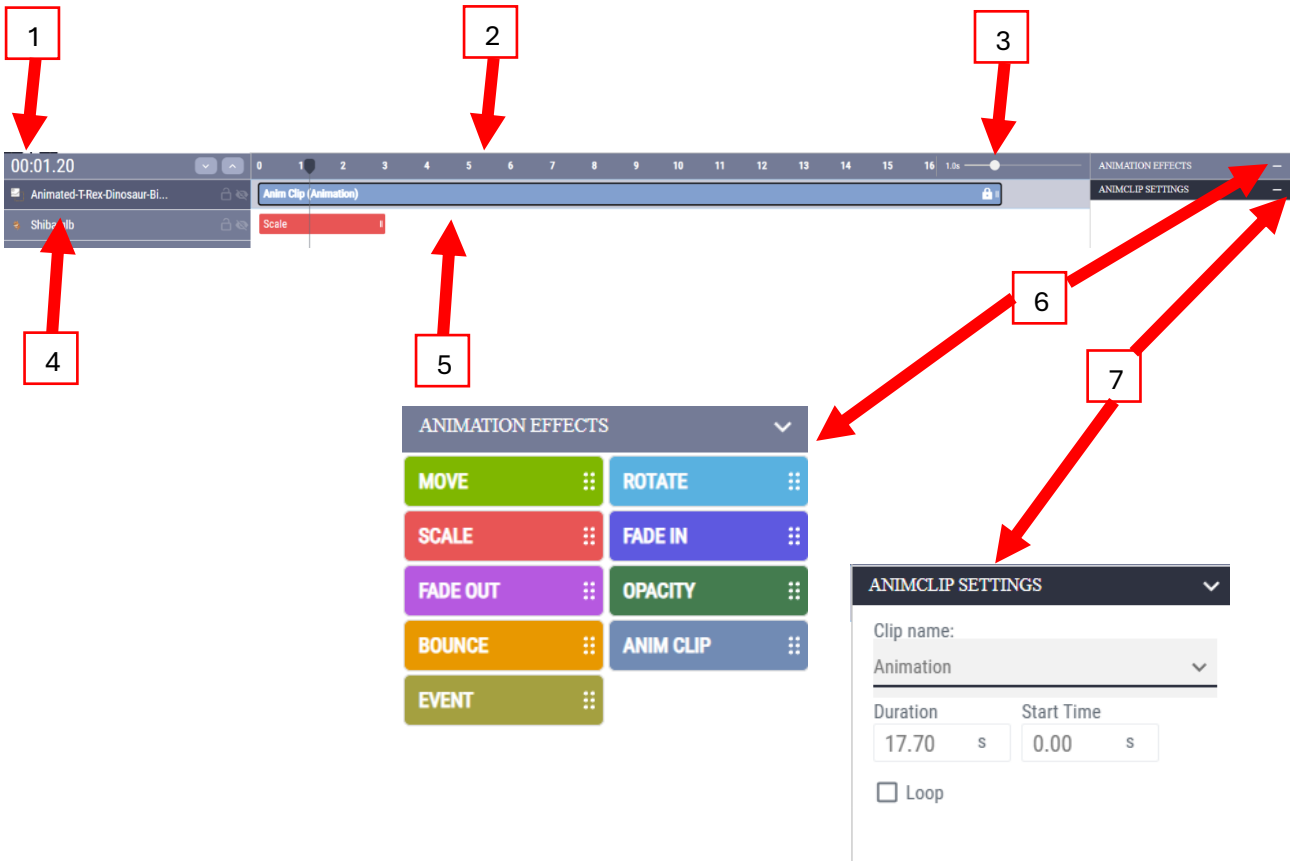

👉🏽 Note. The best method to transition between scenes is to add arrow images to your experience and assign "Go to Scene" actions to them.

# More about the Animation panel

The Animation panel allows you to add basic animations to your assets and control their duration. Initially, the Animation panel is minimized. Only the "Play," "Back," and "Forward" buttons are visible. Click on the "^" button to expand it.

