# Wonder Dash Teacher Guide

Scroll Quest challenges for Dash

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# Level 1: Hello World, Celebrations, Go Bot, Stroll Patrol, Clap and Dance, Press to Express

## Concepts covered

- Sequencing commands left to right
- Connecting commands
- Dragging commands to desktop
- Transitions: Auto, Instant
- Animations: Celebration, Take off, Stop, Turn, Dance
- Sounds: Using pre-recorded sounds and phrases from the Sound menu.
- Lights: Programming colored lights, i.e., magenta to turn on and off.
- Move: Programming distance for Dash to move forward or backward in cm.
- Connecting a command back to an earlier command in a loop.

## Key terms

**Code**: One or more sequenced commands programmed on the Wonder app to be carried out by Dash. Other forms of the word include: coder (noun), coding (verb)
**Programming**: The act of creating a code or program for Dash to carry out. Other forms of the word programming include: programmer and program (noun).
**Command**: An instruction you code for Dash to follow.
**Cue**: Cues tell Dash when to transition to the next command, e.g., auto, instant, clap, press top button, press button 1, 2 or 3.
**Auto**: Dash will go to the next state after finishing the current action.
**Instant:** Dash will go to the next state immediately.
**Animation**: To bring Dash to life with movements, sounds or a combination of both, e.g, celebrate, push, kiss, burp
**Sounds**: A command that allows you to play a pre-recorded sound to be recalled within a program.
**Move**: A command that allows you to move Dash forward or backward in cm.

## Extension questions

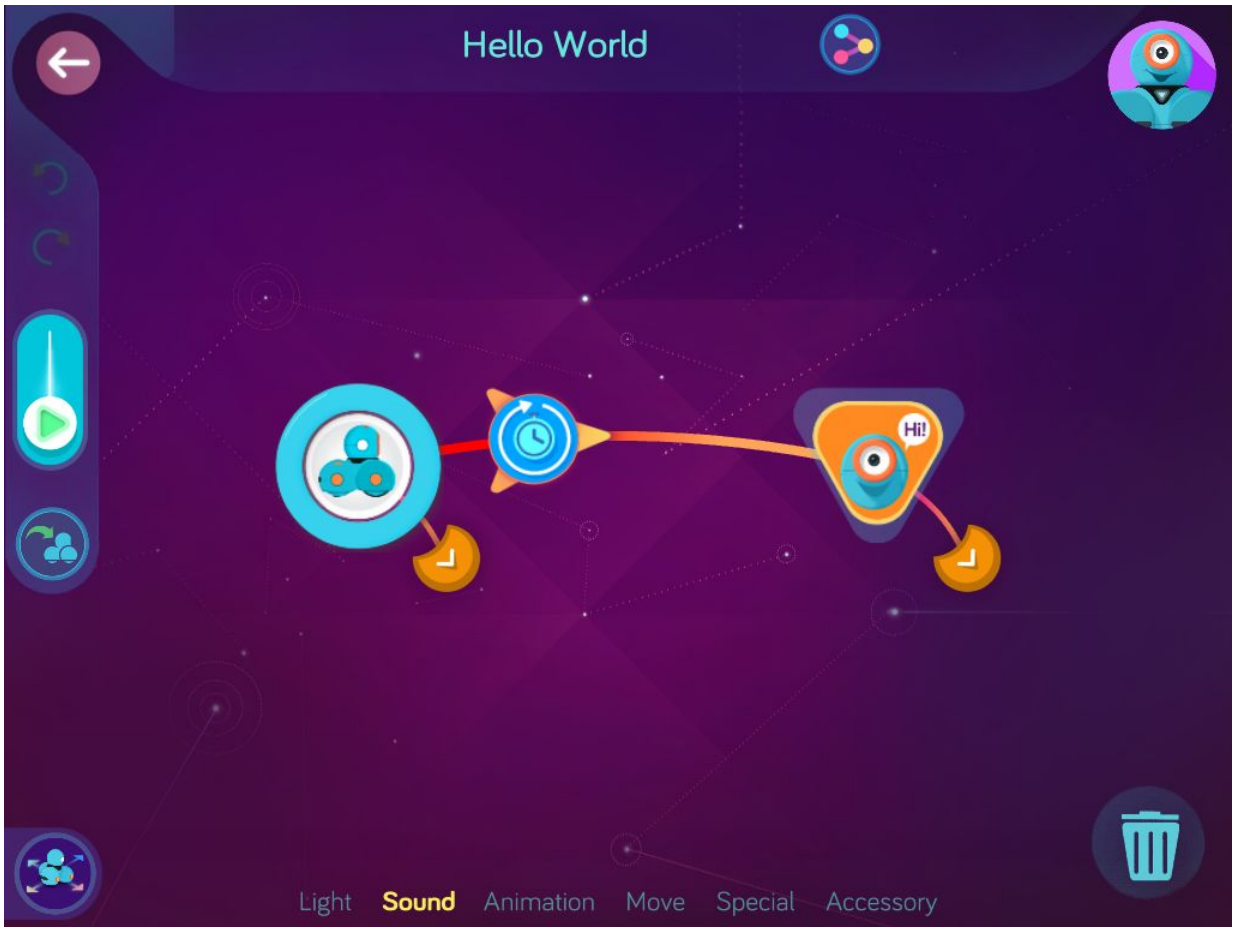
1. What did you learn about coding from this first set of challenges?
2. In what direction is a Wonder app code typically sequenced? What is the exception?
3. What are some different cues that can be used between commands? Explain the purpose of each. (Possible answers: instant, auto, clap, press top button, press buttons 1, 2 or 3)
4. What is the difference between an Animation and a Sound?
5. What are some different ways in which Dash can move? (Response: forward, backward, and turning around.)
6. What is the difference between the function of the Take Off versus the Move Forward command?

