Accessible Programming

User Guide

Welcome to Blocks4All! Thanks for giving our application a try. If you haven't already downloaded and installed the application, check out the Installation Manual.

Let's get started!

Blocks4All is an application intended to serve the community of tens of thousands of parents, educators, and children who are involved in creating and solving programming activities for those who are vision-impaired.

Our application has three key features:
Activity Creation, Activity Solving, and Activity Management

Users can also unleash their programming creativity in the final mode:
Free Play

This user guide will explain the differences of each of these three features.

Use Cases

Educators might want to introduce programming to their class. However, this might be difficult if the teacher has a vision impaired child in their class. With Blocks4all, teachers can create and modify lessons that are compatible with screen readers and focus on senses other than vision, such as hearing. Many educational apps for younger kids rely on visual cues rather than audible or tactile ones. Kids with vision impairments often have difficulty understanding and learning from these apps.

People with vision impairments often use screen readers such as VoiceOver to dictate the position of objects on a user interface. The complexity only grows, as screen readers are not standardized and create further barriers for users. Screen readers have different controls and struggle parsing pages which are not designed with accessibility standards in mind.

Parents sometimes want to keep their kids busy to finish other work or simply want to get involved with their child's playtime. Parents can use Blocks4All to create or modify custom activities suited to their kid's interests.

Kids are able to complete the activities made for them. Or they might simply want to explore the app without any guidance in the free play mode. However, kids can also become very creative when they play with their peers. If they have a competitive streak, they might want to create challenging activities for their friends to complete.

Activity Creation

Activity Creation is designed for users who want to generate programming activities for themselves or others. The Activity Creation section has full VoiceOver support — enabling low-vision users to also make activities. But the prime users of this Activity Creation section will be parents and educators. They can create activities to make programming more accessible to low-vision students.

To access Activity Creation, open the Blocks4All application.

Free Play

Do Activity

Create Activity

Manage Activity

Set Block Size

Manage Robots

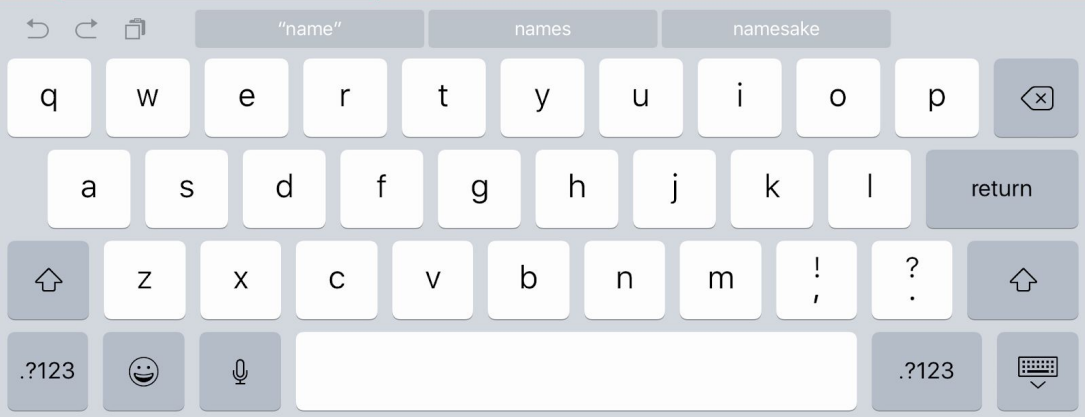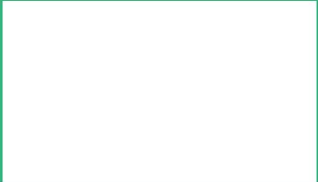Tap on the "Create Activity" button.

Menu   Create Activity   Save Preview Done

Activity Name: [   ] | Instruction | Solution Blocks | Starting Blocks |

Description

iPad 📶   10:25 PM   🔄 65% 🔋⚡

Menu   Create Activity   Save Preview Done

Activity Name: [good name] | Instruction | Solution Blocks | Starting Blocks |

Description

| "name" | names | namesake |

q w e r t y u i o p ⌫

a s d f g h j k l return

⇧ z x c v b n m ! ? ⇧
                              , .

.?123 😀 🎤 [space] .?123 ⌨

Tap on the "Activity Name" field and enter the name of your activity.

