

Name: \_\_\_\_\_

Microsoft Imagine 

# Kodu Makerspace

Learn to make your own games!



## Student Guide

## Welcome to Kodu Makerspace

The Kodu Makerspace is a unit of eight 50-minute lessons, designed to introduce Kodu Game Lab and demonstrate how anyone can create rich and exciting games. In this series, you will explore the design process and cover skills needed to create worlds and games with Kodu Game Lab. You'll have a blast working on Kodu games including Boku's Amazing Race, Flashy Fishbots and Air Delivery. Get ready to learn how interesting and powerful games can be created with simple building blocks and techniques.

## Objective

The objective of this unit is to:

- Create fun games
- Use Kodu Game Lab to design game rules, characters, environments, and points systems
- Create game action using When...Do...constructs
- Communicate design ideas
- Apply an iterative design method of create, test, analyze, and redesign.
- Test games and resolve challenges by applying Kodu Game Lab features and capabilities
- Provide and accept constructive peer feedback
- Demonstrate the ability to use critical-thinking and computer science skills

We're looking forward to getting you excited about computer programming!



## Lesson 1: Managed Test Drive

### Big Questions

- What is Kodu Game Lab?
- How can you use Kodu Game Lab to make fun games?
- How do you navigate the Kodu menus?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab **icon**

To access Flashy Fishbots:

- Flashy Fishbots: <http://aka.ms/flashyfishbots>

## Activity: Flashy Fishbots Objects

Directions: Follow the steps to modify the appearance of objects and characters in Flashy Fishbots.

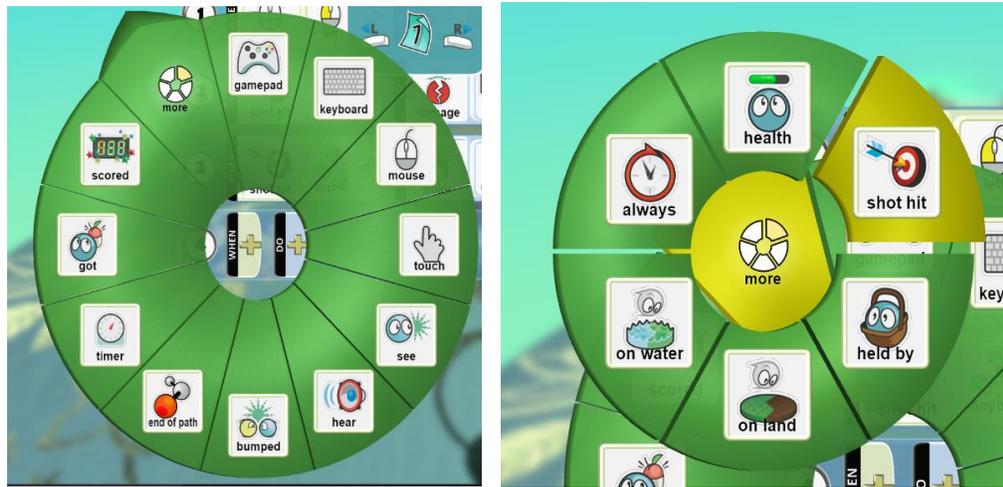
### Activity checklist

1. Select **Load World**
2. Click in the search box and type **Flashy Fishbots**
3. Read the information about the game that appears on the bottom of the screen
4. Select **Play**
5. Click on the **Objects Tool**
6. Move Kodu
  - Left click and drag
7. Change the color of Kodu
  - Click on Kodu
  - Use the arrows to pick colors from the palette at the top of the screen



8. Add new objects (rock, octopus)
  - Click on the **Object Tool**
  - Click anywhere in the world

- Notice the layers of the **Menu Wheel**



9. Notice the sections of the Menu Wheels that are “pointed” have more sub-choices

- Add a rock
- Add an octopus

10. Change the color of each fish

11. Change the starting position of a fish

## Activity: Saving Changes

Directions: Save changes to your revised game.

### Activity checklist

1. Click the **Home Menu** button
2. Select **Save My World**
3. Add 1 to the version number
4. Change the name of the game in the top row, as desired
5. Add your initials to the end of the game's name
6. Revise the Description, as desired
7. Click **Save**



## Lesson 2: Guided Investigation

### Big Questions

- What is the When...Do... game action?
- How can you modify game characters and action?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab **icon**

To access the Fishbot Tutorial and Flashy Fishbots:

- Fishbot Tutorial: <http://aka.ms/fishbotstutorial>
- Flashy Fishbots: <http://aka.ms/flashyfishbots>

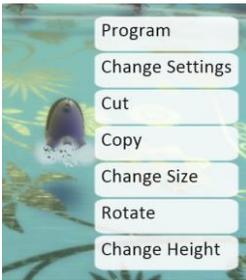


## Activity: Add A New Line

Directions: Add a new line of code to Flashy Fishbots.

