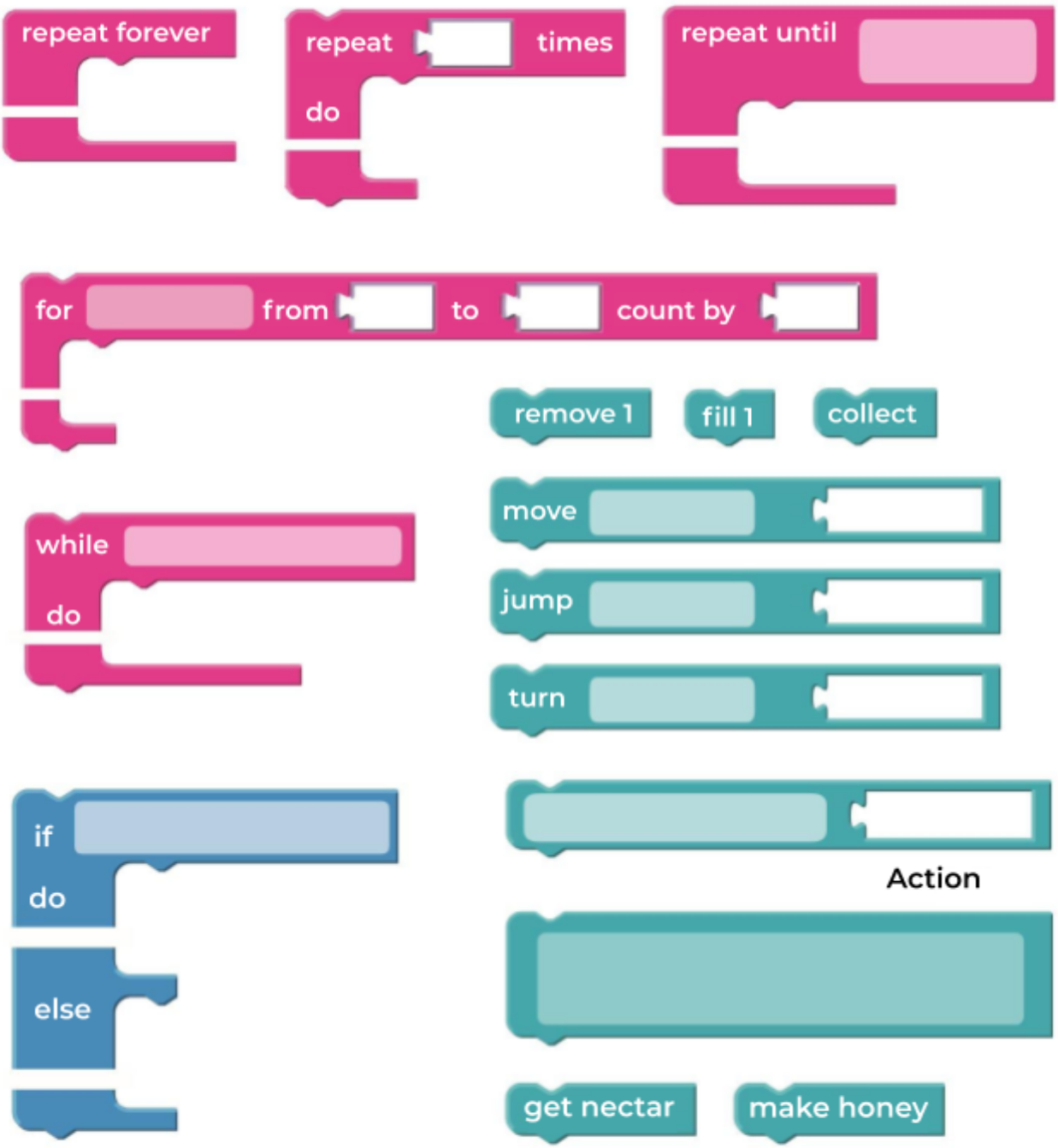
Unit 5 Lesson 1

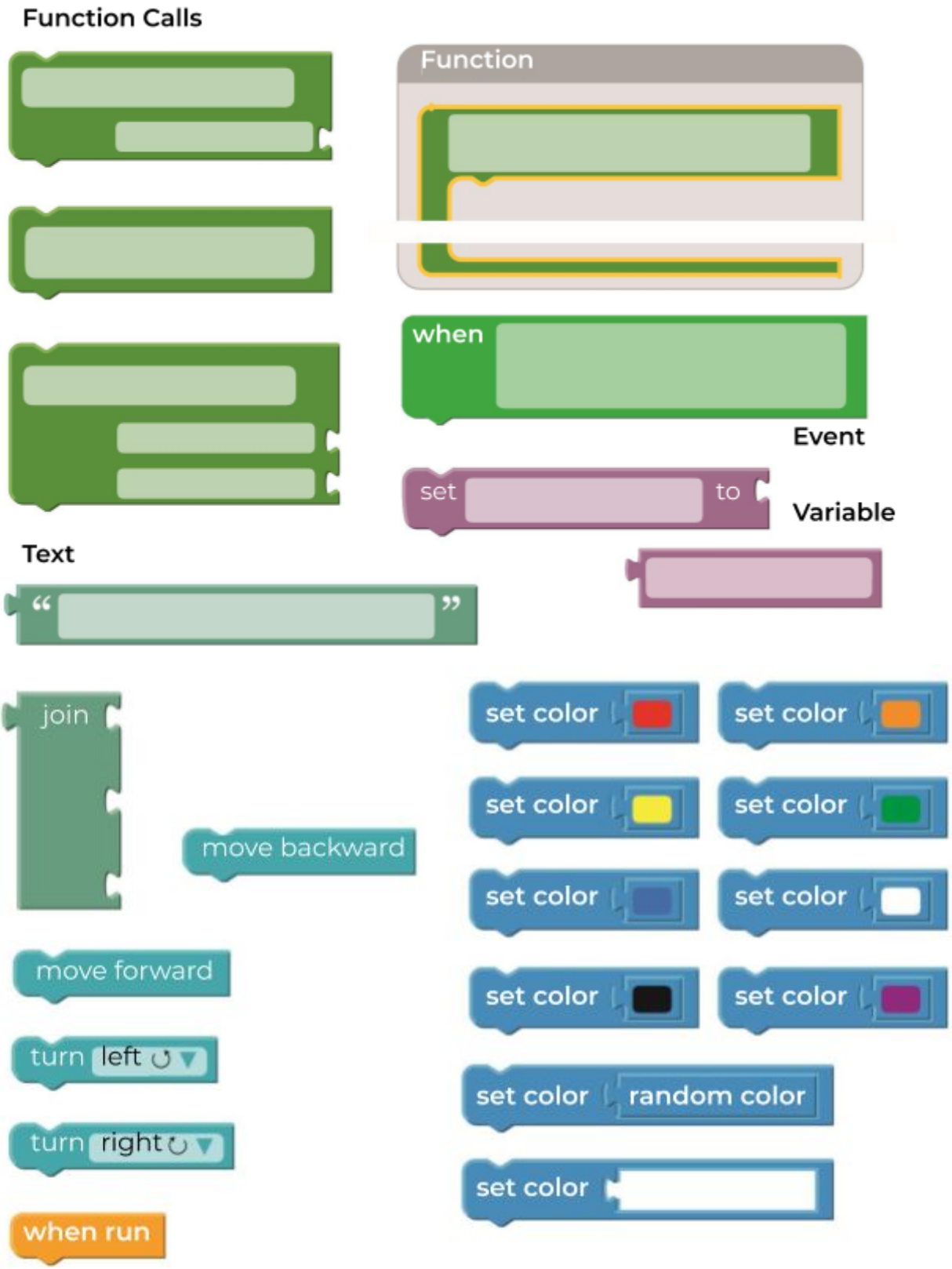
Sequencing in the Maze

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Code.org Debugging Recipe

These debugging tips will help you keep moving when you get stuck!

Work to Avoid Mistakes

- Read the directions.
- What is the goal of the puzzle?
- Take it slow and go one step at a time.
- Can you talk about the problem in your own words?
- Were you given any code to start?
  - What does it do?
  - Why do you think it's there?