Menu   **Create Activity**   Save   Preview   Done

Activity Name: good name | Instruction | Solution Blocks | Starting Blocks |

Description

You task today is to

"to"   too   totally

q w e r t y u i o p ⌫

a s d f g h j k l return

⇧ z x c v b n m ! ? ⇧

.?123 😀 🎤   .?123 ⌨
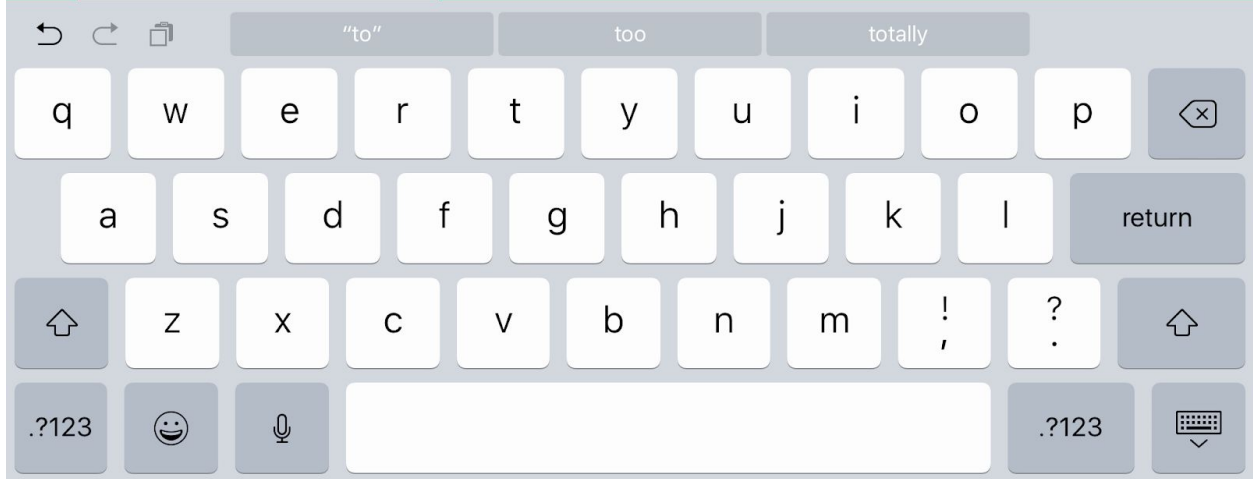
Tap the "Description" box and type in a summary of the activity. The summary should describe the goal of the activity or any instructions you have.

Activity Name: good name

| Instruction | Solution Blocks | Starting Blocks |

Toolbox

Spatial Layout

Sound

Animals

Drive

Control

▶

Next, tap on "Solution Blocks."

Create Activity

Activity Name: good name | Instruction | **Solution Blocks** | Starting Blocks |

< Back **Animals**

Spatial Layout

▶

Using the "Toolbox," tap on any category to access blocks within that category. For example, tap on the "Animals" category to get animal sounds.

Activity Name: good name | Instruction | **Solution Blocks** | Starting Blocks |

< Cancel

Spatial Layout

To put blocks in the solution space, tap the desired block and then tap the solution space, to the right of the "Toolbox."

