Unit 6 Lesson 1

Functions in Minecraft

Resources

Unit 6 Lesson 2

Swimming Fish with Sprite Lab

Resources

Unit 6 Lesson 3

Alien Dance Party with Sprite Lab

Resources

Unit 6 Lesson 4

Drawing with Loops

Resources

Unit 6 Lesson 5

Nested Loops in Maze

Resources

Unit 6 Lesson 6

Envelope Variables

Resources

Name(s)_____ Period _____ Date _____

Variables in Envelopes

Robot Variables Worksheet

Think about a robot. What is it supposed to do? What does it look like?

Draw your robot on paper. When you're done, answer the three questions below on separate pieces of paper, then put them in the correct envelopes.

robotName	*numUnitsTall*	*purpose*

1. My robot's name is _____*robotName*_____
2. My robot's height is _____*numUnitsTall*_____ (don't forget units!)
3. My robot's primary purpose is _____*purpose*_____

TEACHER KEY

Variables in Envelopes

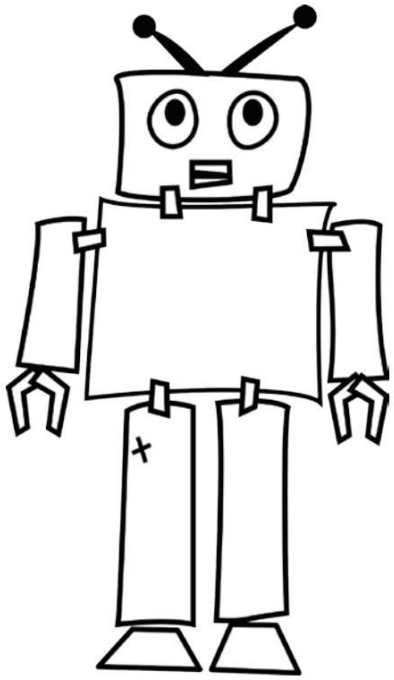
Robot Variables Worksheet

Think about a robot. What is it supposed to do? What does it look like?

Draw your robot on paper. When you're done, answer the three questions below on separate pieces of paper, then put them in the correct envelopes.

robotName	numUnitsTall	purpose

Example



1. My robot's name is _____Elijah_____ robotName = Elijah
2. My robot's height is _____27 feet_____ numUnitsTall = 27 feet
3. My robot's primary purpose is __being awesome__ purpose = being awesome

Name(s)_____ Period _____ Date _____

Variables in Envelopes

Variables Assessment Worksheet

Given the value of each variable envelope, fill in the blanks to finish the sentence.

color = pink	When I grow up, I want to own a guard_____. (animal)
petalNumber = 22	I found a flower with_____ petals, so I picked it. (petalNumber)
animal = monkey	My dad just painted his house_____ to match his car. (color)
bestSport = golf	I love_____. I do it every evening. (hobby)
hobby = coding	There is no such thing as_____ rivers, so if you find one, don't swim in it! (color)
	The best sport in the world is_____, do you agree? (bestSport)

Variable envelopes can also contain number values. Use these envelopes and the provided equations to figure out the magic numbers below.

numOne = 2	[ ] = _____ − _____
numTwo = 5	magic NumberA = numThree − numOne
numThree = 7	[ ] = _____ × _____
	magic NumberB = numTwo × numOne
	[ ] = _____ + _____ × _____
	magic NumberC = numOne + numTwo × magicNumberB

TEACHER KEY

Variables in Envelopes

Variables Assessment Worksheet

Given the value of each variable envelope, fill in the blanks to finish the sentence.

color	= pink
petalNumber	= 22
animal	= monkey
bestSport	= golf
hobby	= coding

When I grow up, I want to own a guard____monkey_____.
animal

I found a flower with____22_____ petals, so I picked it.
petalNumber

My dad just painted his house____pink____ to match his car.
color

I love_____coding_____. I do it every evening.
hobby

There is no such thing as_____pink____ rivers, so if you find one, don't swim in it!
color

The best sport in the world is____golf_____, do you agree?
bestSport

Variable envelopes can also contain number values. Use these envelopes and the provided equations to figure out the magic numbers below.

numOne	= 2
numTwo	= 5
numThree	= 7

5 = 7 _____ − 2 _____
magic NumberA = *numThree* − *numOne*

10 = 5 _____ × 2 _____
magic NumberB = *numTwo* × *numOne*

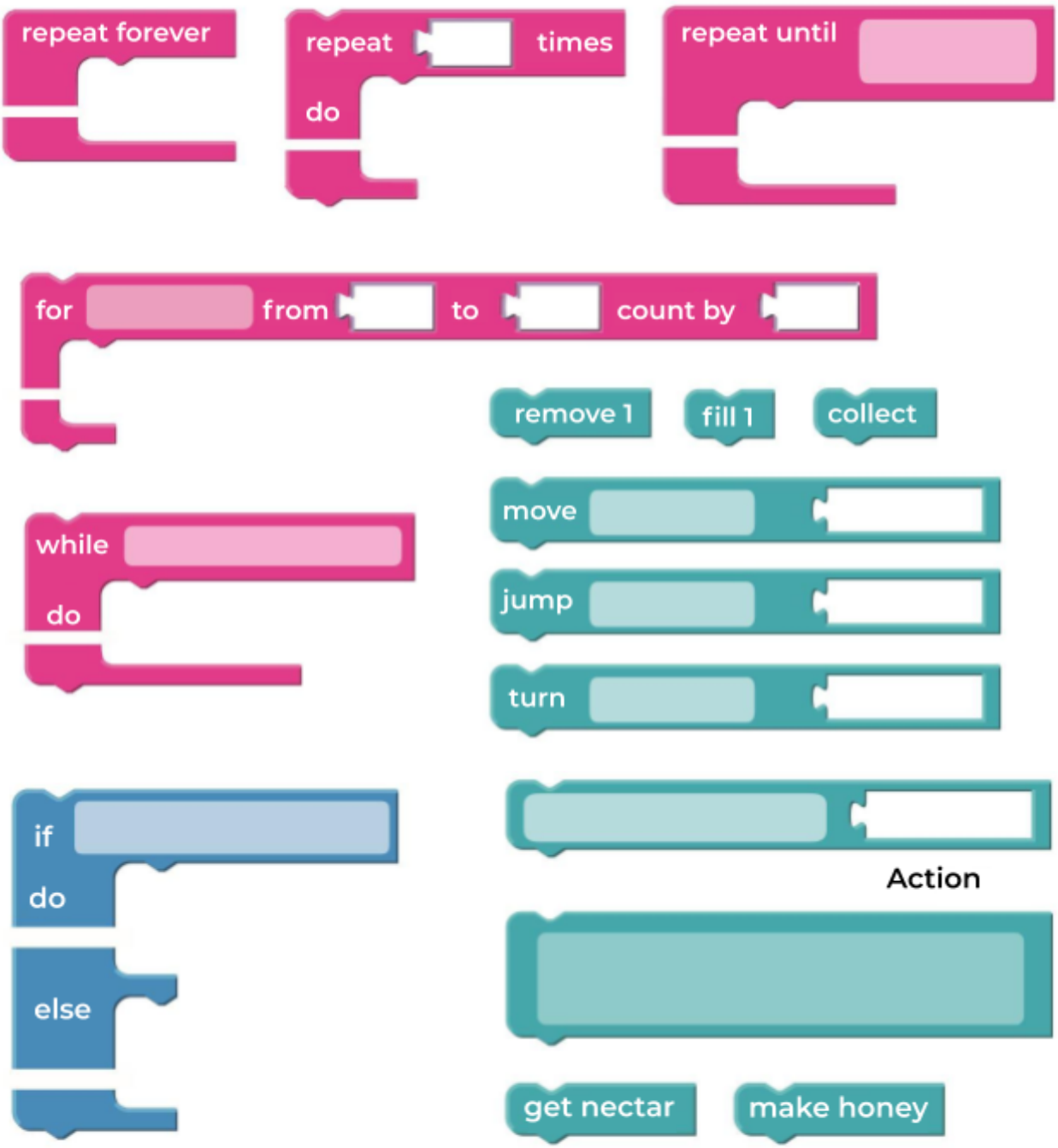
52 = 2 _____ + 5 _____ × 10 _____
magic NumberC = *numOne* + *numTwo* × *magicNumberB*

