Coding for Good Badges

Plug It In

The K-5 Coding for Good badges are unplugged — no device needed! However, if girls want to practice coding on a device as part of the badges, you can use codeSpark Academy on a computer (or other device). CodeSpark Academy is a program that teaches kids, especially girls, the basics of coding. This meeting aid will give you more information on how to access codeSpark Academy and lead girls through the plugged activities.

Girl Scouts is delighted to offer free access to certain codeSpark content for councils and service units to use at events as well as discounts for parents to access codeSpark Academy as the result of the generous support of codeSpark. To learn more about codeSpark and the special opportunities for Girl Scouts and how it supports Girl Scouts to learn about coding, you can visit www.codespark.com

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About codeSpark

codeSpark's platform "codeSpark Academy" introduces young learners to the fundamentals of computer science and coding concepts through interactive puzzles, games and creative projects.

As a company founded on a mission to empower girls through coding education, a partnership with Girl Scouts was a natural next step. Computational skills like sequencing, pattern recognition, and abstraction are crucial for general problem solving and critical thinking. These Coding for Good badges are a small step towards equity in STEM, but we're excited to bridge the gap in computer science education so our youngest kids can learn to code, thereby learning how to engage with the digital world around them!

We are excited for you to use codeSpark Academy with your troop and hope you have a Foo-tastic time!

Using codeSpark Academy

With codeSpark Academy, your girls will be able to take what they learn in the Coding For Good badges and use visual command blocks to solve puzzles and create their own video games & animated stories. Below is a table outlining which codeSpark sections align to each Girl Scout badge. However, the girls should feel free to explore other areas of codeSpark Academy as well.

Girl Scout Badge	CodeSpark Academy
Brownie Coding Basics	Donut Detective, Tool Trouble, Kite Plight
Brownie Digital Game Design	Create Game
Brownie App Development	Create Story

Who are the Foos?

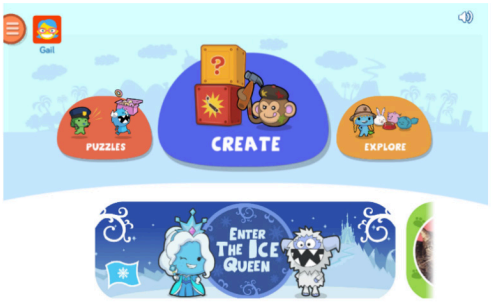
The Foos are the inhabitants of Fooville, creative world modeled after computer microchips. Foos are happiest when they solve problems by working in a team, having fun, acting silly, and of course completing tasks efficiently! They can also experience sadness, frustration, silliness, surprise, and all sorts of emotions.

As girls make their way through codeSpark Academy puzzles, they'll encounter different Foos who will introduce and practice coding concepts like sequencing, loops, conditionals and more. Each Foo has a special ability and different personality traits. For example, Naomi can shrink and grow, throw a banana, and unlock things. She's also fiercely loyal to her friends. Val has a jetpack, can use dynamite, and travels through a transport portal. She's also brave and very knowledgeable in all things science related.

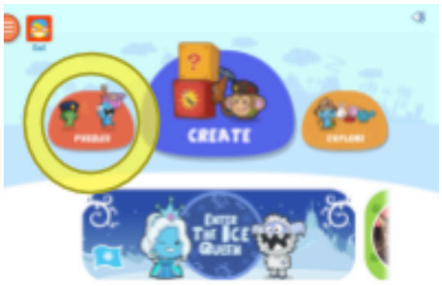
Getting Started Guide

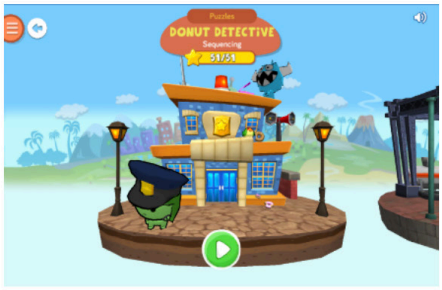
Navigating codeSpark Academy

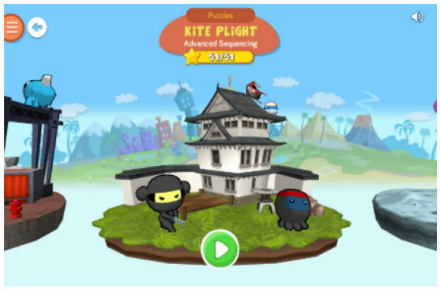
Within codeSpark Academy there are three main areas: Puzzles, Create, and Explore.



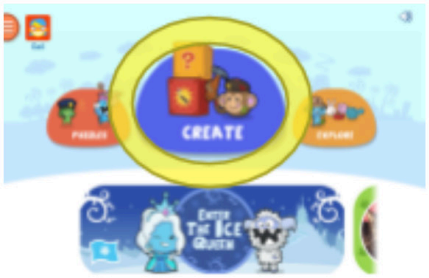
Donut Detective and Kite Plight (Coding Basics badges) are found in the Puzzles section. Tap "Puzzles" on the home screen then swipe to find Donut Detective and Kite Plight.

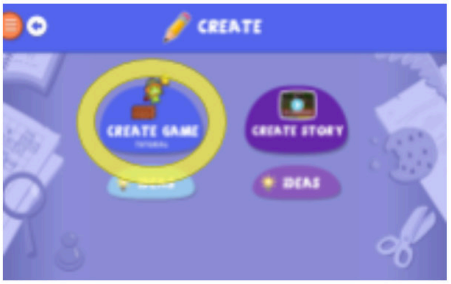




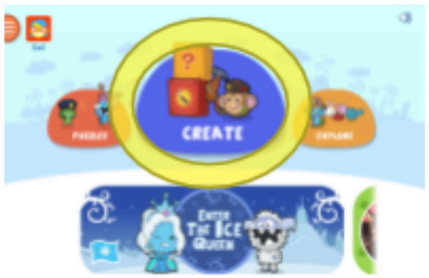


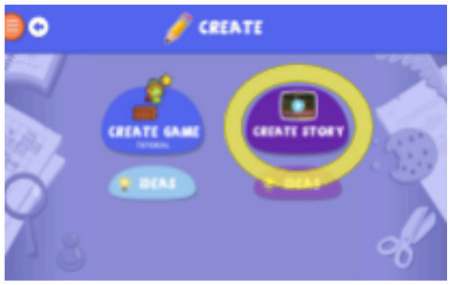
Create Game is found in the "Create" section. Tap "Create" then "New" then "Create Game."





Create Story is also found in the "Create" section. Tap "Create" then "New" then "Create Story."





Helping your Girl Scouts

It's recommended that the Donut Detective and Tool Trouble puzzles are completed before working on creating games and stories in the Create area.The puzzles are meant to introduce important coding concepts that are used when creating games and stories from scratch.