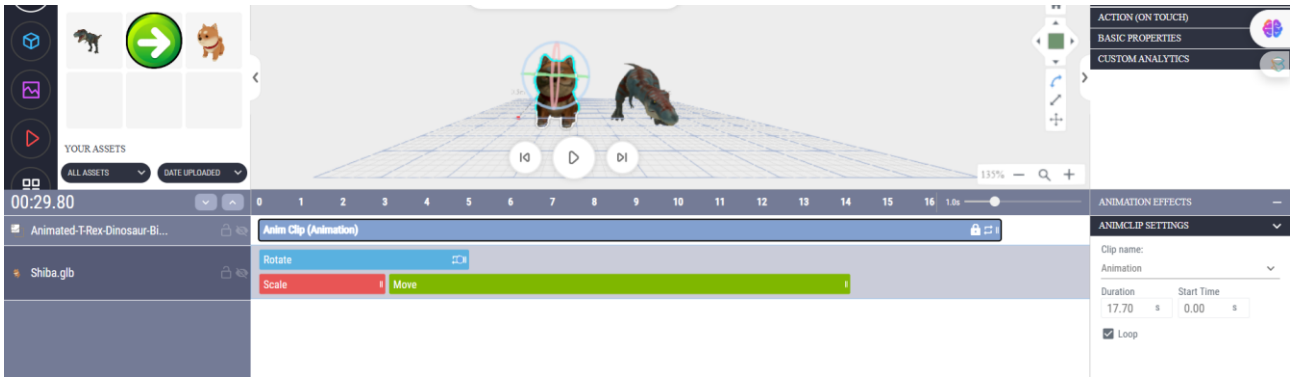
👉 Note. You can click on the "^" button multiple times to expand it even more.


The Animation toolbar consists of several elements:




1. The animation's duration (if one is added).
2. The timeline.
3. The scale of the timeline.
4. The list of assets in the experience. Each asset can have its own animation or sequence of animations.
5. The animation(s) added to the timeline of a specific asset. Click and drag it to make it last for a shorter or longer period of time. Select it and press the "Delete" key on your keyboard to delete it. If it has a "Lock" icon, this means that it is an animation already present in the asset (e.g., in a 3D model you imported from Sketchfab).
6. The list of the available animation effects. Click on the "-" button to expand it.
7. The animation's settings. Select an animation already added to the timeline and then click on the "-" button to expand it. The available settings depend on the type of animation.

In the example below, the animation in the T-Rex will loop (meaning that it will play indefinitely. The little dog will be scaled for three seconds. Following that, it will move for about 11 seconds and then it will stop.



# Advanced topics

# Actions and Events

BlippBuilder allows users to effortlessly create intricate AR experiences without any coding knowledge. It boasts an intuitive flow chart-like layout, where various objects in the scene can be independently controlled. The software allows for looping and branching within the scene, facilitating easy sequencing and flow control. It is also extendable, enabling the addition of multiple feature sets. Users are granted complete control over various events and actions that can be applied to objects, with fully customizable options. The simple drag-and-drop interface allows users to easily connect various vectors, variables, actions, and events. Additionally, the build-along interface, complemented by a powerful in-app preview feature, allows for customization prior to publishing the experience. The system's dynamic nature offers easy options for modifications or design changes.

**How to Access**

To access the "Actions and Events" feature, follow the steps outlined below:

1. Create a new project and select the type of experience you wish to create.
3. You will be redirected to the Blippbuilder Design Canvas.
4. Click on the "Toggle Actions and Events Creator" on the top toolbar and the "Actions and Events" Flow Designer will appear in the panel. Resize this tab if needed.