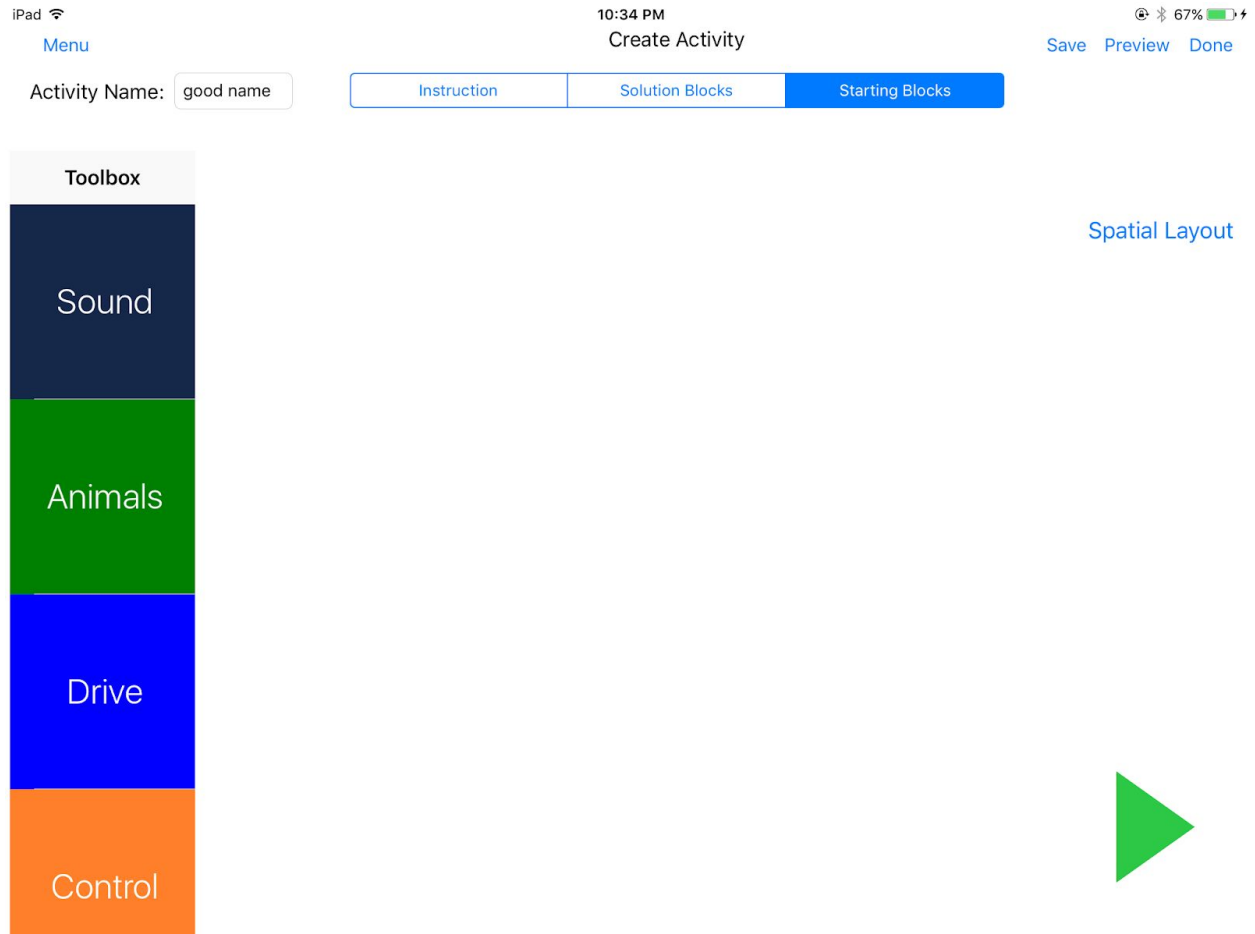Activity Name: good name | Instruction | **Solution Blocks** | Starting Blocks |

< Back **Animals**

Spatial Layout

▶

Next tap on "Starting Blocks."

Activity Name: good name | Instruction | Solution Blocks | **Starting Blocks** |

Toolbox

Spatial Layout

Sound

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▶

Repeat the same procedure for "Solution Blocks" to setup the user's environment at the beginning. Note: you do not have to put any blocks into the "Starting Blocks."

Tap the "Save" button to save the activity. Hit the "Preview" button to see what the application will look like when a user goes to solve the activity. To finish creating your activity, press "Done."

If you want to leave the Activity Creation screen, hit the "Menu" button.

Activity Solving

Activity Solving is designed for users who want to play with created activities. The Activity Solving section has full VoiceOver support — enabling low-vision users to jump right in and get started solving activities!

To access Activity Solving, open the Blocks4All application.