Coding can be frustrating at times because errors (or bugs) prevent programs from functioning as expected. It's important to encourage your girls and help them persevere through productive struggle. If girls get stuck on a level, SAY:

- *If a computer scientist can't solve a problem right away, she perseveres. That means she's keep trying!*
- *When you persevere, you don't give up. Do your best and keep trying!*
- *If you get stuck, ask someone to help you or try a different way to solve the level.*
- *Let's see if your neighbor can help you figure out how to get unstuck.*

Technology Tips

- Before the meeting, confirm adequate wireless connectivity. codeSpark requires Internet connection *while in use.*
- The minimum device requirements to run codeSpark Academy are:
  - Apple iOS 9 (iPad 2)
  - Android 4.1 Jellybean
  - Desktop/Chromebook: 4GB of RAM, might need to close all other apps
- If you're using tablets, download, install, and login to codeSpark *before* your meeting. This process always takes longer than you think it should.
- If you're using desktop/laptop computers (at http://www.codespark.com/play) be patient as the game takes some time to load the first time you open it.
- Be sure to test codeSpark in the environment and with the devices you plan on using ahead of time. Some schools/libraries/public Internet access firewalls are very strict and only allow a predetermined list of websites.
- One device per girl is ideal but you can practice "pair programming" by grouping girls in twos. When pair programming, one girl holds the device and codes while the other tells her partner what to do and helps debug when errors occur.
- Be sure the batteries in your devices (tablets or computers) are fully charged.
- Headphones are optional but can help keep the noise in the room down.
- If you run into glitches or bugs in the program, email us at support@codespark.com or check out the FAQ's at codespark.com/frequently-asked-questions.

Plugged Activities

Donut Detective

What girls do: Solve Donut Detective puzzles in codeSpark Academy

What girls learn: Algorithms

Steps: Have girls complete levels as much of the Donut Detective chapter from CodeSpark Academy as they can to practice programming algorithms.

Have girls login to codeSpark Academy navigate to "Puzzles" then "Donut Detective," and complete levels 1-17. Girls can work alone or in pairs. As they work on the puzzles, encourage them to persist through the challenges, like trying again when their solution doesn't work on the first try.

SAY:

- *Algorithms are very important to computer scientists. Remember that an algorithm is a list of steps to complete a task. Computer scientists write algorithms for computers to follow.*
- *Next, we're going to practice writing our own algorithms that tell a character how to reach a goal in the Donut Detective chapter of codeSpark Academy.*

If girls get stuck on a level, **SAY:**

- *Let's try acting out what the character should do to get the gems and reach the goal!*
- *Before we look for the solution, let's understand the problem, can you describe to me what you want the character to do* (girl should say something like: move right, jump right, jump right...).
- *Earn all three stars by tapping on the character only once to run your algorithm and be sure to collect all of the gems before reaching the goal.*

Tool Trouble

What girls do: Solve Tool Trouble puzzles in codeSpark Academy

What girls should know already: Algorithms (see Donut Detective Activity)

What girls learn: Loops

Steps: Have girls complete levels as much of the Tool Trouble chapter from CodeSpark Academy as they can to practice programming algorithms.

Have girls login to codeSpark Academy navigate to "Puzzles" then "Tool Trouble," and complete levels 1-16. Girls can work alone or in pairs. As they work on the puzzles, encourage them to persist through the challenges, like trying again when their solution doesn't work on the first try.

SAY:

- *Loops are very important to computer scientists. They make code shorter and easier to write while also making it easier for a computer to understand.*
- *Next, we're going to practice using loops in the Tool Trouble chapter in codeSpark Academy.*

As girls work on the devices, use the following questions to encourage them to use loops. **SAY:**

- *Can you use a loop on every puzzle?*
- *Does using loops generally make your programs smaller (e.g. do they use fewer total commands to solve the puzzle)?*
- *Can you use multiple loops within a puzzle?*
- *Does understanding loops make challenges easier?*
- *Earn all three stars by tapping on the character only once to run your algorithm and be sure to collect all of the gems before reaching the goal.*
- *On some of these puzzles you will need to use a loop in order to earn all three stars.*

Kite Plight

What girls do: Solve Kite Plight puzzles in codeSpark Academy

What girls should know already: Algorithms (see Donut Detective Activity); Loops (see Tool Trouble)

What girls learn: Advanced Sequencing and Loops

Steps: Have girls complete Kite Plight from codeSpark Academy to practice creating algorithms with loops and more complicated sequences on a computer (or another device).

Have girls login to codeSpark Academy navigate to "Puzzles" then "Kite Plight," and complete levels 1-17. Girls can work alone or in pairs. As they work on the puzzles, encourage them to persist through the challenges, like trying again when their solution doesn't work on the first try.

SAY:

- *When writing code, events are actions that cause something else to happen.*
- *Next, you're going to use events in codeSpark Academy and explore how events can cause things to happen.*

If girls get stuck on a level, **SAY:**

- *Try completing just one small part of the solution before tackling the entire sequence.*
- *See how far you can get without a loop then go back and see if you can spot a pattern where a loop can be used in your code.*
- *Try writing down the directions you want to give you character and see if you spot a pattern. Use the pattern to recognize where loops belong.*

Puppy Problems

What girls do: Solve Puppy Problems puzzles in codeSpark Academy

What girls should know already: Algorithms (see Donut Detective Activity); Loops (see Tool Trouble)

What girls learn: Events

Steps: Have girls complete Puppy Problems from codeSpark Academy to practice creating algorithms with loops and events on a computer (or another device).

Have girls login to codeSpark Academy navigate to "Puzzles" then "Puppy Problems," and complete levels 1-10. Girls can work alone or in pairs. As they work on the puzzles, encourage them to persist through the challenges, like trying again when their solution doesn't work on the first try.

SAY:

- *When writing code, events are actions that cause something else to happen.*
- *Next, you're going to use events in codeSpark Academy and explore how events can cause things to happen.*

If girls get stuck on a level, **SAY:**

- Remember that an event triggers code to run. Can you name the event (bump into).
- What direction should the character go when she bumps into the object?
- Be sure and use loops when possible.

Game Maker Tutorials

What girls do: Learn how to create a game in codeSpark Academy by completing the tutorials in the Create Game area

What girls learn: Game Development

Steps: Have girls complete the 9 Game Maker tutorials from CodeSpark Academy to practice creating a digital game. Then have girls create their own games.

Have girls login to codeSpark Academy navigate to "Create" then "New" and then "Create Game" to work on the tutorials and then create their own game. Girls can work alone or in pairs. As they work on the puzzles, encourage them to persist through the challenges, like developing multiple iterations as they make better versions of their game.

If girls get stuck on a level, **SAY:**

- *If a computer scientist can't solve a problem right away, she perseveres. That means she's keep trying!*
- *When you persevere, you don't give up. Do your best and keep trying!*
- *If you get stuck, ask someone to help you or try a different way to solve the level.*
- *Let's see if your neighbor can help you figure out how to get unstuck.*
- *Before we look for the solution, let's understand the problem, can you describe to me what you want the character to do* (girl should say something like: move right, jump right, jump right...).

- *Earn all three stars by tapping on the character only once to run your algorithm and be sure to collect all of the gems before reaching the goal.*

Create Game

What girls do: Code their own games in the Create Game area of codeSpark Academy

What girls learn: Game Development

What girls should know already: Algorithms (see Donut Detective Activity); Loops (see Tool Trouble Activity)

Steps: Have girls create their own games in the "Create Game" section of codeSpark Academy.

Have girls login to codeSpark Academy navigate to "Create" then "New" and then "Create Game" to create their own game. Girls can work alone or in pairs. As they work on creating their games, encourage them to persist through the challenges, like developing multiple iterations as they make better versions of their game.

If girls get stuck on a level, **SAY:**

- *Make sure you're able to win your own game. If it's impossible to win, you should go back and make it easier.*
- *You can buy more objects in the store. You can earn more coins by completing puzzles and other parts of codeSpark Academy.*
- *You can code any object including blocks, enemies, and items!*
- *Try checking out other games made by kids in the "Community" area to get some inspiration.*
- *It's a good idea to plan ahead and make sketches of your ideas before you start coding.*

Create Story

What girls do: Code their own story in the Create Story area of codeSpark Academy.

What girls should know already: Algorithms (see Donut Detective Activity)

What girls learn: How to code an interactive story

Steps: Have girls code their own interactive story in the Create Story area of codeSpark Academy.