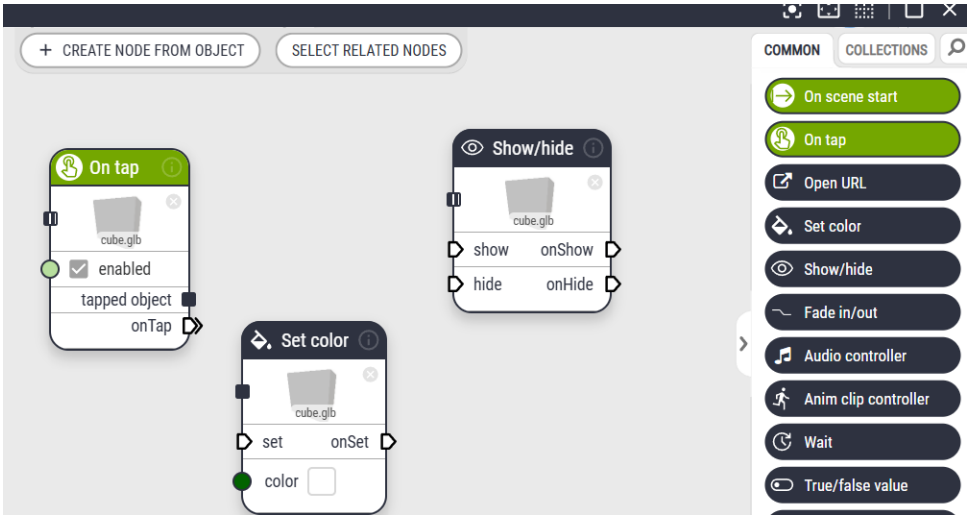
# Nodes, Node Connectors, Node Pins, and Sockets

A node can be defined as a reference to a specific event or action applied to a single or multiple 3D objects in a scene, creating a flow-like structure to outline the AR experience.

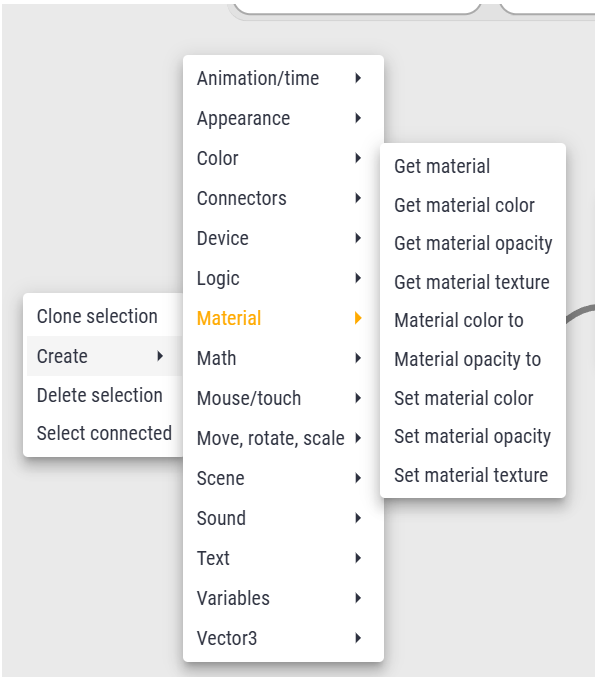
**How to add a Node**

1. Add some 3D objects to the Design Canvas.
2. Click on "Actions and Events Creator" on the top toolbar to start the Flow Designer.

3. Drag and drop Nodes from the right panel or click the required node to add it to the Flow Designer.

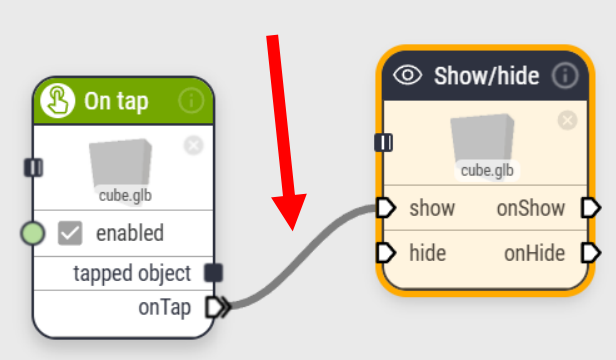



👉 Note. Only the most commonly used Nodes are listed on the right panel. If you right-click anywhere on the Flow Designer and select "Create," you will access the full set of Nodes.