# Hello World

Zone: Wonder Workshop
Challenge Progression 1

## Solution

*Make Dash automatically say, “Hi.”*



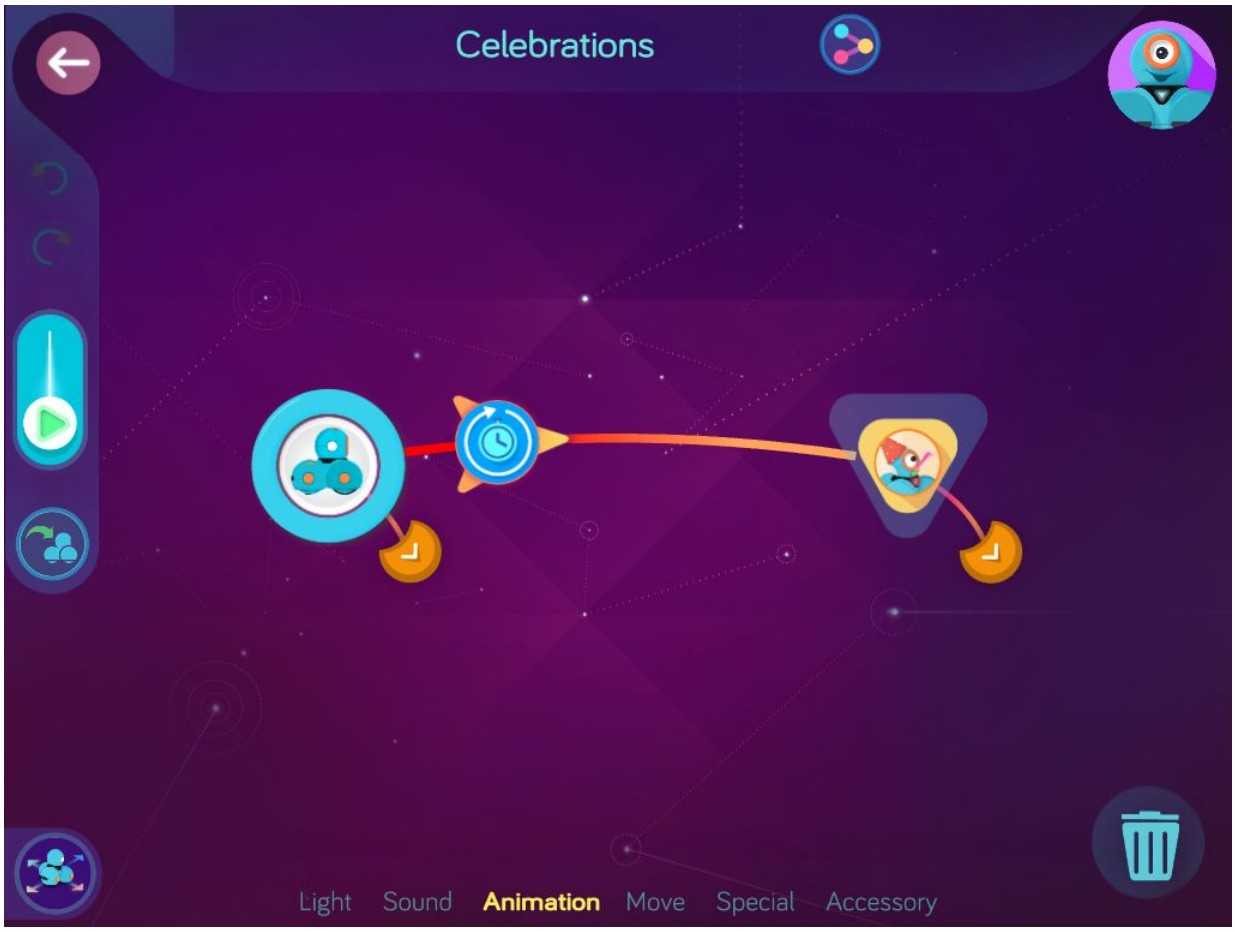

**Wonder key**: jkqv

# Celebrations

Zone: Wonder Workshop
Challenge Progression 2

## Solution

*Make Dash automatically celebrate.*



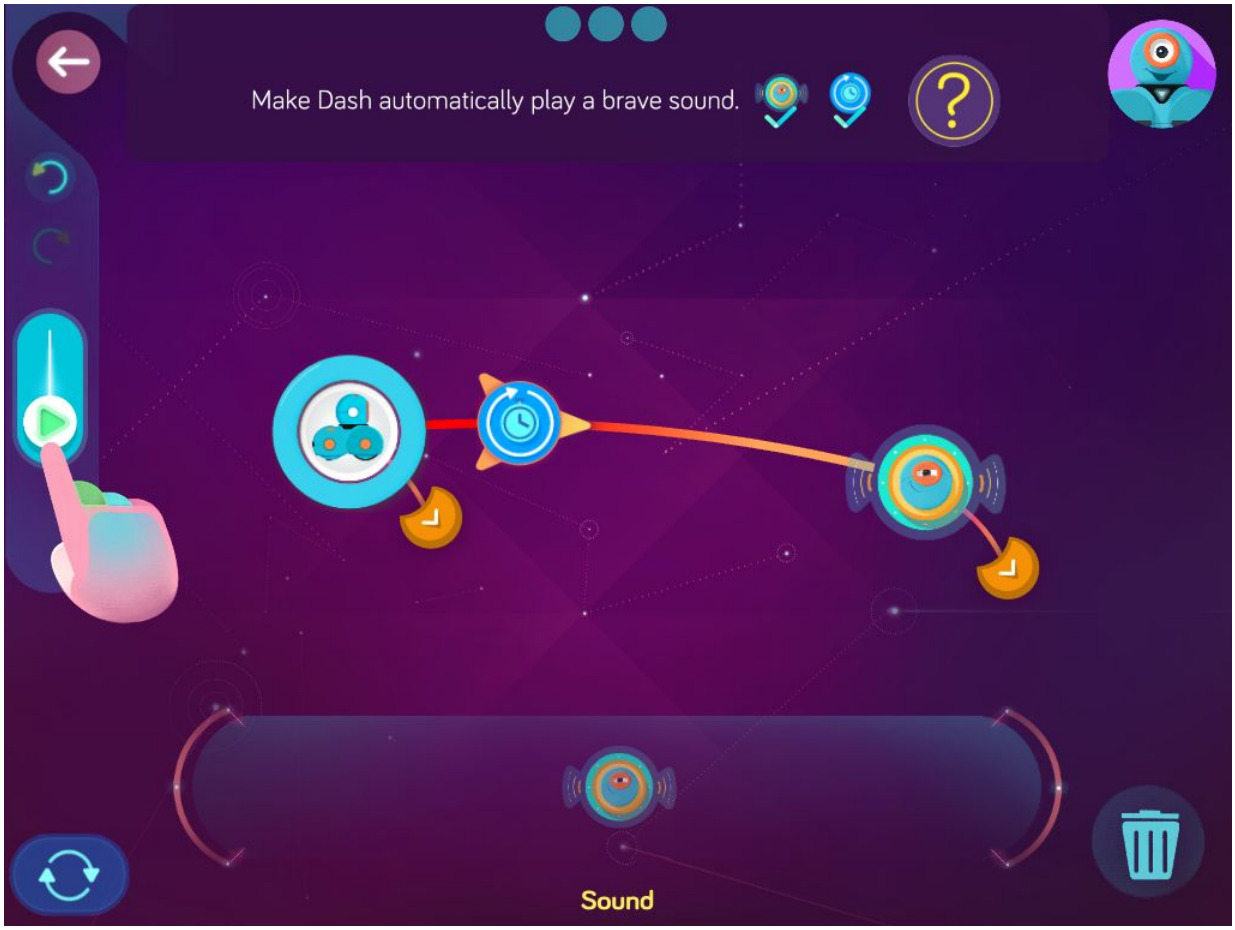

**Wonder Key**: ysod

# Go Bot

Zone: Wonder Workshop
Challenge Progression 3

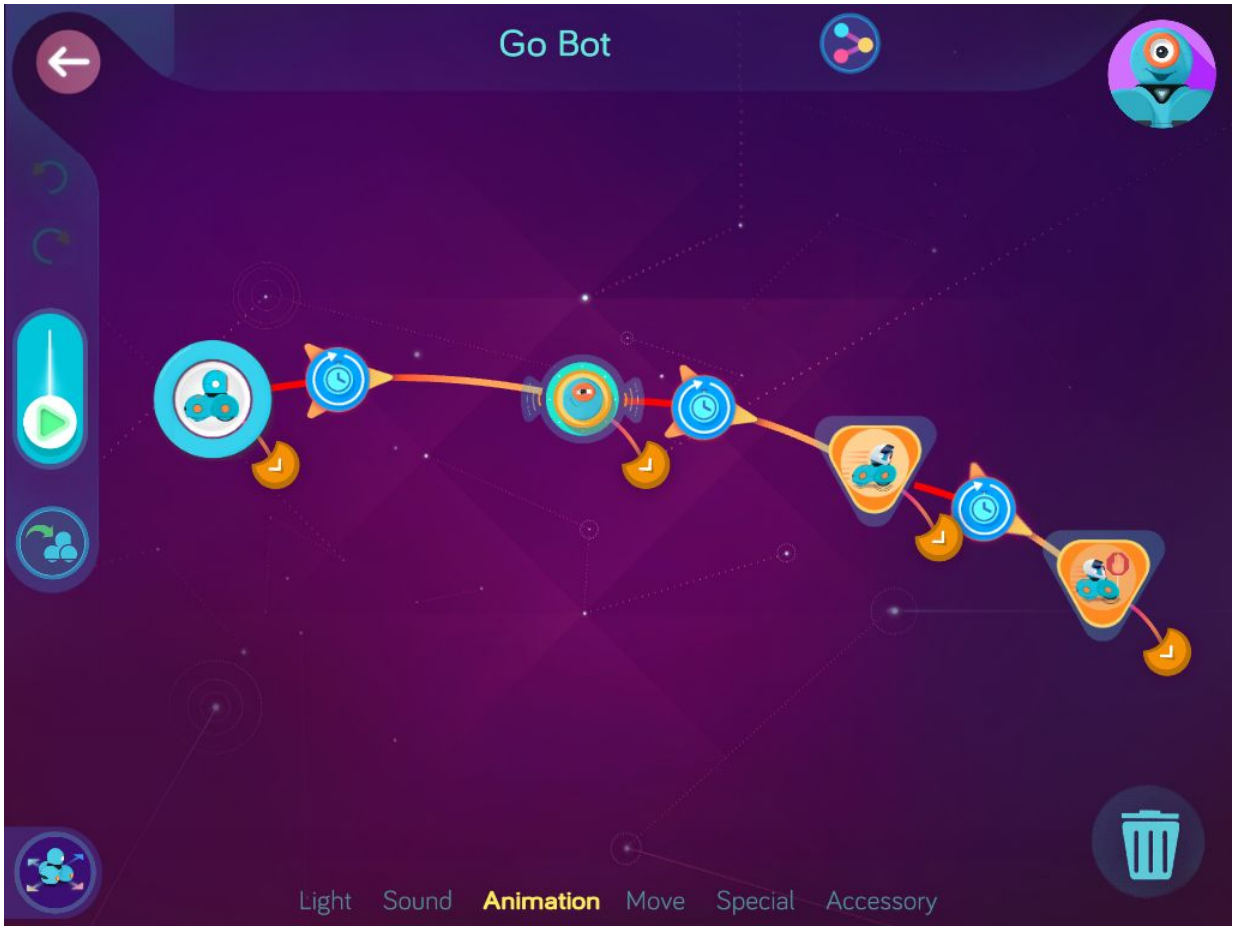
## Solutions

***Step 1**: Make Dash automatically play a brave sound.*



***Step 2**: After the sound, make Dash automatically take off.*

***Step 3**: After taking off, make Dash automatically stop.*



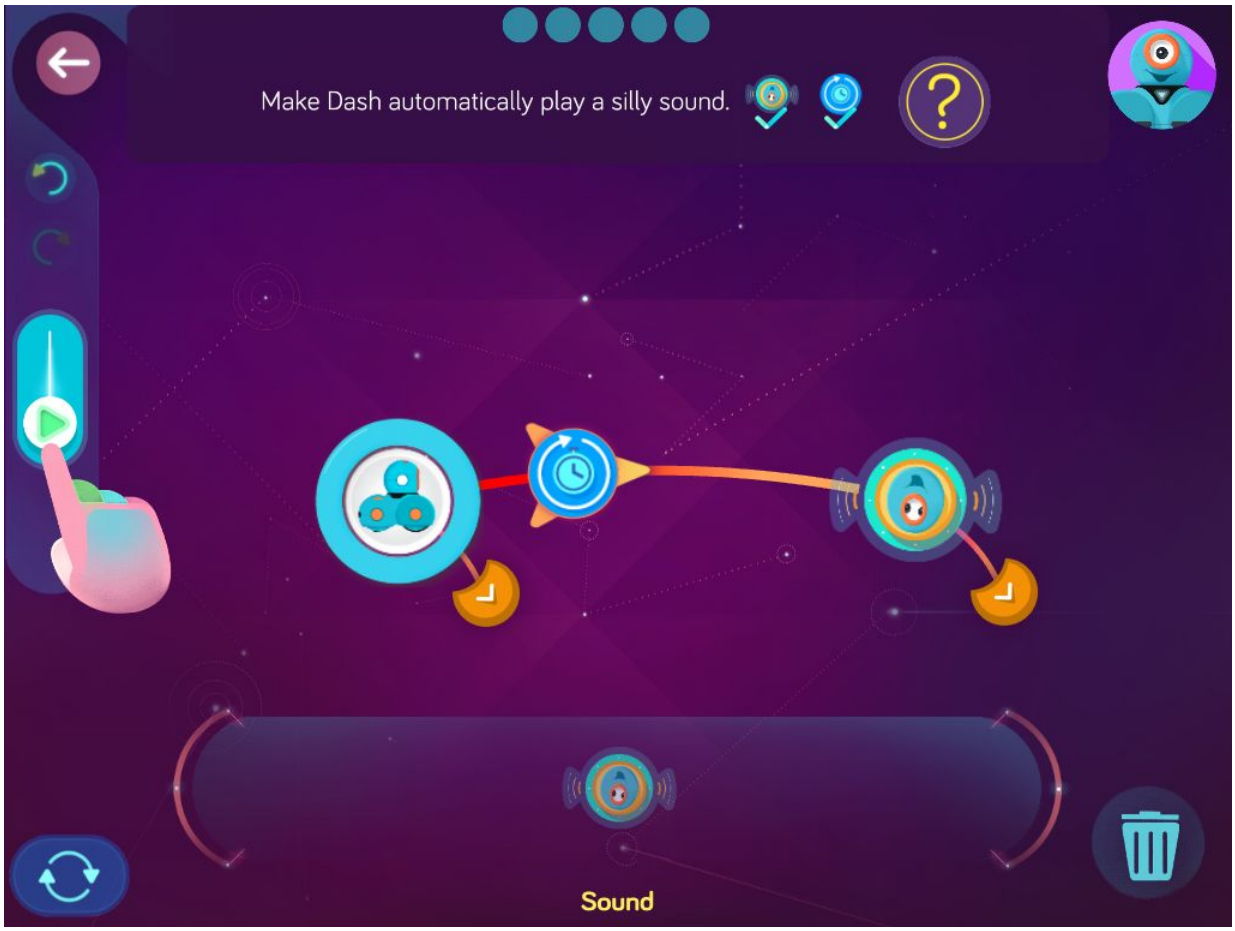

**Wonder key**: sbfz

# Stroll Patrol

Zone: Wonder Workshop
Challenge Progression 4

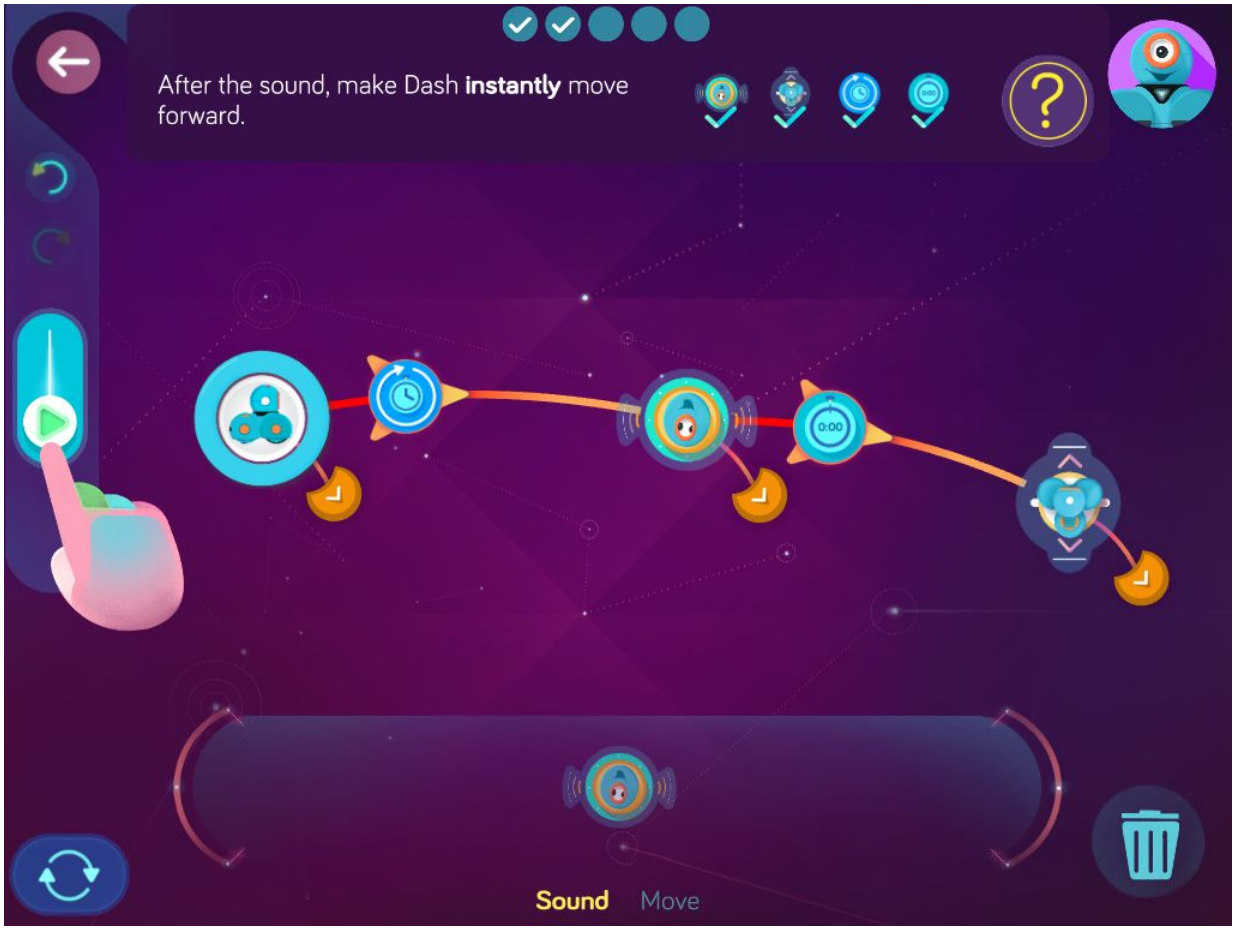
## Solutions

***Step 1**: Make Dash automatically play a silly sound.*



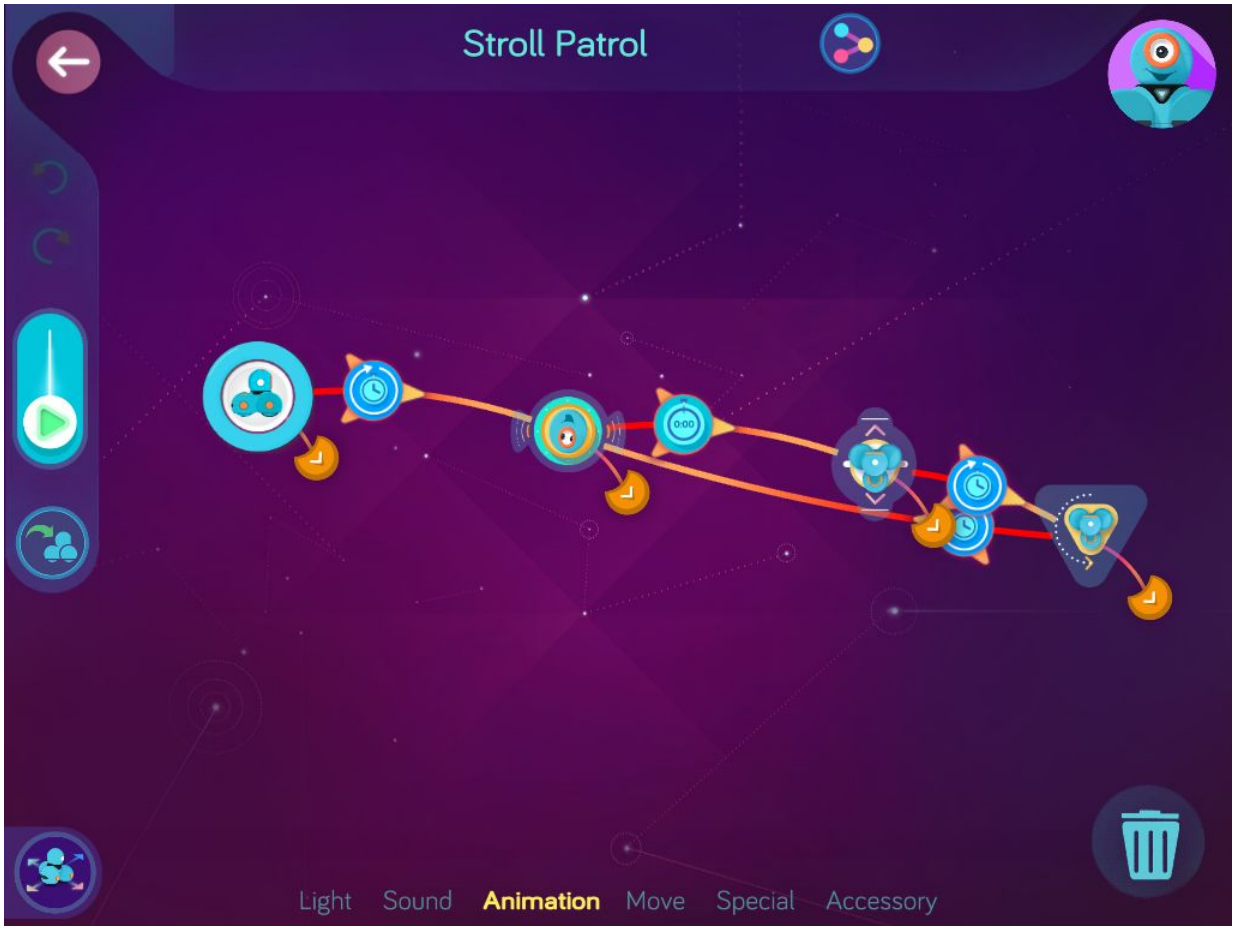
***Step 2**: After the sound, make Dash automatically move forward 50 cm. *Click on the move forward command to program distance.*