Have girls login to codeSpark Academy navigate to "Create" then "New" and then "Create Story" to create their own story. Girls can work alone or in pairs. As they work on their stories, encourage them to persist through the challenges, like developing multiple iterations as they make better versions of their story.

If girls get stuck on a level, **SAY:**

- *You can buy more objects in the store. You can earn more coins by completing puzzles and other parts of codeSpark Academy.*
- *You can code any object including blocks, characters, and items!*
- *It's a good idea to plan ahead and make sketches of your ideas before you start coding. Use the storyboarding technique to plan out your story.*

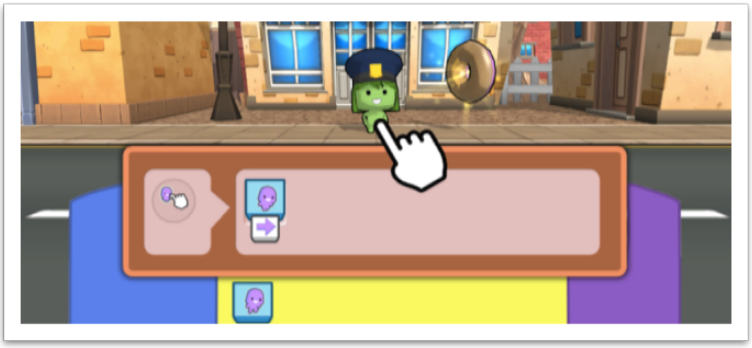
Solution Guides

Donut Detective Solutions Guide

Gather the coins, get to the star, and catch The Glitch!

Level 1

A single walk right command should do! See, this is easy!



Level 2

Now the player needs to walk 2 spaces to the right. Drag in two walk commands.

Level 3

Use the now unlocked jump command to get onto the wood crate.

Level 4

Walk, jump, walk, jump – see a pattern? This is setting up the programming concept of repeating or looping.

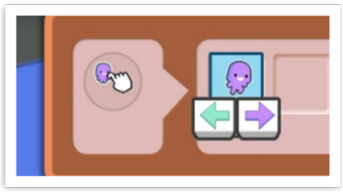
Level 5

Levels are gradually getting more difficult. Walk or jump once and then jump twice up the crates.

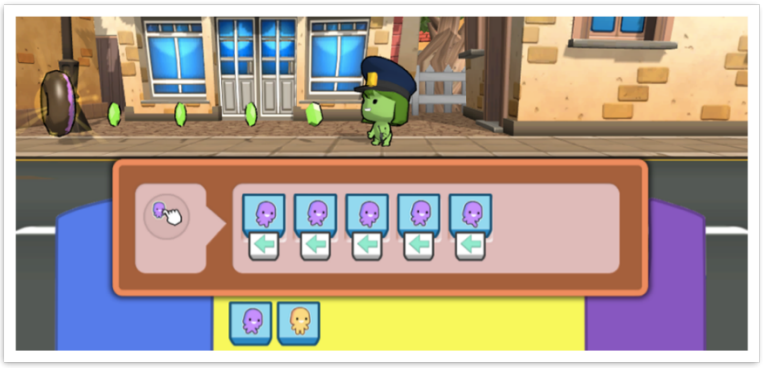
Level 6

Players now learn that commands take parameters. Up to now the Police Foo has always walked to the right, but the Glitch has knocked some coins out of the Police Foo's pocket and the star is also on the left. What will you do?

The walk command has a purple and blue arrow. Tap it and two parameters appear. Now the player can change the command to “walk left” from “walk right."

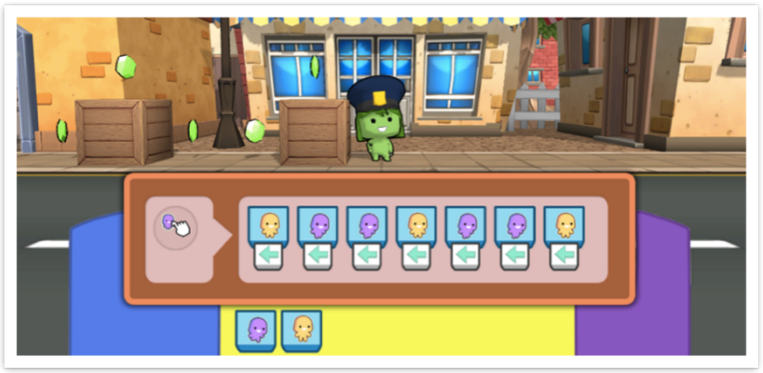


Program the Police Foo to walk all the way to the left and get the donut

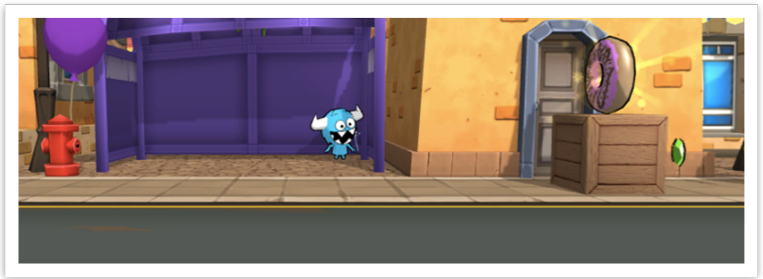


Level 7

Now it’s getting harder! The player has to get Police Foo over crates and walk towards the left.



Bonus: Did you notice the Glitch hiding around the corner? Click or tap on him to see what he does.



Level 8

Oh look! Now the donut is on a balloon! There are multiple ways to solve this puzzle. Some people like to walk forwards and time it with the balloons lowering.

You can also do a walk/jump pattern when the balloons are floating above.

Level 9

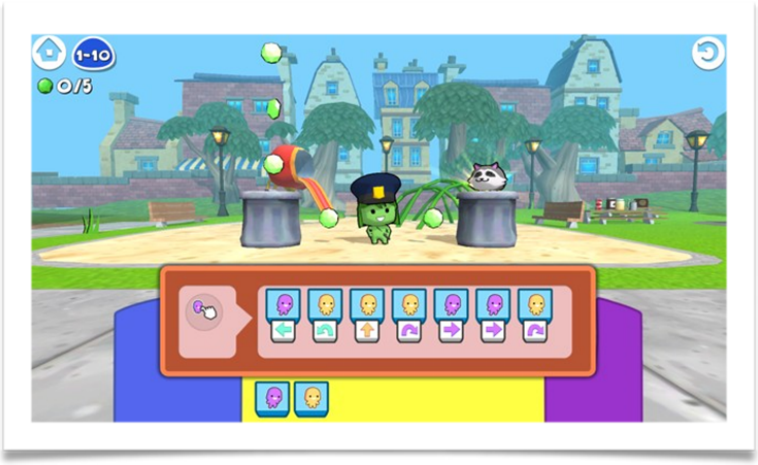
Oh look! Is that Glitch hiding behind the pole? Click or tap on him and see what that does.

In this level, the Police Foo has to walk right once, jump up the crates three time, jump once more to get to the ground and use the walk left command to get to the fox.


