Hour of Code 2017

Teacher Notes

PREFACE

Coding is a literacy of the digital age. The more our kids know about technology, about its magic and boundless possibilities and its building blocks the better.

With Freggers Play, everyone can learn and teach how to code.

Kids can tell stories with animated animals and characters or invent their own games. Or they just have fun building in 3D and at the same time improve creativity and spatial imagination. With its many possibilities our award-winning app inspires girls and boys of almost every age.

Teachers can utilize the app brightening up class with "a game within" or by launching an official joint project like "We code a game" or "We create an animated movie" that can be saved and resumed any time until considered done.

YOU NEED

- 45-60 minutes

- at least 1 iPad or tablet per 2 students

- no experience in programming

- optional: beamer to show video tutorial

STUDENTS LEARN

- spatial orientation and navigation in a 3D environment

- basic ideas of object oriented programming

- how to test the effect of commands

- how to build a simple program flow (a chain of commands)

- how to trigger events in other objects

- how to use an object / a variable to store state

TRANSFER GOALS

- Develop confidence and grasp the possibilities of programming (esp. important for girls to bridge the gender gap in STEM).

- Develop persistence by creating and editing the rules that control objects in a computer program.

- Identify errors (bugs) and strategies to fix them (debugging).

- Structure a bigger project into smaller parts.

- How to use stories to engage players.

VOCABULARY

object	item or character in the Freggers Play world
command	graphical block that represents the smallest coding unit in Freggers Play
sequence	group of commands with linear execution
signal	command that sends a message to other objects
receiver	command that receives messages from other objects
trigger	command that triggers something due to an action or is triggered by some event

OVERVIEW

1	Introduction	Messaging Concept	5 min
2	Basics	Using Freggers Play	5 min
3	Building	Objects and Commands	10 min
4	Coding	Game Intro	10 min
5	Coding	Little Panda Bears	10 min
6	Coding (optional)	Peacock Counter	10 min
7	Reflection (optional)	Imagine different stories for this game	10 min

1. INTRODUCTION

In this "Hour of Code" your students will program a searching game. This includes building a setting for the game, manipulating and customizing objects, testing and combining commands and finding and fixing bugs.

As a programmer you define the behaviour of the objects in a game with commands. You can use commands to move a character a certain distance, turn the character a certain degree and let it say something. But those command sequences don't have to be linear. You can also tell an object to send a message if a certain event occurs. For example if the player touches the object.

To understand the concept of events and messages in coding, it helps to imagine that every "thing" in a game or program can call. Other "things" can hear these calls and react on them. This is the main concept to learn in the next hour.

2. BASICS

1
Start Freggers Play app
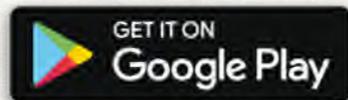
2
Start new project


3
Choose Asian scene

4
Object box opens automatically

5
Drag object into scene
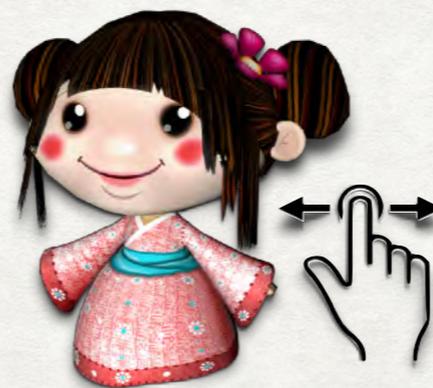
Tip: You can drag all the objects from the other scenes into the current one as well :-)

6

Zoom scene

Rotate scene or object

Delete object
(feed the monster ;-)

2. BASICS: CODE EDITOR

Each object can be manipulated by individual code. As soon as you touch an object, the respective code editor appears; the affiliation between code and object is indicated by a ray of light beaming from object to the code editor's command line.

Each group of command types has its own color to enable easier identification of the respective affiliation:

Yellow: define trigger

Blue: define move direction

Green: define scale and visibility

Purple: define action and effect

Orange: define speed and duration of an action

Test a command: move it to editor and touch once.