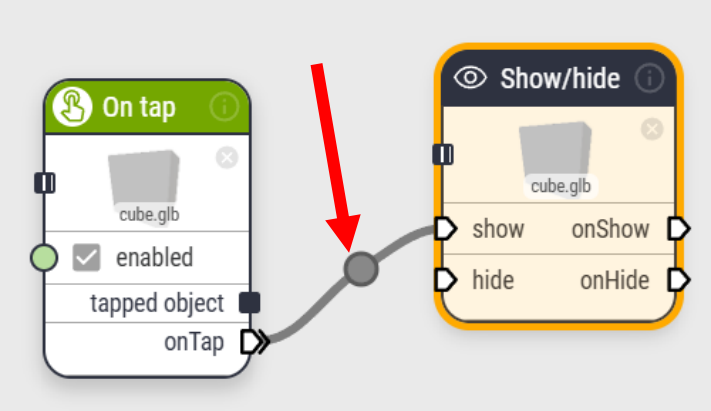
**How to delete a Node**
1. Click on the Node to be deleted. Its color will turn orange, indicating that it is selected.
2. Press the "Delete" key on your keyboard.

**Node Connectors and Node pins**
The connection between an input and an output event is called a Node Connector.



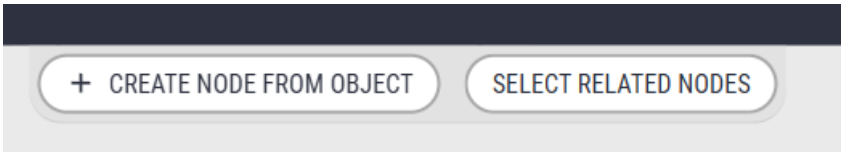

To delete a Node Connector, click on it holding the CTRL key. It will turn red and will be deleted.

To reposition a Node Connector, click it until a dot appears. Use the dot to reposition the connector. This dot is referred to as a Node Pin.




To delete a Node Pin, click on it holding the CTRL key. It will turn red and will be deleted.

👉🏽 Notes. You can easily create Nodes from objects by clicking the "Node from an object" button. You can quickly select all the nodes that are related by clicking the "Select Related Nodes" button.




1. Select the object from the Design Canvas and click 'Create Node from Object'. An object node will appear on the 'Actions and Events' flow designer.
2. Click 'Select Related Nodes'. All nodes related to a specific object will turn ORANGE, allowing for easy movement and design adjustments.

**Node categories**

The various categories of nodes include:

- Event Nodes. Identifiable by a green tile, Event Nodes trigger specific actions for an object. There are four types of event nodes:
    - On Scene Start. Triggers an action at the scene's start.
    - On Tap. Initiates an action upon tapping an object.
    - On Update. Triggers an action when an object is updated.
    - On Timeline Event. Initiates actions using the "Event" tab in the animation timeline.

- Action Nodes. With a black tile, action nodes define specific actions for objects during the scene, such as:
    - Set Color. Modifies an object's color upon an event.
    - Wait. Sets time intervals before another action begins.
    - Open URL. Links the action to an event, like opening a URL on scene tap.
    - Show/Hide. Shows or hides an object in response to an event.
    - Audio Controller. Applies audio controls to specific objects.
    - Anime Clip Controller. Controls animation effects for specific objects.
    - Fade In/Out. Modifies an object's opacity.
    - True/False. Defines true or false actions for events.
    - Number. Indicates time intervals to trigger an action.
    - Create from XYZ. Defines X, Y, and Z axes for object actions.
    - Branch. Applies branched or multiple events for different scenarios.
    - Event Connector. Connects sets of events for easy mapping.
    - Specialized Action Node. Specifies particular objects for action nodes, like the Audio or Anime Clip Controller.