### Activity checklist

1. Right click on the Kodu and select Program



2. Add Line 4 to Flashy Fishbots



3. Run the program to see what happens
4. Add an expression to be spoken. Add a word your character can say. Choose one of the following words to add:
  - Gotcha
  - Yippee
  - Nice!
  - Awesome

5. Add line 5 to Flashy Fishbots to cause any red bot to disappear when hit



6. Run the program to see what happens

## Lesson 3: Exploring Developer Experience, part 1

### Big Questions

- What new things can we learn about the character menus?
- What new things can we learn about the When...Do... form?
- What ideas do we have for redesigning one of the games we've played?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab icon

To access Boku's Amazing Race or Air Delivery Tutorial:

- Boku's Amazing Race: <http://aka.ms/amazingrace>
- Air Delivery Tutorial: <http://aka.ms/airdelivery>

## Activity: Let's Review the When...Do...

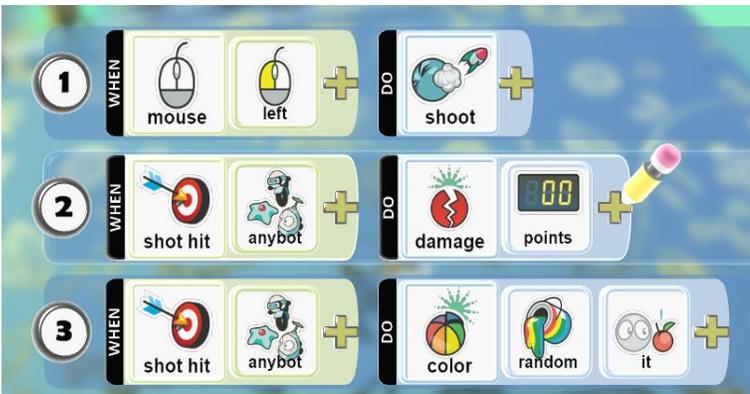
Directions: Fill in the blank.

### Activity checklist

What is each tool that appears on the Kodu Tool Palette?

1.  \_\_\_\_\_
2.  \_\_\_\_\_
3.  \_\_\_\_\_
4.  \_\_\_\_\_

In your own words, describe the following When...Do... actions:



- **Line 1:**
  
- **Line 2:**
  
- **Line 3:**

## Activity: Revising Boku's Amazing Race

Directions: Follow the steps to add objects, add a new line of code and to add objects and actions.

### Activity checklist

1. Select **Load World**
2. Click in the search box and type **Boku's Amazing Race**
3. Read the information about the game that appears on the bottom of the screen
4. Select **Play**
5. Add an Object
  - Click on the **Object Tool**
  - Right click somewhere on the land between Boku and the boat ramp
  - Add a few rocks
6. Add a new line of code
  - Add code for Boku to say "Ouch!" when he hits a rock



7. Add characters and actions
  - Add fish to the water
  - Change their rotation
  - Add code to the boats to stun any fish they bump



## Lesson 4: Exploring Developer Experience, part 2

### Big Questions

- What ideas do we have for redesigning one of the games we've played?
- What cool ideas will others have for our game's plans?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab icon

To access Boku's Amazing Race, Air Delivery Tutorial, Air Delivery Complete or Flashy Fishbots:

- Boku's Amazing Race: <http://aka.ms/amazingrace>
- Air Delivery Tutorial: <http://aka.ms/airdelivery>
- Air Delivery Complete: <http://aka.ms/airdeliverycomplete>
- Flashy Fishbots: <http://aka.ms/flashyfishbots>

## Activity: Game Changer

Directions: Follow the six steps to design your game.