Modify a command: touch the block's little flag and change value.

To define what an object is supposed to do or what is supposed to happen with it a sequence of commands or also multiple sequences are compiled. A sequence starts with a trigger followed by further commands; triggers without a round edge never can start a sequence.

Test sequence: touch the yellow trigger.

Commands not required anymore can be dragged over the command line; then they vanish.

3. BUILDING
(10 MINUTES)

Let your students build something like this…

Intro and status area

Area to hide little pandas

3. BUILDING: TIPS

Change perspective to place **objects** on top.

Rotate scene to place **objects** behind.

Touch **objects** and use **commands** to precisely position, rotate and scale; each new **object** is generated just as the preceeding new **object** - in rotation as well as in scale.
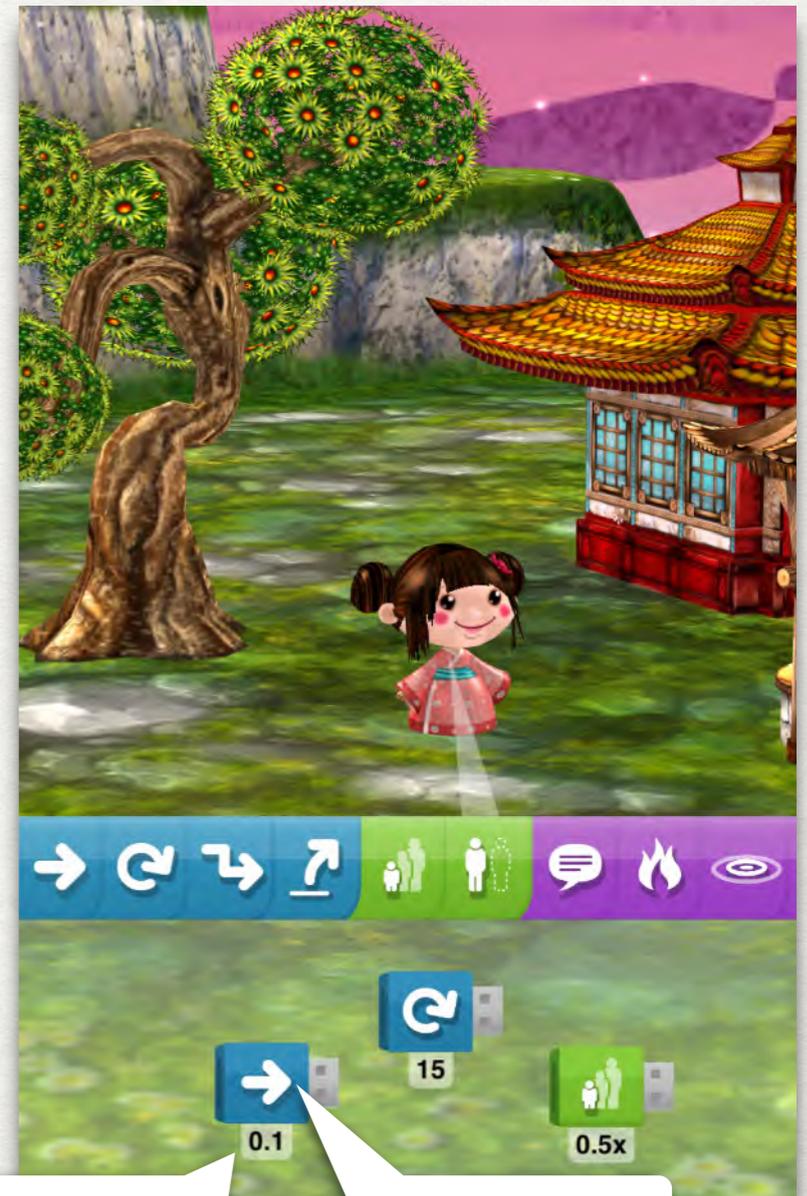
Touch here to change values

Touch here to execute **command**

4. CODING: GAME INTRO
(10 MINUTES)

The game intro will first show the player the whole scene. Then it zooms to the girl (or boy) that explains what to do. The girl object controls what happens. Touch it to open the code editor and connect the following commands to a sequence:

The "On Start" trigger starts this sequence when user touches ▶

Zoom out to show the whole scene then drag "Set Point of View" into the editor.