Unit 6 Lesson 7

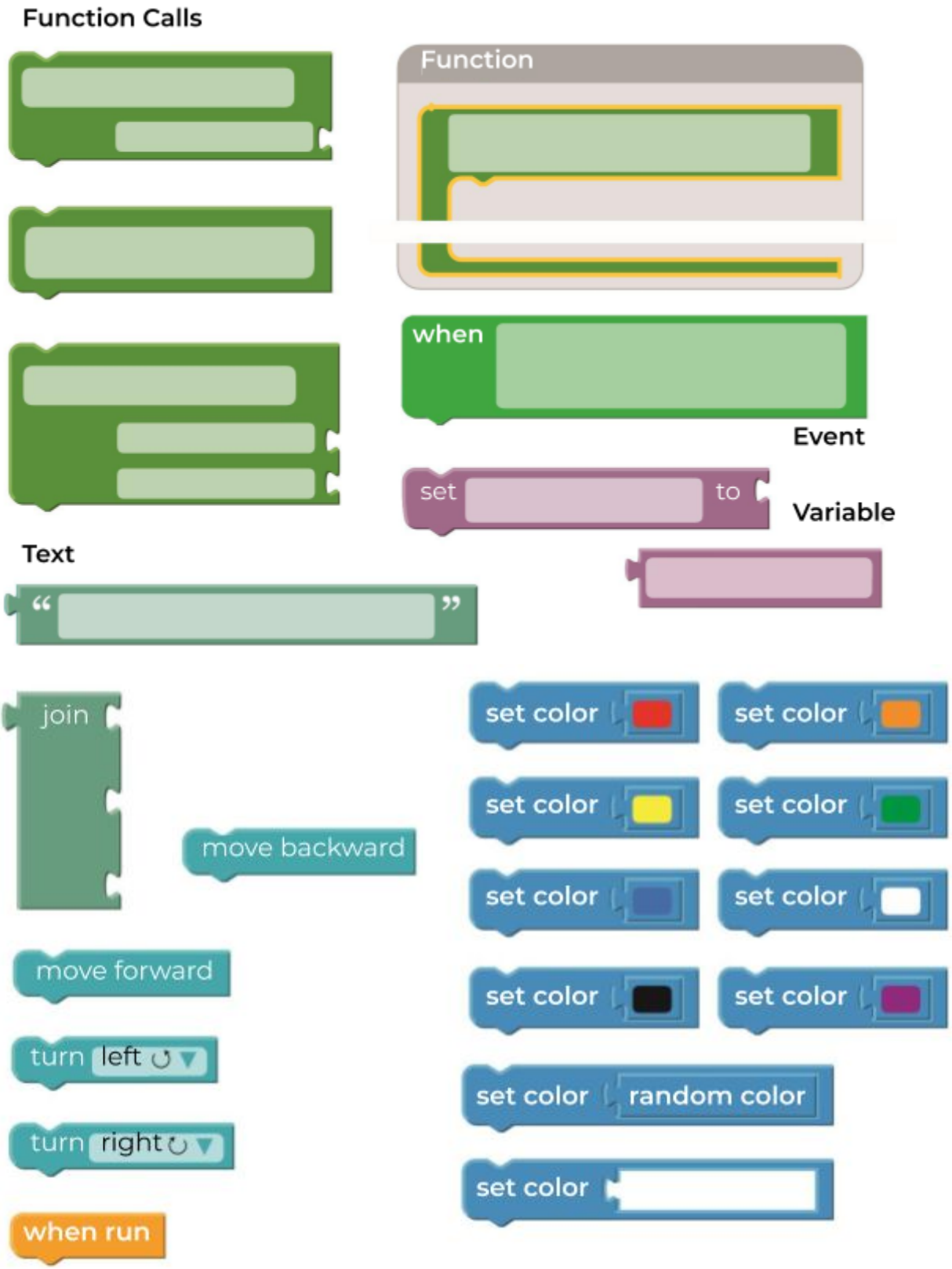
Variables with Artist

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Unit 6 Lesson 8

Changing Variables with Bee

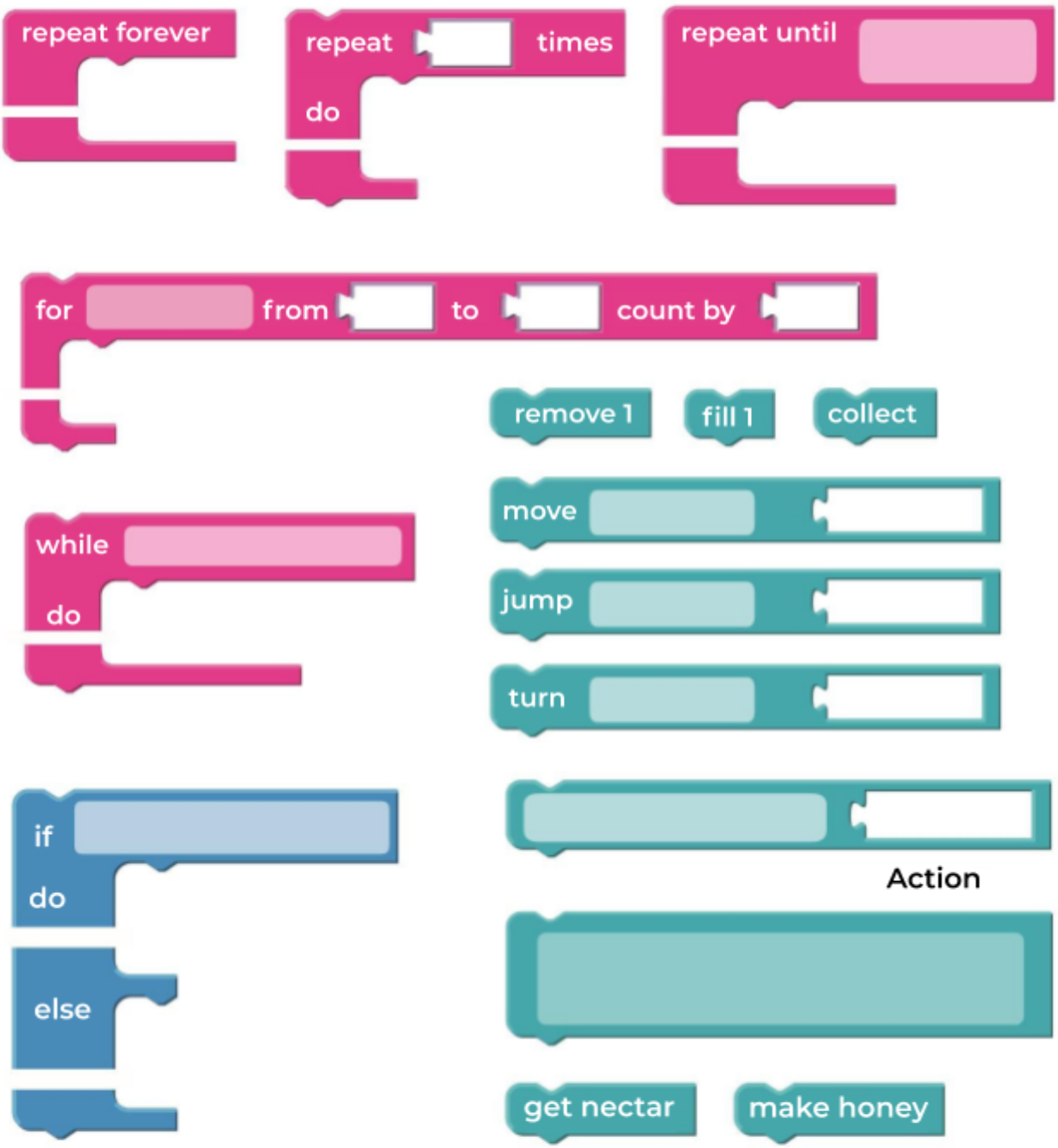
Resources

Unit 6 Lesson 9

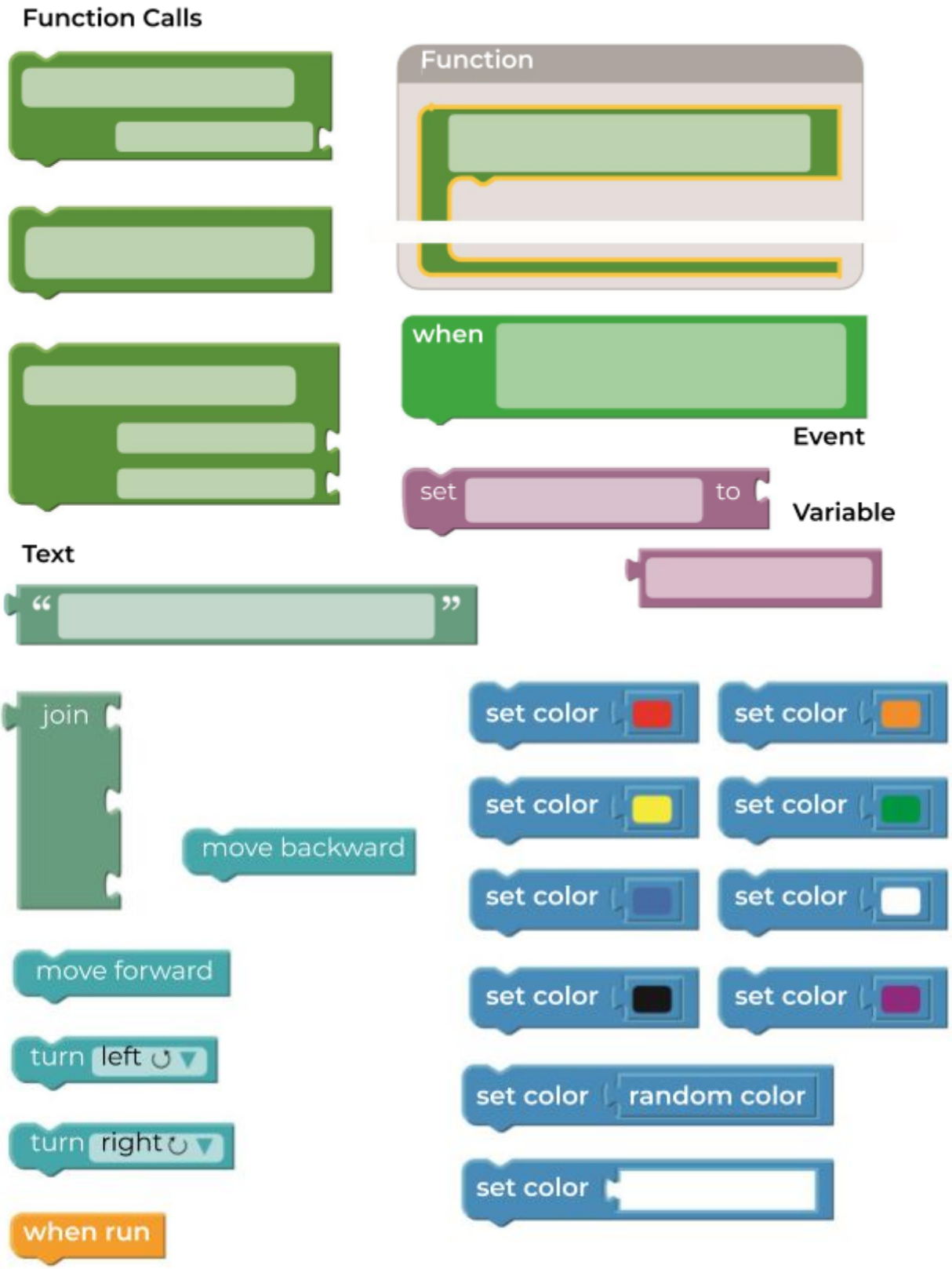
Changing Variables with Artist

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Unit 6 Lesson 10

Simulating Experiments

Resources

Name(s)_____ Period _____ Date _____

Running Simulations

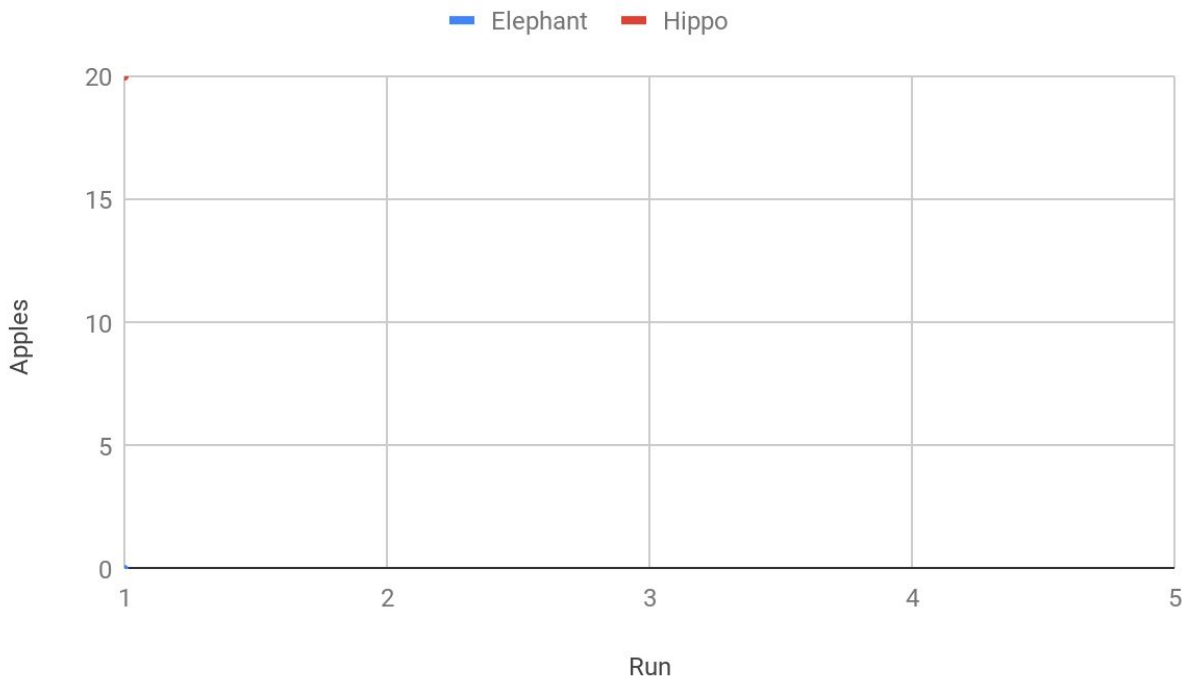
Collect Data

Let's figure out who's the best apple collector, the elephant or the hippo. Run the simulation on the first bubble of this lesson *at least* 5 times and record how many apples each animal collected and how long it took to collect all of the apples

	Run #1	Run #2	Run #3	Run #4	Run #5
Elephant					
Hippo					
Time					

Line Graph

Using a different color for each animal, draw a line graph that tracks how many apples each animal collected during each of your five simulations.