Debugging

- Look for problems each step of the way.
- Describe what was supposed to happen.
- Describe what is going wrong.
- Does the difference between what was supposed to happen and what did happen give you any clues?
- Fix one thing at a time, then describe how the result changed.
- Try leaving "breadcrumbs" in your program. You can put clues inside your code (like having your program "say" something) to let you know when each chunk runs.
- Try doing each task as its own chunk, then put all of the pieces together at the end so it is easier to see what each thing does.
- Talk to a friend. Maybe one of your classmates can help you figure out where your plan goes awry.
- Try at least three ways of xing problems before you ask for help.

Unit 5 Lesson 2

Drawing with Loops

Resources

Unit 5 Lesson 3

Conditionals in Minecraft: Voyage Aquatic

Resources

Unit 5 Lesson 4

Conditionals with the Farmer

Resources

Unit 5 Lesson 5

Simon Says

Resources

Unit 5 Lesson 6

Swimming Fish with Sprite Lab

Resources

Unit 5 Lesson 7

Alien Dance Party with Sprite Lab

Resources

Unit 5 Lesson 8

Private and Personal Information

Resources

Unit 5 Lesson 9

About Me with Sprite Lab

Resources

Unit 5 Lesson 10

Designing for Accessibility

Resources

Unit 5 Lesson 11

Nested Loops in Maze

Resources

Unit 5 Lesson 12

Fancy Shapes using Nested Loops

Resources

Name(s)_____ Period _____ Date _____

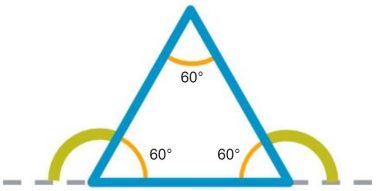
Turns & Angles

in Regular Polygons

Triangle

(**3** sides)

120°
Right Turn



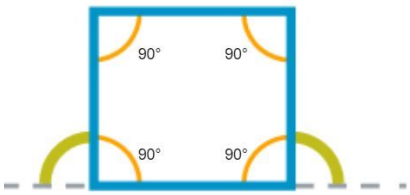
120°
Left turn

Each turn is 360° / **3** = **120°**
Each angle is 180° - **120°** = **60°**

Rectangle

(**4** sides)

90°
Right Turn



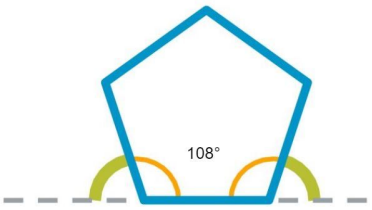
90°
Left Turn

Each turn is 360° / **4** = **90°**
Each angle is 180° - **90°** = **90°**

Pentagon

(**5** sides)

72°
Right Turn



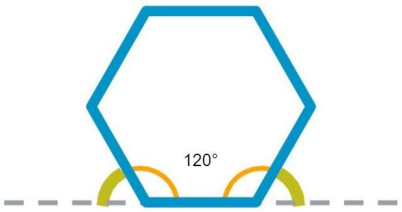
72°
Left
Turn

Each turn is 360° / **5** = **72°**
Each angle is 180° - **72°** = **108°**

Hexagon

(**6** sides)

60°
Right Turn



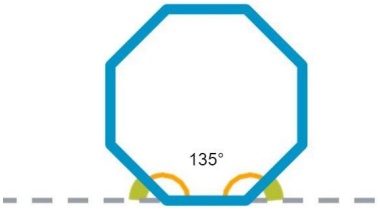
60°
Left Turn

Each turn is 360° / **6** = **60°**
Each angle is 180° - **60°** = **120°**

Octagon

(**8** sides)

45°
Right Turn



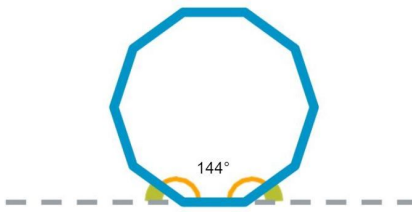
45°
Left
Turn

Each turn is 360° / **8** = **45°**
Each angle is 180° - **45°** = **135°**

Decagon

(**10** sides)

36°
Right Turn



36°
Left Turn

Each turn is 360° / **10** = **36°**
Each angle is 180° - **36°** = **144°**

Unit 5 Lesson 13

Nested Loops with Frozen

Resources

Unit 5 Lesson 14

Songwriting

Resources

Songwriting

Using Lyrics to Explain Functions

One of the most magnificent structures in the computer science world is the function. Functions (sometimes called procedures) are mini programs that you can use over and over inside of your bigger program.