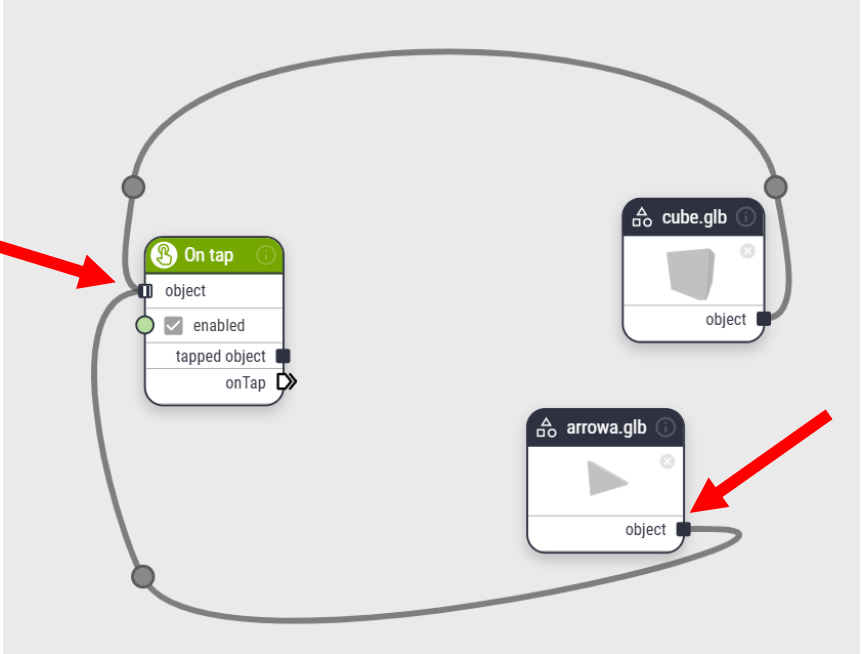
- Object Nodes. Utilize specific nodes created from objects to control individual elements within a scene.

**Sockets**

Event and action nodes have input and output Sockets for objects, events, and actions. These Sockets join events, actions, and objects to build a detailed scene. Types include:

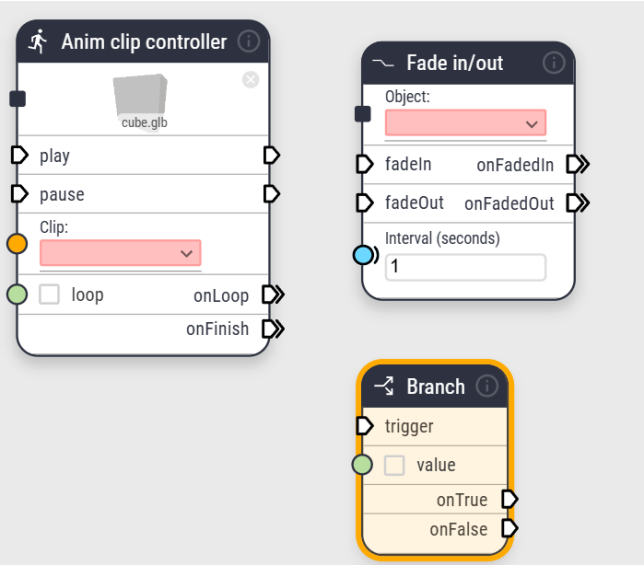
- Input Sockets
    - Object Socket. Specifies an object in the scene for property reading or setting. A Script Node can retrieve properties from an object or, in the context of processing an event, set properties on the object. Utilize the Black object connectors to implement actions and events on objects.

    - Multiple Object Socket. Connects multiple objects from a single event.




- Input Event Socket. The Input Event Socket watches for incoming signals, including taps, scene changes, and other external events. Upon receiving an input event, the Node can execute calculations on its inputs and parameters, modify properties on an object reference, and trigger output events.

  - Vectors. Apply vectors such as x, y, and z. Vector Nodes have a purple color.
  - Numbers. Define the time intervals. Number Nodes have a blue color.
  - Data. Define data values. Identify and specify values for each node with an orange color.
  - Boolean. define Boolean data.
  - Input values (numbers, vectors, strings, Booleans, and other simple data types) provide values for calculations performed by this node. If an input port is not connected to another node, this node can (optionally) display controls in the "parameters and/or input values" that allow the user to enter specific values to use for each parameter.