Free Play

Do Activity

Create Activity

Manage Activity

Manage Robots

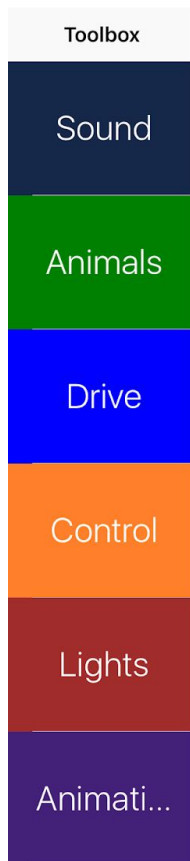Set Block Size
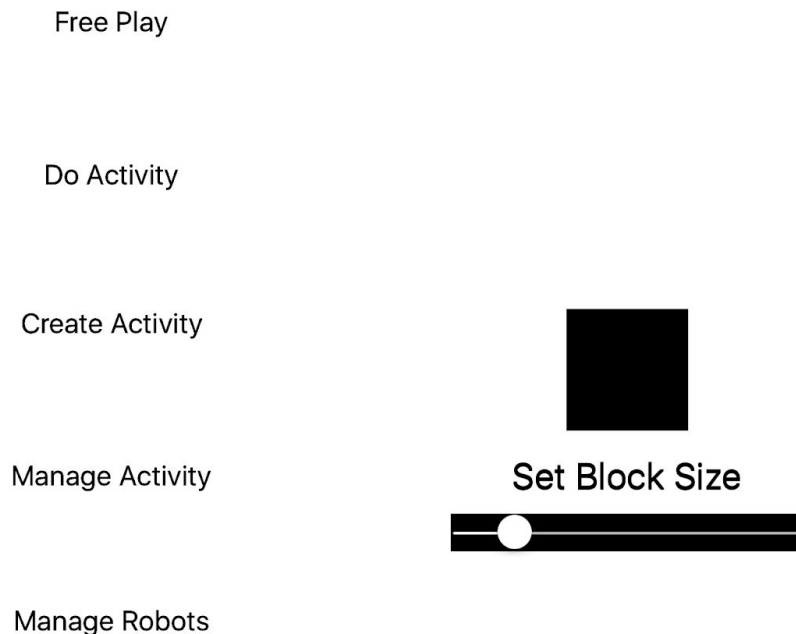
Tap on the "Do Activity" button.

Menu

Do Activity

Croc

Select the activity you would like to complete.

On the next screen, you can use the toolbox to select categories. From the categories, you can select blocks.

Toolbox

Sound

Animals

Drive

Control

Lights

Animati...

Your task today is to make a loud crocodile sound! To complete the activity find the crocadile sound in the blocks menu and place it in the block program, then press play to hear the crocadile roar!

Menu

Spatial Layout

Check Answer

Feedback

▶

<Cancel

Menu

Your task today is to make a loud crocodile sound! To complete the
activity find the crocadile sound in the blocks menu and place it in the
block program, then press play to hear the crocadile roar!

Spatial Layout

Check
Answer

Feedback

You can place them into the solution space on the right by tapping on
blocks and then tapping on the solution space. To delete blocks from the
solution space, tap the block in the solution space and then tap the trash
can that appears.

‹ Back Animals

Menu

Your task today is to make a loud crocodile sound! To complete the activity find the crocadile sound in the blocks menu and place it in the block program, then press play to hear the crocadile roar!