"Wait" for 2 seconds.

Zoom in to show the intro area then drag "Set Point of View" into the editor.
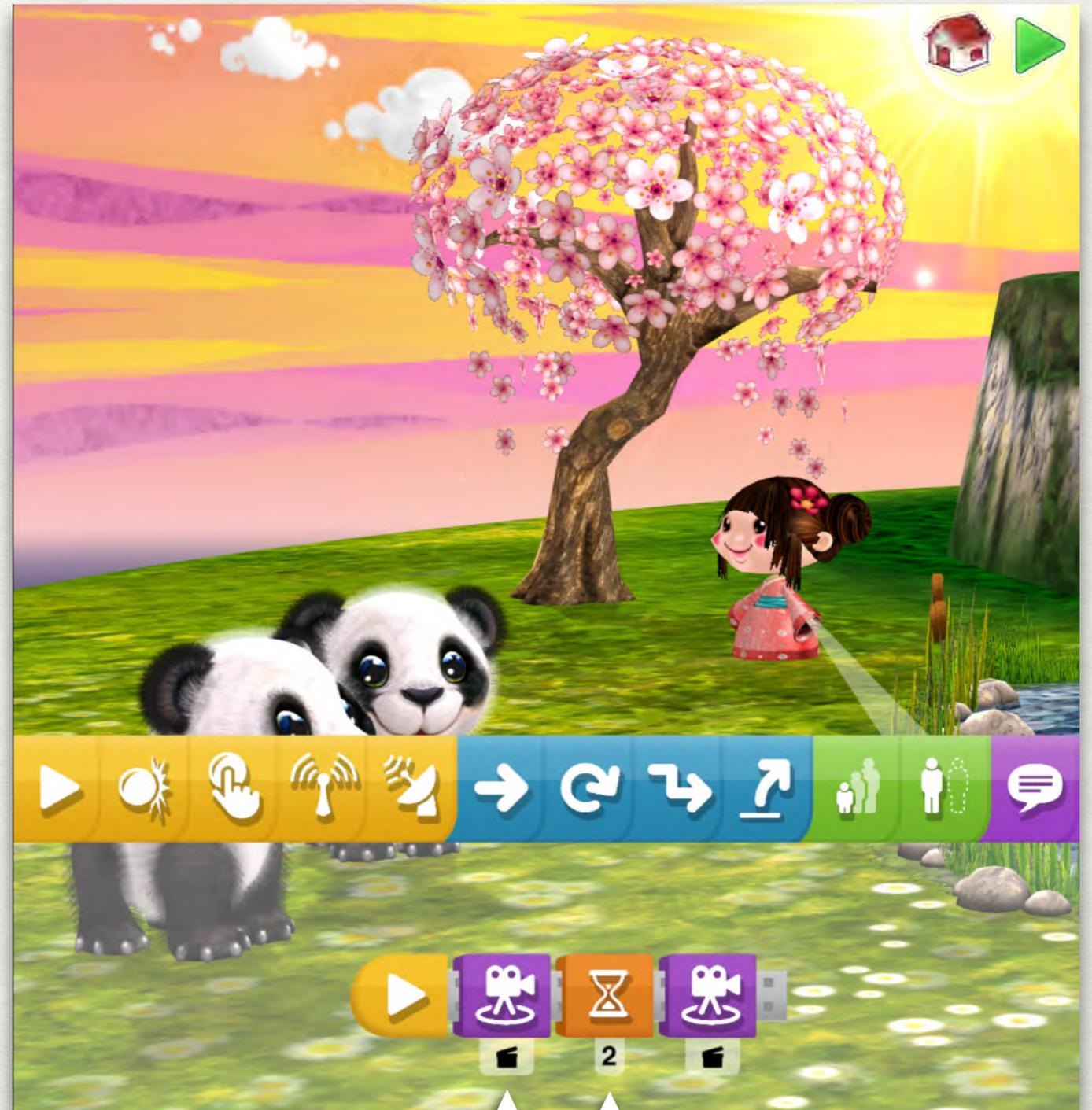
Touch here to reset point of view