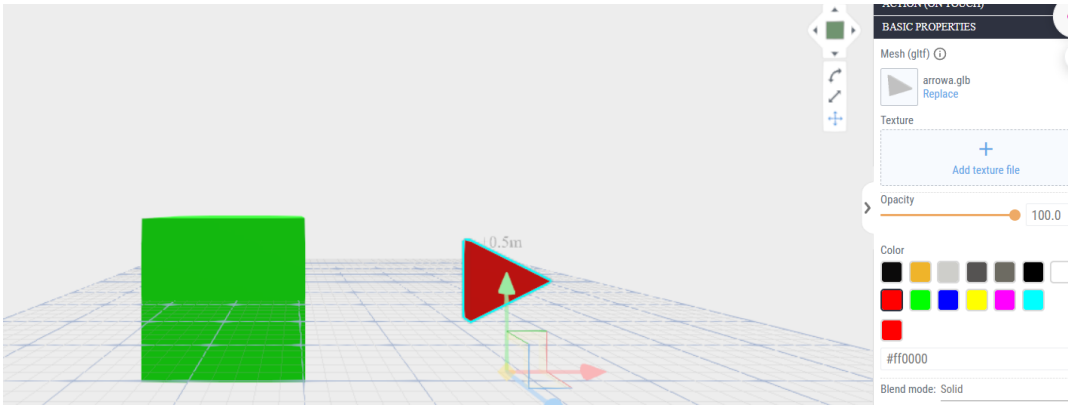



Output Sockets. Output sockets serve as event indicators to denote the occurrence of an output. They are designed to facilitate the attachment of action and event nodes, for which specific objects must be designated. Output values should employ the same symbolic conventions as input values. These values encapsulate the results derived from the computations or tasks executed by the node.

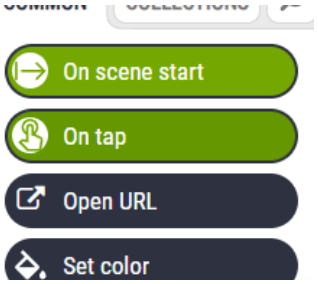
# An example of using the Flow Designer for an on-tap event

Let's see a quick example of how to use the Flow Designer. Suppose you want to change the color of an asset when tapping on another asset.

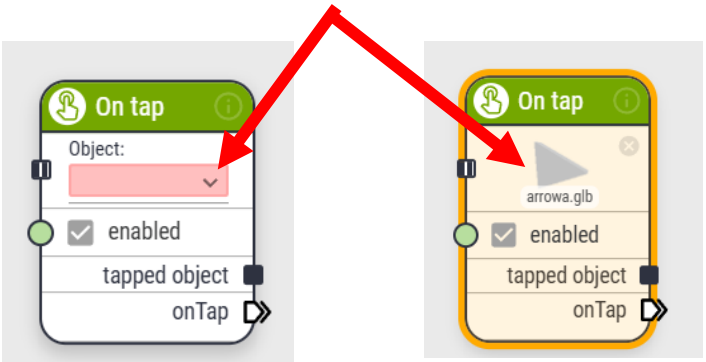
1. Add two 3D objects on the Design Canvas, for example, an arrow and a cube
2. Select the arrow and set its color to red via the basic properties in the right panel of the Design Canvas. Similarly, select the cube and set its color to green.



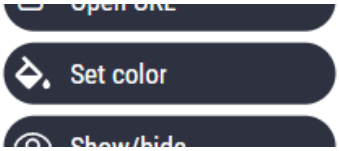

3. Click on the "Toggle Actions and Events Creator" on the top toolbar to start the Flow Designer.
4. Drag and drop or click on the "On tap" button in the right panel to add an "On tap" Node to the Flow Designer.