1~9
0/4

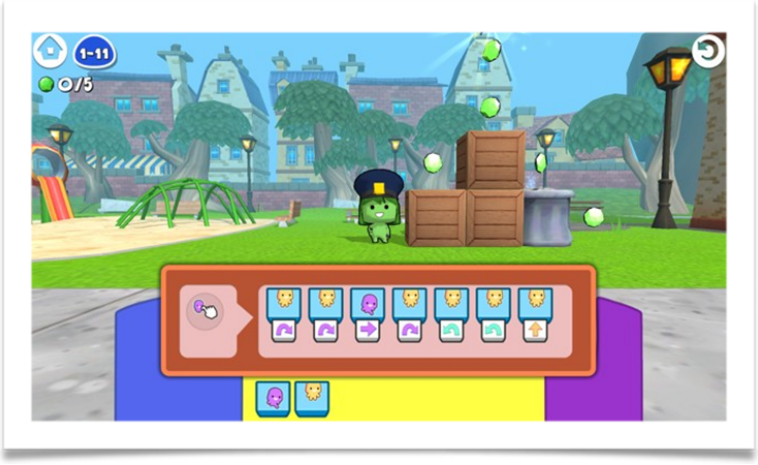
Level 10

Here the player needs to first collect the coins on the left and then get the raccoon on the right. Walk left one space, jump left, jump up once, then jump off the stand to the right, walk three spaces and jump up onto the stand to collect the pet.



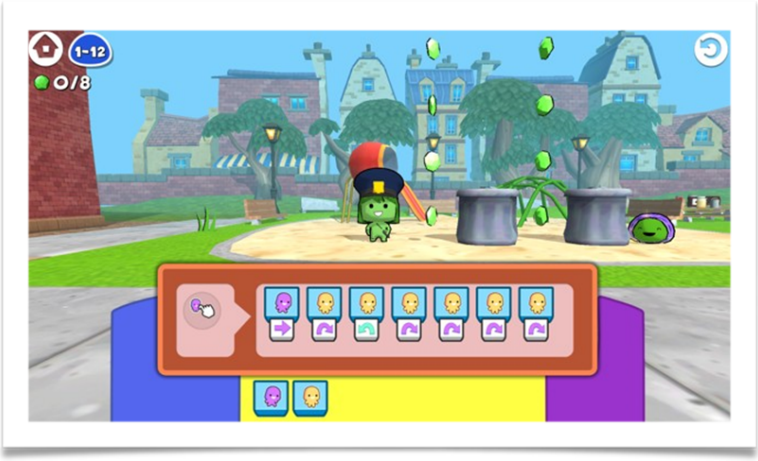
Level 11

Jump up the crates twice, but don't jump up to collect the parrot yet. Use the walk right command once, followed by a jump to the right - collect the
coins; then jump left twice and jump up once to finally collect the bird.



Level 12

In order to collect the turtle and all coins, use the following commands: walk right, jump right, jump left, then jump right four times.

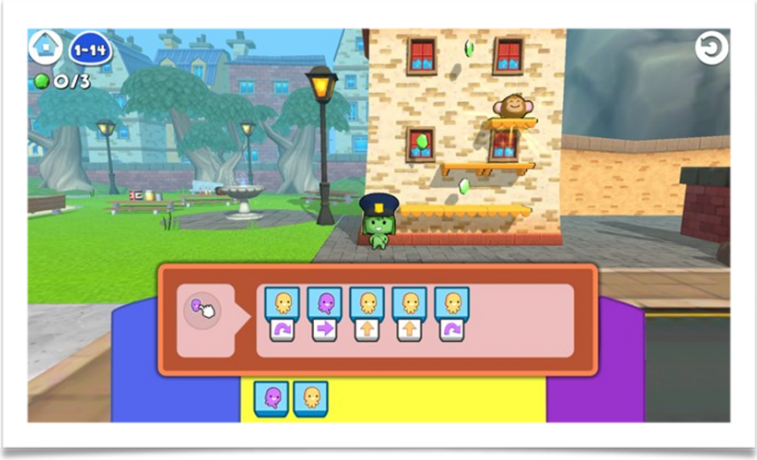


Level 13

One of the ways to collect the brown cat in this level is by jumping left, then right, followed by a jump up. You just rescued another pet!

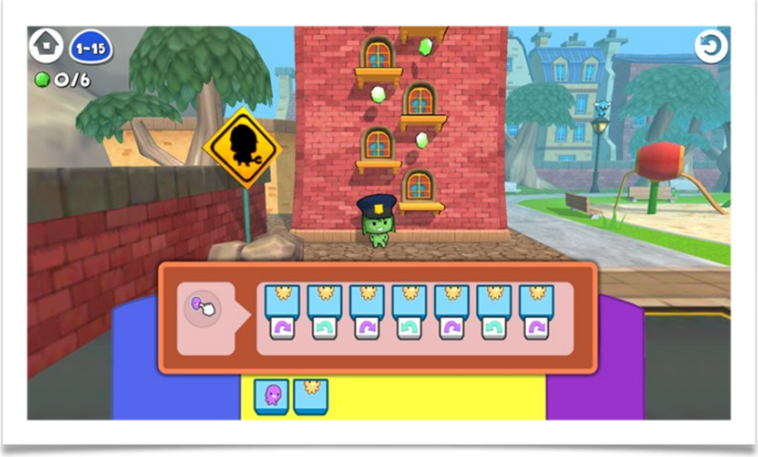
Level 14

Here the trick is to not get the monkey before collecting all of the coins. Jump right, walk right one space, jump up twice to get the green coin, then jump right to collect the pet.



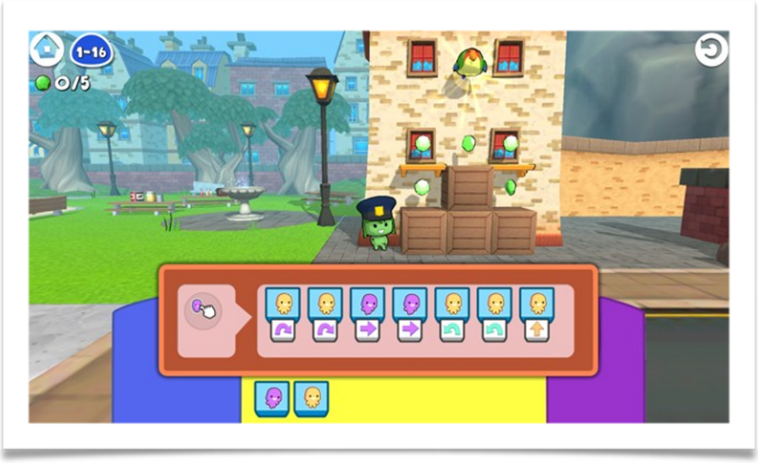
Level 15

In this level, the player needs to use the commands jump left and jump right to get to the pet at the top.



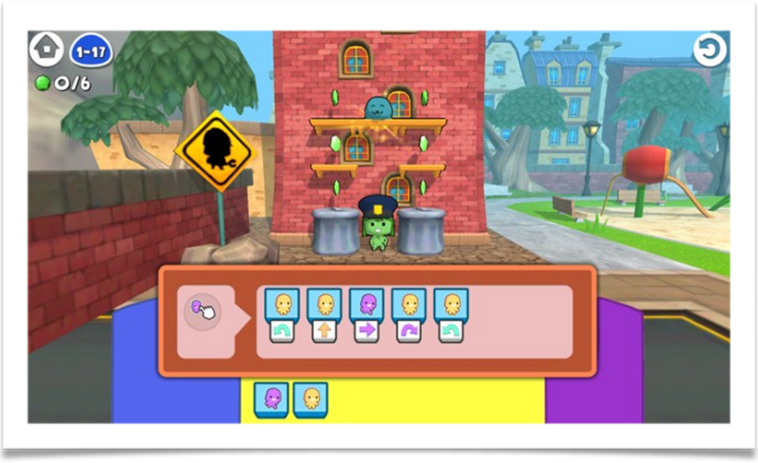
Level 16

Jump up the crates twice, walk right two spaces, jump left twice, and finally jump up to collect the bird.