### Activity checklist

1. Start with one of the games you've created. Pick **one** game you want to change.

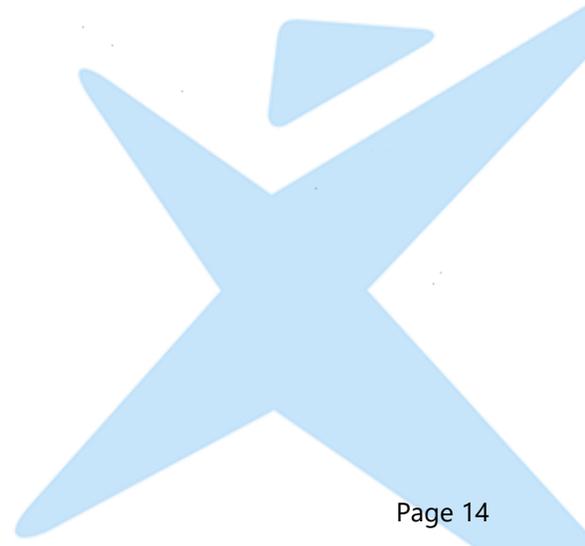
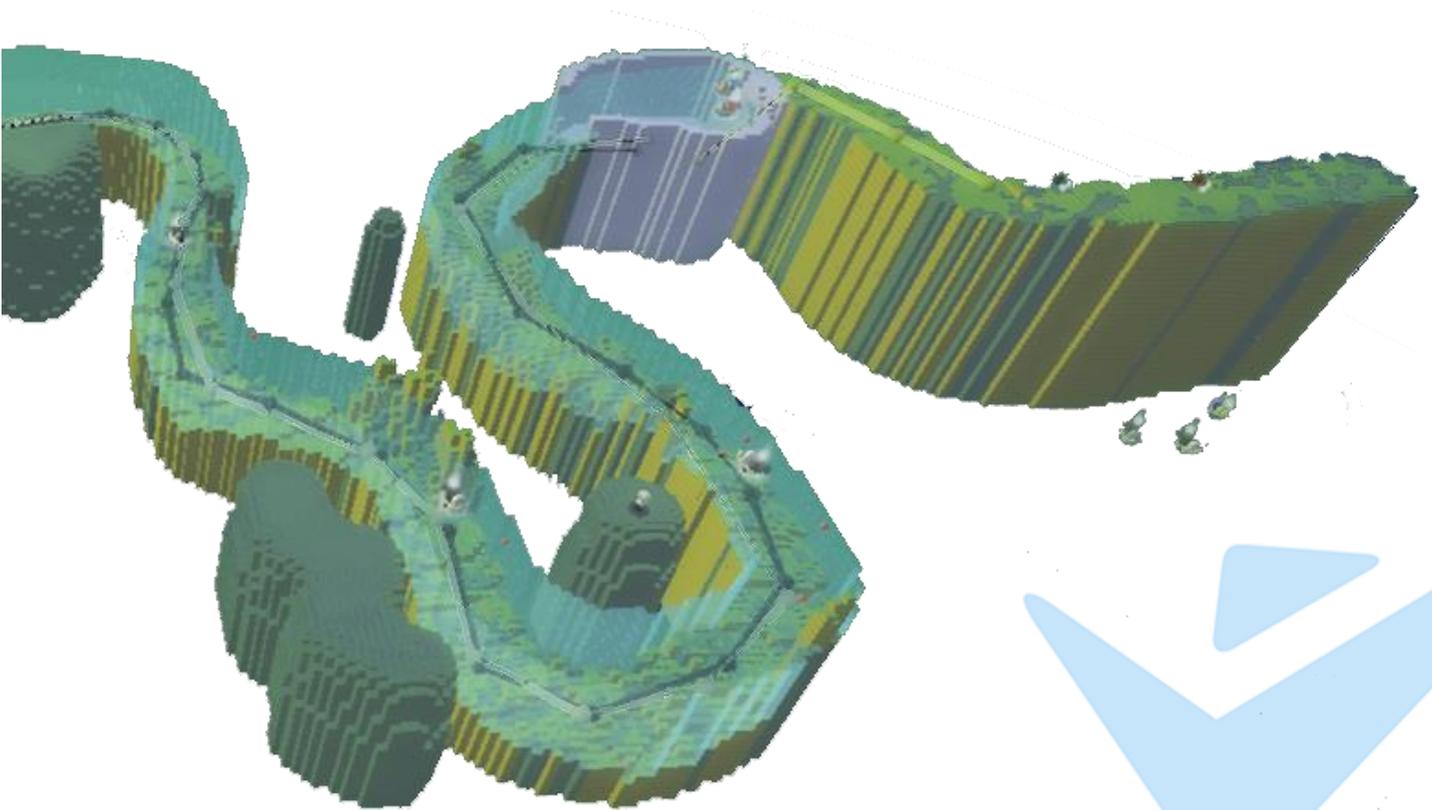
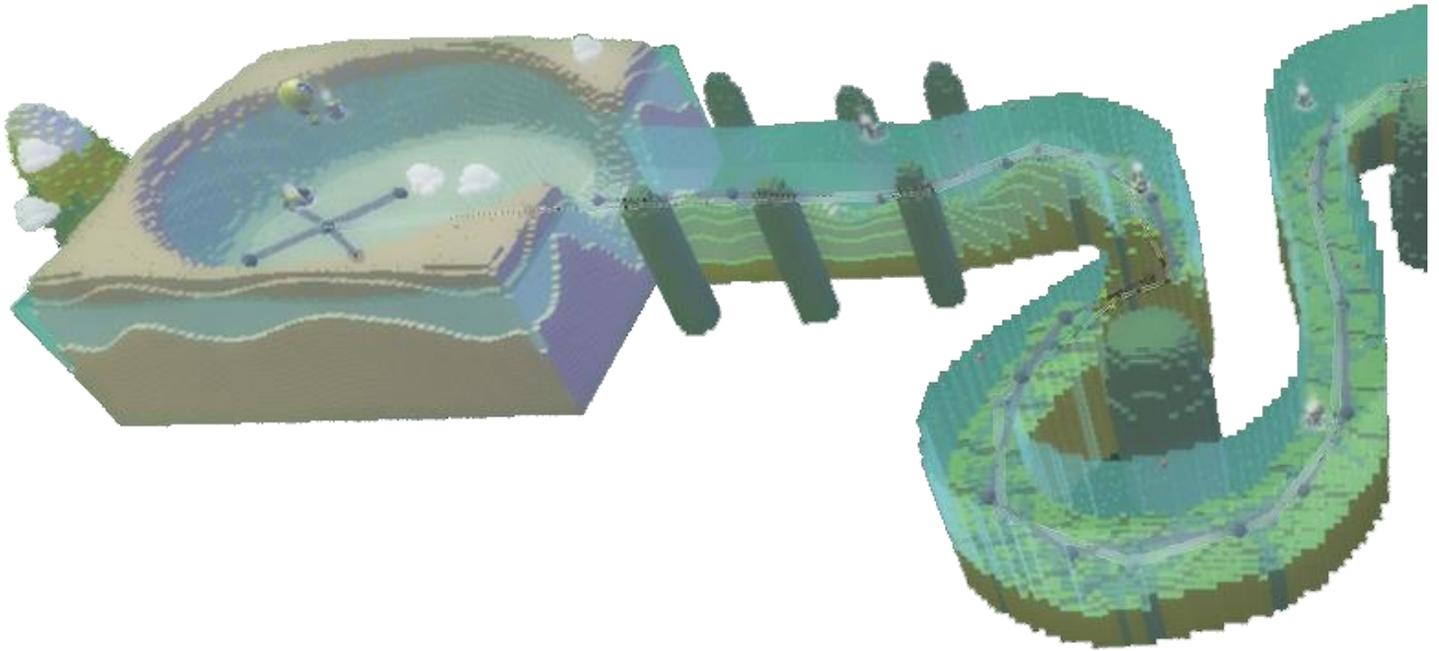
- Flashy Fishbots
- Boku's Amazing Race
- Air Delivery