***Step 3**: After the sound, make Dash instantly move forward.*



***Step 4**: After moving forward, make Dash automatically turn around.*

***Step 5**: After turning around, make Dash automatically play the silly sound again.*



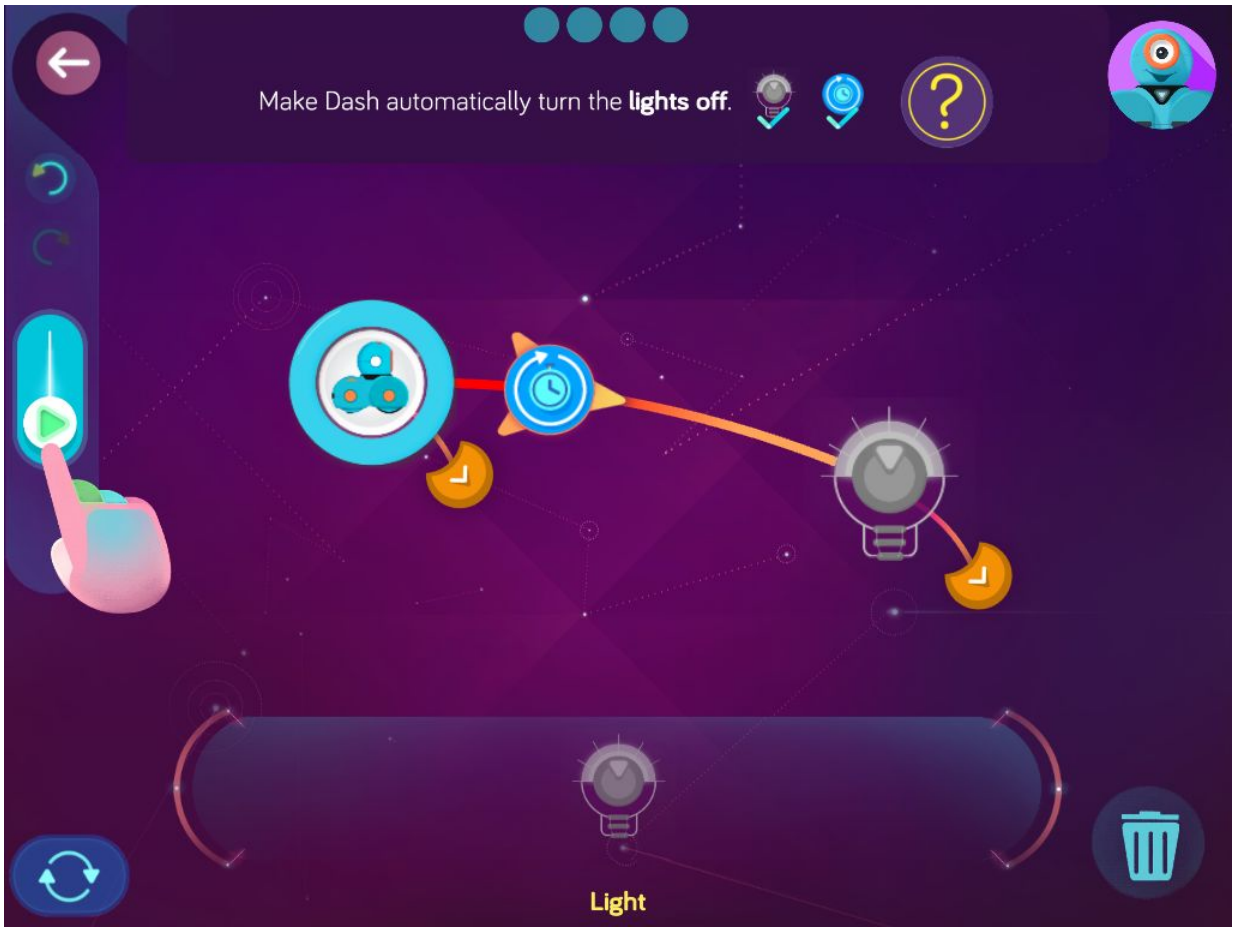

**Wonder key**: eshu

# Clap and Dance

Zone: Wonder Workshop
Challenge Progression: 5

## Solutions

**Step 1**: *Make Dash automatically turn the lights off.*



**Step 2**: *After turning the lights off, make Dash play a silly sound when a clap is heard.*

**Step 3**: *After the sound, make Dash instantly dance to the left.*

**Step 4**: *After dancing left, make Dash automatically turn the lights off again.*

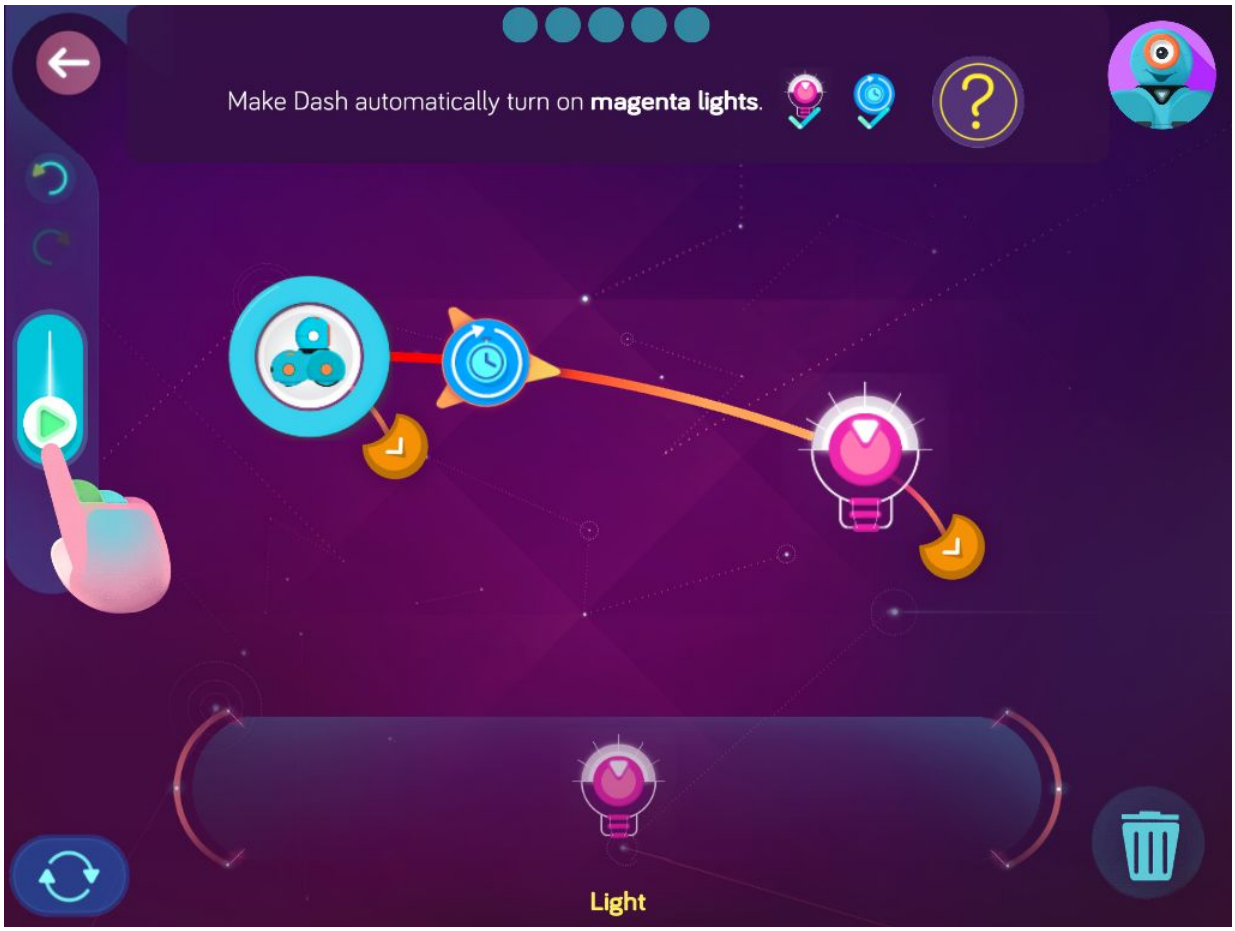

**Wonder Key**: zupp

# Press to Express

Zone: Wonder Workshop
Challenge Progression: 6

## Solutions

**Step 1**: *Make Dash automatically turn on magenta lights.*

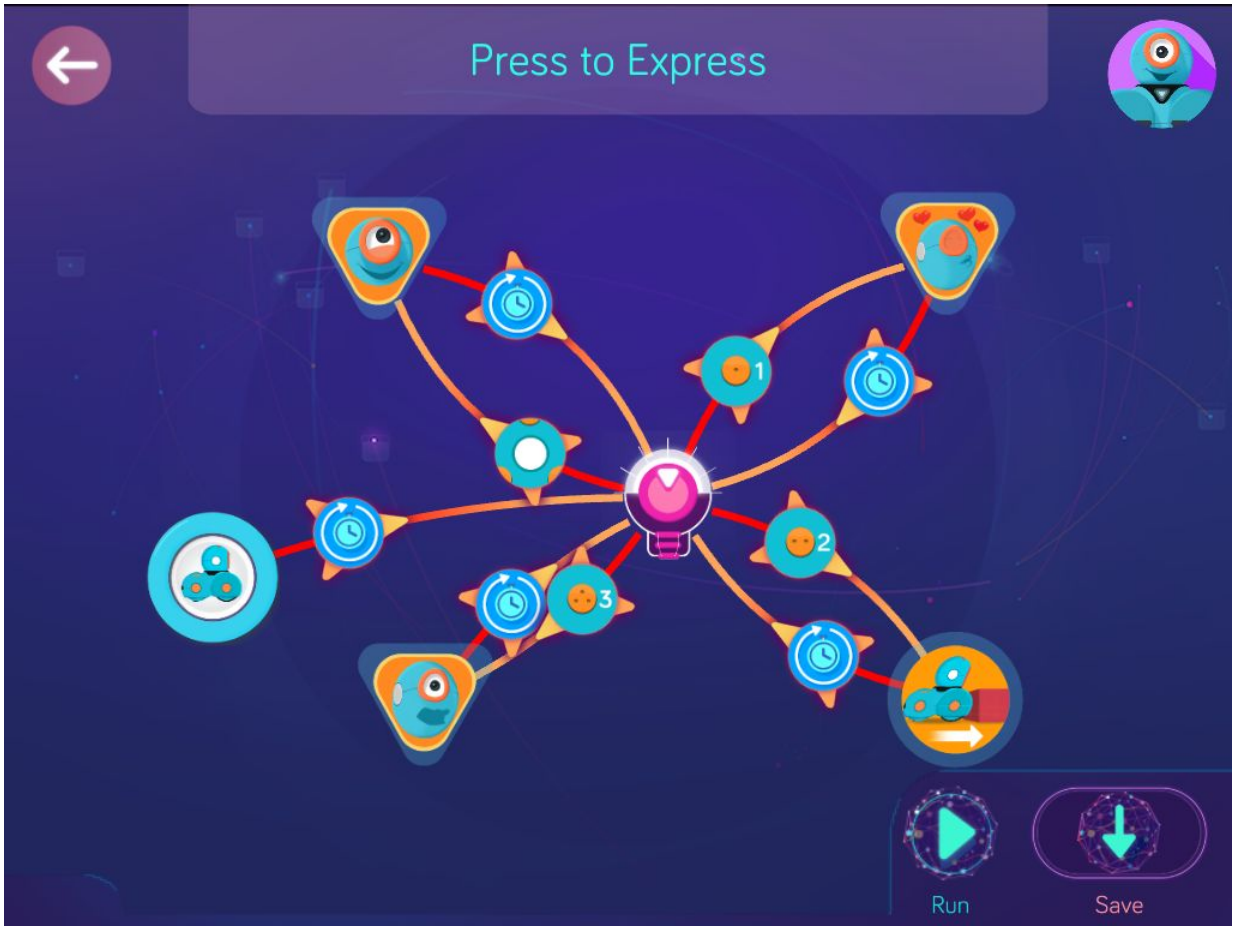


**Step 2**: *After turning on the lights, make Dash laugh when the top button is pressed. Then make Dash automatically turn on magenta lights again.*

**Step 3:** *After turning on the lights, make Dash give a kiss when button 1 is pressed. Then make Dash automatically turn on magenta lights again.*

**Step 4**: *After turning on the lights, make Dash push when button 2 is pressed. Then make Dash automatically turn on the magenta lights again.*

**Step 5**: *After turning on lights, make Dash burp when button 3 is pressed. Then make Dash automatically turn on magenta lights again.*




**Wonder Key**: t8ho

# Level 2: Firefly Watch, Water Wiggle, Marco Polo

## Concepts covered

- Program the **Random** cue to randomize a sequence of events.
- Program colored lights to turn on, off or randomly sequence, i.e., orange, magenta, green, blue and yellow.
- Program **Wait for** cue to set a time when Dash will transition to the next command.
- Program **Voice** cue to make Dash turn toward the speaker.
- Record and program original sounds
- Program Dash speed moving forward at cm/s.
- Program wheel differential to make left or right turns.

## Key terms

**Wait for:** putting a hold on the program until a new cue or command is introduced.
**Sensors**: a device that detects and responds to changes within the environment.

## Extension questions

1. How did the random cue affect the programming of the orange, magenta and green lights in Firefly Watch?
2. In Firefly Watch: After each colored light, you programmed Dash to wait for 1.0 s then turn the lights off again. What would have happened if you had used the auto cue instead or wait for?
3. How did you program Dash to turn left in step 2 of Water Wiggle? Based on this information, how would you program Dash to turn right?
4. In Marco Polo, which cue was programmed to make Dash turn toward you when you spoke?
5. How did you program Dash to say, “Polo” in the Marco Polo challenge? What else can you program Dash to say? Can you program a new game?

# Firefly Watch

Zone: Firefly Lagoon
Challenge Progression 1

## Solutions

**Step 1**: *Make Dash automatically play a curious sound then automatically turn the lights off.*

**Step 2**: *After turning the lights off, make Dash randomly choose to turn on orange, magenta, or green light*s.

**Step 3**: *After each colored light, make Dash wait for 1.0 s then turn the lights off again.*

**Step 4**: *After turning the lights off, make Dash randomly choose to turn around then automatically play the sound again.*

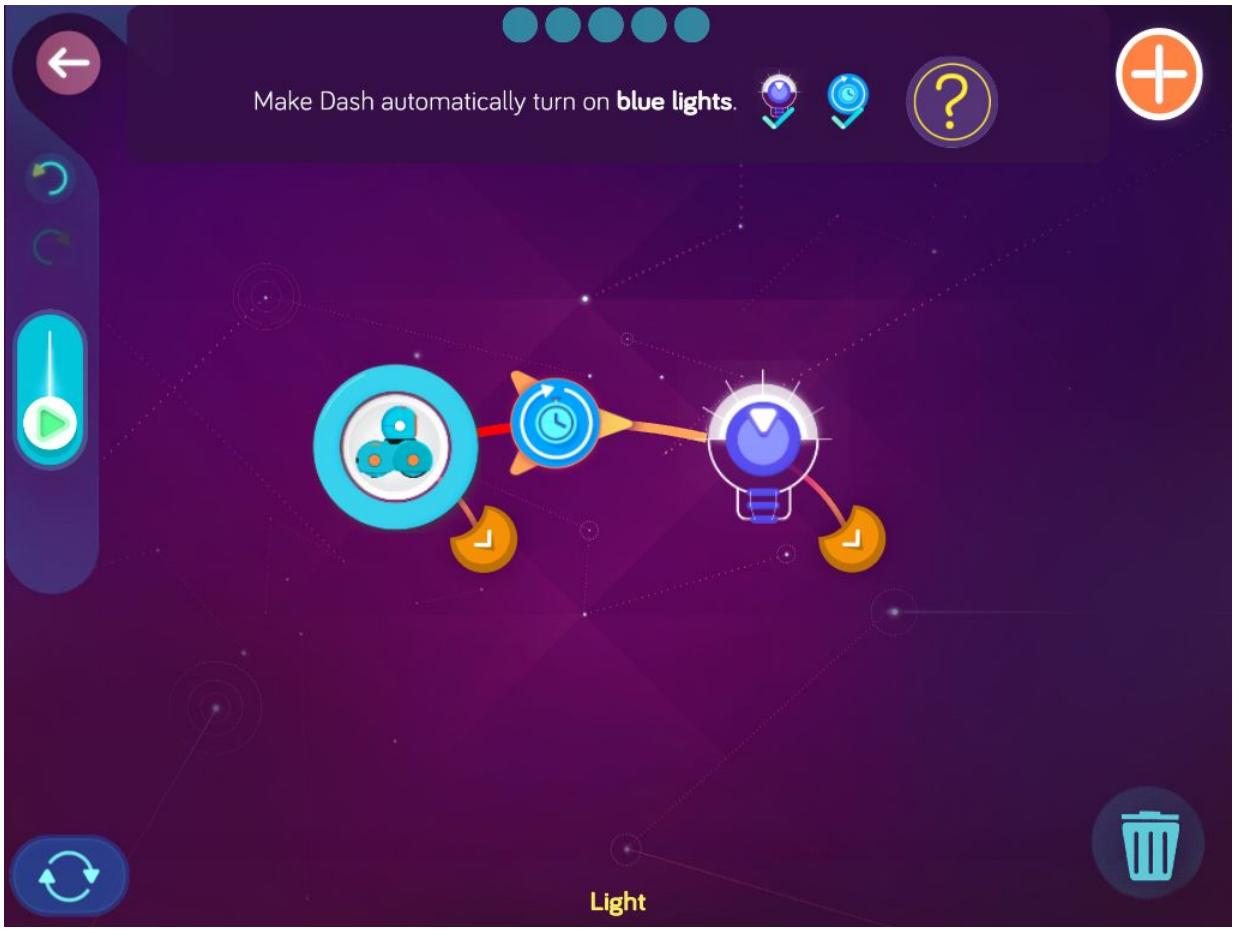

**Wonder Key**: vtqc

# Water Wiggle

Zone: Firefly Lagoon
Challenge Progression 2

## Solutions

**Step 1**: *Make Dash automatically turn on blue lights.*



**Step 2**: *After turning on the light, make Dash automatically turn left with the left wheel set 30 cm/s and the right wheel set to 40 cm/s.*

**Step 3**: *After turning left, make Dash instantly play the Tugboat sound.*

**Step 4**: *After the sound, make Dash wait for 1.0 then turn right with the left wheel set to 40 cm/s and the right wheel set to 30 cm/s.*

**Step 5**: *After turning right, make Dash instantly play a new Tugboat sound. Then make Dash wait for 1.0 s and then turn left again*.

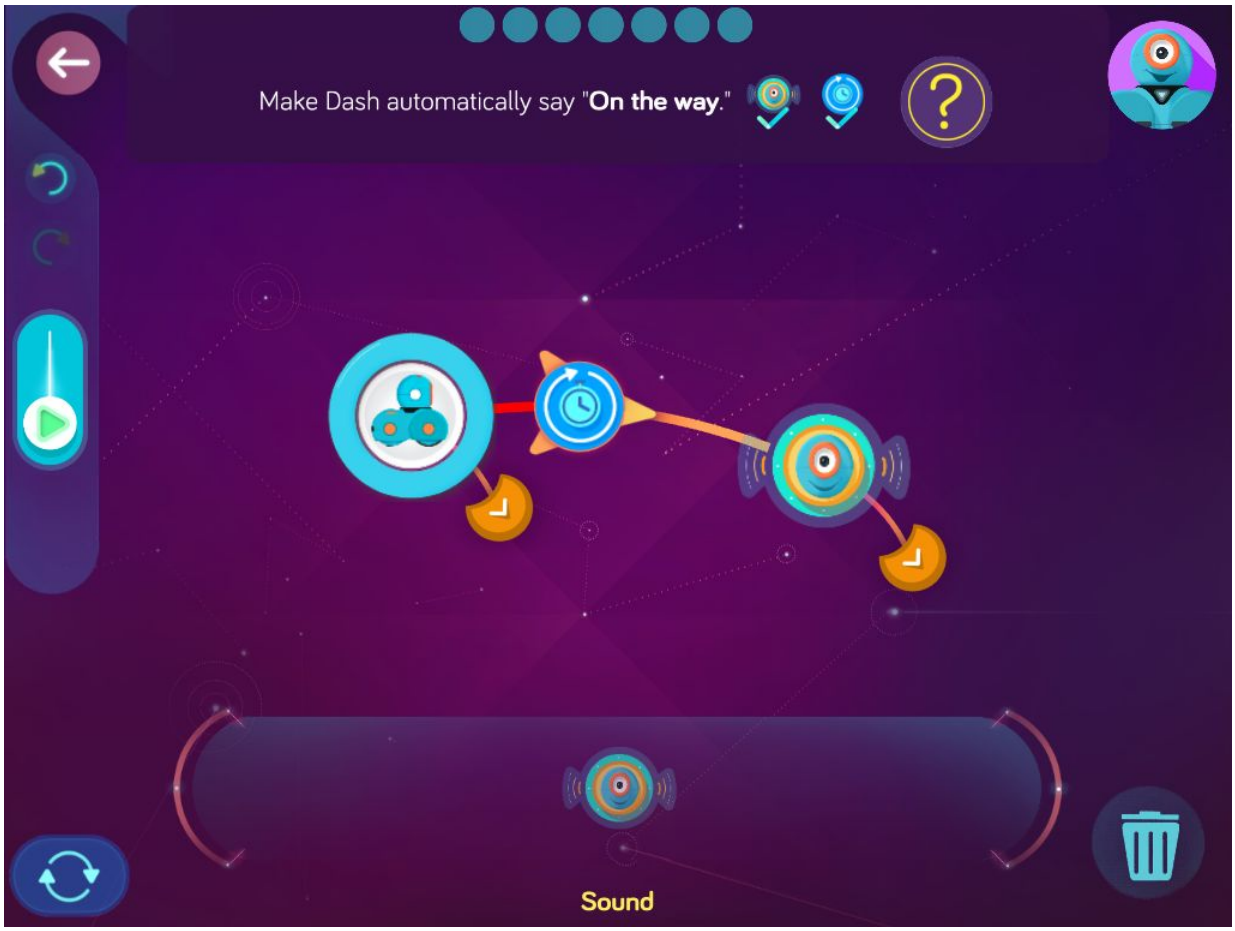

**Wonder Key**: own2

# Marco Polo

Zone: Firefly Lagoon
Challenge Progression 3

## Solutions

**Step 1**: Make Dash say, “On the way!”



**Step 2**: After speaking, make Dash instantly turn on green lights.

**Step 3**: Make Dash turn to you when you say, “Marco!”.

**Step 4**: After turning toward your voice, make Dash automatically turn on yellow lights.

**Step 5**: After turning on yellow lights, make Dash automatically say, “Polo” (or whatever you record).

**Step 6**: After saying, “Polo,” make Dash instantly move forward 50 cm.

**Step 7**: After moving forward, make Dash automatically turn on green lights again.


**Wonder Key**: oflj

# Level 3: Thrill Ride

## Concepts covered

- Program to **Push Dash Backward** as cue for next command.
- Program to **Move Dash Forward** as cue for next command.
- Program Dash to move forward as fast as possible.

## Key terms

**Move Forward:** Dash will go to the next state when moved forward.
**Push Backward:** Dash will go to the next state when pushed backward.

## Extension questions

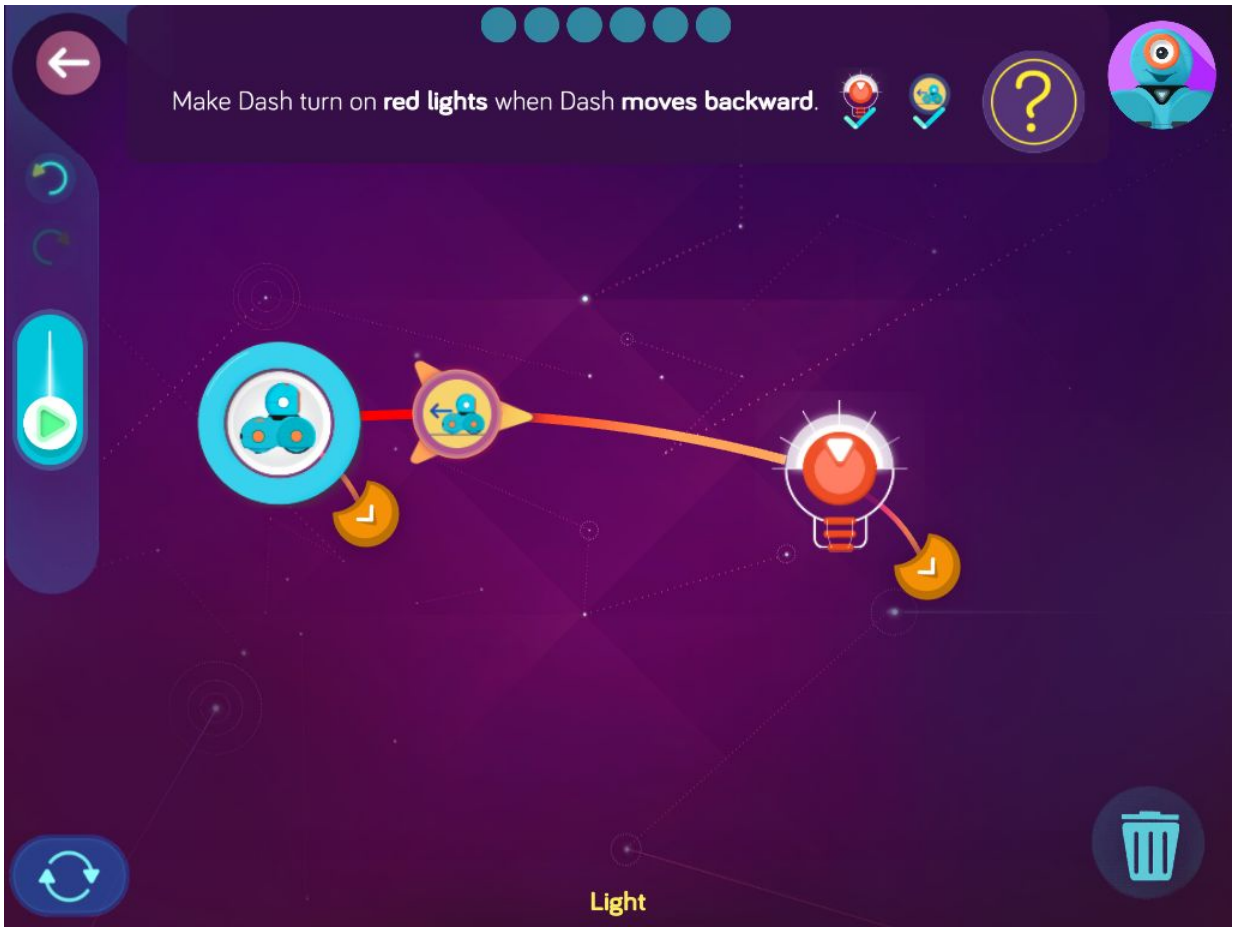
1. What new cues were introduced in the Thrill Ride? (Push Forward, Move Backward)
2. Brainstorm ways in which this cue could be used in another type of amusement park ride.
3. When programming the Thrill Ride, did all of your commands sequence from left to right? Explain.
4. What is the top speed that Dash can be programmed to move forward? Backward?
5. In Thrill Ride, you set both of Dash's wheels at the same speed. What would have happened if you had set the left and right wheels at two different speeds? Try it.