A fantastic way to compare functions to something we see in our everyday lives is to look at songs. Songs often have certain groups of lyrics that repeat over and over. We call such a group a “chorus.”

Directions:

1) Divide into groups of 4, 5, or 6.

2) Give each group several copies of the Songwriting Worksheet.

3) Play a short song for the class that contains a clear chorus that does not change from verse to verse.

4) Challenge the class to identify (and write down) the chorus.

5) Compare results from each group. Did everyone get the same thing?

New Word!

Function

Say it with me: Func-shun

A piece of code that you can call over and over again

Let’s make a **function** for the bits that we use most often so that we don’t need to write so much as we go.

Name(s)_____ Period _____ Date _____

Songwriting Worksheet

Using Lyrics to Explain Functions

Song 1 Name:

Chorus:

Song 2 Name:

Chorus:

Name(s)_____ Period _____ Date _____

Songwriting

Using Lyrics to Explain Functions - Assessment

Look at the lyrics for the two songs below.

If it were your job to write these songs as computer programs, what chunk of code from each would you turn into a function so that you could use it over and over again with just one word?

Circle the segments of each program that repeat most often. Is everything that you circled exactly the same? If so, that can be your chorus!

Finish by writing the chorus for each song on the Songwriting Worksheet and give it a name. Those are your functions!

Song: The Candy Man

Who can take a sunrise,
Sprinkle it with dew?
Cover it in chocolate and a miracle or two

The candy man, the candy man can,
The candy man can cause he mixes it with love
and makes the world taste good

Who can take a rainbow,
Wrap it in a sigh?
Soak it in the sun and make a groovy lemon pie

The candy man, the candy man can
The candy man can cause he mixes it with love
and makes the world taste good

The candy man makes
everything he bakes
Satisfying and delicious.
Talk about your childhood wishes.
You can even eat the dishes!

Who can take tomorrow,
Dip it in a dream?
Separate the sorrow and collect up all the cream

The candy man, the candy man can
The candy man can cause he mixes it with love
and makes the world taste good

Song: Skip to my Lou

Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Skip to my Lou, my darlin'

Fly's in the buttermilk,
Shoo, fly, shoo,
Fly's in the buttermilk,
Shoo, fly, shoo,
Fly's in the buttermilk,
Shoo, fly, shoo,
Skip to my Lou, my darlin'.

Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Skip to my Lou, my darlin'.

Cows in the cornfield,
What'll I do?
Cows in the cornfield,
What'll I do?
Cows in the cornfield,
What'll I do?
Skip to my Lou, my darlin'.

Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Lou, Lou, skip to my Lou,
Skip to my Lou, my darlin'.

Name(s)_____ Period _____ Date _____

Songwriting

Using Lyrics to Explain Functions - Assessment

Song 1 Name:

Chorus:

Song 2 Name:

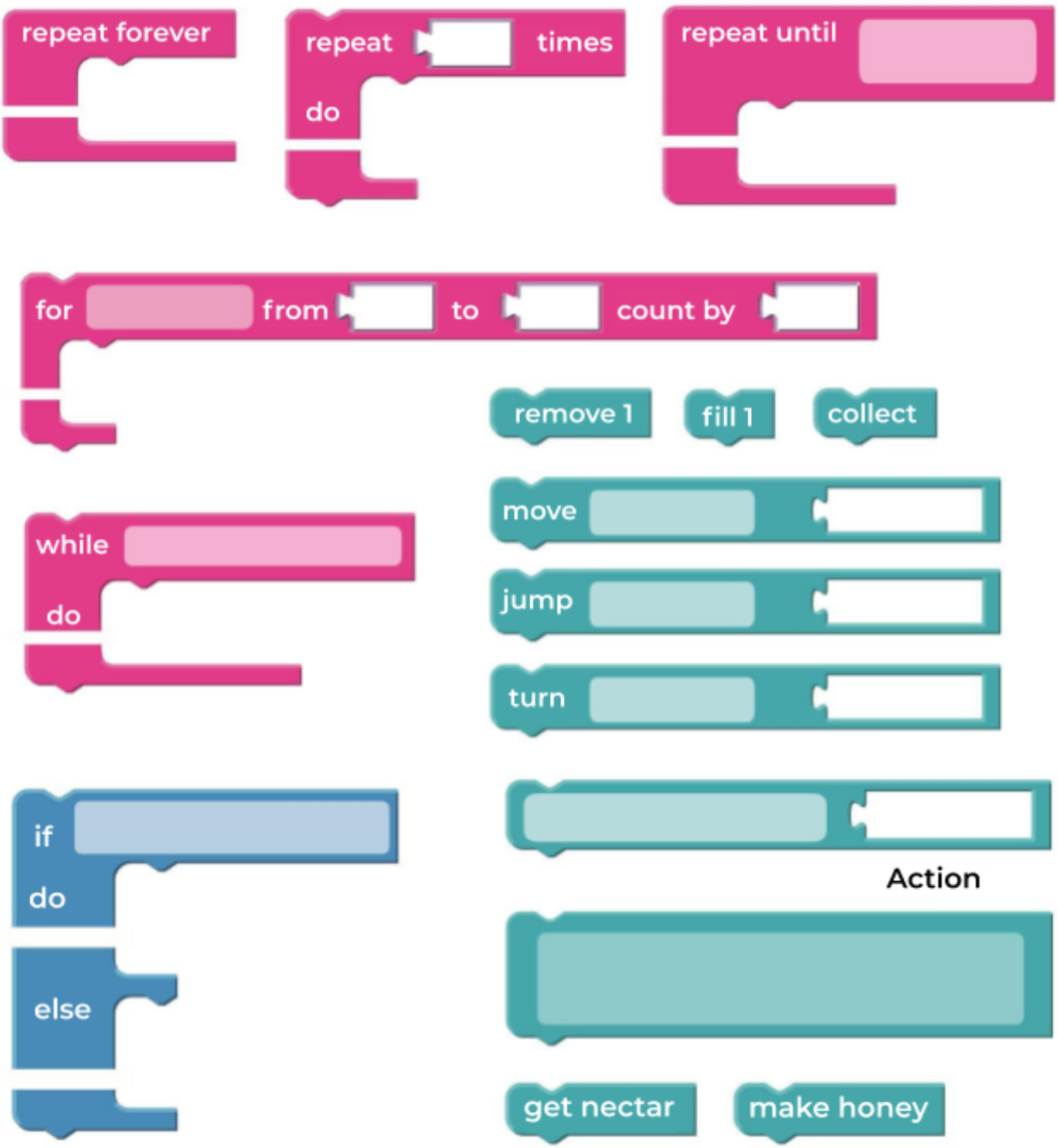
Chorus:

Unit 5 Lesson 15

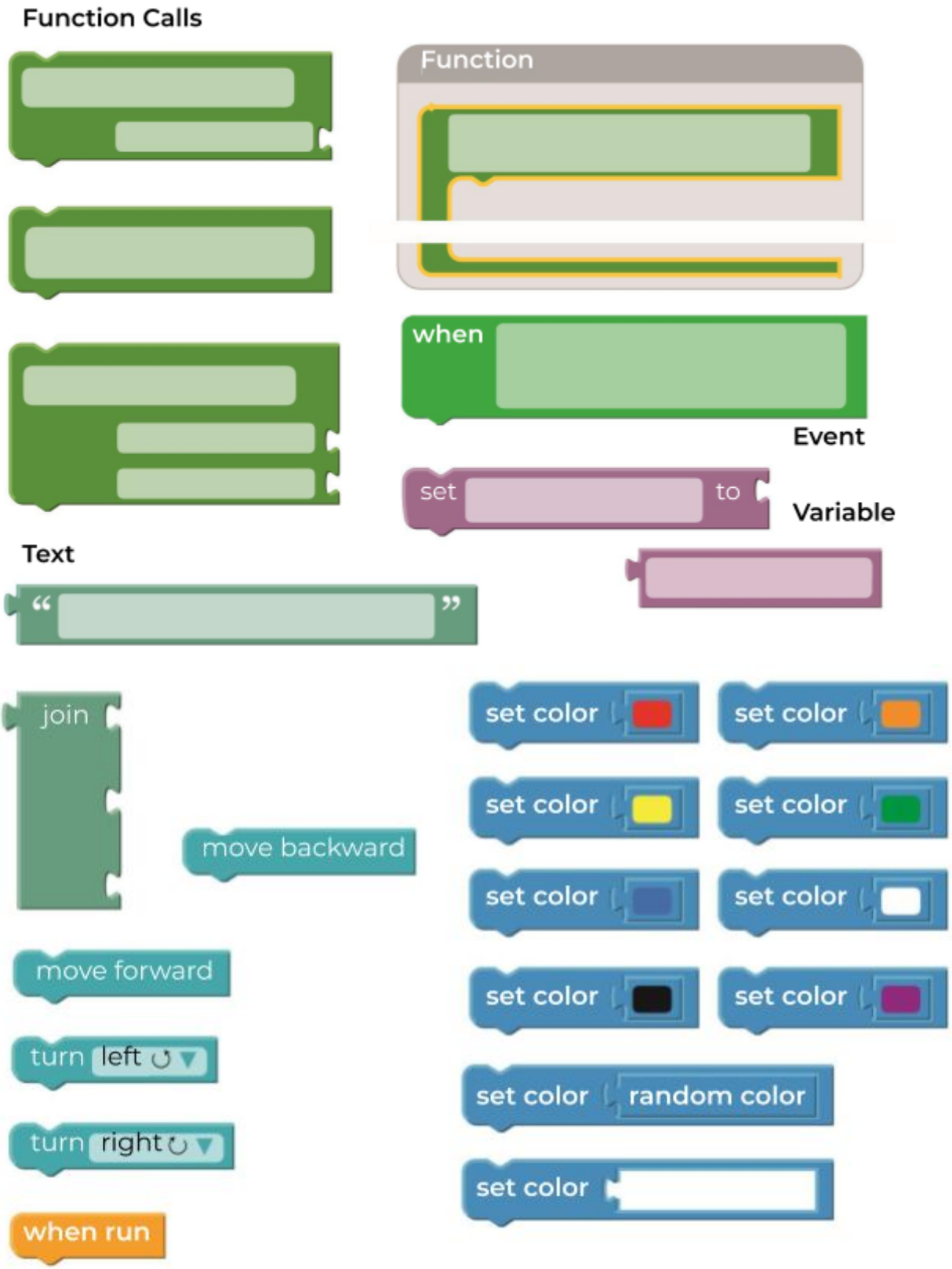
Functions in Minecraft

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Unit 5 Lesson 16

Functions with Harvester

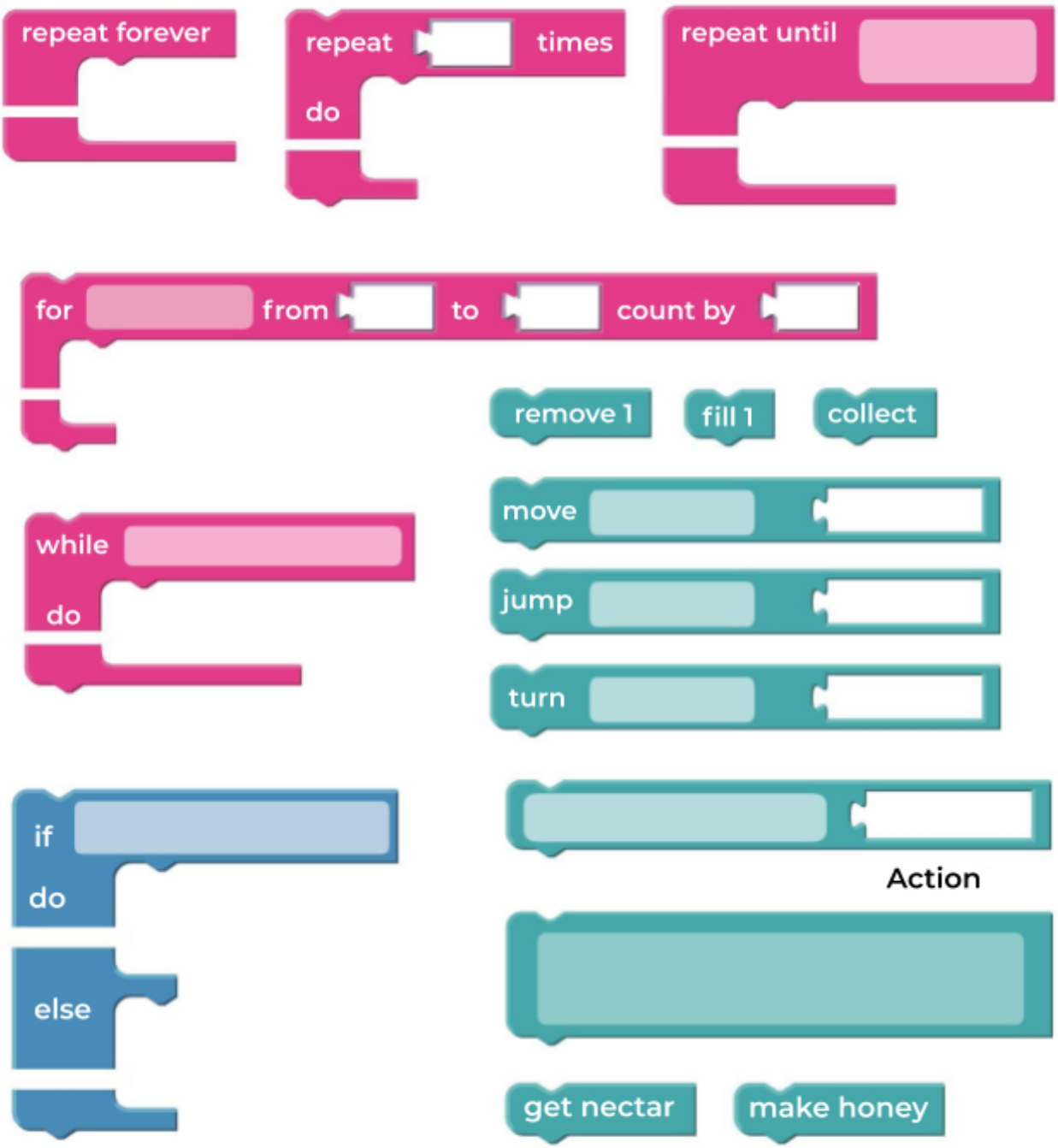
Resources

Unit 5 Lesson 17

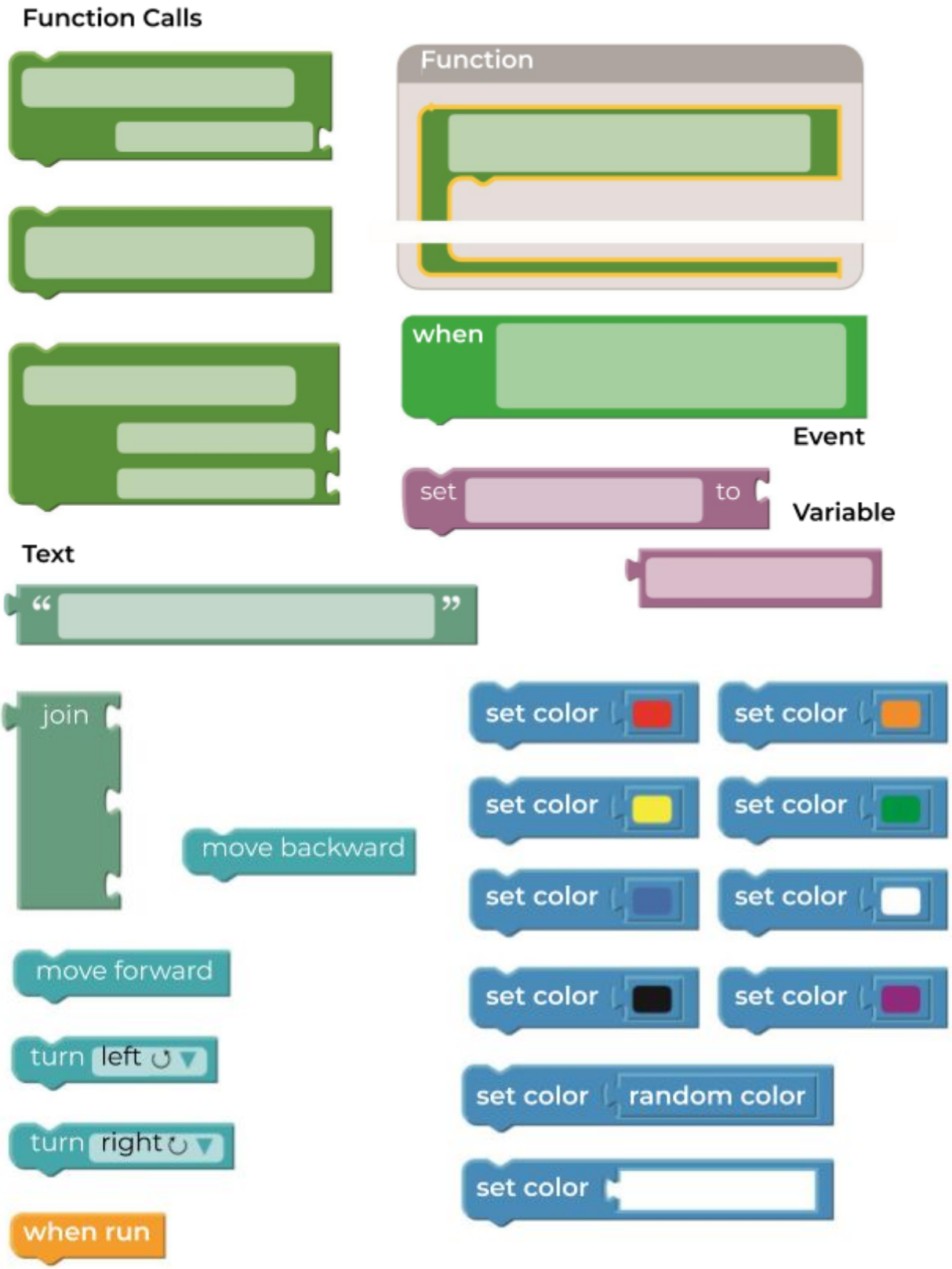
Functions with Artist

Resources

Unplugged Blocks (Courses C-F)



Unplugged Blocks (Courses C-F)



Unit 5 Lesson 18

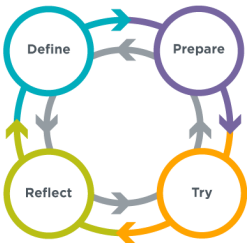
End of Course Project

Resources

Name: _____

Project Planning Guide

Use this planning guide to help think about the project you would like to create and start planning for it before you hop on the computer. Remember that problem solving is always linear, so it's always okay to go back to previous steps once you get working if you need to refine your plan - this is your project!



Define

Use the space to describe or sketch what kind of a project you want to create. Consider checking out the example projects on Code Studio or using any of the previous programs you've made for inspiration.

Name: _____

Project Planning Guide

Prepare

Once you know what you want to make, it's time to prepare for success. This step can look different depending on what exactly you are trying to do, so **pick two prompts** that make sense for you.

What programming concepts (like loops, event or conditionals) will you need to use? Brainstorm where you can go to get more help with each concept.	How will you break the project into smaller tasks? What parts of your code will you write right away and what can you save for later?
What parts of your program do you know how to do, and what parts are you less clear on? How could you figure those out?	Have you made programs in the past that do similar things to your project idea? What could you borrow from those programs?

Name: _____

Project Planning Guide

Try

Using the resources you collected in the prepare step, start working on your project. Use the space below to write down questions that come up as you work, jot down notes that you might need in the future, or just as scratch space to think through problems.

Name: _____

Project Planning Guide

Reflect

Try out your project and share it with classmates. Once you've seen how your project works and what others think if it, reflect on how you got there and where you might go next.

What are you most proud of?

What was surprising or difficult?

What would you like to change or improve?

What would you do differently next time?

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!