2. Sketch out your idea for changing the game onto image of the game you want to change.

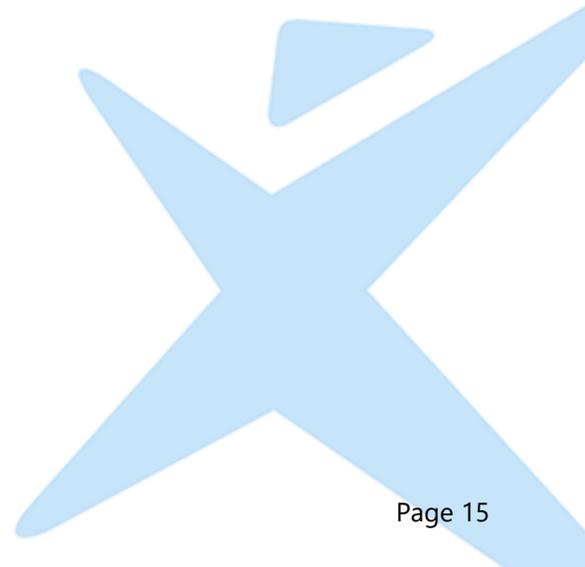
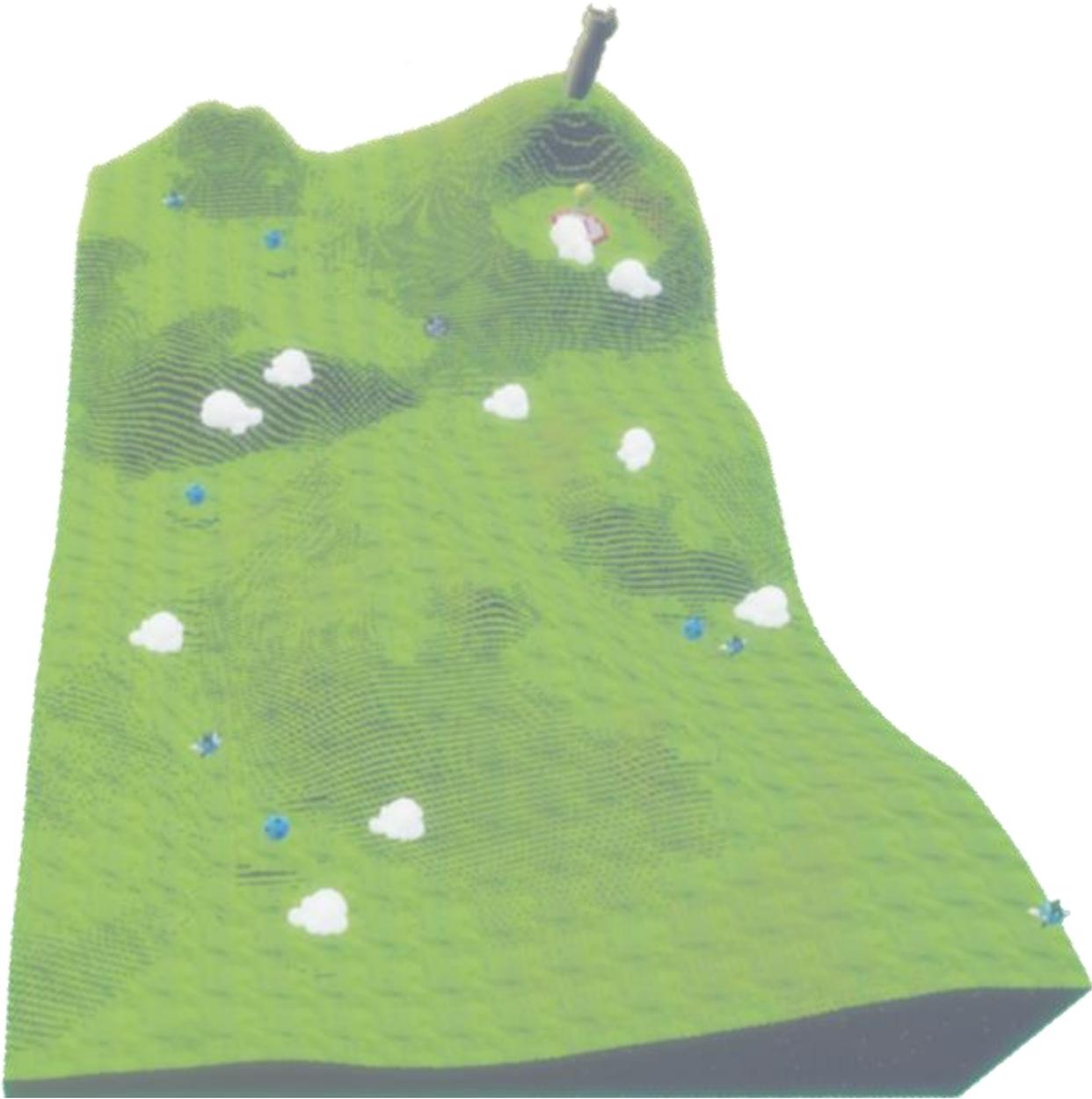
**Flashy Fishbots?** Sketch your image here:



**Boku's Amazing Race?** Sketch your image here:



**Air Delivery?** Sketch your image here:



**Prepare** to present your game idea.

Jot down the things you will want to tell everyone about your game!

- What **game** did you pick?
  
- Does your **sketch** show your ideas for changing the game?
  
- What is the **goal** of your game?
  
- How will you **change the appearance** of the Objects?
  
- What Objects will you **add**?
  
- What do you want your Objects to **do**?

### 3. **Present** your game idea!

Tell everyone what **game** you picked.

**Show** your ideas. Use your **sketch** and point out your ideas for changing the game.

Tell everyone the **goal** of your game.

Tell everyone how you will **change the appearance** of the Objects.

Tell everyone the Objects will you **add**.

Tell everyone what you want the Objects to **do**.

4. **Ask** the group for feedback after you give your presentation. Jot down the feedback you get.

Does anyone have an idea about the objects in my game?

Does anyone have an idea about the actions in my game?

5. **Tweak** your game design.

What is one easy thing you can do to make your game more fun or interesting?

What is the second thing you would like to add?

What is one more thing you could change?

You'll find additional game changing ideas in the back of your Student Guide:

- Appendix A: Customizing Flashy Fishbots, Boku's Amazing Race, Air Delivery
- Appendix B: General Customization Ideas for Kodu Games

## Lesson 5: Creative Collaboration

### Big Questions

- What are the best parts of working with a partner?
- How can other classmates contribute to a project?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab icon

To access Boku's Amazing Race, Air Delivery Complete or Flashy Fishbots:

- Boku's Amazing Race: <http://aka.ms/amazingrace>
- Air Delivery Complete: <http://aka.ms/airdeliverycomplete>
- Flashy Fishbots: <http://aka.ms/flashyfishbots>

## Activity: Progress Check

Directions: Look back at your game plan as you completed the six steps in the Game Changer Activity checklist (pages 13-17) in your Student Guide. Then, use your pen/pencil to markup your game plan on pages 13-17 by completing the three tasks listed below.

### Activity checklist

- ✓ Check off the elements on the plan that were completed
  
- ✓ Put a star next to each of the two ideas you like the most
  
- ✓ List one problem you encountered that you may need additional help with

## Lesson 6: Open-ended Developer Experience, part 1

### Big Questions

- What cool ideas can we get from others to improve our games?
- How is a First Draft Show and Tell valuable?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab icon

To access Boku's Amazing Race, Air Delivery Complete or Flashy Fishbots:

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## Lesson 7: Open-ended Developer Experience, part 2

### Big Questions

- What advantages are there in working with a partner to create a game?
- Why is testing an important step in creating games?
- What characteristics make game directions useful?

