



codekingdoms

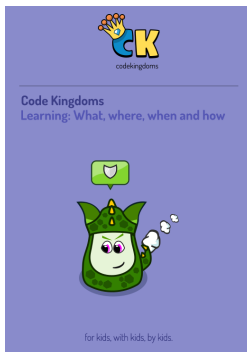
Code Kingdoms Sandbox Guide



for kids, with kids, by kids.

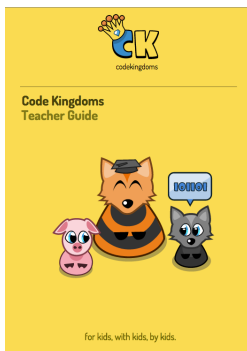
Resources overview

We have produced a number of resources designed to help people use Code Kingdoms. There are introductory guides to all parts of the product and classroom materials to help teach lessons around Code Kingdoms.



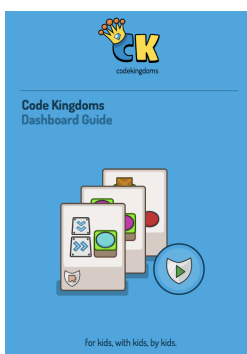
Code Kingdoms Learning: What, where, when and how

A summary of the Code Kingdoms approach to learning.



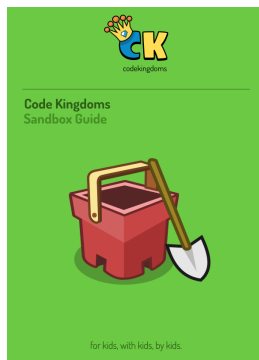
Teacher Guide

An overview for teachers. Describes the Code Kingdoms learning ethos and details the different parts of the product.



Dashboard Guide

A beginner's guide to using our group management tool. Describes everything from registering for an account to assessing the progress of your kids.



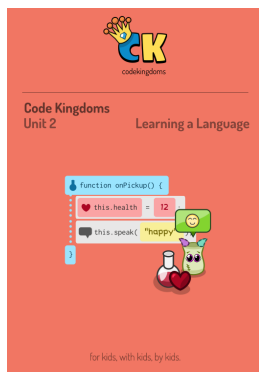
Sandbox guide

A guide to using our unstructured creation environment. Learn everything from using the menus to making great puzzles.



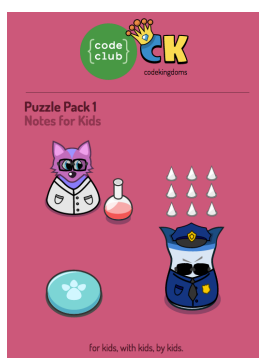
Unit 1: Introducing Code Kingdoms

An introductory unit of six 'off-the-shelf' lesson plans. Targeted at KS2 kids.



Unit 2: Learning a language

Six 'off-the-shelf' lesson plans designed to teach kids the basic of JavaScript

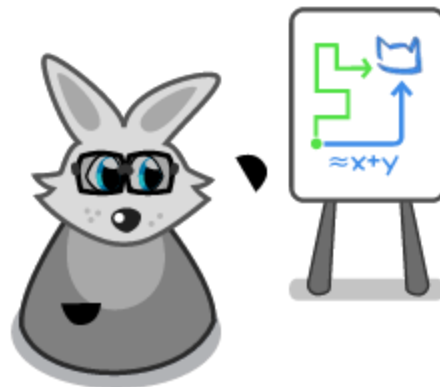


Puzzle Packs

A guide to building specific puzzles in Creative mode. Step-by-step instructions from start to finish. Four puzzles per pack.

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About this Guide

This guide is for teachers, volunteers and kids wanting to use the Sandbox mode contained in CK School (school.codekingdoms.com). It guides you around the Sandbox mode and describes how to build your own puzzles and games in this environment.



Introduction

The Sandbox mode is designed deliberately to be an open and unguided environment where players have the freedom to create the puzzles and games they want to code. As such, there are no in-game tutorials or assistance. For many, this is Minecraft but you get to code your world. This environment runs to the heart of what Code Kingdoms is about: giving kids the freedom and the tools to build what they want to build using code.

We have supporting materials that allow teachers to teach lessons mapped to the National Curriculum and give players inspiration around what to build (available at codekingdoms.com/teachers). The expectation is that these materials will serve as an introduction for teachers and players. With access to a full code library and numerous puzzle objects, we hope they will be inspired to exceed our expectations of what was possible in the Sandbox when it was first conceived.

Sandbox View

This is the editing view in the Sandbox, all aspects of the land can be controlled from here.