Level 17

The levels have progressed in difficulty. Again, the trick is to not get to the pet before collecting all of the coins. Jump left, jump up, walk right one space, jump right and then jump left.



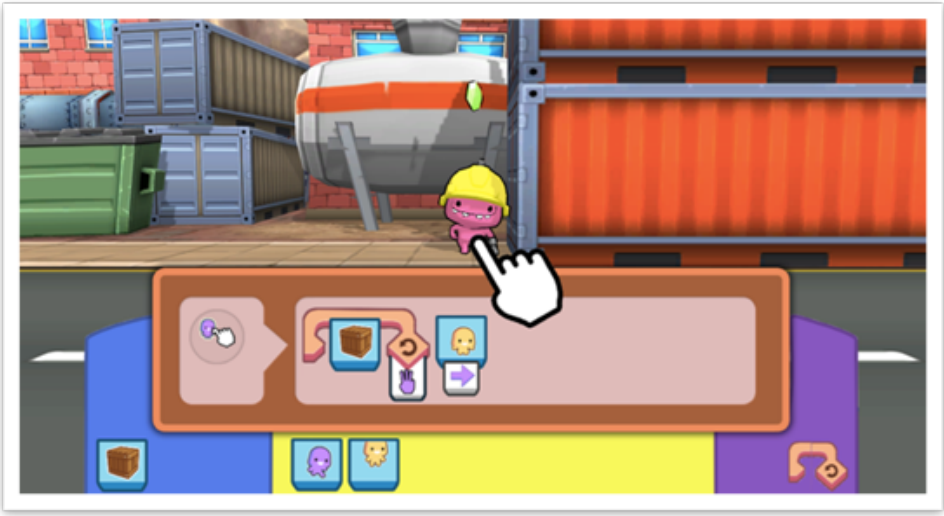
Tool Trouble Solutions Guide

Level 1

Stack crates on top of each other to get the star. The Construction Foo builds crates slowly but that's on purpose – you'll see why in the next level.

Level 2

Now you've unlocked the Loop block. Drag it in, add a crate command, and watch how fast the Construction Foo builds crates now! Looping commands also take less space (memory) in your code tray, so players are able to write more powerful programs now! Woohoo!

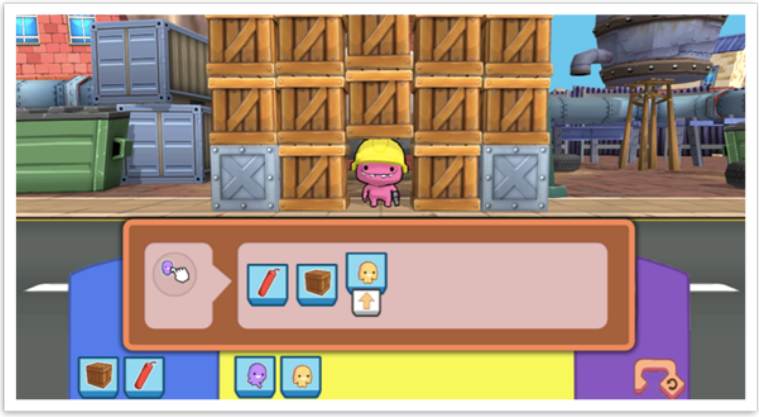


Level 3

Time to blow some stuff up! Use your dynamite to destroy these crates and get down to the screwdriver. It takes two sticks to get there.

Level 4

Reinforcing the same concept as last level, but now the star is up above the Construction Foo.



Level 5

More pattern recognition here, but now we have the Loop block to make things easier. There are several different ways to structure the loop and get to the tool.

Level 6

Uh oh, The Glitch is throwing old tires at the Construction Foo. Blow up the tires and jump to get the saw. Since you don't know how far Construction Foo needs to jump, set the parameter to "infinite" and he'll jump until he gets to the saw!

Level 7

This is an interesting level that utilizes the throw command. First place a throw command in the command box to push the board over. Then have Construction Foo keep jumping until he reaches the screwdriver.

Level 8

Now this is complicated. Try to get all the coins and the hammer. The trick to getting all the coins is to walk forward, build a box, and jump up. This is just one of many possible solutions.

Level 9

Now you not only get to blow up things, but also cause some big splashes. Walk to the about-to-burst pipe, use dynamite to blow it up and jump onto the water stream to get the screw.

Level 10

Do you see a pattern here? The player has to structure a loop, so Construction Foo can repeat the same series of actions several times to get to the tool.

Level 11

The player would have to create a loop and set the parameters to “infinite” in order to get the coins and the tool at the end. There are multiple ways to pass this level.

Level 12

There are multiple ways to get through this particular level. The challenge is that Construction Foo has to jump up the pipes, then when he ends up back on the ground, build some crates to get back up and continue jumping up the pipes to get to the final goal. This is best accomplished by using loop blocks.

Level 13

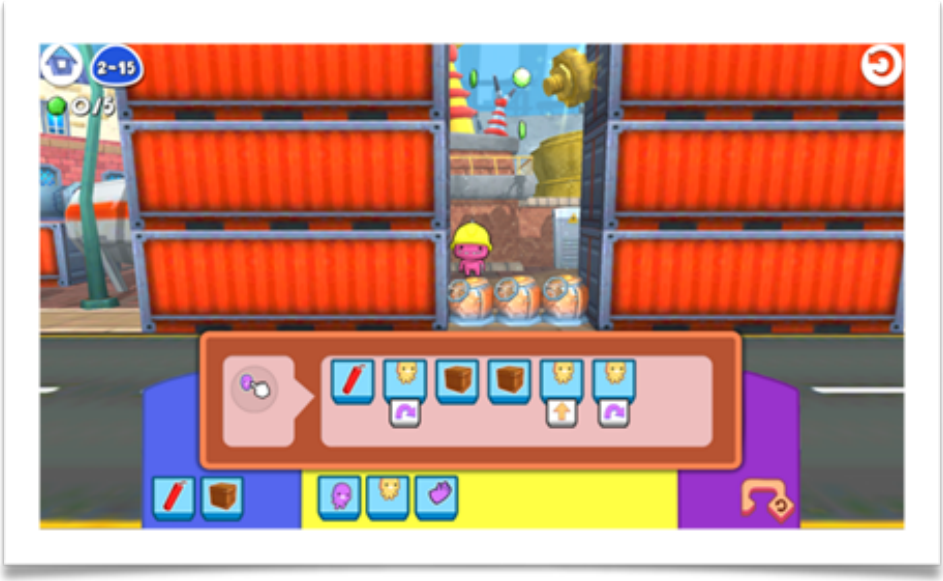
More patterns! One of the ways for a player to get to the bottom is by creating a loop and setting it to “infinite” or count the number of times the player would have to repeat the actions and set the loop to run that many times. Just like the pipes, crates can be blown up with dynamite too.

Level 14

This time again the player would have to use a loop block to make it easier for Construction Foo to collect all the coins and get to the tool at the end.

Level 15

Did you know that Construction Foo can also build crates on top of the water spurts? Help him by first blowing up a pipe with a stick of dynamite, then jump on the spurt and build two crates on top of it to reach even higher.



Level 16

In this fun level, the player can set off a pattern of spurts that would carry Construction Foo to the end, by simply using one stick of dynamite to blow up the first pipe he is standing on.