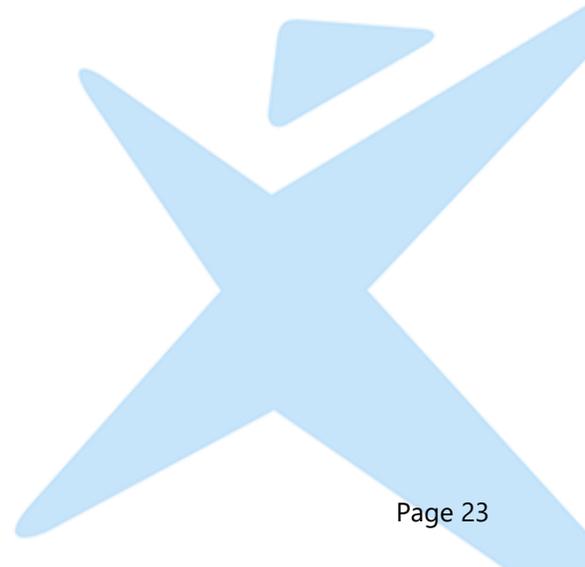
### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
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## Activity: Easy as One, Two, Three

Directions: Test your game to make sure it is working properly. Jot down three things a user has to know to play your game.

### Activity checklist

Three things a user has to know to play my game:

1.

2.

3.

Writing directions in Kodu is easy. Follow these steps:



- Click the **Home Menu** button
- Select **Save My World**
- Add 1 to the version number
- Change the name of the game in the top row, as desired
- Add your initials to the end of the game's name
- Revise the Description, as desired
- Add directions below the description
- Click **Save**

## Lesson 8: Showcase Experience

### Big Questions

- What is important to remember when looking at someone's game in a Gallery Walk?
- What have I learned by creating a game in Kodu?

### Online Resources

To access Kodu Game Lab:

1. Download and install Kodu Game Lab from <http://www.kodugamelab.com>
2. Open Kodu on your computer by clicking the  Kodu Game Lab icon

To access Boku's Amazing Race, Air Delivery Complete or Flashy Fishbots:

- Boku's Amazing Race: <http://aka.ms/amazingrace>
- Air Delivery Complete: <http://aka.ms/airdeliverycomplete>
- Flashy Fishbots: <http://aka.ms/flashyfishbots>

You'll find information about how to use Kodu games outside of the classroom in the back of your Student Guide:

- Appendix C: Using Kodu Games Outside of the Classroom

## Activity: Reflection

Directions: You learned about characters, actions and directions. Self-reflect to discover how you feel about what you learned in the Kodu Makerspace unit.

1. Answer the three questions.
2. For each of the nine statements, put a checkmark in the box beneath the emoticon that best reflects how you feel about what you learned.

### Activity checklist

1. What's one word that describes Kodu Makerspace?
2. What's one word that best describes your game?
3. What is one thing about your game that you are proud of?

<b>Characters</b>			
My characters are interesting			
My characters are the right size			
My characters add to the fun of the game			
<b>Actions</b>			
My game is fun			
My characters are exciting			
My character actions work			
<b>Directions</b>			
My directions are easy to understand			
My directions are complete			
My directions work when they are followed			

## Appendix A: Customizing Flashy Fishbots, Boku's Amazing Race, Air Delivery

### ➤ **Make only one change at a time. Follow this pattern of development:**

1. Think carefully about the idea you have.
2. Create the code one line at a time.
3. Run the game.
4. Analyze the results of the added line.
5. Correct or delete as necessary.
6. Remember there is an Undo button.

### ➤ **Watch the Resource meter**



The resource meter on the right side of the screen in Edit Mode looks like a thermometer, and is there to tell players how much more 'stuff' they can add to and code in the world before they run into performance issues.

As the player makes changes, they'll need to watch how much they've added with this meter so that everything works correctly when playing.

### ➤ **Ideas!**

#### **Flashy Fishbots**

##### **Ideas for changing Flashy Fishbots:**

- Change the colors
- Add obstacles that interfere with the paint balls
- Make new objects that would move toward and interact with Kodu
- Change the reaction of when fish are hit
- Change the terrain

#### **Boku's Amazing Race**

##### **Goals of the original game:**

- Move your blue Kodu (Boku) to the blue boat (far side of the dock).
- Control the blue boat to the balloon bot at the end of the course.
- Avoid the yellow, purple, and black boats
- Watch out for the red rival.
- Go for apples

## Boku's Amazing Race

### Description of bots:

- **Boku 1/Float Bot 4** – these are the player-controlled characters, and the player's character takes damage from rockets or bumps from other colors in particular. Also, apples bumped into give points and health to the player.
- **Boku 2/Float Bot 5** – this is the rival character that the player races against. It's also a target for all of the other float bots (ships) on the map and will fire rockets. Follows the yellow path nodes as a Kodu bot, then follows the white path nodes as a Float Bot ship.
- **Purple Float Bots** – these bots do not fire rockets, but do the most damage to the player's ship on contact. They follow the purple path nodes along the ground.
- **Black Float Bots** – these bots do not fire rockets, and do some damage to the player's ship on contact. They follow the black path nodes along the ground.
- **Yellow Float Bots** – these bots do fire rockets rapidly at the player. Doesn't require path nodes to travel on map.
- **Balloon Bot** – this bot is the goal, and looks for both the player and rival ships. Immobile.
- **Sutekki Bot** (aka Stick Bot) – this bot is neutral and holds the game timer along with the background music. Immobile.