Touch here to set seconds

4. CODING: GAME INTRO
(10 MINUTES)

Now we want the girl to turn left, walk towards mama and papa panda and tell the player what to do in this game. Then we want to zoom out to show the whole scene again to let the game begin.

Add the following commands to the existing sequence:

"Turn" left 45 degrees.

"Move" 4 meters.

"Say" to the player: "My pandas lost their 3 kids. Can you find them?"

Zoom out to show the whole scene then drag "Set Point of View" into the editor.

Press "Play" to try the intro.

Press "Stop" to stop the intro.
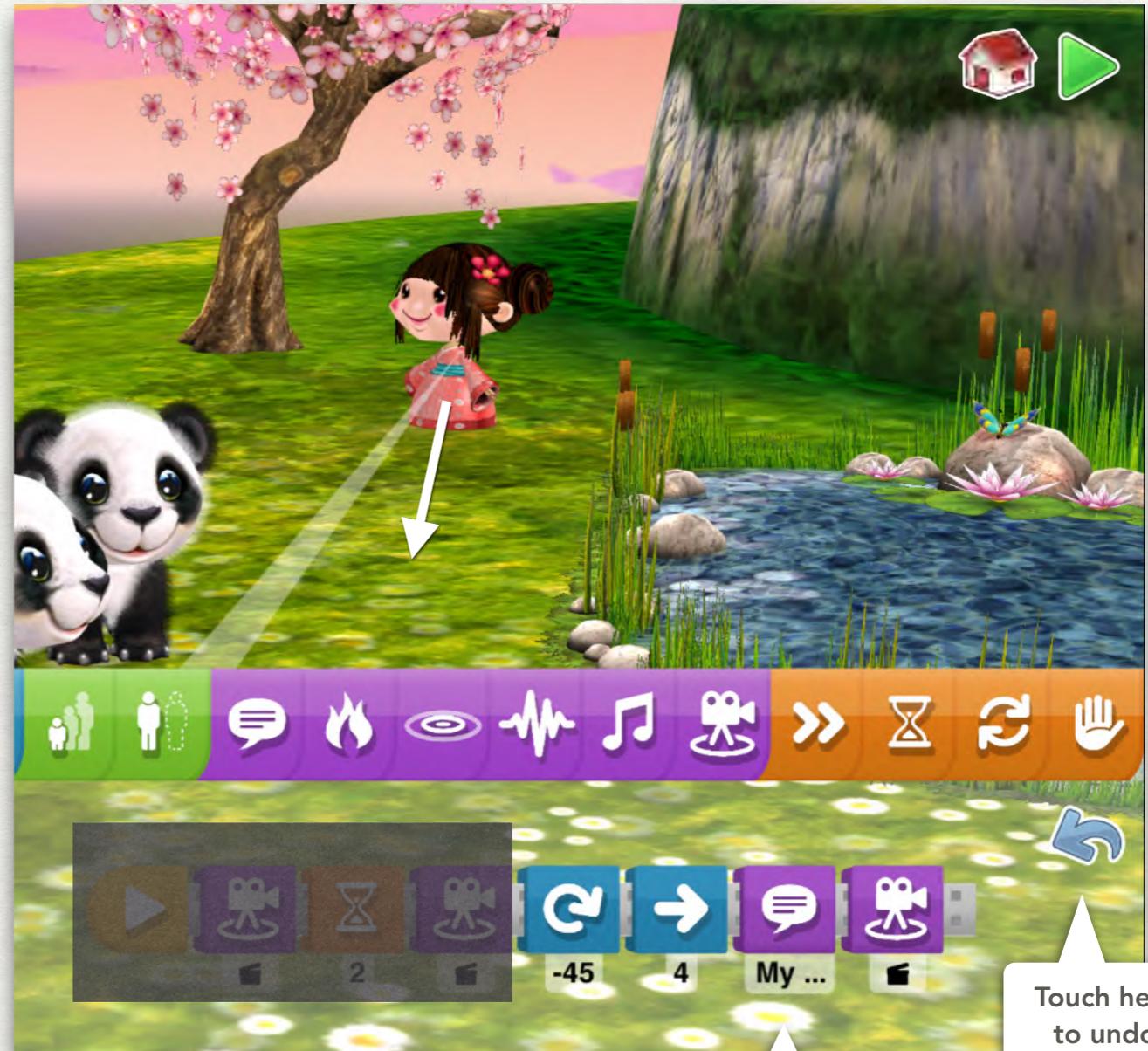
Touch here to enter text