# Thrill Ride

Zone: Dragon Reach
Challenge Progression 1

## Solutions

**Step 1**: *Make Dash turn on red lights when Dash moves backward.*



**Step 2:** *After the red light, make Dash play a brave sound when Dash moves backward again.*

**Step 3:** *After the brave sound, make Dash automatically turn on red lights again.*

**Step 4:** *After the red light, make Dash turn on green lights when Dash moves forward. After the green light, make Dash automatically play a silly sound.*

**Step 5:** *After the silly sound, make Dash instantly start to move forward as fast as possible, with both wheels set to 80 cm/s.*

**Step 6:** *After moving forward, make Dash wait for 3.0 s then stop. Then make Dash wait for 1.0 se and turn on red lights again.*


**Wonder Key**: ajcc

# Level 4: Snowman, Crazy Skates

## Concepts covered

- Programming and customizing eye ring patterns to create an expression, i.e., a smile
- Programming the **Listener** to wait for a cue
- Programming a clap as a cue for the next command
- Programming a loop

## Key terms

**Eye Ring:** a customizable circle of lights on the front of Dash's face.
**Moving Basics**: Dash will begin spinning, turning, or going straight depending on the speed you choose for each wheel.
**The Listener**: works at the same time as the main code and waits until a cue causes it to change to a new state.
**Loop**: a set of instructions that a computer program repeats.

## Extension questions

1. How can Dash's eye ring be customized to resemble a smile?
2. What other expressions can you create for Dash using the eye ring?
3. How were you able to make Dash switch back and forth between two different eye ring patterns?
4. Which cue did you use to program the time delay between eye ring patterns?
5. In Step 3 of Crazy Skates, how did you create a loop? What happened in the program when you did?

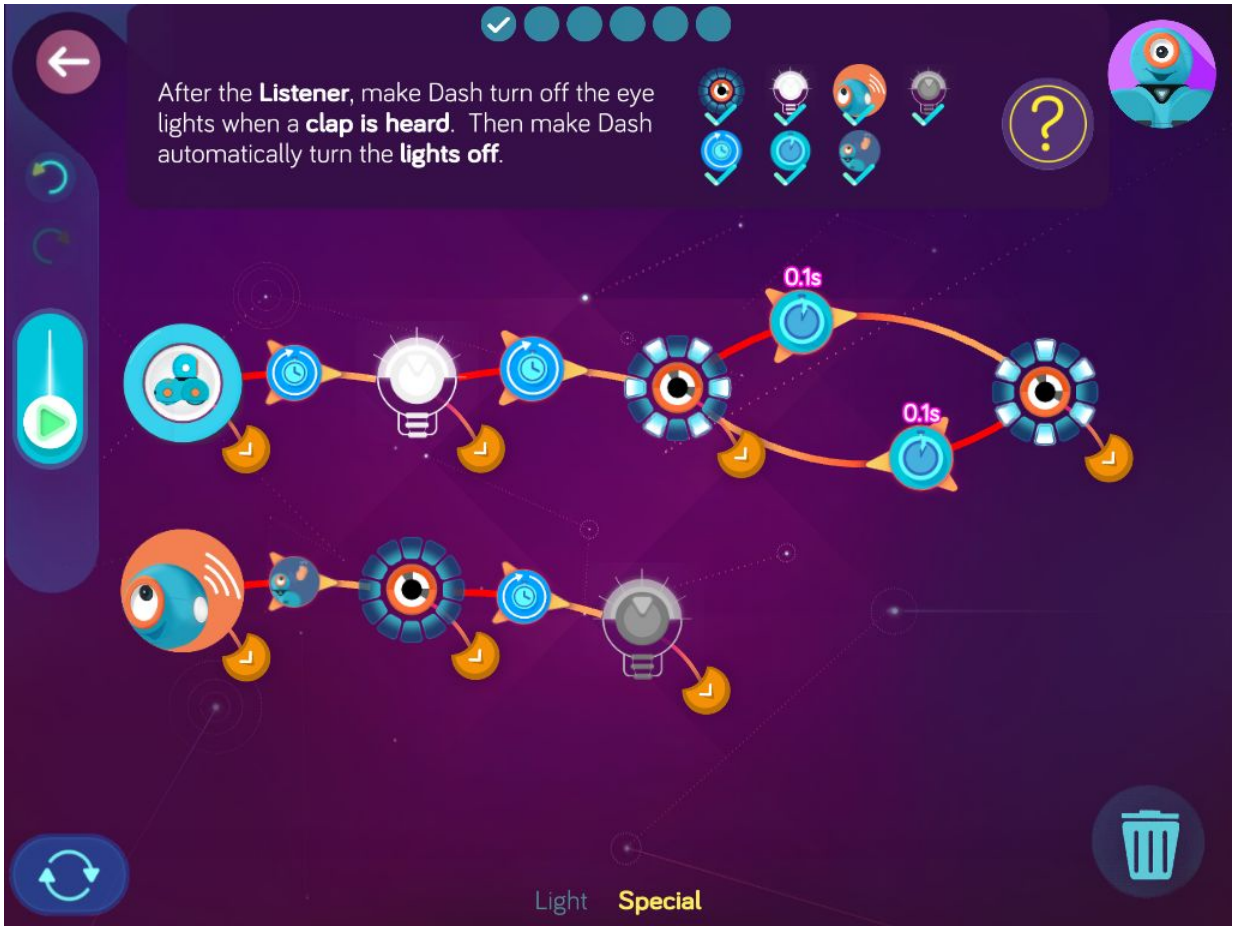
# Snowman

Zone: Yeti Pass
Challenge Progression 1

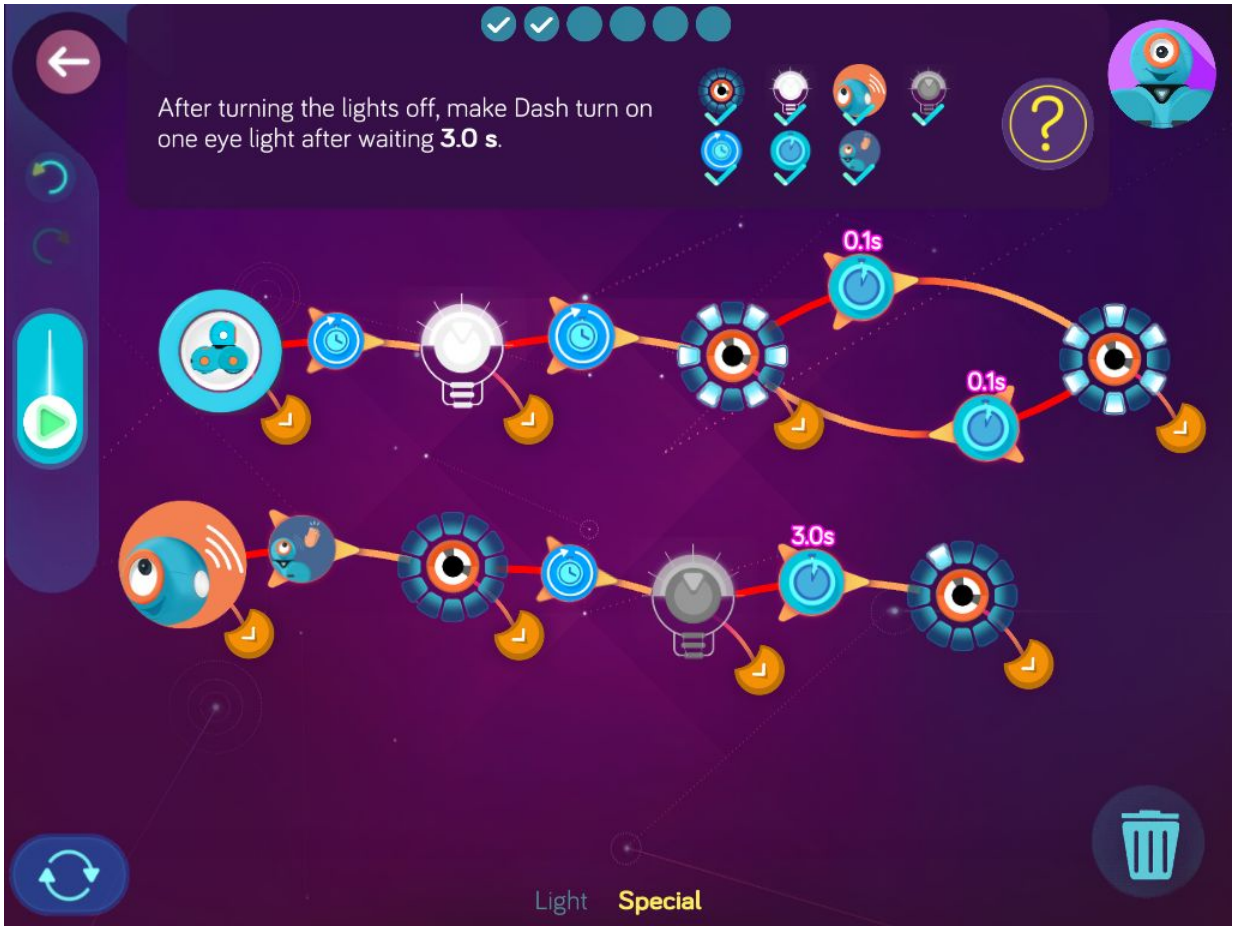
## Solutions

**Step 1**: *Make Dash switch back and forth between the two eye ring patterns every 0.1s.*

**Step 2**: *After the Listener, make Dash turn off the eye lights when a clap is heard. Then make Dash automatically turn the lights off.*

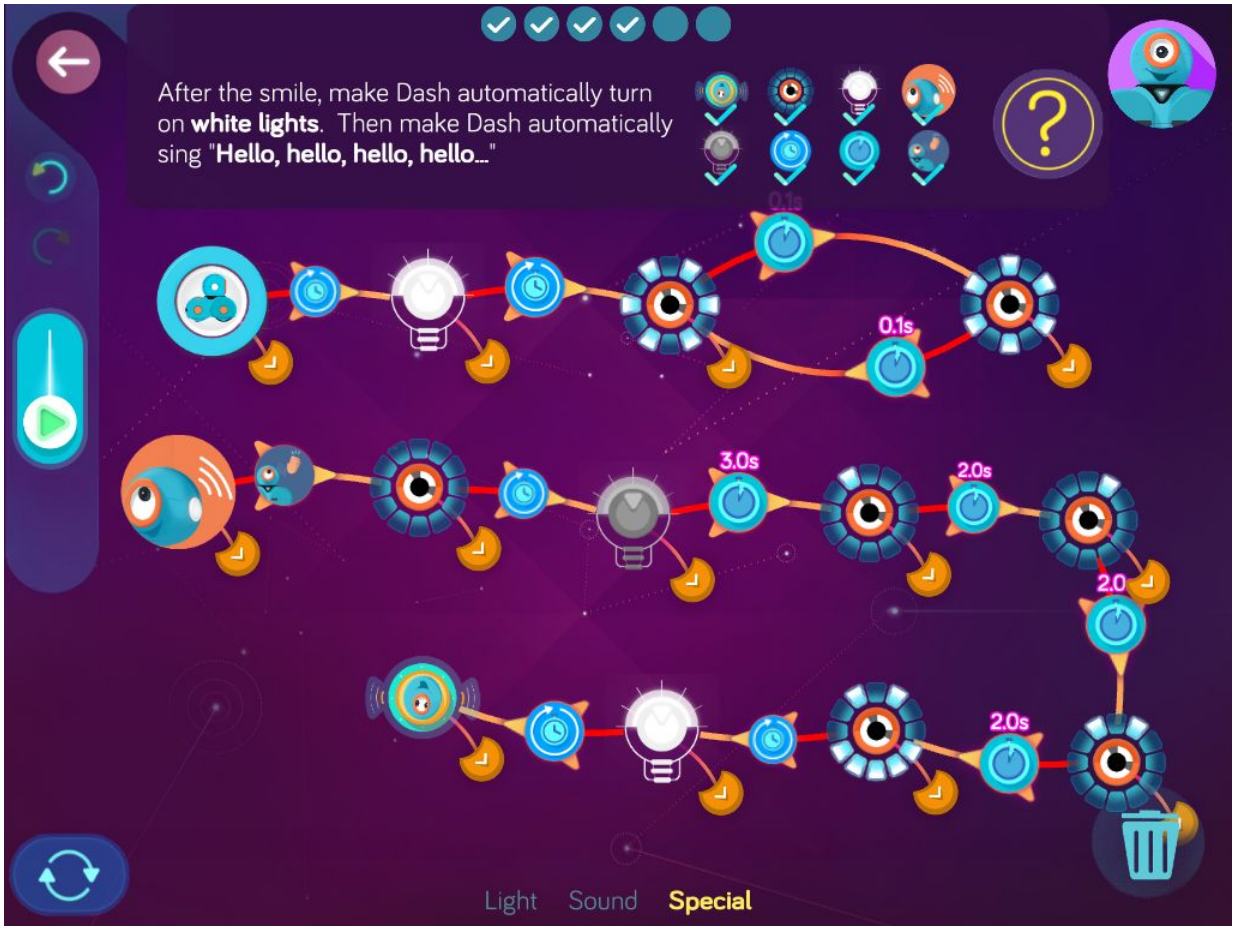


**Step 3**: *After turning the eye lights off, make Dash turn on one eye light after waiting 3.0 s.*

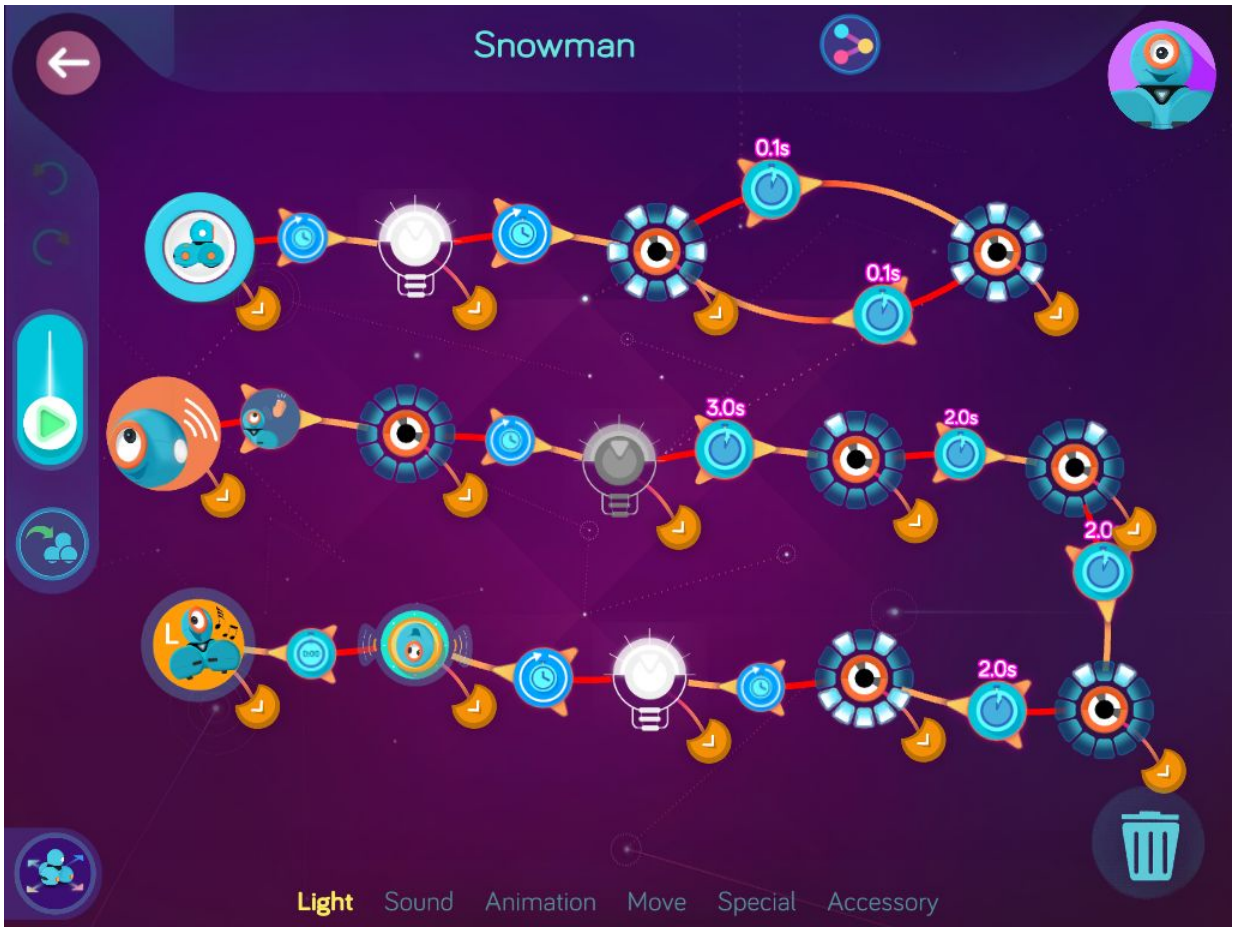


**Step 4**: *Make Dash turn on more eye lights every 2.0 s Dash is smiling.*

**Step 5**: *After the smile, make Dash automatically turn on white lights. Then make Dash automatically sing, “Hello, hello, hello, hello…”*



**Step 6**: *After Dash sings, “Hello, hello, hello, hello…”, make Dash instantly dance left.*




**Wonder Key:** d52i

# Crazy Skates

Zone: Yeti Pass
Challenge Progression 2

## Solutions

**Step 1**: *Make Dash automatically turn on white lights, turn on three eye lights, and play the "Let's go!" #3 sound.*

**Step 2**: *Edit the first Moving Basics state (the one on the left) to: left wheel 40 cm/s, right wheel 30 cm/s. Then edit the other Moving Basics state: left wheel 30 cm/s, right wheel 40 cm/s.*

**Step 3**: *Tap on the new eye ring and turn off some of the lights to give Dash a smile. Link the Listener to the eye ring so that Dash smiles after 8.0 s.*

**Step 4**: *Create a loop by connecting the two new Moving Basics states with two Wait For cues set 2.0.*


**Wonder Key**: tl9k

# Level 5: Volcanic Trek, Random Volcano

## Concepts covered

- Programming distance in centimeters per second
- Programming a spin using wheel differential
- Programming the **Picked Up** cue
- Programming **Put Down** cue
- Programming the **Random** cue for a variable number of seconds between 0 and 5.
- Programming a custom sound using record in the sound command
- Using buttons as cues, e.g., top, 1, 2 and 3 buttons.