## Boku's Amazing Race

### Ideas for changing Boku's Amazing Race:

This game is fairly complex and already uses many resources. Items can be added as long as the Resource Meter (the thermometer that appears in Edit Mode) allows for it.

- Add objects to the world that interfere with the Kodus or ships.
- Make objects that change colors every three seconds!
- Add other creature bots to the game world that talk when they see the player!
- Change the reaction of the objects involved in collisions.
- Change the action of any of the objects you added to the world (rocks and fish).
- Change the Do section of the Yellow ship (Float bot 1), Black ship (Float bot 2), or Purple ship (Float bot 3).
- Change the background music or increase/decrease the time available on the first page of the Stick bot (Sutekki 1).

## Air Delivery

### Ideas for changing Air Delivery:

- It can be frustrating when bumping into non-ball things and exploding, but the power of coding lets us fix that! Instead of exploding and sending the player back to the start try something else.
- Right now, the fans scattered through the game world push the player away, but they can be reprogramming to pull/suck them in!

- It's possible to program the Balloon Bot to shoot blips, but these blips will destroy everything – trees included! Go into Edit Mode, select Program on the Balloon Bot, and then add this code to the bottom of the first page (for when the player hasn't picked anything up yet)



## Appendix B: General Customization Ideas for Kodu Games

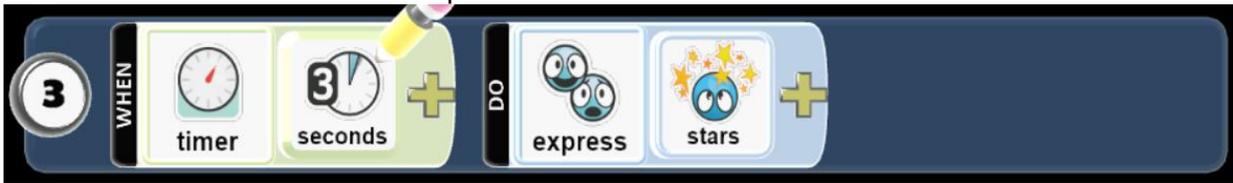
These ideas work with most objects in the games.

This does not have to be Line 3, just include it as the last line of code, with no indents.

### Expressive Bot

Make a cloud of stars that follows the character (or whatever effects you'd like) – in this line of code, it has a condition (WHEN) of waiting 3 seconds, and then the Bot that has this code will produce a cloud of stars.

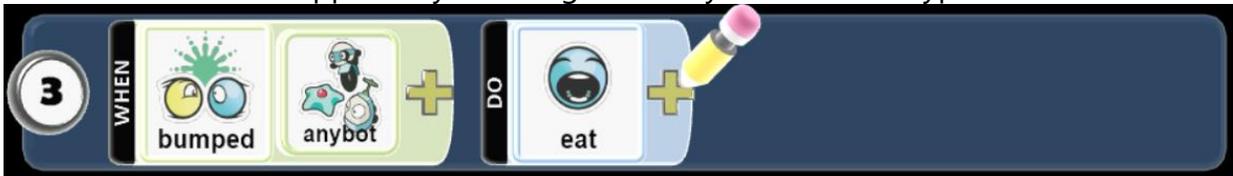
- What if the timer was only 1 second?
- What if the Bot expresses hearts instead of stars?



### Hungry, Hungry Bot

A Bot with this line of code will munch up any other Bots that it bumps into!

- What happens if you change the "anybot" to specific objects?
- What happens if you change the "anybot" to other types of Bots?



### Zappy Bot

A Bot with this code can stun anything else it touches!

- What if you changed "anything" to something else?



### Puffy/Shrinky Bot

A Bot with this code can change the size of anything it touches – either making it bigger or smaller.

- What happens if you change the scale or change anything else?



### Target Bot Shrinks/Grows

A Bot with this code can either shrink or grow when hit with a shot.

- Change the scale to see what happens when a shot hits!



### Lightshow Bot

A Bot with this code will flicker and flash random colors!

- What happens if you change "random" to another color?



### Sound Effect Bot

Want to play music, or have a roaring crowd in the background? A Bot with this code will play sounds as long as it's around. You can change the "arena A" to other "environ" or "music" background effects, or you can play around with the shorter "event" sound effects.



### Jackpot Bot

A Bot with this code will create a coin every time a shot hits it.

- How would you change the code to produce a coin when bumped?
- What about creating other objects besides coins?