Name(s)_____ Period _____ Date _____

Modifying Simulations

Modify and Predict

Now that you have some data about his simulation, it's time to start experimenting. On the second bubble of this lesson you will be able to modify the variables that control this simulation. Pick a variable to change and predict how that will change your data.

Variable to modify: _____

Predicted outcome:

Collecting More Data

Run your modified simulation at least five times and collect the data below

	Run #1	Run #2	Run #3	Run #4	Run #5
Elephant					
Hippo					
Time					

Visualize Your Data

Choose a way to visualize the data you collected to see if your prediction was accurate.

Unit 6 Lesson 11

For Loop Fun

Resources

TEACHER KEY

For Loop Fun

Assessment Worksheet

ROUND 1

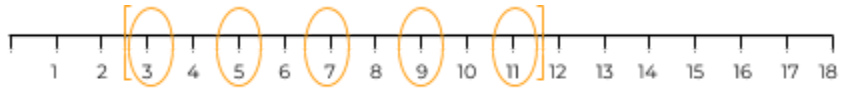
Player 1

For values of **X** from __1__ to _18__ step by __4__
starting value *stopping value* *step*

SCORE _45__

Player 2

For values of **X** from __3__ to _11__ step by __2__
starting value *stopping value* *step*



__35__

ROUND 2

Player 1

For values of **X** from __3__ to _17__ step by __5__
starting value *stopping value* *step*

SCORE __24_

Player 2

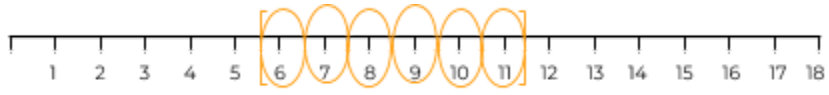
For values of **X** from __5__ to __17_ step by __3__
starting value *stopping value* *step*

__55_

ROUND 3

Player 1

For values of **X** from __6__ to __11_ step by __1__
starting value *stopping value* *step*



SCORE __51__

Player 2

For values of **X** from __2__ to __15_ step by __6__
starting value *stopping value* *step*

__24__

WHO WON?

PLAYER # ___1___

Name(s)_____ Period _____ Date _____

For Loop Fun

Number Lines and Score Sheet

Directions:

- Use the number lines to trace the “for loop” for each turn
  - Start at the starting value of X
  - Count down the number line, circling the numbers at the correct step
  - Stop when you get to the stopping value
- Add all of the circled values to get the score for your round
- Best 2 out of 3 Wins

ROUND 1

Player 1

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

SCORE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

Player 2

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

ROUND 2

Player 1

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

SCORE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

Player 2

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

ROUND 3

Player 1

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

SCORE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

Player 2

For values of **X** from _____ to _____ step by _____
starting value *stopping value* *step*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 _____

TEACHER KEY

For Loop Fun

Number Lines and Score Sheet

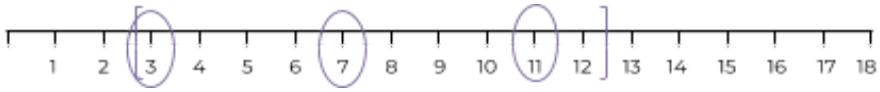
C O
D E

SAMPLE

ROUND 1

Player 1

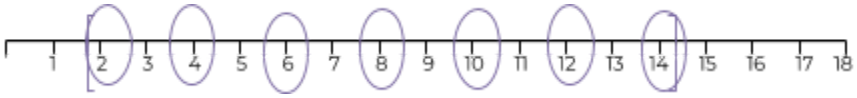
For values of **X** from __3__ to _12__ step by _4__
starting value *stopping value* *step*



SCORE __21__

Player 2

For values of **X** from __2_ to _14__ step by __2__
starting value *stopping value* *step*

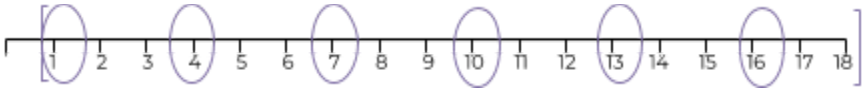


__56__

ROUND 2

Player 1

For values of **X** from _1__ to __18_ step by __3__
starting value *stopping value* *step*



SCORE __51__

Player 2

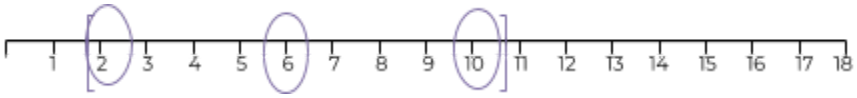
For values of **X** from __5__ to _12__ step by __5__
starting value *stopping value* *step*

__15__

ROUND 3

Player 1

For values of **X** from __2__ to _10__ step by __4__
starting value *stopping value* *step*



SCORE __18__

Player 2

For values of **X** from __3__ to _16__ step by __4__
starting value *stopping value* *step*

__36__

Name(s)_____ Period _____ Date _____

For Loop Fun

Assessment Worksheet

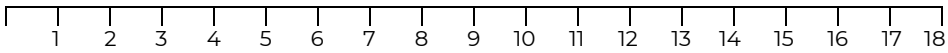
Below, you will find three rounds of the For Loop Game, along with what each player rolled during their turn. Fill out the number lines and tally the scores for each round. Who won the game?

ROUND 1

Player 1

For values of **X** from __1__ to _18__ step by __4__
starting value *stopping value* *step*

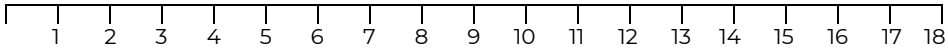
SCORE



_____

Player 2

For values of **X** from __3__ to _11__ step by __2__
starting value *stopping value* *step*



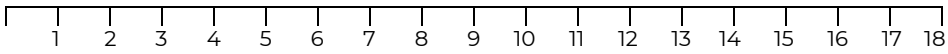
_____

ROUND 2

Player 1

For values of **X** from __3__ to _17__ step by __5__
starting value *stopping value* *step*

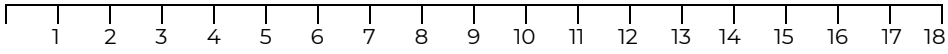
SCORE



_____

Player 2

For values of **X** from __5__ to __17_ step by __3__
starting value *stopping value* *step*



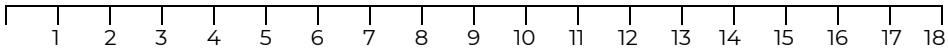
_____

ROUND 3

Player 1

For values of **X** from __6__ to __11_ step by __1__
starting value *stopping value* *step*

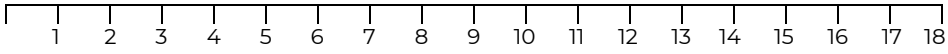
SCORE



_____

Player 2

For values of **X** from __2__ to __15_ step by __6__
starting value *stopping value* *step*



_____

WHO WON?