Kite Plight Solutions Guide

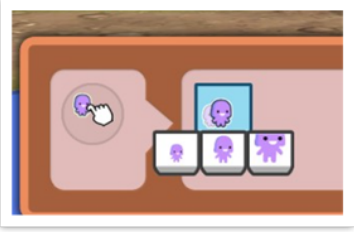
In this chapter we reinforce the concepts of parameters, sequencing, and looping (and throwing bananas).

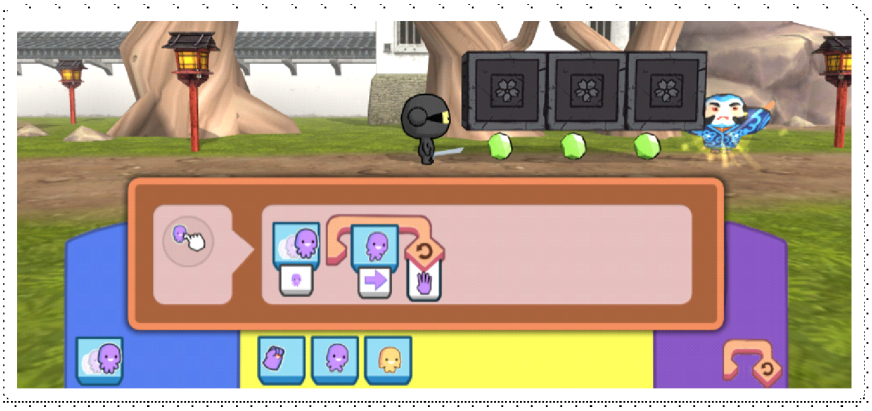
Level 1

The Ninja starts with a special ability to grow. When she's big, she can break crates with ease.

Level 2

The Ninja Foo can also shrink! Use the parameter selector to change the command to shrink instead of growing. Now she can sneak into small spaces!





Level 3

Jump up the stairs and get the kite.

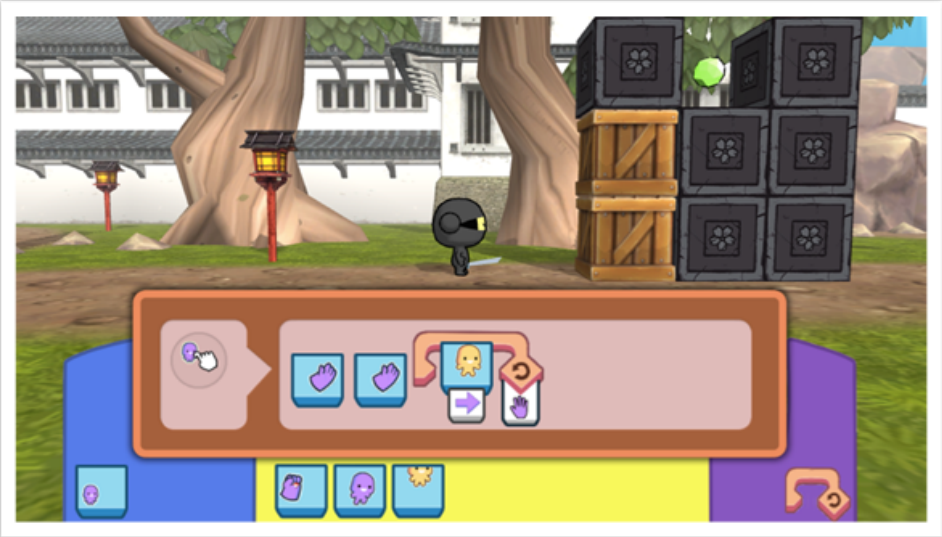
Hint: The Ninja has a powerful weapon at her disposal – throwing bananas! When bananas hit gems they collect them. Throw bananas at gems that are out of reach.

Level 4

Throwing bananas can also destroy crates! Destroy the crates to collect all the gems and get the star.

Level 5

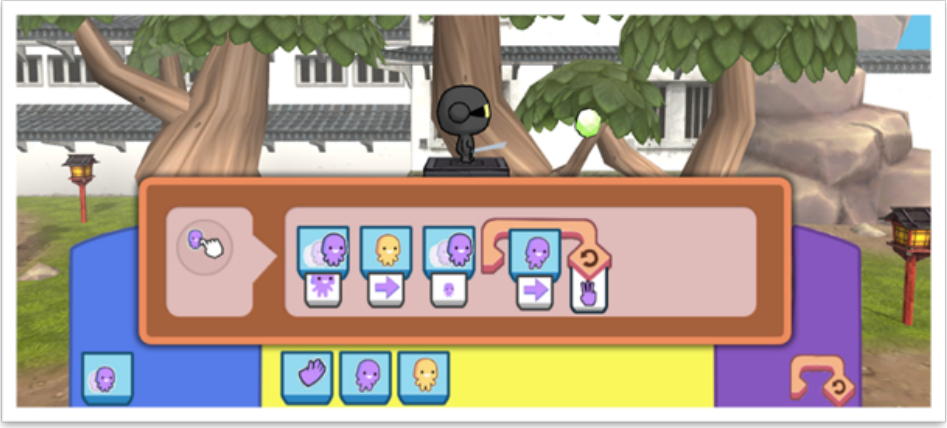
This level is a little tricky. The player needs to create a staircase by knocking out the two wooden crates. This can be done by throwing bananas or by growing large and smashing the crate.



Now jump up the “stairs” and collect the gems and star.

Level 6

In this level you will need to grow and then shrink.



Level 7

We've unlocked the key! Now we can get into treasure chests that hold more gems. Unlock the chest and then jump through the lightning towards the star.

Hint: Set the loop block on infinite jumps to "brute force" your way to the kite.

Level 8

Below is one solution for this tricky level. Drop in a loop block and set the parameter to 3. Then, add a key, jump right, jump right into the loop block. Add in a second loop block and set that parameter to 3. Place a throw command under that loop block. Finally, place a jump right command outside of the second loop block.

Bonus: What happens when you hit the Glitch with a banana?

Level 9

To pass this level and get a golden fish cracker, the player needs to use loops. Jump up the crates and cement blocks four times. Then use the key to get one more coin and choose the walk left command, setting the loop block to infinite.

Level 10

Here, in order to collect all of the coins, the player can use the command “jump right”, then drop in a loop block and set the parameter to three and apply a key command. Finally, use the “walk left” command, followed by a “jump left” command.

Level 11

The levels are getting harder! First, use a loop block and place “throw right” command under it. Set that parameter to “five”. Walk right one space. Use another loop block, add the “walk left” command and set this parameter to two. Finally, walk left one space.

Level 12

This level is very interesting. Jump right, grow big, followed by grow small. Then drop in a loop block and place “walk right” two spaces and throw commands under it. Set that parameter to infinite.

Level 13

To help Ninja Foo get out of the trap, the player can drop in a loop block, apply “throw left” command under it and set that parameter to 3. Then make Ninja Foo grow, so the crates break under her weight, drop in another loop block, apply “walk right” command under it and set it to infinite. This way Ninja Foo would be able to get all of the coins and get to the end of the level.

Level 14

Grow big, drop in a loop block and apply the following commands under it: walk right two spaces, jump up, throw and a key command. Because the player doesn't know how many times, she would have to repeat the actions, set it to “infinite”.

Level 15

Glitch strikes again! One of the ways to pass this level is to grow big, then use a loop block, apply “walk right” command under it and set it to “infinite”. These commands would make Ninja Foo keep going until she reaches the end.

Level 16

In this challenging level the best way to get all the stars is by performing the following commands: Use a key to open the treasure chest, grow small, drop in a loop block and apply “walk left” command, set it to 3. Next drop in another loop block and apply “jump right” command and set it to 3 as well to jump up the stairs. Lastly walk right one space to “fall” in between the blocks to collect the remaining coins.