Spatial Layout

Check Answer

Congratulations! That's correct

▶
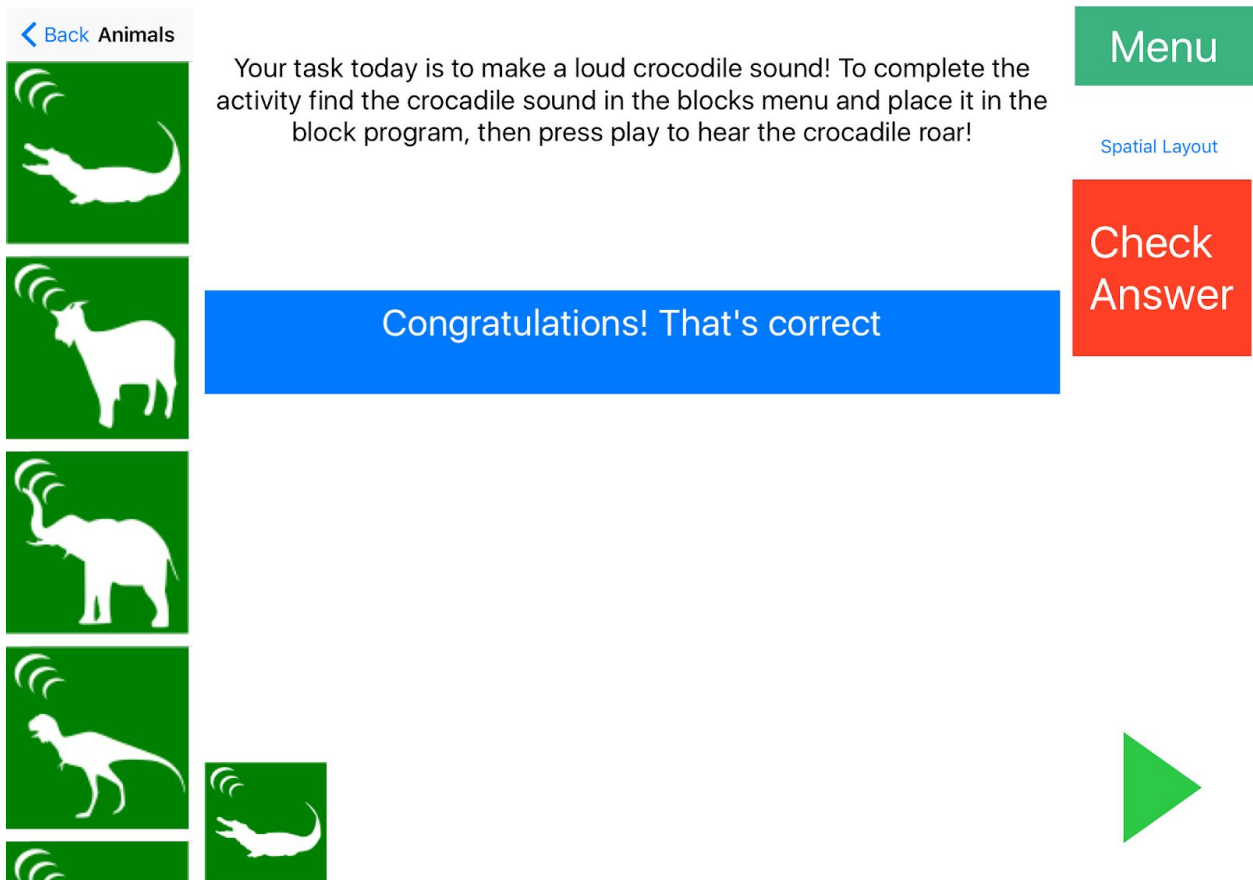
The instructions appear at the top of the screen. You can check your answer by tapping the "Check Answer" button. The feedback box will fill with feedback telling you whether your solution is correct or incorrect.

To go back to the Menu, hit the "Menu" button.

To play your solution, hit the green triangle — play button.

Activity Management

Activity Management is targeted at users who want to edit created tasks — modifying existing solutions or clearing the activity from memory. The Activity Management section has full VoiceOver support — but will mostly be targeted at parents and educators to edit solutions after a student completes a task.

To access Activity Solving, open the Blocks4All application.

Free Play

Do Activity

Create Activity

Manage Activity

Set Block Size

Manage Robots
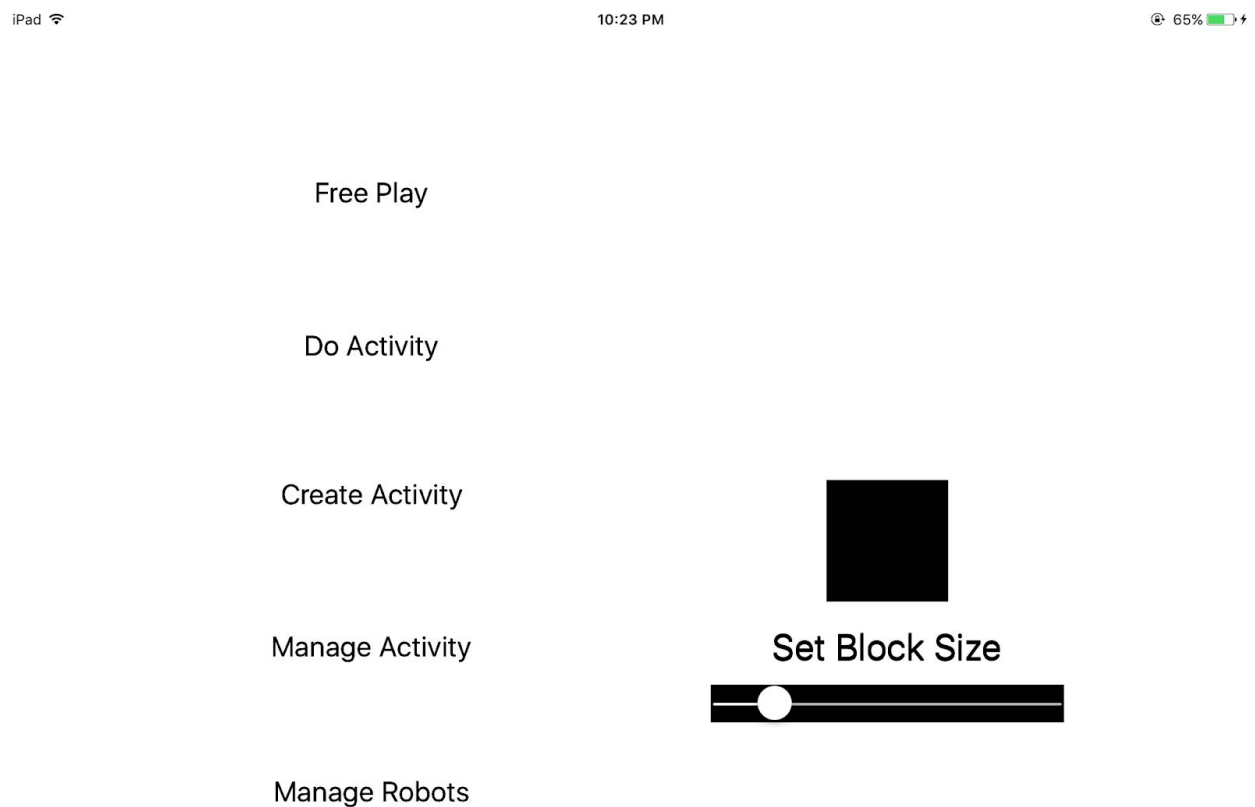
Tap on the "Manage Activity" button.