## Key terms

**Picked up**: a cue to program Dash to go to the next state after being picked up.
**Put Down**: a cue to program Dash to go to the next state after being put down.

## Extension questions

1. Explain how would you program Dash to move ahead 30 cm.
2. In step 3 of the Volcanic Trek, how were the wheels set in order to make Dash spin?
3. Which direction did Dash spin in the Volcanic Trek? Compare the spin command to a turn command. How are the wheels set in each case?
4. In step 2 of Random Volcano, you used the random cue. Explain how it was used and how it affected Dash running the program over again, at least, 3 times.
5. In the final steps of Random Volcano, buttons 1, 2 and 3 were used as cues. When did you need to push these buttons? What happened if you did not?

# Volcanic Trek

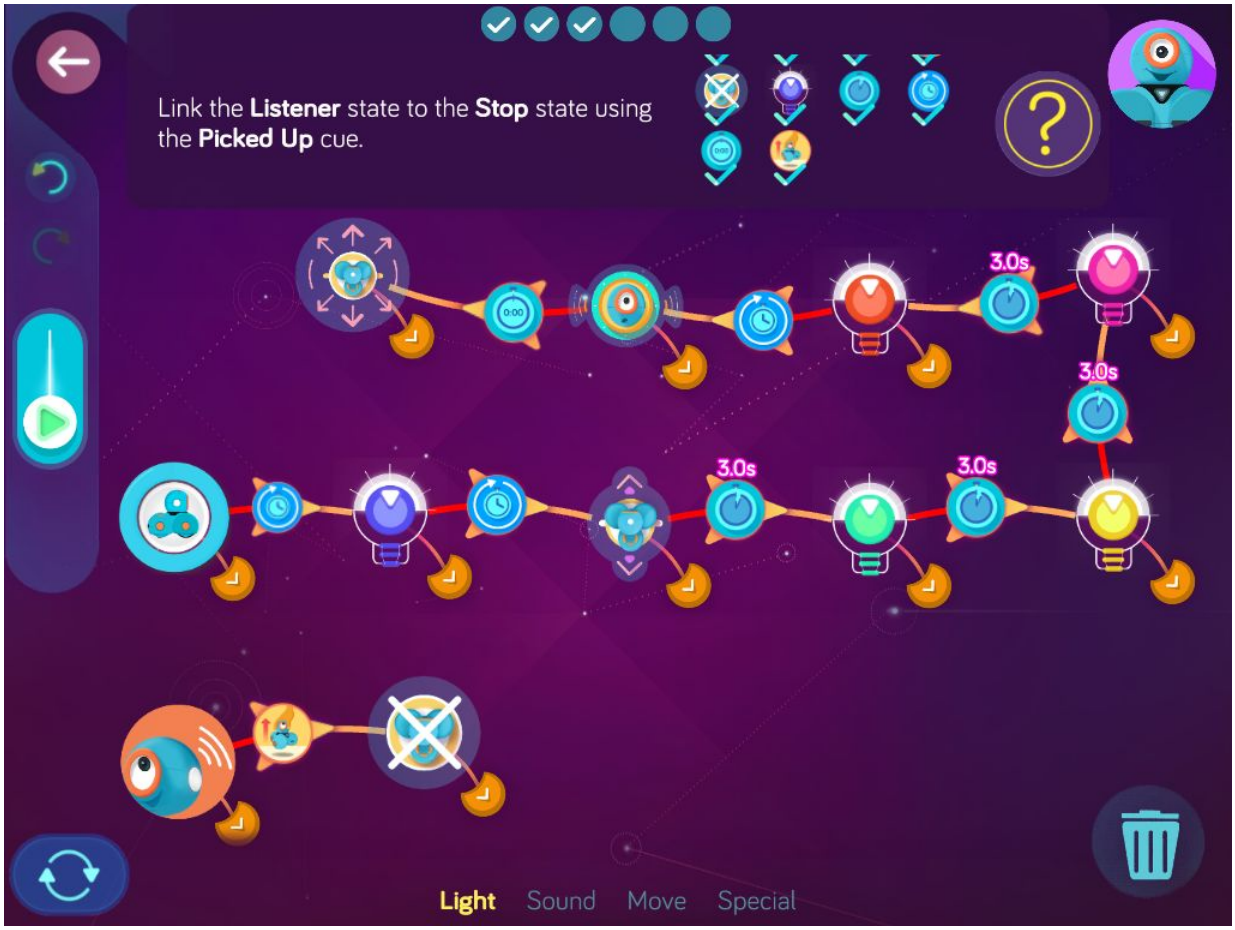
Zone: Mount Ashburn
Challenge Progression 1

**Step 1:** *Make Dash automatically turn on blue lights then automatically move forward 20 cm/s.*

**Step 2:** *After Dash starts moving, make Dash change the light color every 3.0 s. Make Dash change the lights to green then yellow then magenta then red.*

**Step 3:** *After Dash turns on red lights, make Dash automatically say, “Oh no!” then instantly start spinning fast with the left wheel going 80 cm/s and the right wheel going -80 cm/s.*

**Step 4:** *Link the Listener state to the Stop state using the Picked up cue.*



**Step 5:** *After Dash stops, make Dash automatically say, “That’s cool!” and then instantly turn on blue lights.*

**Step 6:** *After Dash turns on blue lights, make Dash move again when Dash is put down.*


**Wonder Key**: 7fhc

# Random Volcano

Zone: Mount Ashburn
Challenge Progression 2

## Solutions

**Step 1**: *Make Dash wait for 1.0 s then turn the lights off.*

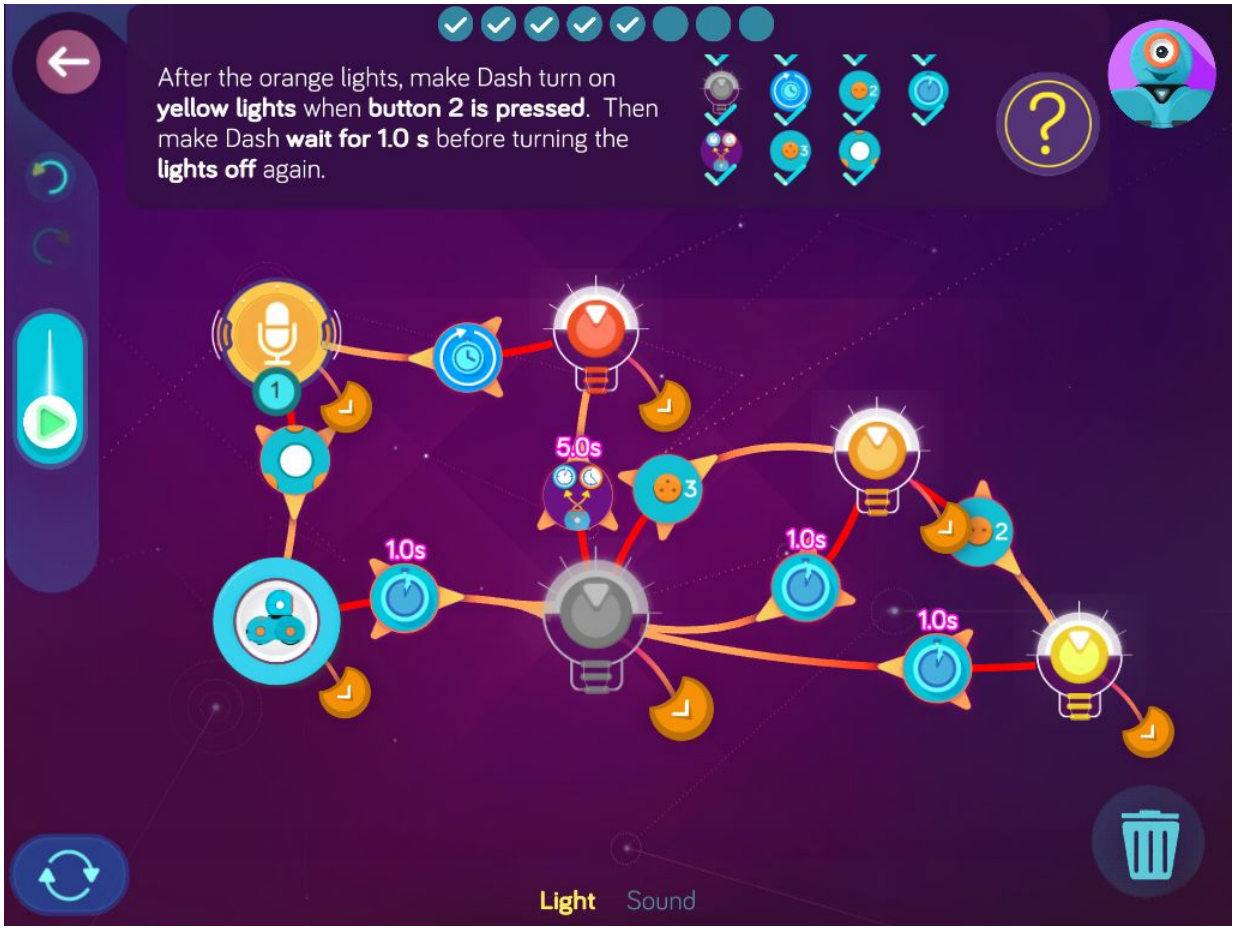
**Step 2**: *Make Dash wait for a random time up to 5.0 s then turn on red lights.*

**Step 3**: *After the red light, make Dash automatically play the sound of an erupting volcano. Use a custom sound to record your own voice making the sound of an erupting volcano.*

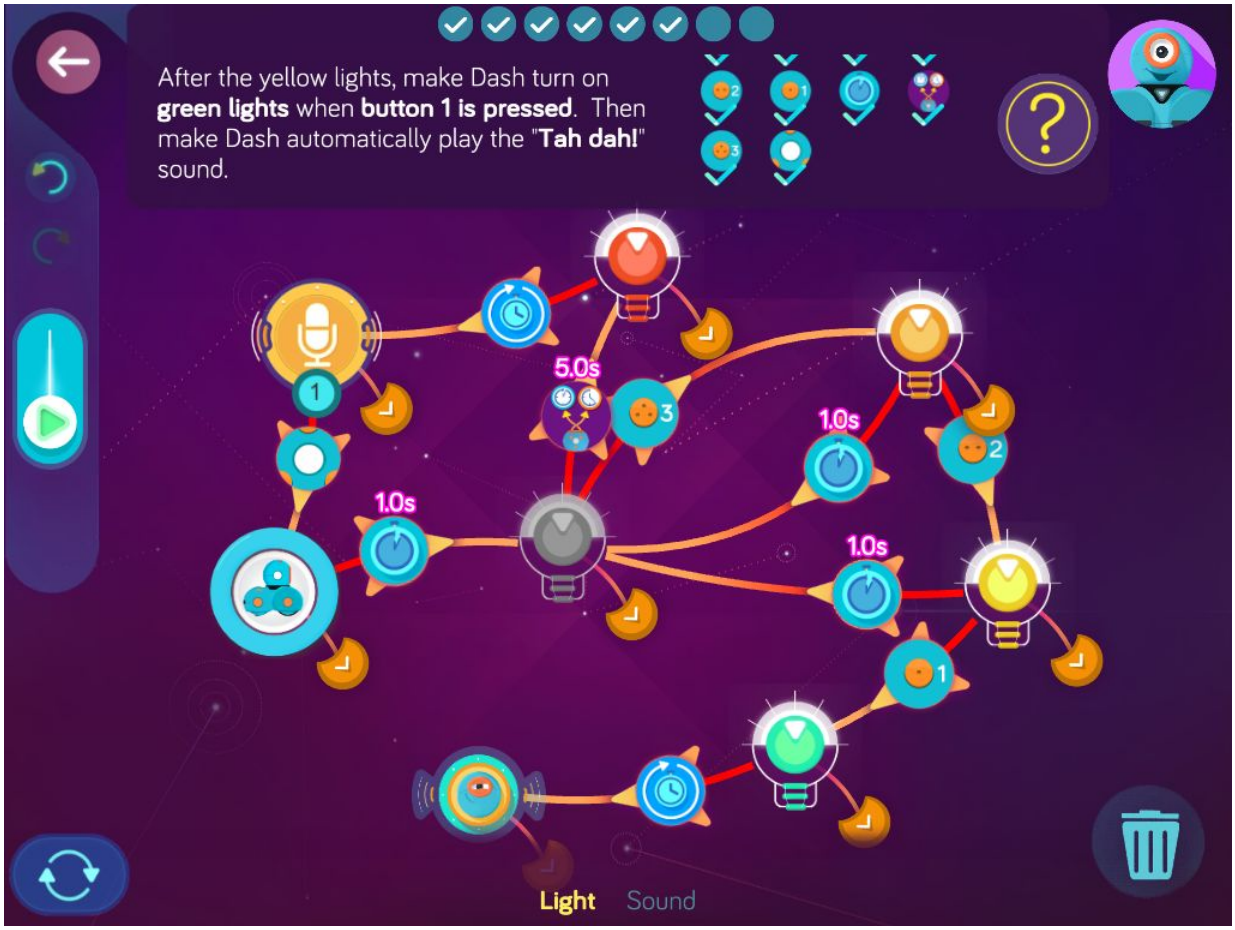
**Step 4**: *After the erupting volcano sound, make Dash return to Start when the top button is pressed.*

**Step 5**: *After the lights are off, make Dash turn on orange lights when button 3 is pressed. Then make Dash wait for 1.0 s before turning the lights off again.*

**Step 6**: After the orange lights, make Dash turn on yellow lights when button 2 is pressed. Then make Dash wait for 1.0 s before turning the lights off again.



**Step 7**: *After the yellow lights, make Dash turn on green lights when button 1 is pressed. Then make Dash automatically play the “Tah dah!” sound.*



**Step 7**: *After the “Tah dah!” sound, make Dash turn the lights off again when the top button is pressed.*


**Wonder Key**: axrg

# Level 6: Spaceship Rescue, Robot Translator

## Concepts covered

- Customizing eye lights
- Programming lights
- Adjusting the speed of a spin
- Cuing eye lights with a button press
- Programming Dash to randomly choose a sound to play
- Programming and recording a custom sound

## Key terms

**Eye Lights**: 12 customizable white LEDs on the front of Dash's face.
**Lights**: Dash's ear lights, tail lights and spotlight

## Extension questions

1. What is the slowest rate of speed you can adjust Dash to spin? What is the fastest?
2. How many different light sources are on Dash? Which lights can be programmed in different colors? Which lights can be programmed to resemble a facial expression, like a smile?
3. How many eye lights does Dash have? How can you program all of Dash's eye lights to turn off? On?
4. In the Robot Translator, what was the easiest/fastest way to replace each happy sound with a custom sound?
5. What was the purpose of the random cue in the Robot Translator?