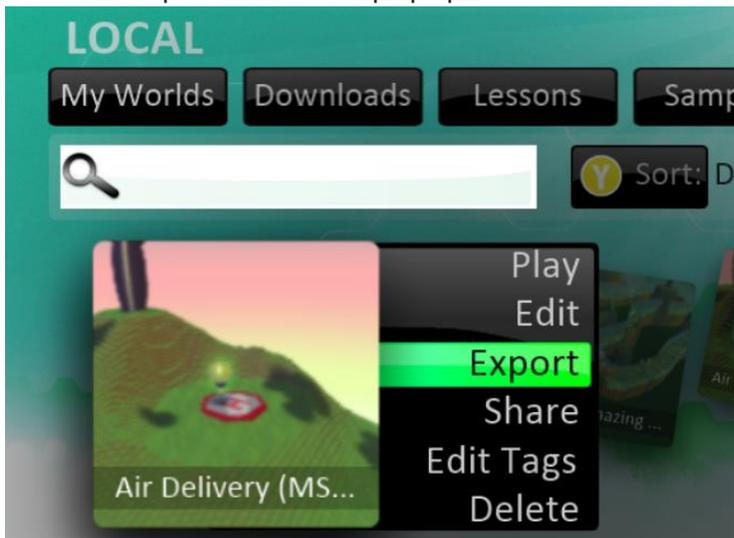


## Appendix C: Using Kodu Games Outside of the Classroom

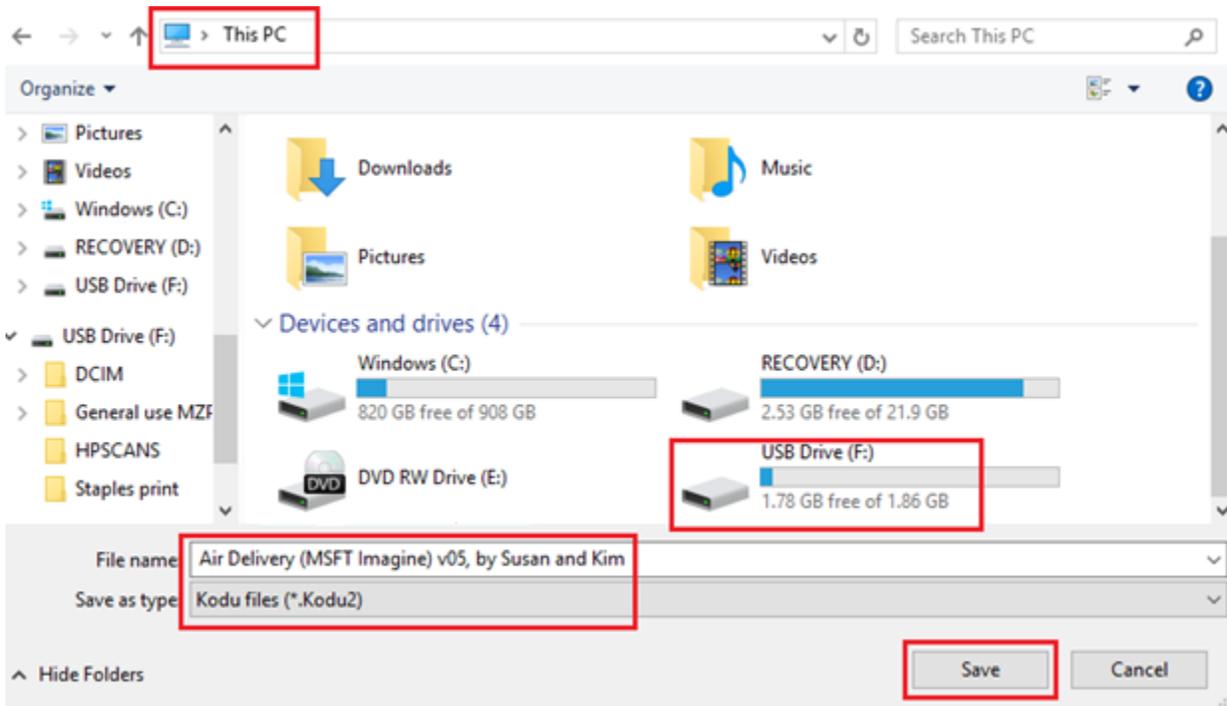
Kodu Game Lab requires installation; it is not a cloud app. Download and install from Kodu Game Lab (<http://www.kodugamelab.com>).

All of the world/game files created by students are stored on the local computer. For students to work on any project they start on a classroom computer on another computer, follow these steps:

1. Download and install Kodu Game lab on the computer
2. Save the game you want to transfer to another computer with an identifiable name and version number
3. From the "Home" menu, select "Load world"
4. Locate the desired world/game
5. Left-click on the desired world/game
6. Choose "Export" from the popup menu



7. Navigate the file/folder structure and select "This PC"
8. Select the desired storage device (USB drive)
9. Check the file name and file type (\*.Kodu2)
10. Click "Save"



On the destination computer...

11. Save the file in a convenient location/folder
12. To open, double-click the saved file
13. The world/game will now appear among the "Worlds" within the local version of Kodu Game Lab