Menu

Manage Activity

Croc

Note: This section is still under development, so further instructions will be added later

Free Play

Free Play is designed for low-vision users who want to explore programming without having to solve activities. The Free Play section has full VoiceOver support.

To access Activity Solving, open the Blocks4All application.

Free Play

Do Activity

Create Activity

Manage Activity

Set Block Size

Manage Robots
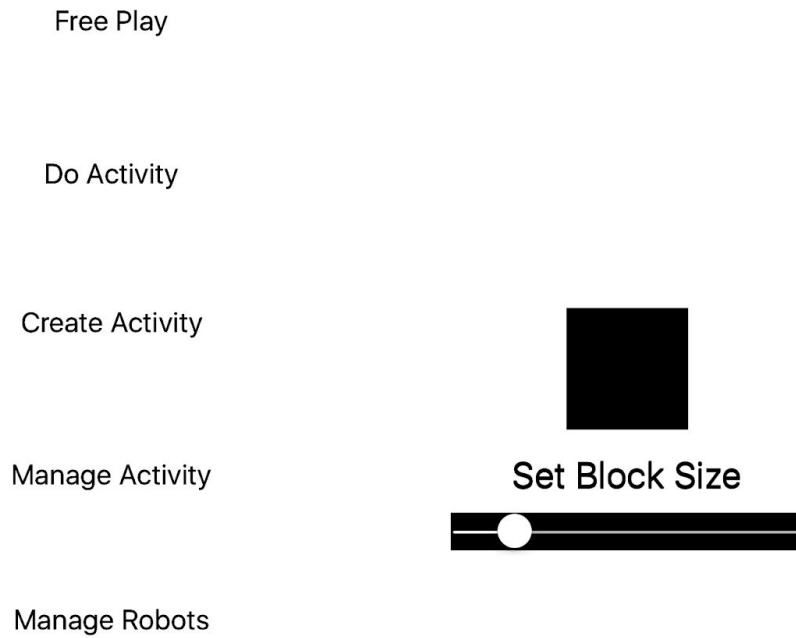
Tap on the "Free Play" button.

On the next screen, you can use the toolbox to select categories. From the categories, you can select blocks.