# Spaceship Rescue

Zone: Galaxy Lake
Challenge Progression 1

**Step 1:** *Make Dash automatically turn the lights off then automatically turn off all eye lights.*

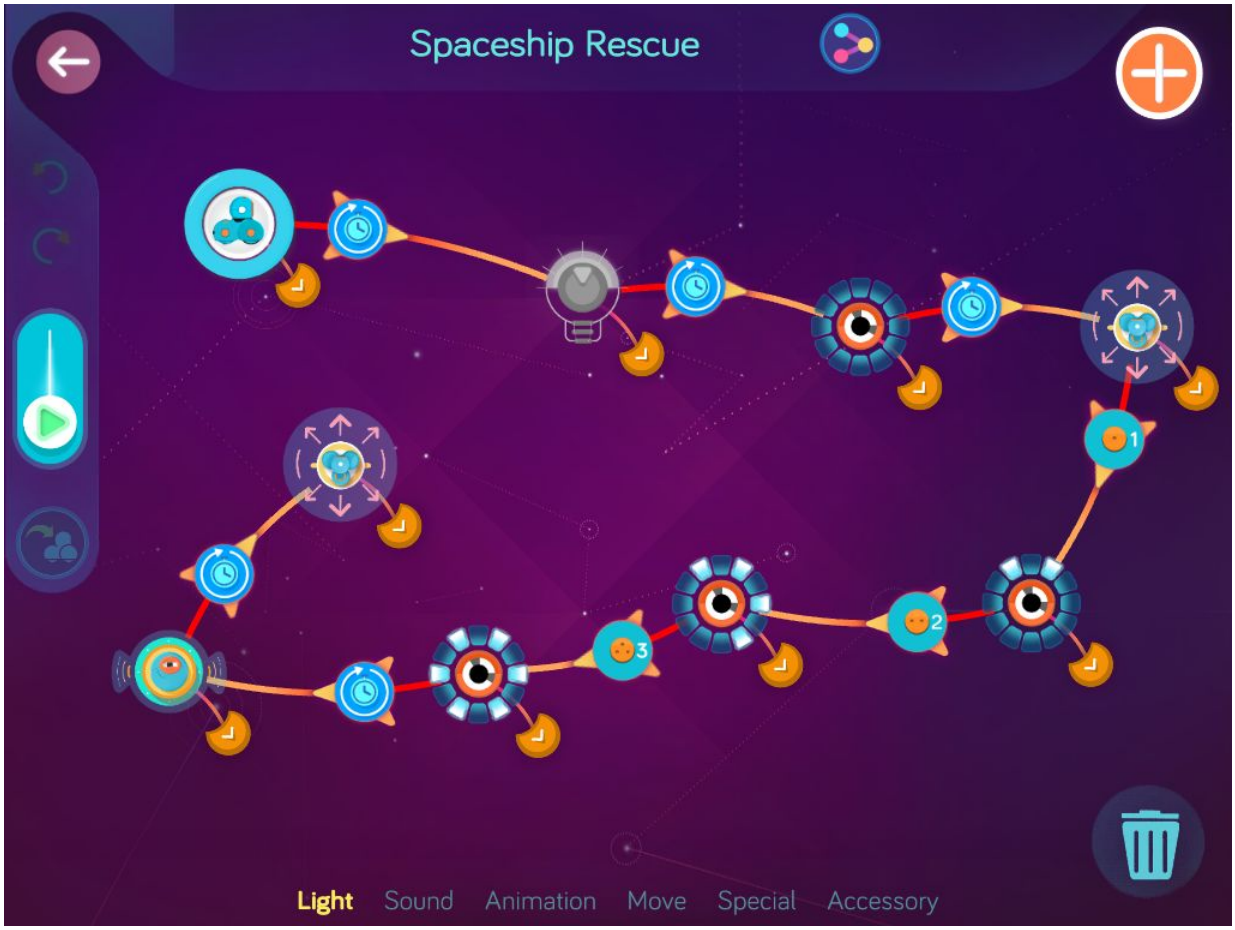
**Step 2:** *After the eye ring, make Dash automatically spin slowly with the left wheel set to 20 cm/s and the right wheel set to -20 cm/s.*

**Step 3:** *After spinning slowly, make Dash turn on two eye lights when button 1 is pressed.*

**Step 4:** *After turning on two eye lights, make Dash turn on 4 eye lights when button 2 is pressed.*

**Step 5:** *After turning on four eye lights, make Dash turn on six eye lights when button 3 is pressed.*

**Step 6:** *After turning on six lights, make Dash automatically play a brave sound. Then make Dash automatically move forward with both wheels set to 80 cm/s.*



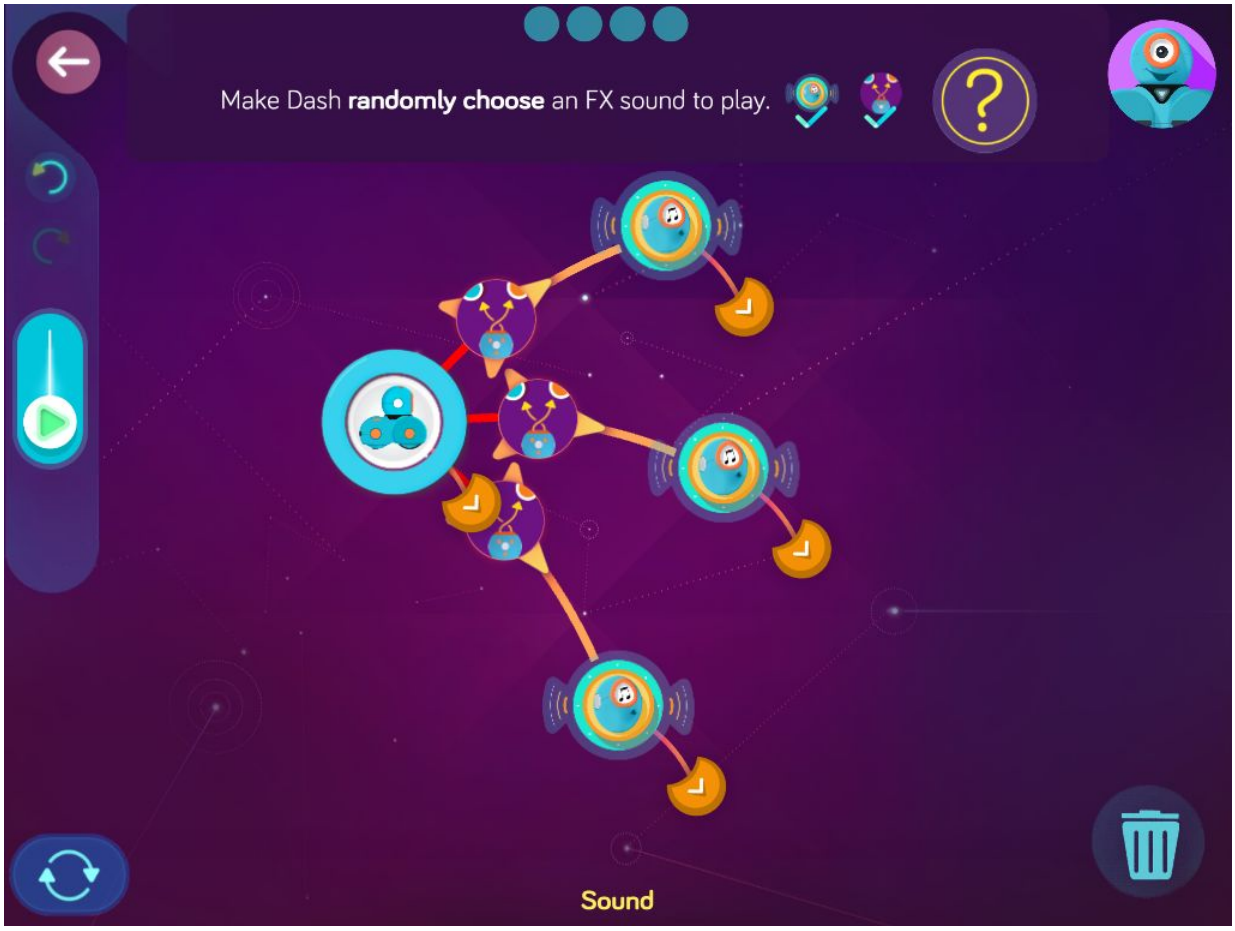

**Wonder Key**: f4m4

# Robot Translator

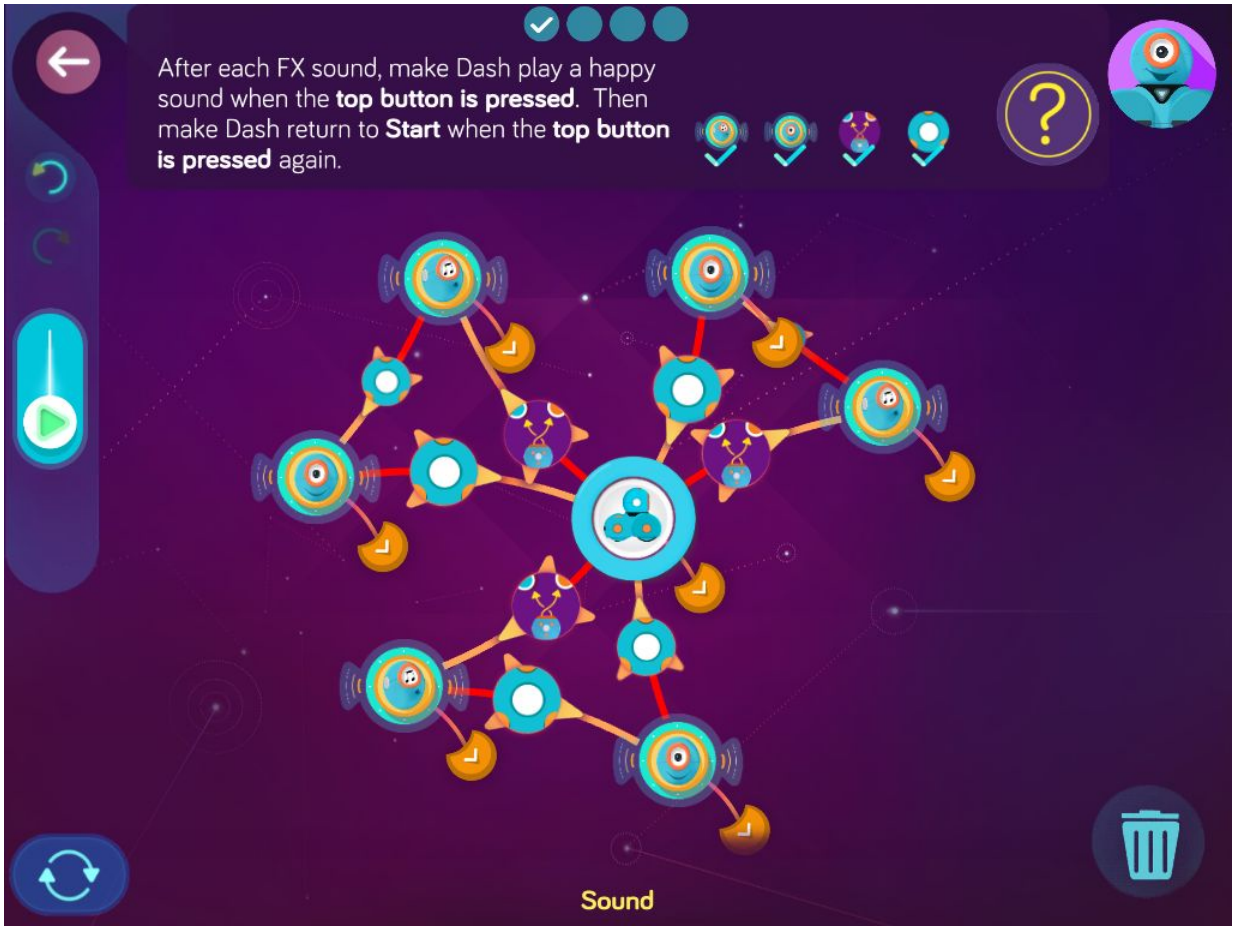
Zone: Galaxy Lake
Challenge Progression 2

## Solutions

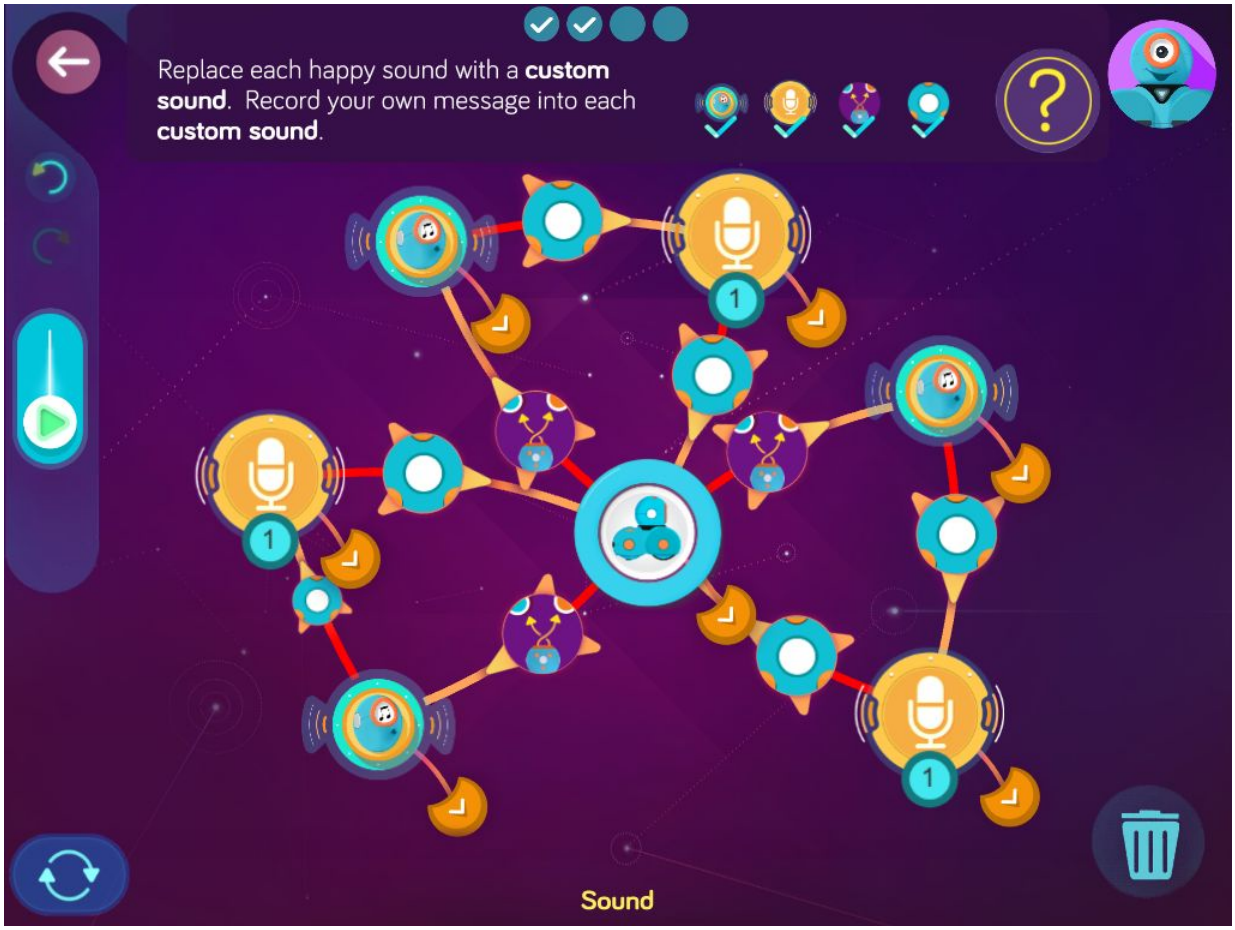
**Step 1**: *Make Dash randomly choose an FX sounds to play.*



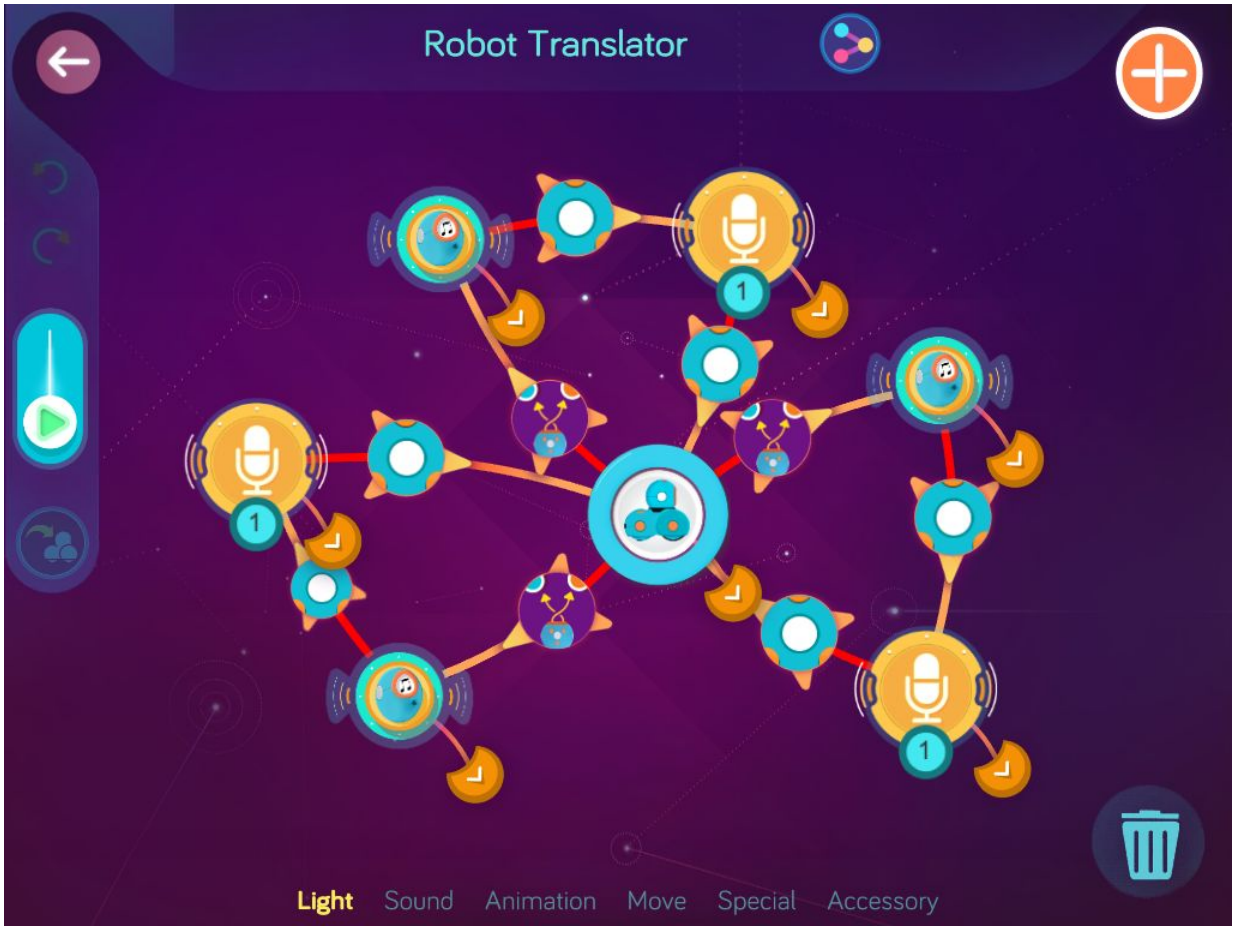
**Step 2**: *After each FX sound, make Dash play a happy sound when the top button is pressed. Then make Dash Start when the top button is pressed again.*



**Step 3**: *Replace each happy sound with a custom sound. Record your own message into each custom sound.*



**Step 4**: *Play with Dash: Press the top button until you hear each of your recorded sounds.*




**Wonder Key**: 56dz

# Level 7: Doing Donuts, Spinning Dash Game, Butler Dash

## Concepts covered

- Programming wheel differential for turns
- Programming a cue for when Dash gets stuck
- Programming the **Top Button Released** cue
- Programming Dash to move a set distance in cm.
- Programming Dash to sense an obstacle in front

## Key terms

**Stuck**: a cue for Dash to go to the next state when stuck.
**Top Button Released**: a cue to program Dash to go to the next state when you release the big white button on Dash's head.