Level 17

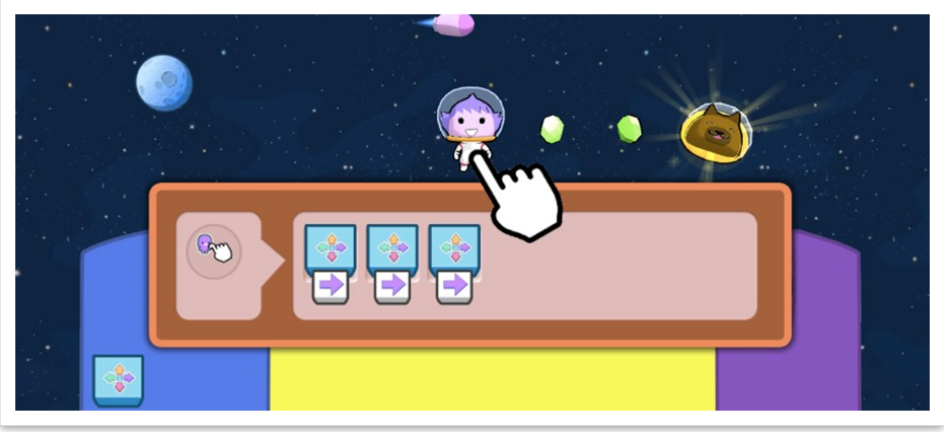
This level requires some creativity. One of the ways to get through it is to use multiple loop blocks. But first, use a throw command, drop in the first loop block and apply walk right command under it. Set this parameter to 4. Drop in a second loop block and apply throw left and walk left commands, set it to “infinite”.

Puppy Problems Solutions Guide

This chapter introduces events, particularly the bump event.

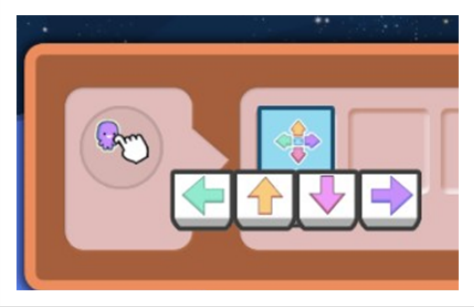
Level 1

Unlike in previous chapters, Astronaut Foo uses a jetpack to move around. Place 3 move commands to reach her space puppy.

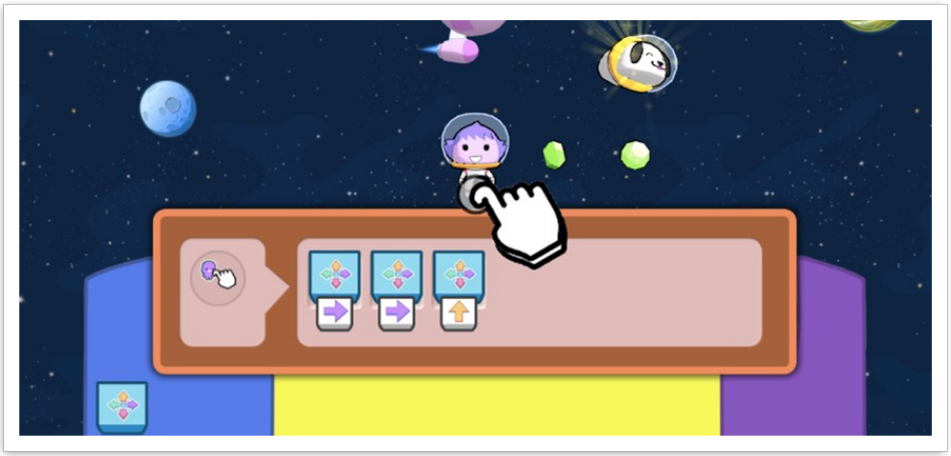


Level 2

Astronaut Foo can fly in any direction thanks to her jetpack. She can fly left, up, down, and right.

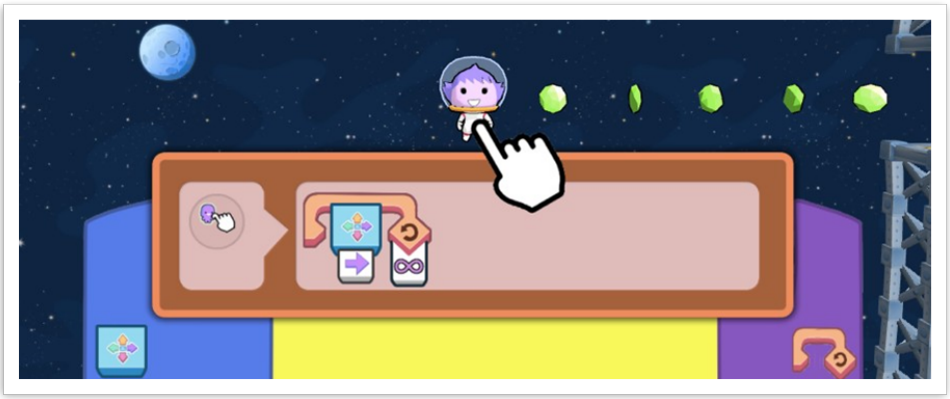


Place 3 move commands; change the last directional arrow to up.



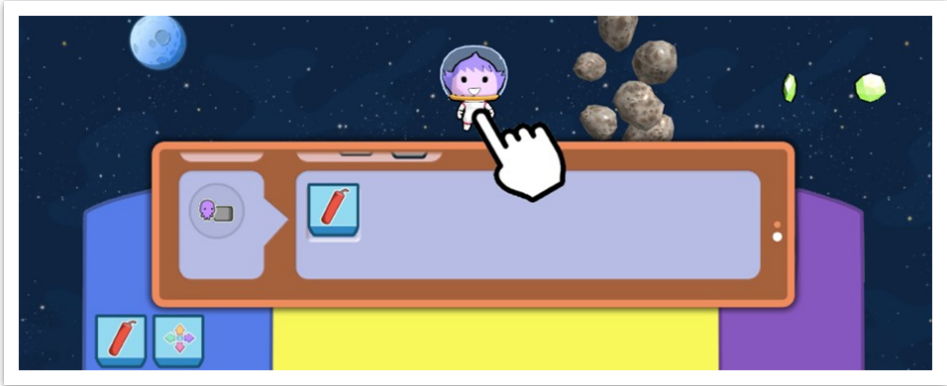
Level 3

This puppy looks really far away. You can set the loop block to infinite to have Astronaut Foo move the right until she gets to her puppy.



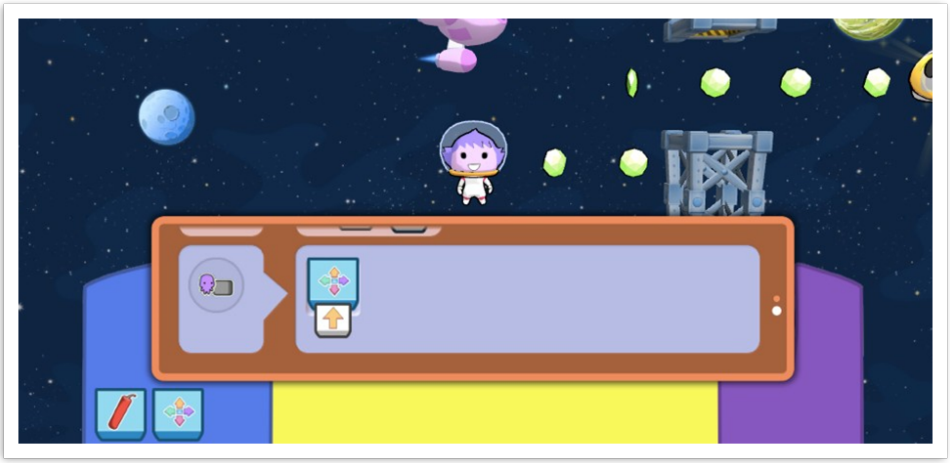
Level 4

This level introduces the “bump” event. When Astronaut Foo “bumps” into something (like those asteroids), a different line of code runs. Drag the command box up to get to the bump event line. Place a dynamite block in. Now every time she bumps into something, she uses dynamite.