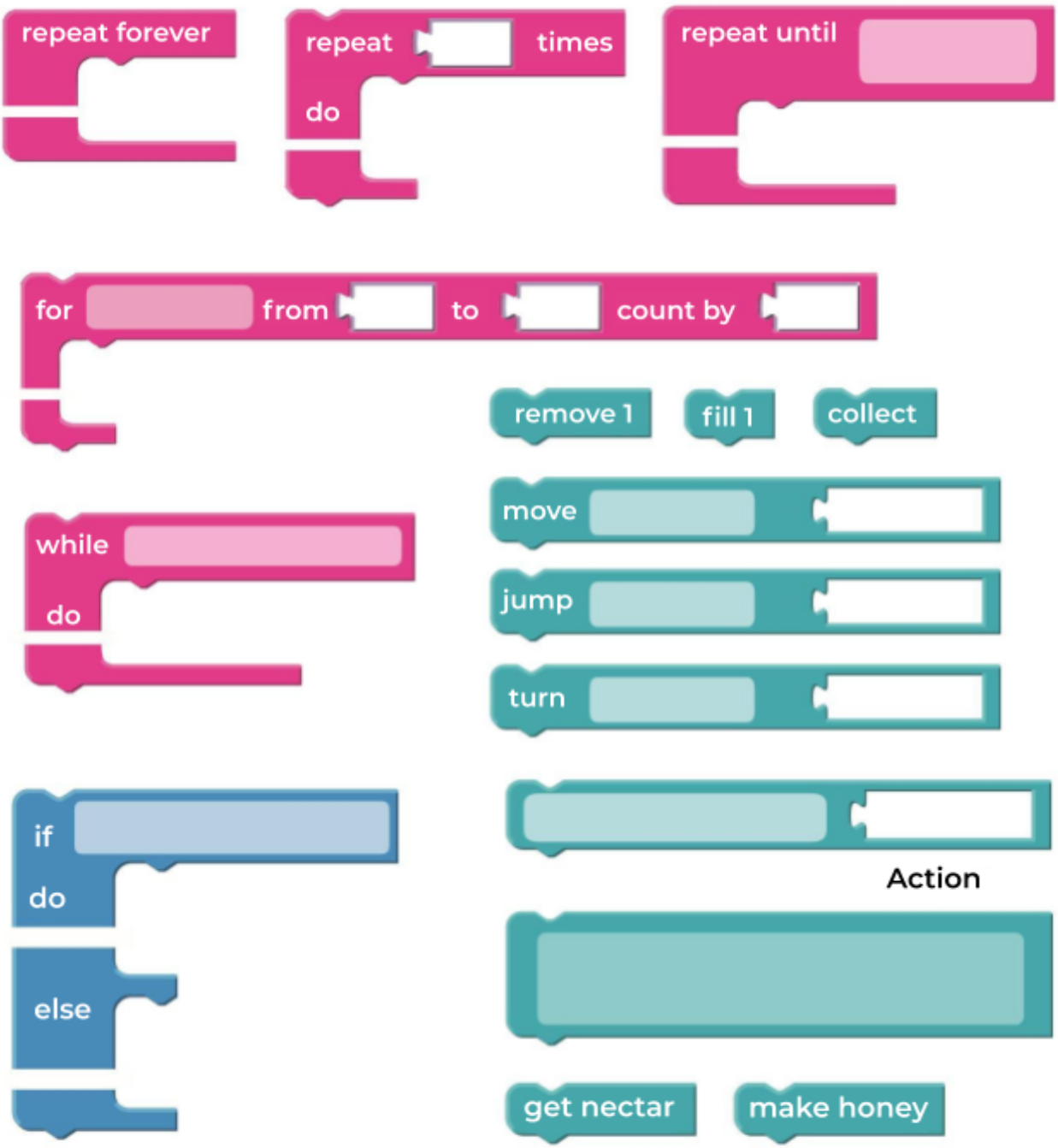
PLAYER # _____

Unit 6 Lesson 12

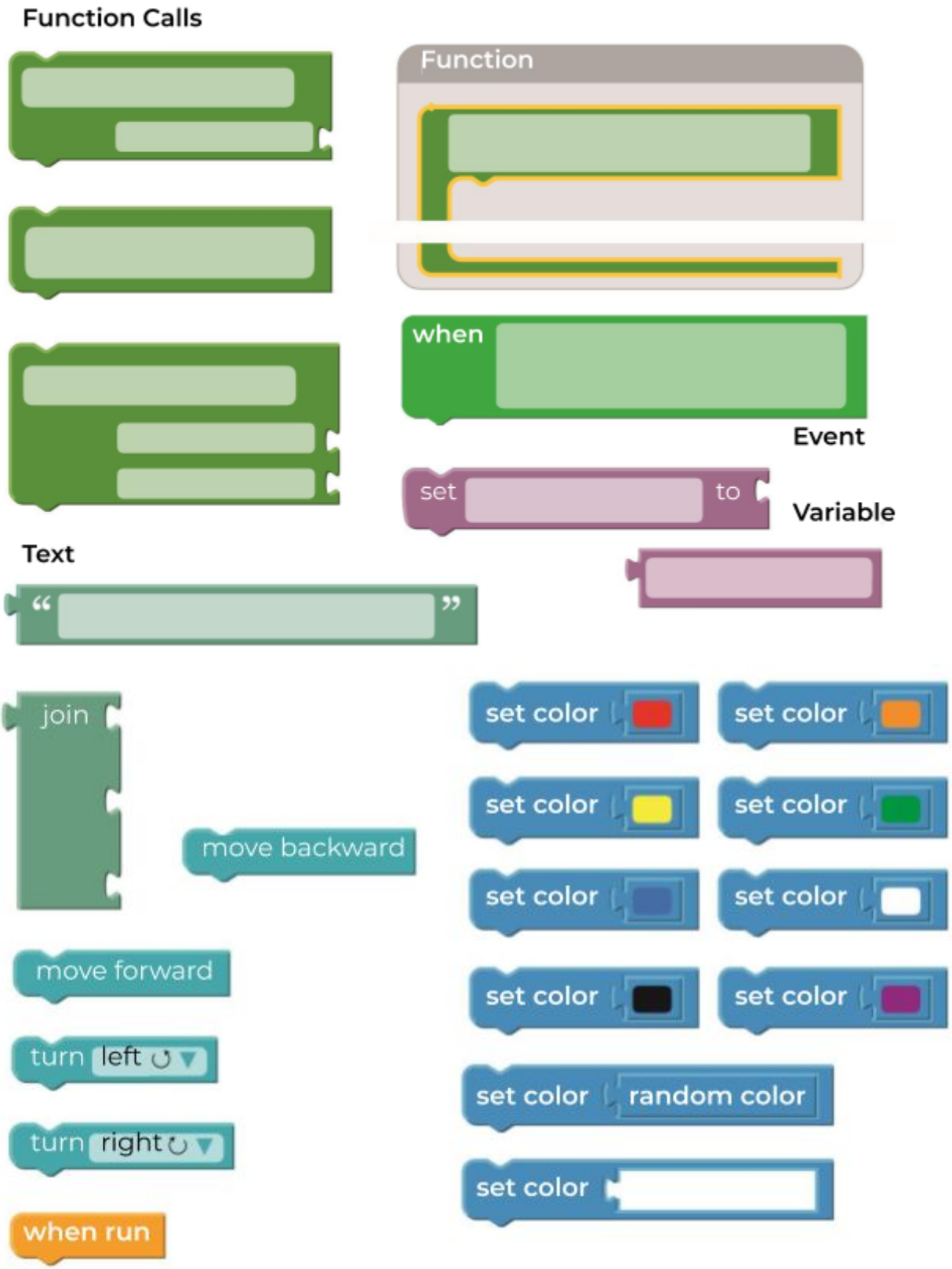
For Loops with Bee

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Unit 6 Lesson 13

For Loops with Artist

Resources

Unit 6 Lesson 14

The Internet

Resources

The Internet

How the Internet Does What It Does

Directions:

1) Create your own DNS table, similar to what is shown here.
2) Have the class help you fill in the blank spots in the table. Pick your favorite URLs and find their IP addresses using a site like www.getip.com.
3) Divide into groups of 3 to 5.
4) Assign each group an IP address from the table, and each person in the group a position:

    * The Message Writer
    * The Internet
    * The Server (carries the IP Address)
    * The Return Internet (Optional)
    * The Message Receiver (Optional)

5) Each group will draw an IP address Card and a Delivery Card to find out where their message is going and what their method of message delivery (Wi-Fi, Cable/DSL, or Fiber Optic Cable) will be.
6) The Message Writer will craft a note to send to the server.
7) The Internet will rip the message up into small pieces called packets, then deliver each packet one at a time to the Server with the IP address that was drawn from the IP address Card stack.
8) The Server will make sure that the message arrives in order, then will send each packet off one at a time with the Return Internet (can be the same person or different person than the original Internet).
9) The Return Internet will deliver each piece back to the Message Receiver (can be the same person or different person than the Message Writer) and put it back together.
10) The Message Receiver will wait for all of the pieces to arrive, then read the message to be sure it arrived correctly!

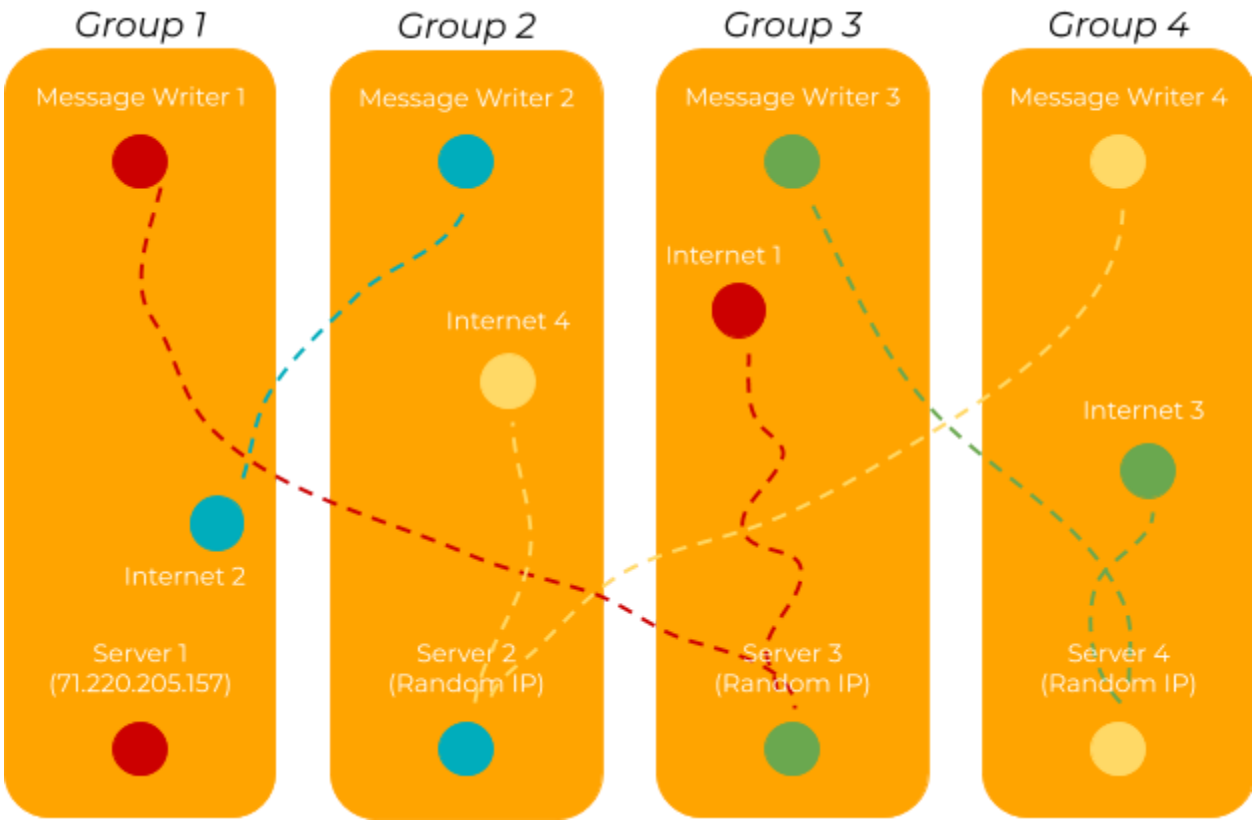
Rules:

1) The Internet must rip the message into exactly four packets.
2) If the Internet drops a packet, they have to pick it up and go back to the start to deliver it again.
3) The server has to wait for all of the message pieces to arrive before it can begin to send the message along.

Sample of DNS Table

#	URL	IP ADDRESS
1	www.code.org	
2		
3		
4		
5		

Sample of Classroom Group Layout During Game Play



The Internet

How the Internet Does What It Does

These cards correlate with numbered entries in the DNS Table.
(You should make one distinct row for each group.)

1	2
3	4
5	6

The Internet

How the Internet Does What It Does

These cards correlate with different methods of delivering messages over the Internet.
(Print enough to have once card for each group.)

Wi-fi	Fiber Optic
DSL	Cable

Types:

1) **Wi-Fi**: Convenient, but spotty. Wi-Fi doesn't require cables, but since the signal bounces all over the place, packets can get lost pretty easily.
   Simulation: *Internet must carry each packet on their shoulder (no hands).*

2) **Cable/DSL**: Fairly good at delivering messages, but you must be connected to a wire.
   Simulation: *Internet must carry each packet on the back of one hand and must keep the other hand touching a wall, desk, chair, or the floor at all times.*

3) **Fiber Optic Cable**: The best at delivering messages, but you must be connected to a wire.
   Simulation: *Internet can carry packets in hand, but must keep the other hand touching a wall, desk, chair, or the floor at all times.*

Name(s)_____ Period _____ Date _____

The Internet

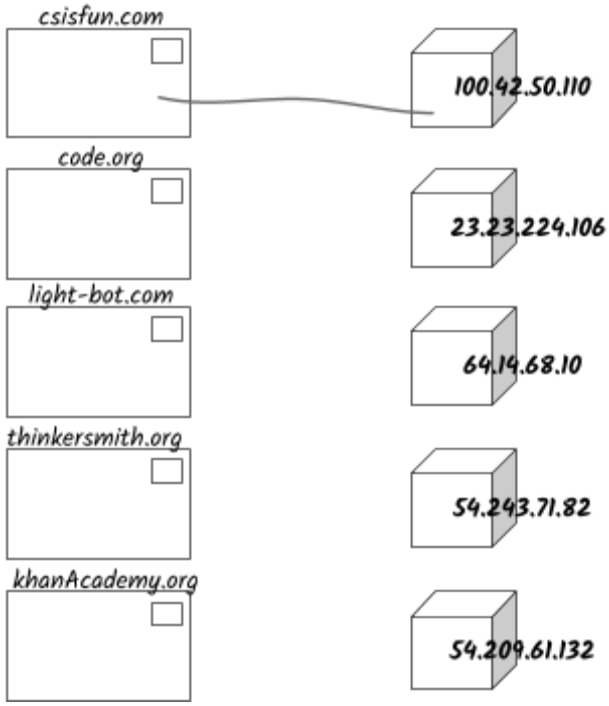
How the Internet Does What It Does

The DNS has gone out, and now you're in charge of delivering information all over the Internet! Use the DNS Look-up Table to figure out where each packet is supposed to go.