Touch here to undo executed commands

5. CODING: LITTLE PANDA BEARS

Now we need three little pandas from the object box that we can hide in the scene. When the player finds and touches them in play mode they should vanish and send a message (signal) to other objects to indicate that they have been found.

Touch each little panda and combine the following commands to a new sequence:

"On Touch" triggers a sequence if player touches the object.

Use the "Visible" command to hide the object.

Use the "Effect" command to show the magic effect 3.

"Send signal" 0 to other objects.

When all three little pandas have the same sequence, the students can hide them in different places in the scene. Behind a bush, under the bridge, behind the water fall...

Press "Play" to try the intro and touch some of the little pandas.

Use "Scale" command to shrink pandas

Touch here to toggle visibility

Effect number

Signal number

5. CODING: LITTLE PANDA BEARS
(10 MINUTES)

After a little panda has been found, the girl receives the message and encourages the player to continue the search.

Touch the girl and add the following commands to a new sequence:

"On Signal" triggers a sequence if an object sends the signal 0.

Zoom in to show the girl, then drag "Set Point of View" into the editor.

Use the "Jump" command to let the girl jump.

"Say" to the player: "Well done!"
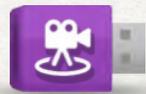
Zoom out to show the whole scene, then drag "Set Point of View" into the editor.