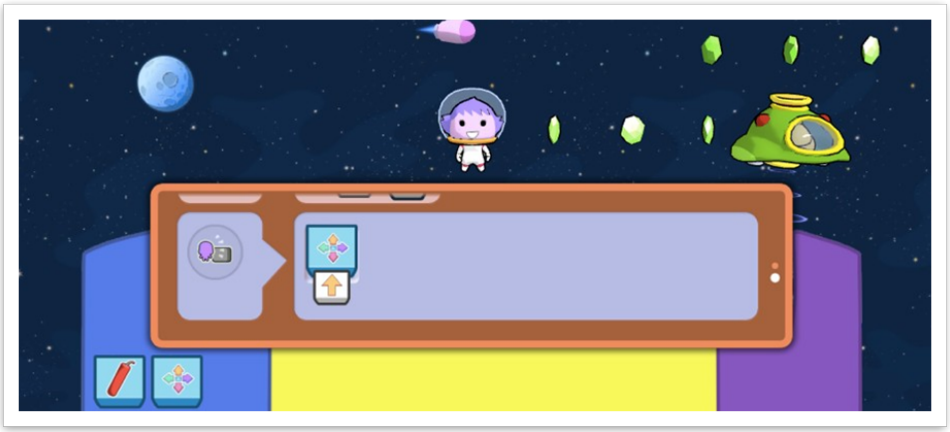
Level 5

Things are getting trickier. Place a move block into the bump event. Change the directional arrow to say “up.”



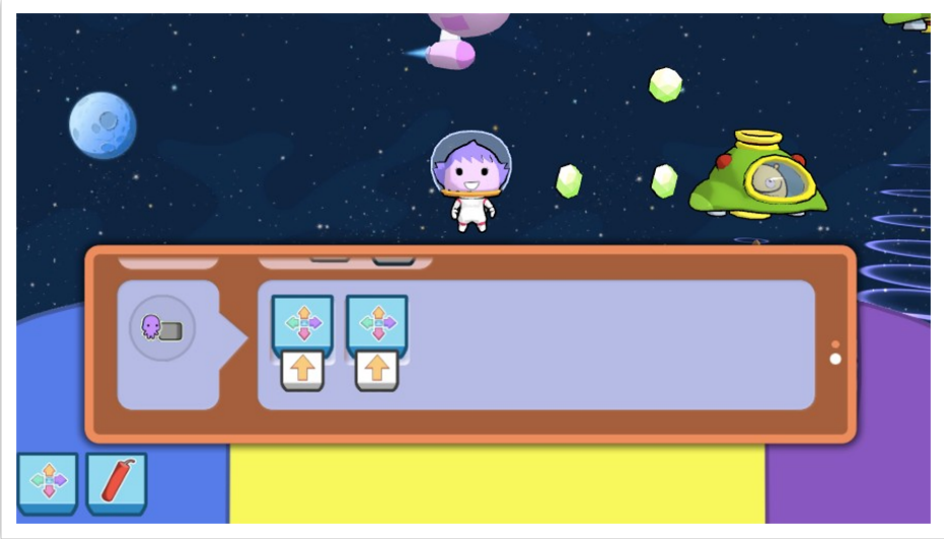
Level 6

This level reinforces the concepts from the previous level. The Astronaut Foo will run the bump code every time she bumps into something.



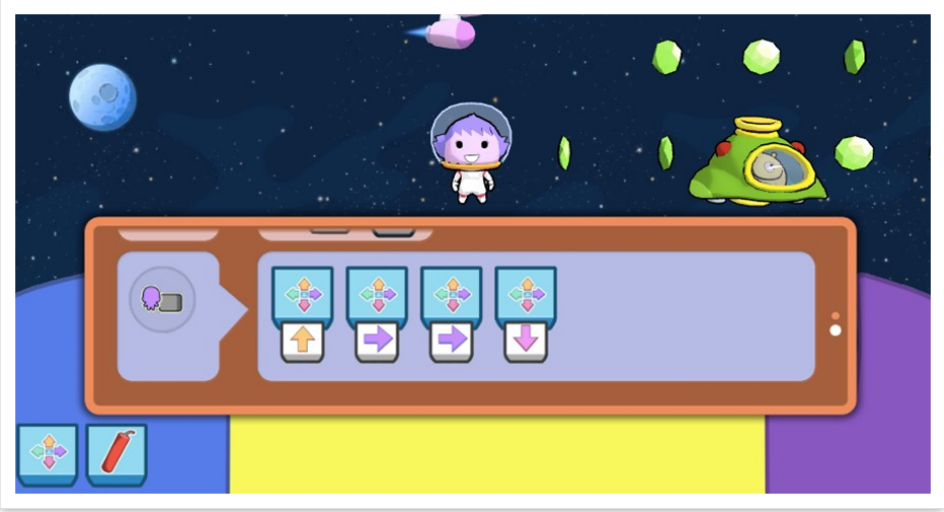
Level 7

Astronaut Foo needs to move up twice now when she bumps into an alien spaceship.



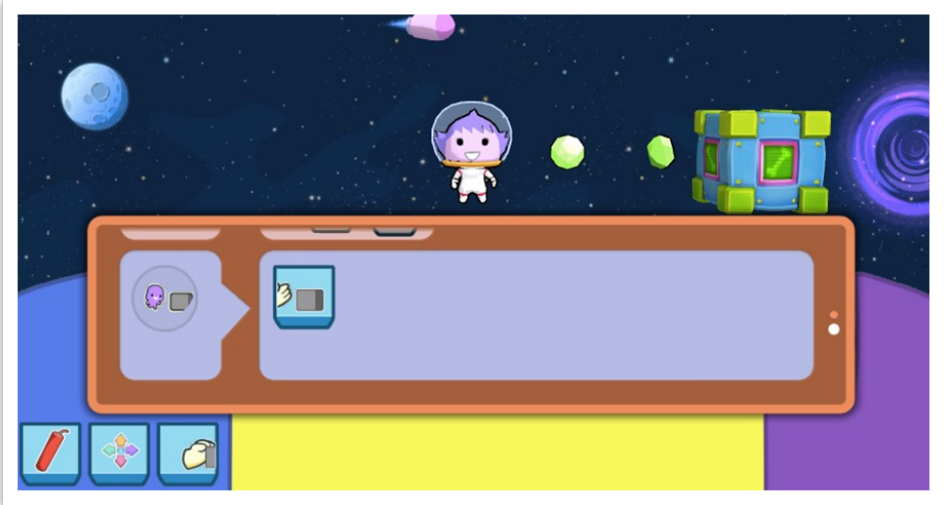
Level 8

Things get even trickier here. Astronaut Foo needs to move up over the spaceship, but then needs to move back down again too. Place 4 move blocks, changing the directions to up, right, right, and down.



Level 9

You've unlocked the "push" block! Now every time you bump into a crate you can push it into the wormhole.



Level 10

Now to put it all together. Place a dynamite block and a push block into the bump event box.