## Extension questions

1. When making a left turn, which wheel turns faster? The left or right wheel. Explain why.
2. How is programming a right turn different than programming a left turn?
3. How is programming a turn different than programming a spin?
4. Which direction did Dash spin when you programmed the turn for -45 degrees in Butler Dash? Which direction did Dash spin when you programmed the turn for 45 degrees?
5. What is the farthest degree that you can set Dash to spin in either direction?

# Doing Donuts

Zone: Kong City
Challenge Progression 1

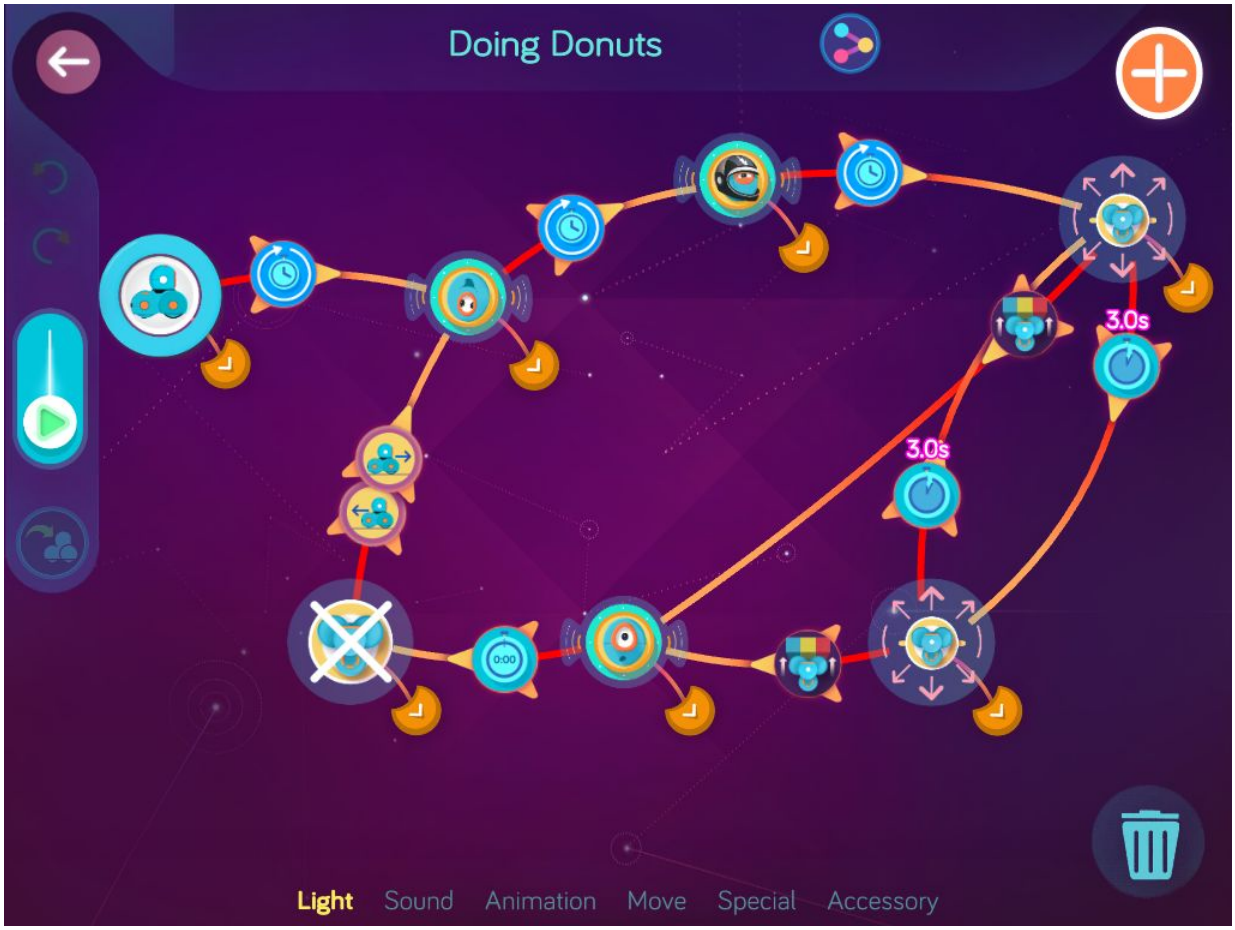
**Step 1:** Make Dash automatically play a silly sound, play a transport sound, then spin right (left wheel 80 cm/s, right wheel 10 cm/s).

**Step 2:** *After spinning right, make Dash wait for 3.0 s, then spin left (left wheel set to 10 cm/s, right wheel set to 80 cm/s.) Then make Dash wait for 3.0 s and spin right again.*

**Step 3:** *While spinning left or spinning right, make Dash say, “Oh no!” if Dash gets stuck.*

**Step 4:** *When Dash says, “Oh no!” make Dash instantly stop.*

**Step 5:** *Make Dash play the silly sound again when Dash moves forward or moves backward.*




**Wonder Key**: qfxv

# Spinning Dash Game

Zone: Kong City
Challenge Progression 2

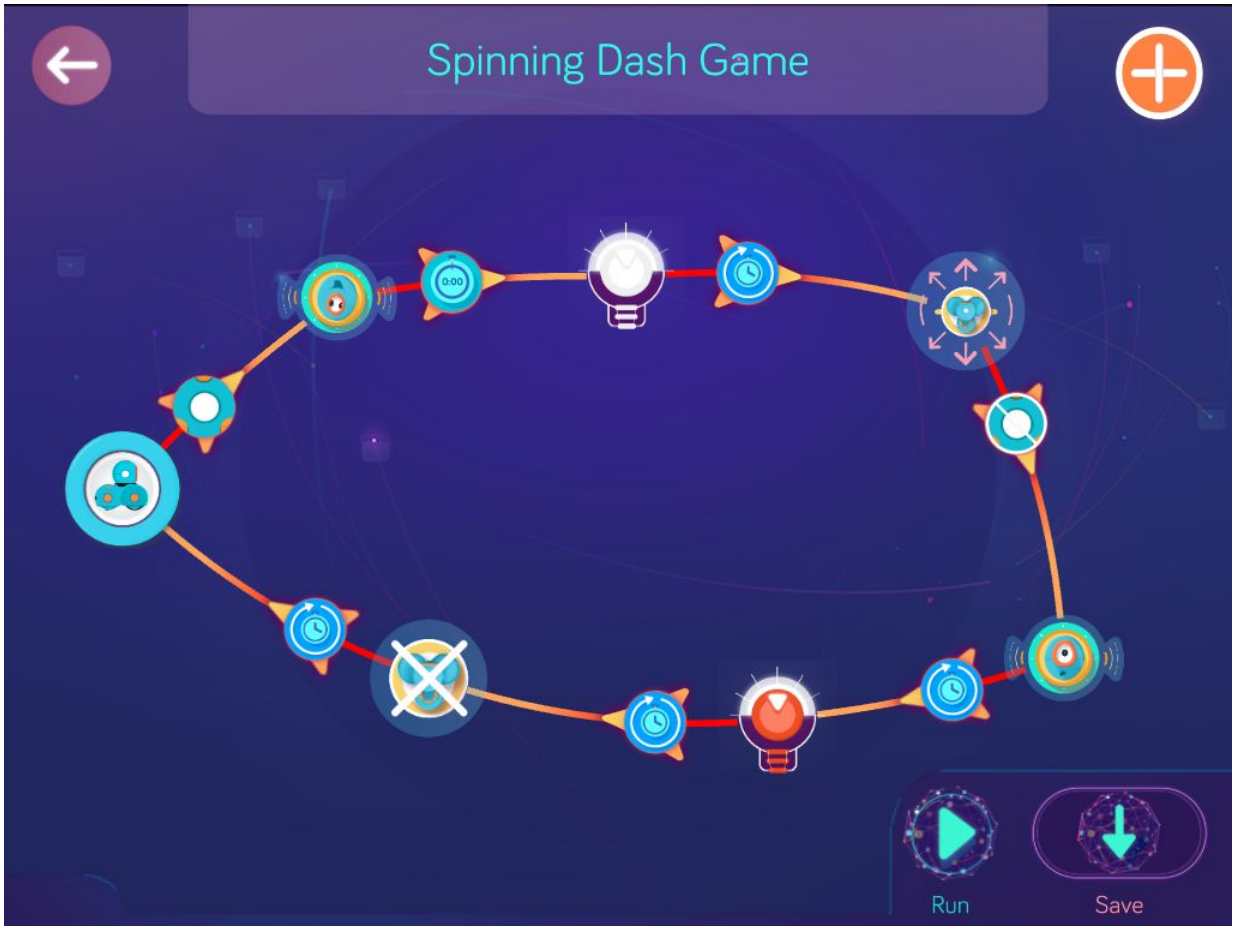
## Solutions

**Step 1**: *Make Dash sing the Inputs and Outputs song when the top button is pressed.*

**Step 2**: *When Dash starts singing, make Dash instantly turn on white lights. Then make Dash automatically spin right (left wheel 30 cm/s, right wheel -30 cm/s).*

**Step 3**: *Make Dash say, “Oh no!” when the top button is released.*

**Step 4**: *After saying, “Oh no!”, make Dash automatically turn on red lights then automatically stop.*



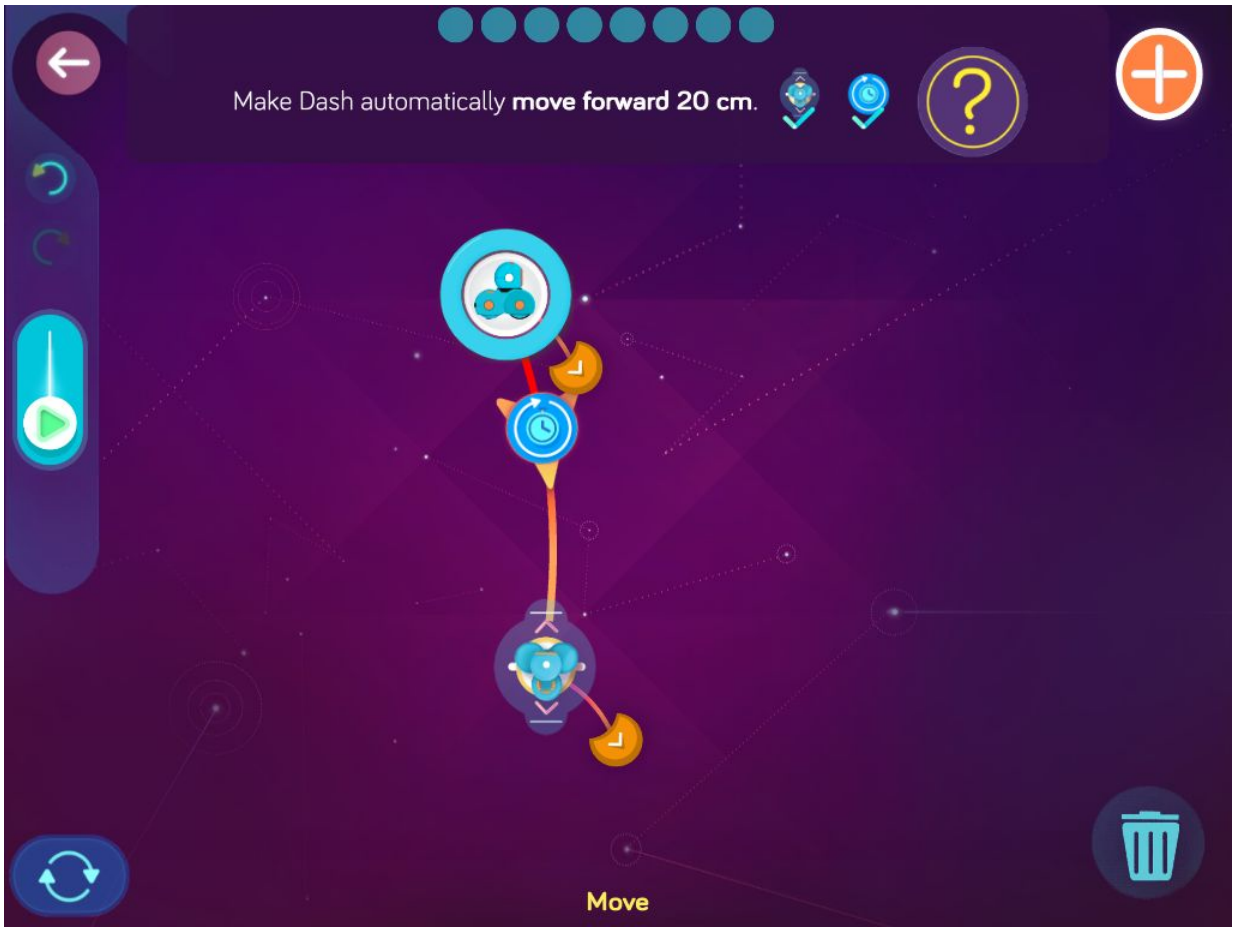

**Wonder Key**: 6ruz

# Butler Dash

Zone: Kong City
Challenge Progression 3

## Solutions

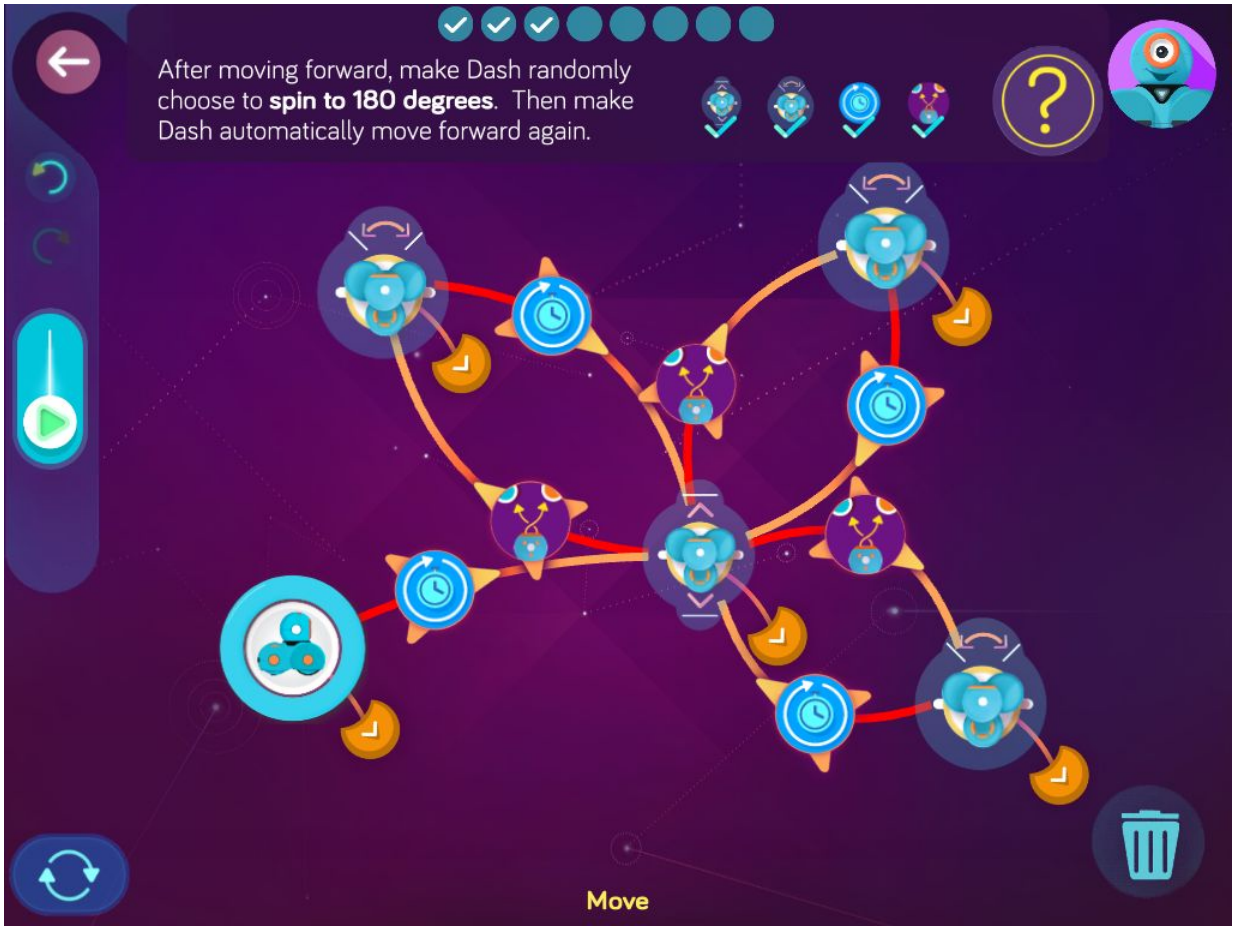
**Step 1**: Make Dash automatically move forward 20 cm.