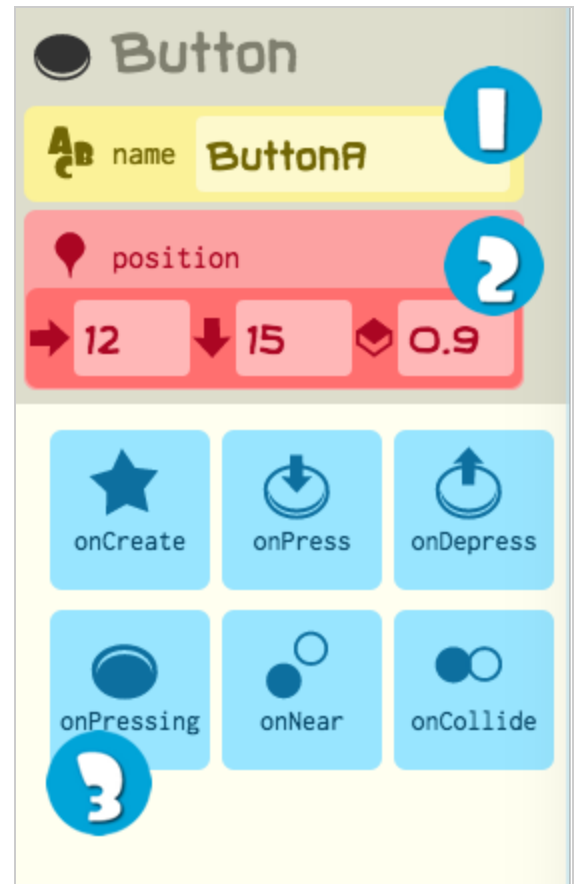


- 1 Character's Face - turn music and sounds on and off and logout by clicking here
- 2 Pieces Tab - these are puzzle objects that can be placed in the land and coded
- 3 Animals Tab - animal's' behaviour can be coded when placed in the land
- 4 Decor Tab - make your land more aesthetically pleasing
- 5 Blocks Tab - change the terrain of your land
- 6 Play Button - use your character to play the land you have created
- 7 Zoom and Undo Tools - zoom in and out and undo your previous actions

Accessing the Sequencer (Coding Environment)

The view below is accessed by clicking on an object placed in the land; it will appear on the right hand side of the screen.

- 1 Object name helps identify the objects you want to code
- 2 Position can be altered by dragging or by changing the X, Y and Z coordinates
- 3 The events icons are the gateway to the Sequencer and help decide what code to give to an object



Using Events

Clicking an event will open the Sequencer and allow the player to begin adding code to the objects and animals in their land.

When using events, ask players to consider what event should trigger the behaviour they are trying to code. For example, onCreate might be used when they want their code to be triggered when the play button is pressed. This is addressed in more detail by the 3Ws which is included in the 'How to use the Sequencer' section of this guide.

Coding in the Sequencer

The Sequencer is the environment where kids write code to control the Animals and Objects in their land. They use real JavaScript through either drag-and-drop or text-based input.



- 1 Tabs - navigate between the animals tab and language tab to see the chunks of code available to use.
- 2 Code Library - these chunks of code can be used in the main coding window
- 3 Main coding window - this is where kids will build their lines of code
- 4 Exit button - return to the Sandbox view by clicking this
- 5 Save button - make sure you save your code before returning to the Sandbox
- 6 Slider - allows kids to move seamlessly from drag-and-drop to text-based programming

How to use the Sequencer

The unguided nature of the Sandbox mode means that players have access to the entire code library and are free to code what they like. We provide a basic structure called the 3Ws to help kids write code that achieves their aims.

3Ws

When?

This is the event that triggers the code to run e.g. onPress for a button

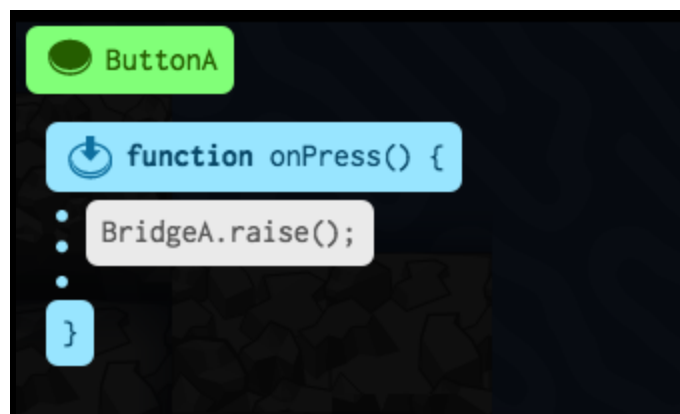
Who?

Which object should the piece of code control? e.g. Bridge A

What?