Toolbox

Sound

Animals

Drive

Control

Lights
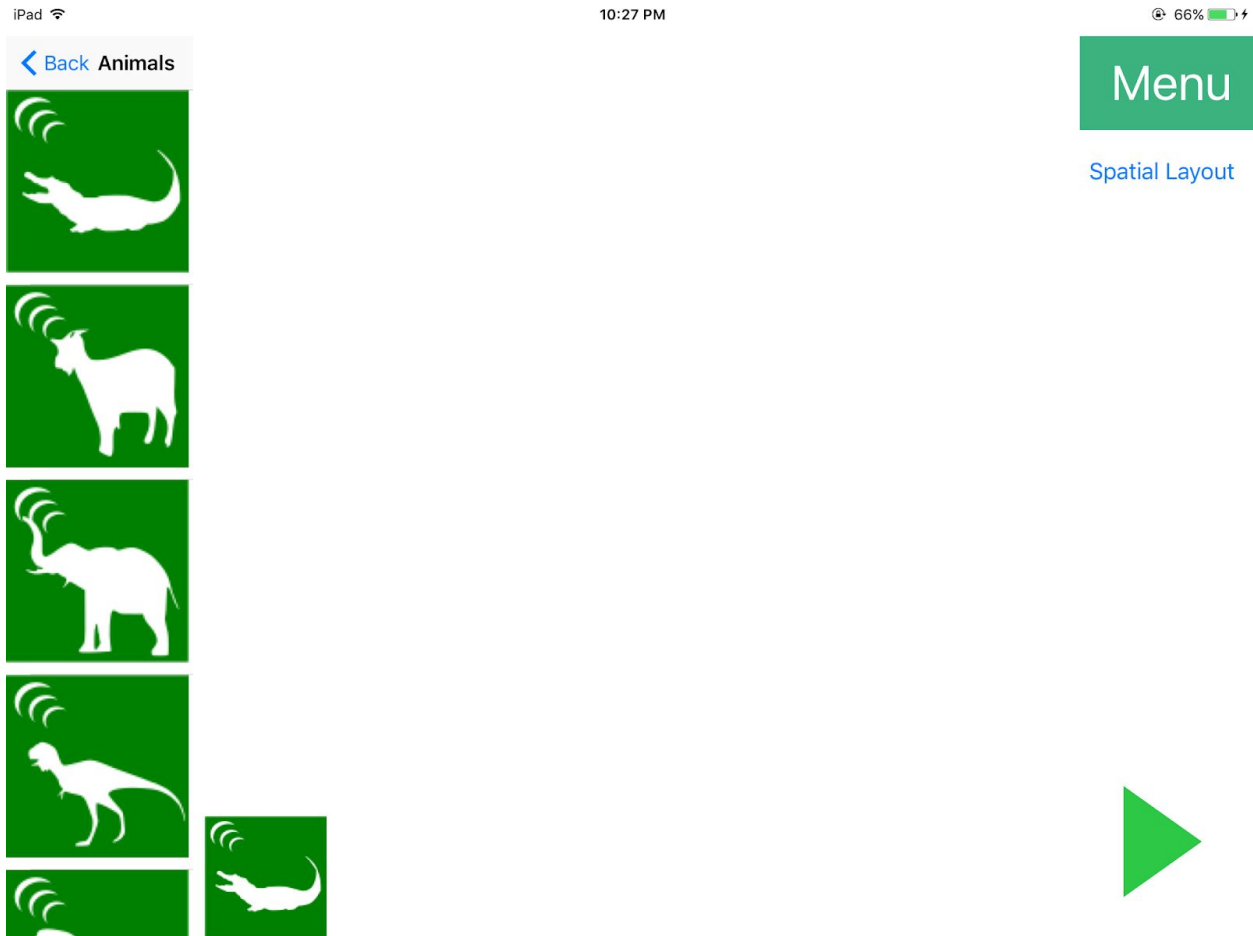
Animati...