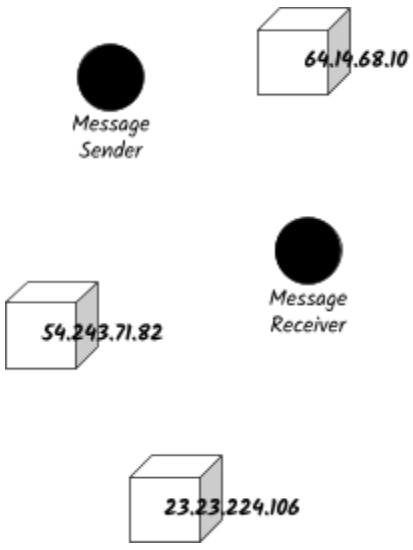
DNS Look-Up Table

#	URL	IP ADDRESS
1	www.code.org	54.243.71.82
2	csisfun.com	100.42.50.110
3	thinkersmith.org	64.14.68.10
4	light-bot.com	54.209.61.132
5	khanAcademy.org	23.23.224.106

Draw a line from each packet to the server where it is supposed to be delivered. The first one has been done for you.



This message is being delivered from someone at code.org to someone at thinkersmith.org. Draw the path that the message is likely to take.



TEACHER KEY

The Internet

How the Internet Does What It Does

The DNS has gone out, and now you're in charge of delivering information all over the Internet! Use the DNS Look-up Table to figure out where each packet is supposed to go.

DNS Look-Up Table

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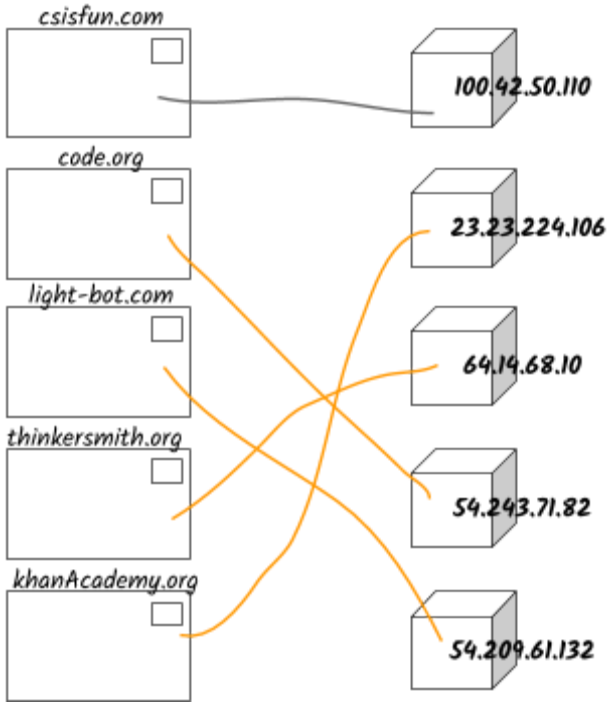

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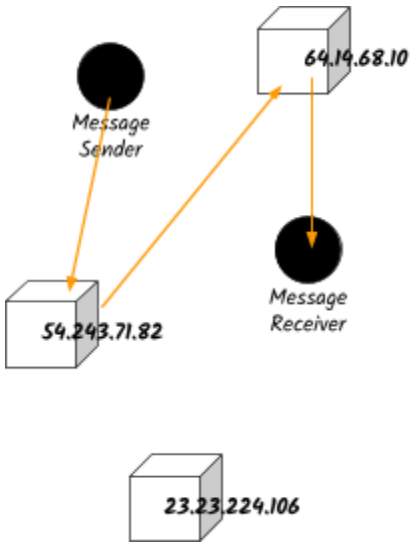


Unit 6 Lesson 15

Behaviors in Sprite Lab

Resources

Unit 6 Lesson 16

Virtual Pet with Sprite Lab

Resources

Unit 6 Lesson 17

The Power of Words

Resources

TEACHER KEY

The Power of Words

ASSESSMENT

1. Alicia receives a text message from her friend Ronald. The message says, "I am having a party. You are not invited." Circle the word that shows how Alicia might feel after she receives the message.

a) hurt

b) excited

c) popular

***Answer feedback**: The correct answer is **a.** Alicia probably feels **hurt** by Ronald's message. Telling someone they aren't invited can hurt their feelings. Things that are hurtful in person are also hurtful online.*

2. Theo is having fun playing Dragons and Knights online. Then he sees a message from another player. It says, "You're ruining the game, stupid!" What should Theo do about the message? What shouldn't he do? Use the chart below to fill in the letters that go with each answer.

Answer feedback

Things Theo should do	Thing Theo should *not* do
a) Ignore the player who sent the mean message d) Save the message in case the other player sends Theo another mean message e) Tell an adult about the message	b) Write a message back that says, "You're so stupid, you're the one ruining the game" c) Pretend that he doesn't feel hurt by the message f) Never play Dragons and Knights online again

The Power of Words

ASSESSMENT

3. The following acronym, STOP, gives advice on what to do when something goes wrong online. Explain what each letter means.

STOP	**What is the meaning of each phrase? Explain in your own words.**
Step away	*When something goes wrong, you should step away from the device and take a break.*
Tell a trusted adult	*If something goes wrong, you should tell a trusted adult so that he or she can help you.*
Okay sites first	*Make sure you are visiting sites that are appropriate for your age.*
Pause and think online	*When you go online, you should pause and think twice before sending, posting, or reacting.*

Name(s)_____ Period _____ Date _____

The Power of Words

ASSESSMENT

1. Alicia receives a text message from her friend Ronald. The message says, "I am having a party. You are not invited." Circle the word that shows how Alicia might feel after she receives the message.

a) hurt

b) excited

c) popular

2. Theo is having fun playing Dragons and Knights online. Then he sees a message from another player. It says, "You're ruining the game, stupid!" What should Theo do about the message? What shouldn't he do? Use the chart below to fill in the letters that go with each answer.

a) Ignore the player who sent the mean message

b) Write a message back that says, "You're so stupid, you're the one ruining the game"

c) Pretend that he doesn't feel hurt by the message

d) Save the message in case the other player sends Theo another mean message

e) Tell an adult about the message

f) Never play Dragons and Knights online again

Things Theo should do	Thing Theo should *not* do

Name(s)_____ Period _____ Date _____

The Power of Words

ASSESSMENT

3. The following acronym, STOP, gives advice on what to do when something goes wrong online. Explain what each letter means.