Press "Play" to try the intro and touch some of the little pandas.
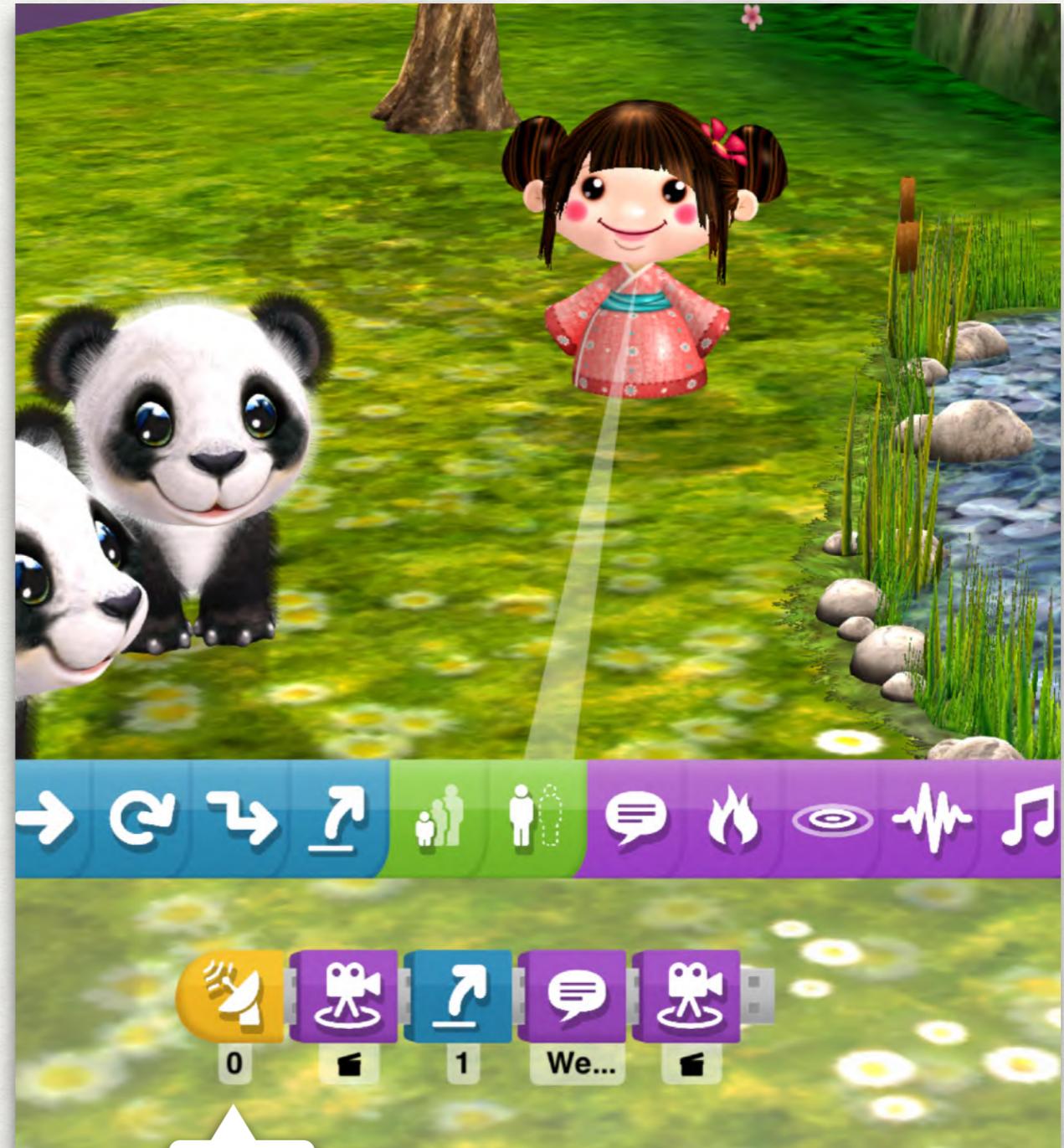
Signal number

6. CODING: PEACOCK COUNTER

(10 MINUTES – OPTIONAL)

To count how many little pandas the player has found, we use a counting peacock. Extend the intro area like in the picture below and make sure the peacock is precisely 3 meters away from the bamboo fence.

1

Move 3 meters backwards

2

6. CODING: PEACOCK COUNTER

(10 MINUTES – OPTIONAL)

Every time a little panda has been touched it sends a message. The peacock receives this messages and steps forward until he reaches the bamboo fence. If the bamboo fence detects a collision it sends a new message.

"On Signal" triggers if an object sends the signal 0.

"Move" 1 meter forward.

"On Collision" triggers if another object collides.

"Send Signal" 1 to other objects.

6. CODING: PEACOCK COUNTER

(10 MINUTES – OPTIONAL)

After the peacock collides with the bamboo fence it sends a message. The girl reacts to this message, sets the point of view to the intro area and congratulates the player.

"On Signal" triggers if an object sends the signal 1.

"Wait" for 2 seconds.

Zoom in to show the intro area then drag "Set Point of View" into the editor.

"Say" to the player: "Great job! Thank you."

Bonus task: To show the panda family reunited add three additional little pandas that become invisible after the play button has been pressed and appear if they receive the message from the bamboo fence.

"On Play"

"Visible" no

"On Signal" 1

"Visible" yes

7. REFLECTION

(10 MINUTES)

- Think about what motivates players to play this game.

- Why do players want to help the panda family?

- Would the game work with dragons?

- Which story would you tell players about missing dragons?

- Any ideas how to extend or modify the game to make it more challenging?

THANK YOU!