What action should occur? e.g. raise

This structure would allow kids to create the following algorithm where a bridge would raise when Button A is pressed:

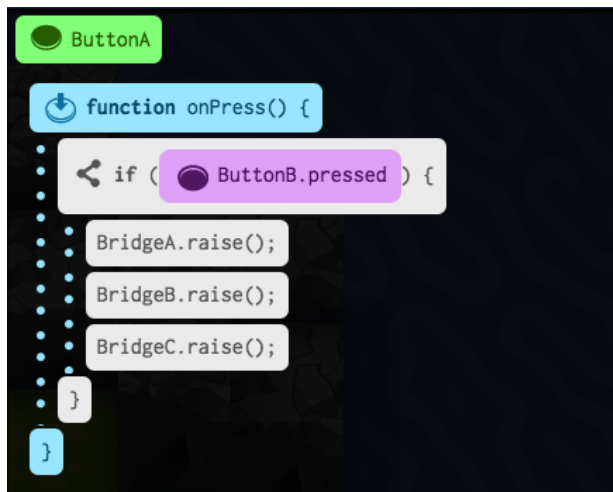


Advanced Coders

Our unique slider allows kids to move seamlessly from drag-and-drop to text-based programming. Mastery of drag-and-drop isn't a ceiling to their progression as they can begin to grasp the syntax and formatting of JavaScript through a typed input.

The slider allows two kids to complete the same activity at two different skill levels. It is also a good motivator for beginners to see what they deem "real code" behind the drag-and-drop interface.

The images below shows the same algorithm completed with the slider set at beginner and most advanced modes.








```
1 function onPress() {  
2   if (ButtonB.pressed) {  
3     BridgeA.raise();  
4     BridgeB.raise();  
5     BridgeC.raise();  
6   }  
7  
8 }
```

Code Cheat Sheet

This cheat sheet gives you an initial understanding of how to use the functions in Code Kingdoms. We have a full cheat sheet detailing all the pieces of code available in the Sequencer at codekingdoms.com/teachers.

Events / Functions

Functions are the starting point for writing code in Code Kingdoms. A function is attached to a specific object (e.g. a button) and will trigger code to run. Functions can be considered events.

	Code	Definition
	<code>onCreate</code>	Runs its code when the object is created in the game
	<code>onPress</code>	Runs its code when a button is pressed once
	<code>onDepress</code>	Runs its code when a button is released
	<code>onPressing</code>	Runs its code whilst a button is pressed down
	<code>onCollide</code>	Runs its code when the object collides with any other object



onNear

Runs its code when another object is nearby
N.B. a near distance must be set for this to work,
shown by a red circle around the object



onAlert

Runs its code when the player is nearby
N.B. a near distance must be set for this to work,
shown by a red circle around the object



onDie

Runs its code when the character dies



onCall

Runs its code when a character is called by
another character

Ideas and Inspiration for your land

If you're stuck for puzzles to create, you can review our resources which will give you some ideas. You can find them at codekingdoms.com/teachers

We also recommend structuring the creation of a new land around our OOSY Method:

OOSY Method

Objective

Your land needs objective. For simplicity it can be to rescue the animals from the cages

Obstacle

Next, the land should have an obstacle that makes the objective impossible to achieve e.g. placing a spike bed to block the path

Solution

Now think of a solution that will allow the player to pass the obstacle e.g. a button that raises a bridge over a spike bed

Your Turn!

Ask someone else to play your land to check it is fun and can be completed



Frequently Asked Questions

Q. How do I save my Sandbox?

Teachers and group leaders can save lands using the Save Projects button from the Dashboard. When you want to revisit the saved land use the Load Projects button, also in the Dashboard.

Q. How do I play my land?

Use the play button in the bottom right hand corner of the Sandbox to play your land as the main character.

Q. Why hasn't my code worked?

Check you are coding the correct object for the outcome you want. For example, if you want a bridge to raise when a button is pressed make sure you have added code to the button not the bridge.

Q. Why can't I control Glitch behaviour?

You can! We have pre-programmed some initial behaviours but you can overwrite them with your own code.



Planning Your Own Map

You can use the OOSY Method poster to help you design your map.

What is the objective of your game?

What objects (characters) will there be in your game and what will they do?

E.g. Giant Glitch – chases player around the map and aims to destroy it.

What obstacles will there be in your game?

What solutions will there be for the obstacles?



Planning Algorithms

When you create your map, the different objects within your game will need instructions to tell them what to do. Use this worksheet to help you consider what those instructions might be. An example has already been done for you.

The OOSY Method

When faced with a blank template and the task of creating a Code Kingdoms map many students will find it difficult to create a playable map.

The OOSY Method will assist students' planning by scaffolding the method of building Code Kingdoms maps.

OBJECTIVE	First a student must think of an objective for their map. For simplicity in our maps the player always has to reach the rocket.
OBSTACLE	Now the pupil should put an obstacle in the way of reaching the objective that makes the map impossible to complete. E.g. placing spikes on a bridge as an impasse.
SOLUTION	Now think of a solution that will let the player get round the obstacle. E.g. if the player places a lot of Glitches then they could now place a net which the player can pick up and catch them with.
YOUR TURN!	Share the map with friends to see if they can complete it!

The 3Ws

To assist students in thinking about structuring lines of code, we recommend using the 3Ws (When? Who? What?)

When?	onCreate
Who?	Glitch A
What?	walk towards player

This will allow students to create an algorithm where a Glitch will walk towards a player when it is created, which will look like:

```
GlitchA.walkTowards(player);
```

This method help students to sequence their commands logically.