STOP	**What is the meaning of each phrase? Explain in your own words.**
Step away	
Tell a trusted adult	
Okay sites first	
Pause and think online	

Name(s)_____ Period _____ Date _____

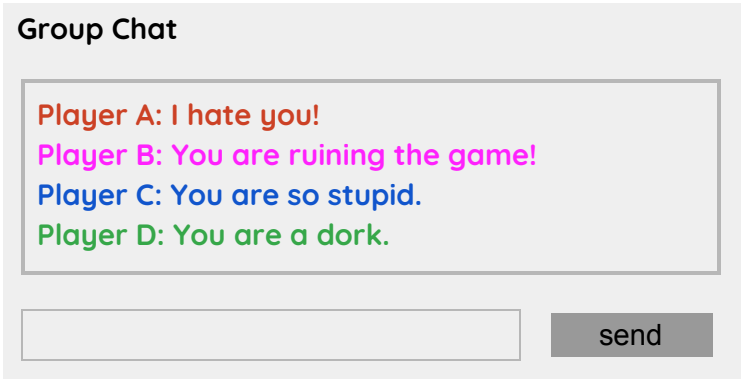
The Power of Words

WORDS CAN HURT

Directions

Ready the story below and then answer the questions that follow.

Rani and Aruna love a website that has games and chatting for kids. Their parents let them play on the site. Lately, though, Rani and Aruna have been receiving mean messages on the site, including:



1. How do you think Rani and Aruna feel when they read those messages?

Rani and Aruna feel _____

_____

2. How would you feel if you received messages like these?

I would feel _____

_____

3. Why do you think people send these kinds of messages to people they don't know?

People send these kind of messages because _____

_____

Use Common Sense!

There's an old saying: "Sticks and stones may break my bones, but words will never hurt me."

I think that this saying it TRUE/NOT TRUE (circle one) because _____

_____

Name(s)_____ Period _____ Date _____

The Power of Words

TALK AND TAKE ACTION

Directions

Create a cartoon about a cyberbullying situation. Each frame should show a different part of the situation:

Frame 1: Make a cartoon about something that a cyberbully might do or write online Remember to use language appropriate for school.

Frame 2: Show what you might do if you saw what the cyberbully has done or written.

Frame 3: What might be a positive outcome, or result, of the situation?

What might a cyberbully say or do?	What would you do in response?
What would a positive outcome be?	

Use Common Sense!

- If someone is mean to you online, take a breather and ignore them. Save a copy of your conversation between you and the bully.
- If you, or someone you know, is cyberbullied, talk to a trusted adult − like a parent, family member, or teacher. Together you can think of a plan for how to respond.

Unit 6 Lesson 18

Crowdsourcing

Resources

Unit 6 Lesson 19

Digital Sharing

Resources

Unit 6 Lesson 20

End of Course Project

Resources

The Design Process

Designing software means solving lots of little problems, all the time. The main problem in software design is what to create in the first place.

This process is useful for all kinds of things, but we are going to focus on using it for app design.

- **Define**
  - What kind of app would you like to create?
  - What are your constraints?
  - What does success look like?
- **Prepare**
  - Brainstorm / research possible elements
  - Compare pros and cons
  - Make a plan
- **Try**
  - Put your plan into action
- **Reflect**
  - How do your results compare to the goals you set while defining the app?
  - What can you learn from this or do better next time?
  - What new problems have you discovered?

What it Looks Like

Over the course of the next several weeks, you will have the opportunity to experiment with some existing games and design your own game based off of what you have learned. After creating your game, you will get the chance to present it to others and receive feedback. These steps are all critically important in the software industry, and getting practice with the elements of the design process will help you create better products more efficiently. Here is what the coming weeks will hold as we learn more about the design process.

1. **Define & Prepare**
   - Play existing games to get ideas and understand limitations
   - Brainstorm and plan your new or modified app
2. **Try**
   - Follow your plan to build an app
3. **Reflect & Edit**
   - Swap apps with another group to help make your projects better
4. **Present**
   - Show off your final product!

Handout

Final Project Design Worksheet

Use this worksheet to make sure you are following the right steps to get your final project completed correctly and on time. If more space is needed for answers, you can use the back of the paper.

Day 1: Define & Prepare

Time to plan the details of your final project!

Section A: Determine your project style

1) What type of project will you be creating?	**Sprite Lab** *(skip section B)* or **Artist** *(skip section C)*
2) Do you want this to be a showcase piece or an interactive game?	**Showcase Piece** *(skip section D)* or **Interactive App** *(skip section E)*
3) Is your project a remix or brand new? (If remix, add URL of original)	
4) Describe in three to five sentences what your project will be.	

Section B: Artist Project

1) Will your drawing be a planned, detailed image which is the same each time, or change each time it's run?	
2) If your drawing stays the same each time it's run, what is the design you are trying to build, and why does it make an interesting project? (More room on back of sheet.)	

Final Project Design Worksheet

3) If your drawing changes each time it is run, describe why it changes and how the program will make that happen.	

Section C: Sprite Lab Project / Other

1) How many characters will your game have?	
2) Will your app be a story that plays the same way each time it is run, or is it meant to change each time?	
3) If your app is a story that runs the same way each time, describe the story it will be telling and the scene where it will take place.	
4) If your app is meant to change each time it is run, describe why it changes and how the program will make that happen.	

Handout

Final Project Design Worksheet

Section D: Interactive App

1) In what way does your app require audience interaction?	
2) For this type of app, you must use at least two of these suggested items. Circle the items you think you will use and describe what you might do with them. (5th grade concepts in red)	• Random • Conditionals with both `if` and `else` • Nested Loops • Functions • Variables • For Loops

Section E: Showcase Piece

1) For this type of app, you must use at least two of these suggested items. Circle the items you think you will use and describe what you might do with them.	• Random • Functions • Nested Loops • Variables • For Loops

Handout

Final Project Design Worksheet

Day 2: Try

Coding day! Be sure to refer back to your table from day 1 to make sure your finished product represents the project that you said you were going to make.

Section F: What is going well?

1) What parts of your project are turning out just the way you thought they would?	
2) What are you learning about the concepts or blocks that you're using?	

Section G: What is not going well?

1) Is there anything that you planned to do that you needed to change? Why did you need to change it?	
2) Are there any blocks or concepts that you don't understand how to use? Which ones?	

Handout

Final Project Design Worksheet

Day 3: Reflect and Edit

Time to make your project the best it can be. Pass this sheet to a classmate, then have them try your app and fill out the boxes below. Your classmates will have 20 minutes to review your app, then you will have the rest of the class period to fix any issues that they found.

Share your project URL:

Section H: The app in general

1) What do you like about this app?	
2) Is there anything about this app you don't understand?	
3) Name two things you might change about this app if you were the one creating it.	

Handout

Final Project Design Worksheet

Section I: Assessing the app

1) Does the app match the description from day 1?	
2) Does the app use at least 2 of the concepts from the required category?	
3) Does the app feel like it was well-planned?	

Handout

Final Project Design Worksheet

Day 4: Present

Great computer scientists need to be able to show off their accomplishments. It's time to present your work.

Share your project URL:

Section J: Describe your work

1) Why did you decide to create this specific project?	
2) What does your project do?	
3) Which of the required ideas did you use, and how did you use them?	

Handout

Final Project Design Worksheet

Section K: Reflect on the process

1) What did you learn in creating this project?	
2) What was the most challenging part about this experience? How did you overcome that challenge?	
3) What part of this experience was the most fun?	
4) Describe a time that something did not go as planned and you had to be persistent to get everything to work out in the end.	

Handout

Final Project Design Worksheet

5) Is there anything that you would try to change if you had extra time?	
6) How well did you and your partner/team work together? Were you able to make compromises in order to end up with a project that you were both happy with?	
7) What else do you want people to know about your project?	