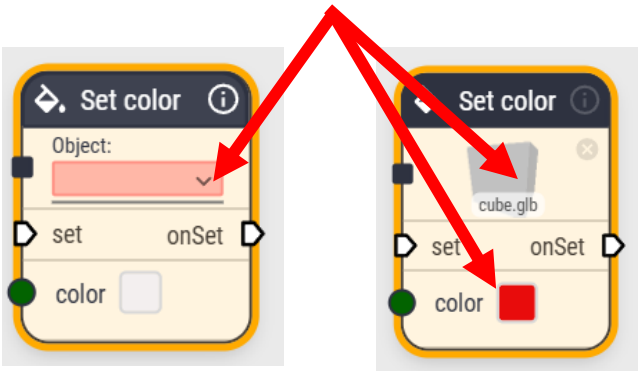

5. Select the arrow as the tapped "Object."



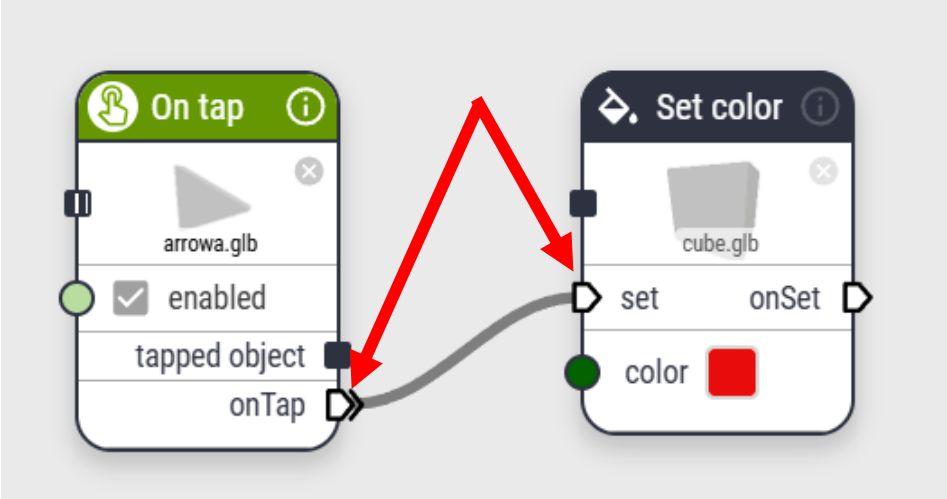

6. Click or drag and drop a "Set color" button, to add a "Set color" Node to the Flow Designer.



7. Select the cube as an object from the drop-down menu and select red as the color.




8. Connect the "On Tap" Node output to the input of the "Set Color" Node.

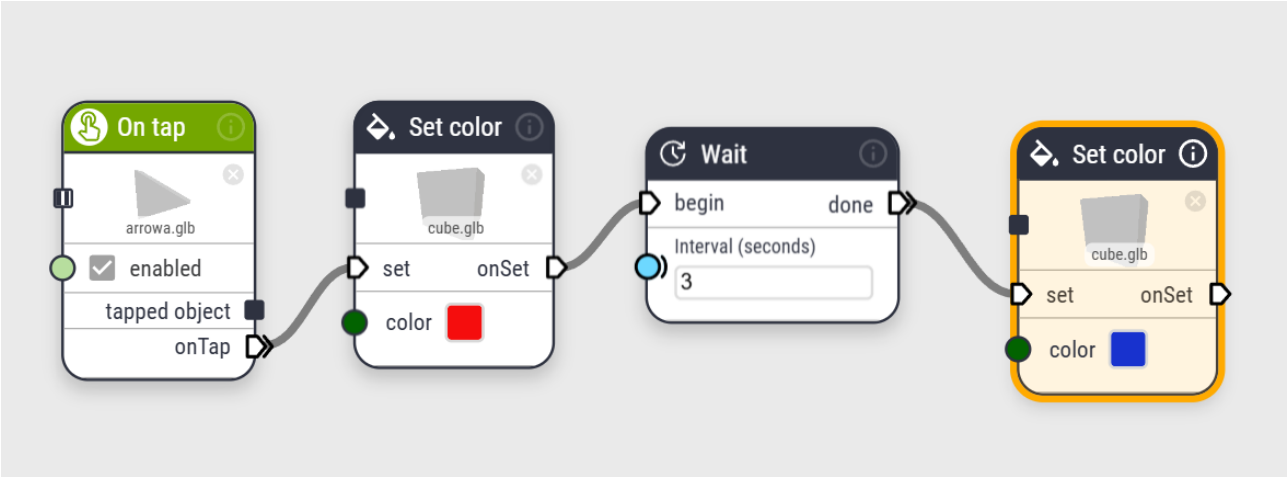



9. You are done! Exit the Flow Designer and click "Preview" or "Test on Device" to see the result.

👉🏽 Note. You can connect multiple assets on the "On tap" Node.