Menu

Spatial Layout

▶
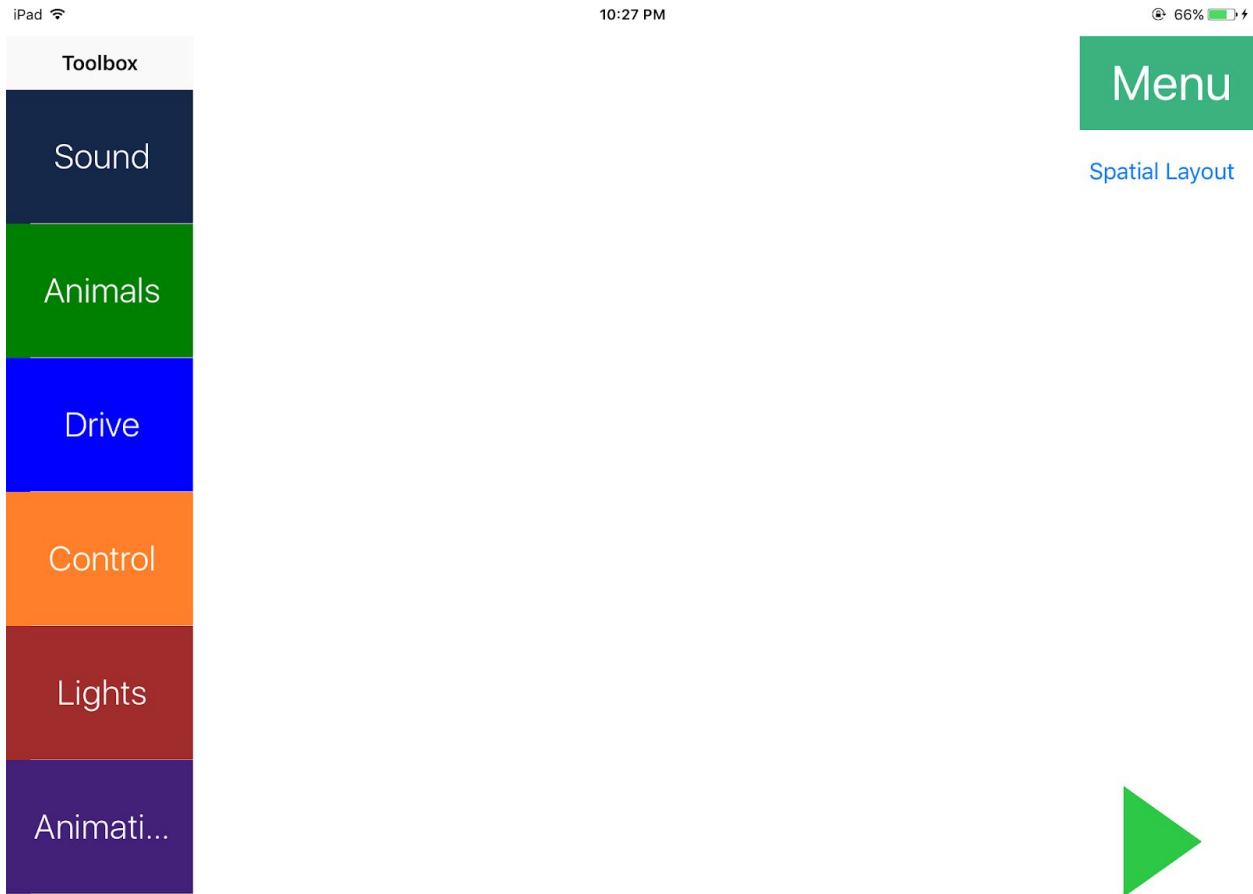
You can place them into the solution space on the right by tapping on blocks and then tapping on the solution space. To delete blocks from the solution space, tap the block in the solution space and then tap the trash can that appears.

Menu

Spatial Layout

Menu

Spatial Layout

To go back to the Menu, hit the "Menu" button.

To play your program, hit the green triangle — play button.

How to Deal With Failures

The Blocks4All application is very forgiving. The solution space comes with a delete tool (trashcan) to remove blocks which have been placed on accident. Activities can be modified after their creation, enabling users to fix up mistakes or riff on others' ideas.

Users can use the Submit feature to get feedback as they are completing an activity. This feature can be used as many times as the user presses it.

Our team has developed the application with failure modes in mind. With these in mind, we added a number of safeties and conditions to catch mistakes before they hit the user. But we cannot catch them all.

Prior to restarting the application or iPad, take a screenshot of your current screen to save any progress you have on the screen. To take a screenshot: hold down the Home button and the Lock button at the same time. If successful, the screen will flash white and the photo will be saved in your Photos app on the iPad. You can use this screenshot to remember what you had on the screen when it comes to returning to your work.

If the application stops responding or crashes, close the application completely: double tap the Home button on the iPad and swipe the program up to close it. Then try re-opening Blocks4All. Depending on where you are in the application, you might lose some progress.

If restarting the application doesn't work, try restarting the entire iPad by holding down on the power button and swiping on the Power Off slider. Wait 30 seconds and then turn the iPad back on by holding down on the power button.

If that fails to fix the problem, remove the application from your iPad: go to the Home Screen on the iPad, hold down the Home button on the iPad (until the apps start jiggling), then hit the X button on the Blocks4All application. Then go back to our Installation Manual and re-install the application. In this case, you will lose all of your progress -- and we apologize for that.