# An example of using the Flow Designer for an on wait on tap event

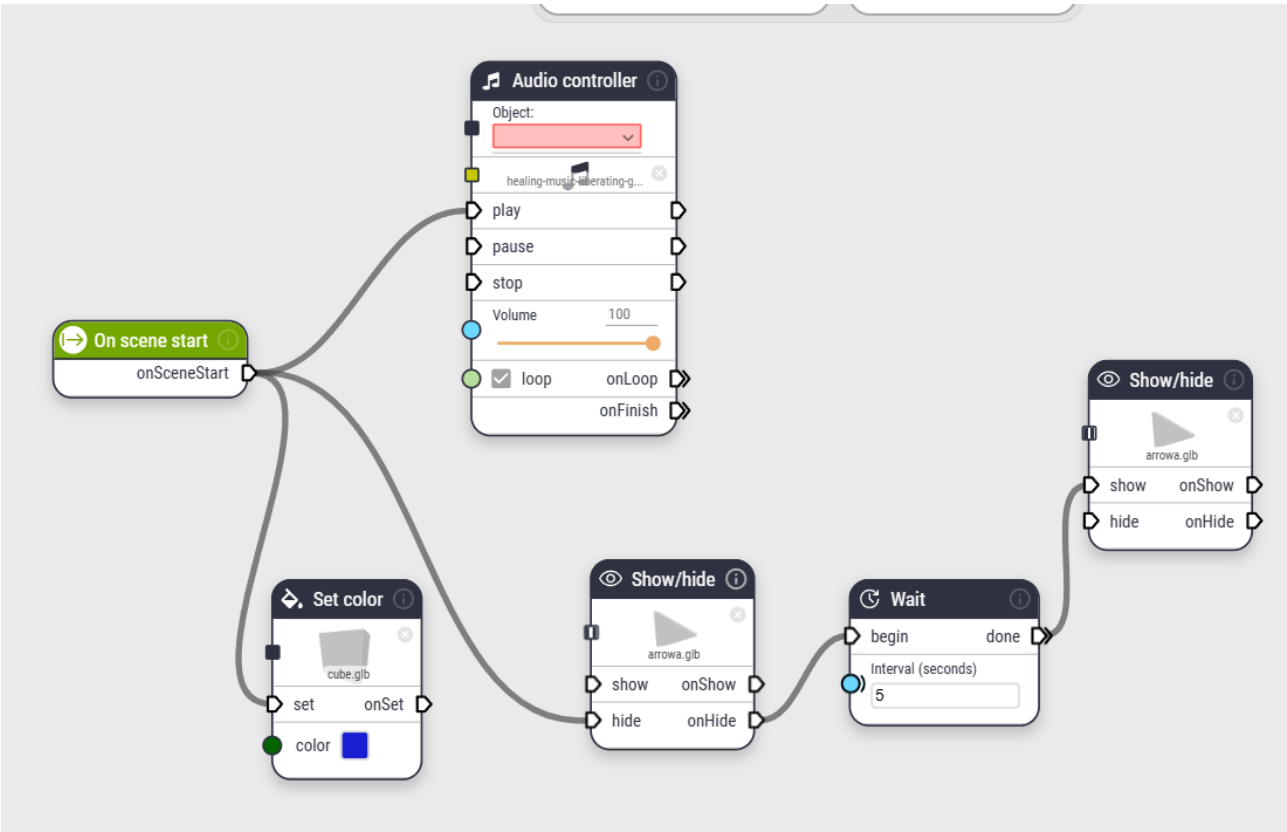
Follow the same steps as in the previous example, but after step 8, configure the Nodes on the Flow Designer as follows:




When you tap on the arrow, the cube will become red, but after 3 seconds it will become blue.

# An example of using the Flow Designer for multiple events when the scene starts

For this example, you need to upload an audio file to your Media Library and add it as an asset to your current project. Add the green cube and arrow used in the previous examples and configure the Nodes on the Flow Designer as follows:




When you preview your experience and the scene loads, the sound file will begin to play, the cube will become blue, and the arrow will disappear. After five seconds, the arrow will appear in the scene.

You've reached the end of the notes! If you read them carefully, you are experts at Blippar!