**Step 2**: *After moving forward, make Dash randomly choose to spin -45 degrees. Then make Dash automatically move forward again.*

**Step 3**: *After moving forward, make Dash randomly choose to spin 45 degrees. Then make Dash automatically move forward again.*

**Step 4**: *After moving forward, make Dash randomly choose to spin 180 degrees. Then make Dash automatically move forward again.*

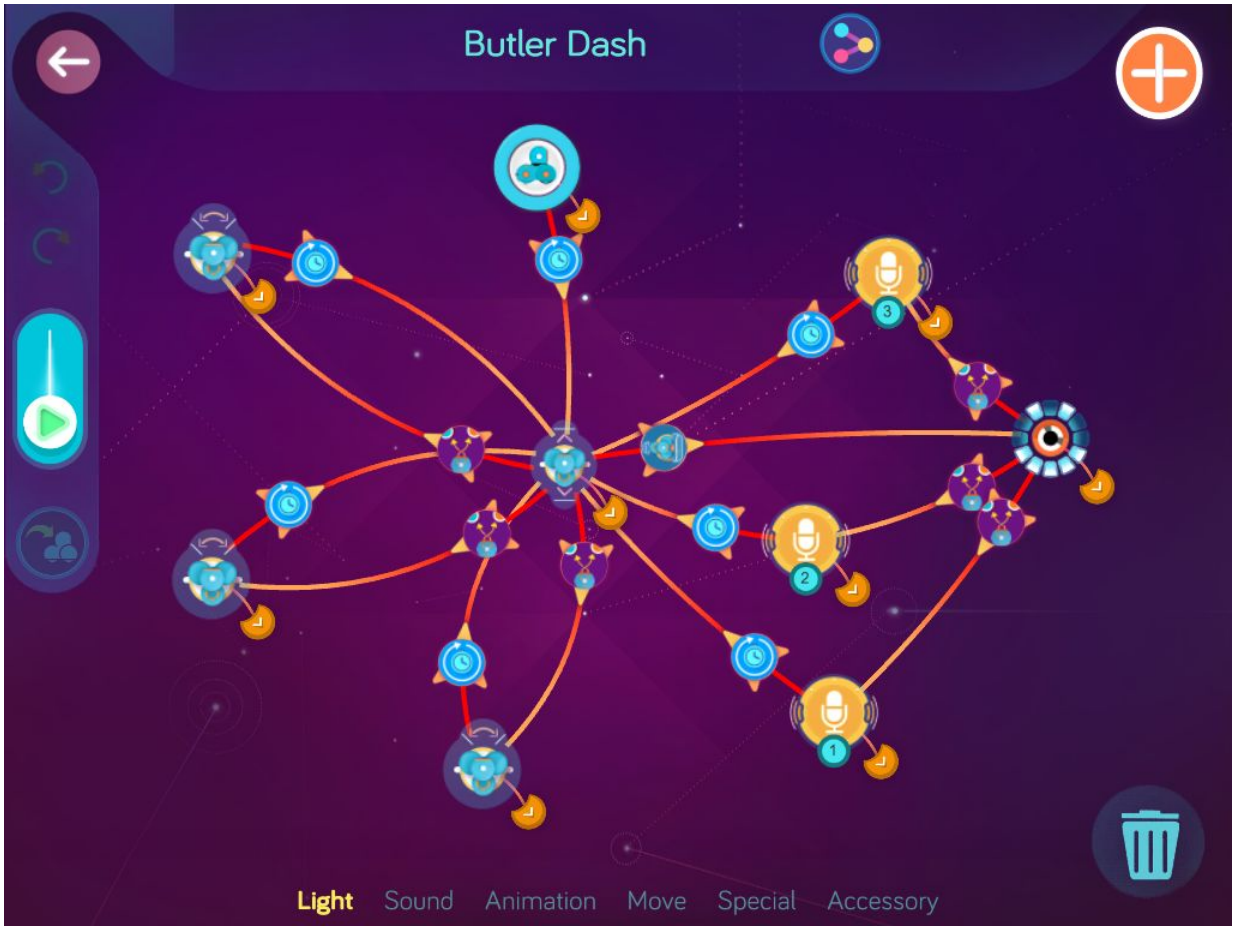


**Step 5**: *While moving forward, make Dash smile if an obstacle is seen in front.*

**Step 6**: Edit the custom sound to make Butler Dash offer some food.

**Step 7**: *After smiling, make Dash randomly choose to play a new custom sound that offers something to eat or drink.*

**Step 8**: *After smiling, make Dash automatically choose to play another custom sound that offers a different kind of food or drink. Then make Dash automatically move forward again.*




**Wonder Key**: inyq

# Level 8: OMG Poppies, Ancient Robot

## Concepts covered

- Program Dash using **Sleep** Animation
- Programming commands as a loop
- Programming a clap as a cue

## Key terms

**Loop**: a set of instructions that a computer program repeats over and over again

## Extension questions

1. What is a loop and how was it used to program OMG Poppies?
2. How was Dash programmed to sleep in OMG Poppies?
3. How was Dash programmed to awaken?
4. What is the difference between the 4 eye light patterns programmed in Ancient Robot?
5. Explain the steps to program Dash to turn off a series of 5 eye lights (one at a time) each time you clap?

# OMG Poppies

Zone: Forgotten Jungle
Challenge Progression 1

**Step 1:** Make Dash automatically go to sleep then automatically turn the lights off. Then make Dash automatically turn off all eye lights.

**Step 2:** *After turning off the eye lights, make Dash wake up when a clap is heard.*

**Step 3:** *After waking up, make Dash wait for 10.0 s then go to sleep again.*


**Wonder Key**: 4jb2

# Ancient Robot

Zone: Forgotten Jungle
Challenge Progression 2

## Solutions

**Step 1**: *Make Dash turn on more eye lights each time you clap.*

**Step 2**: *After smiling, make Dash automatically say a custom message.*


**Wonder Key**: unij

# Level 9: Square Dance, Desert Dash, Dune Buggy

## Concepts covered

- Programming sound effects, e.g., car trouble
- Practicing commands and functions learned in Scroll Quest thus far.

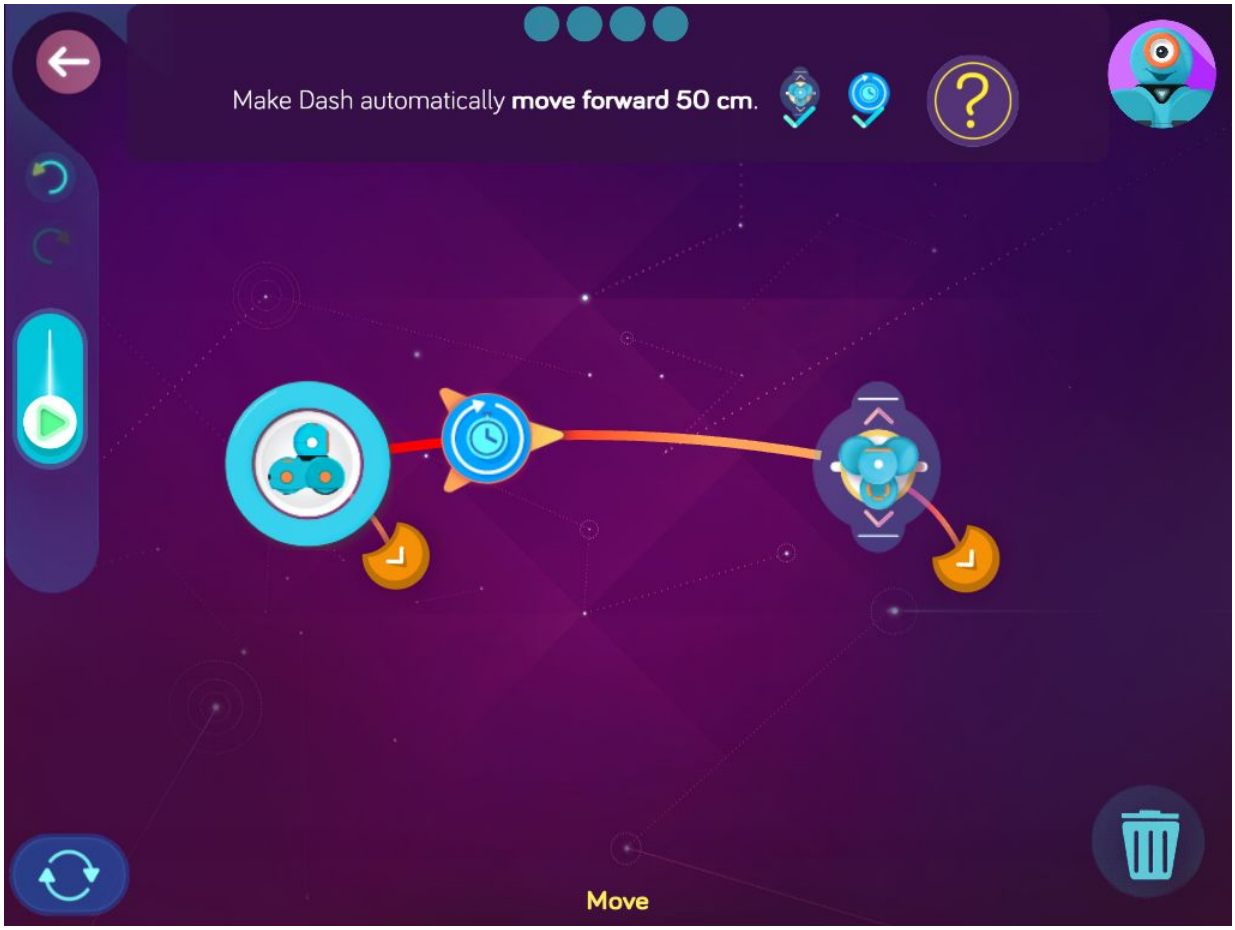
## Extension questions

1. Which direction does Dash spin when set to 90 degrees? How can you reverse the spin?
2. Which commands in the Square Dance were part of a loop?
3. Describe two ways in which the top button was used as a cue in Desert Dash.
4. Describe the commands in the loop that were programmed for Dune Buggy.
5. In Step 4 of Dune Buggy, Dash is programmed to wait for 2.0 s and then stop. What other cue could have been used here in place of the wait for cue? How would it change this program?

# Square Dance

Zone: Dry Gulch
Challenge Progression 1

**Step 1:** *Make Dash automatically move forward 50 cm.*



**Step 2:** *After moving forward, make Dash spin to 90 degrees.*

**Step 3:** *After spinning right, make Dash automatically play a silly sound.*

**Step 4:** *After the silly sound, make Dash automatically move forward 50 cm again.*

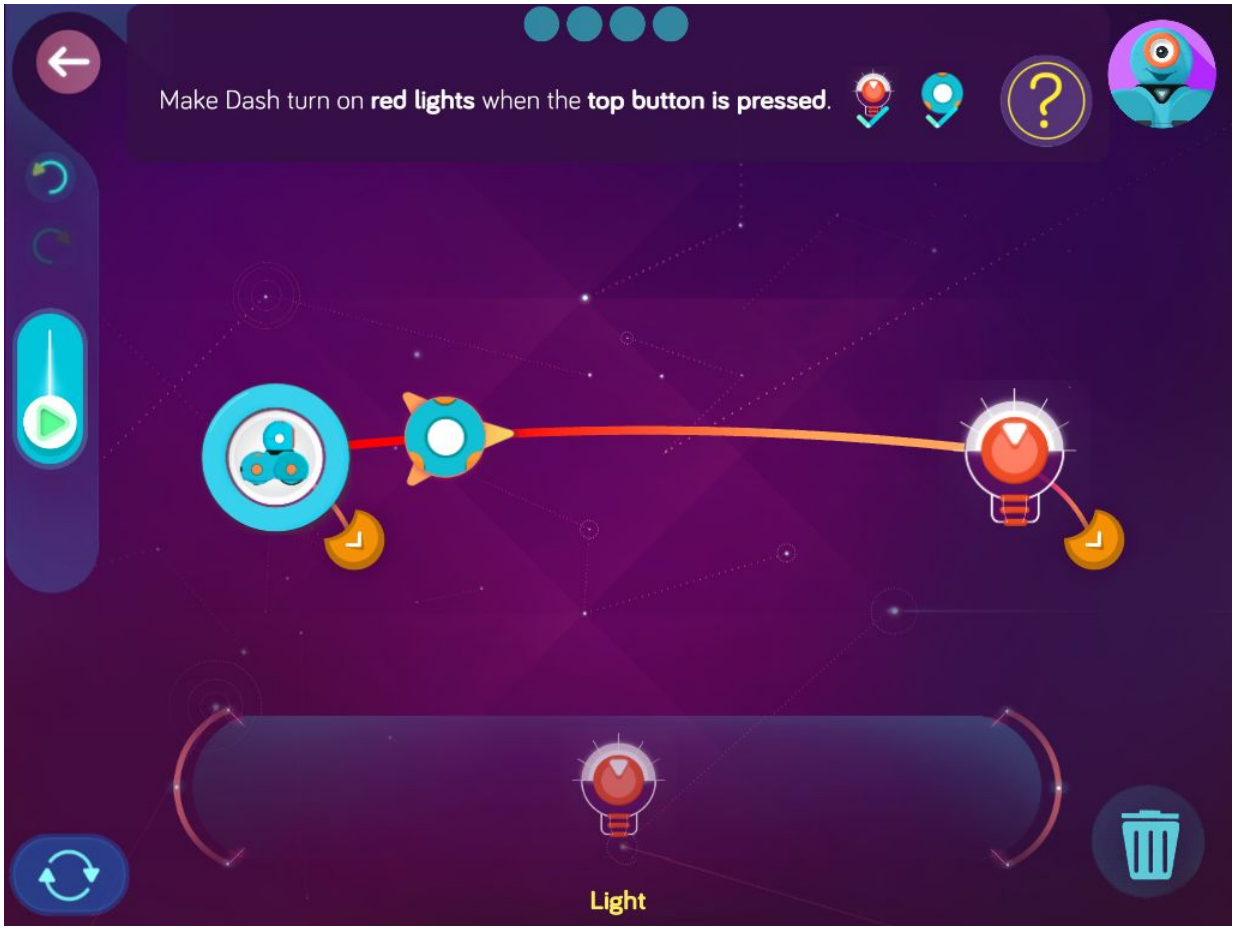

**Wonder Key**: ffrg

# Desert Dash

Zone: Dry Gulch
Challenge Progression 2

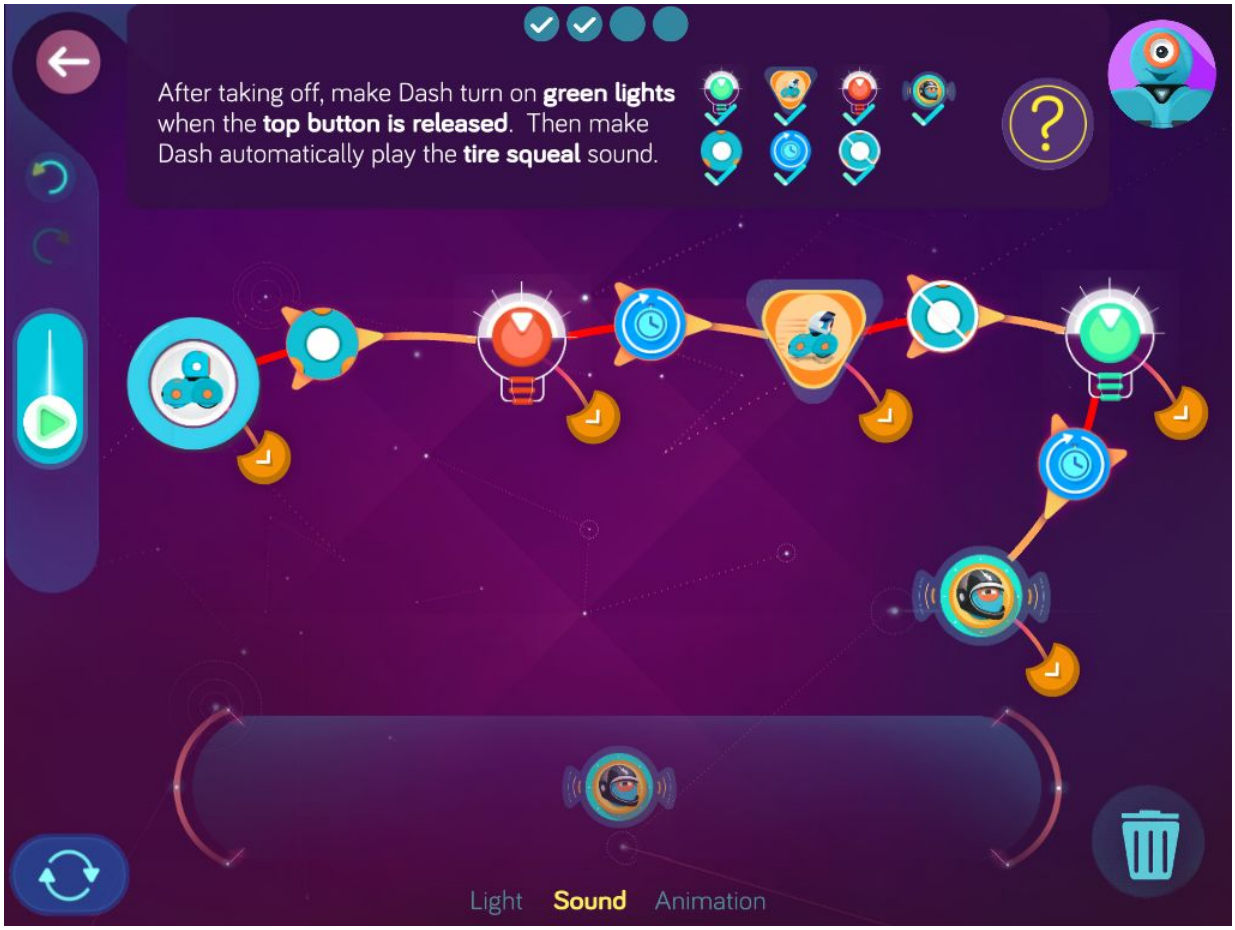
## Solutions

**Step 1**: *Make Dash turn on red lights when the top button is pressed.*



**Step 2**: *After turning on red lights, make Dash automatically take off.*

**Step 3**: *After taking off, make Dash turn on green lights when the top button is released. Then make Dash automatically play the tire squeal sound.*



**Step 4**: *After playing the tire squeal sound, make Dash instantly move forward with both wheels set to 80 cm/s.*

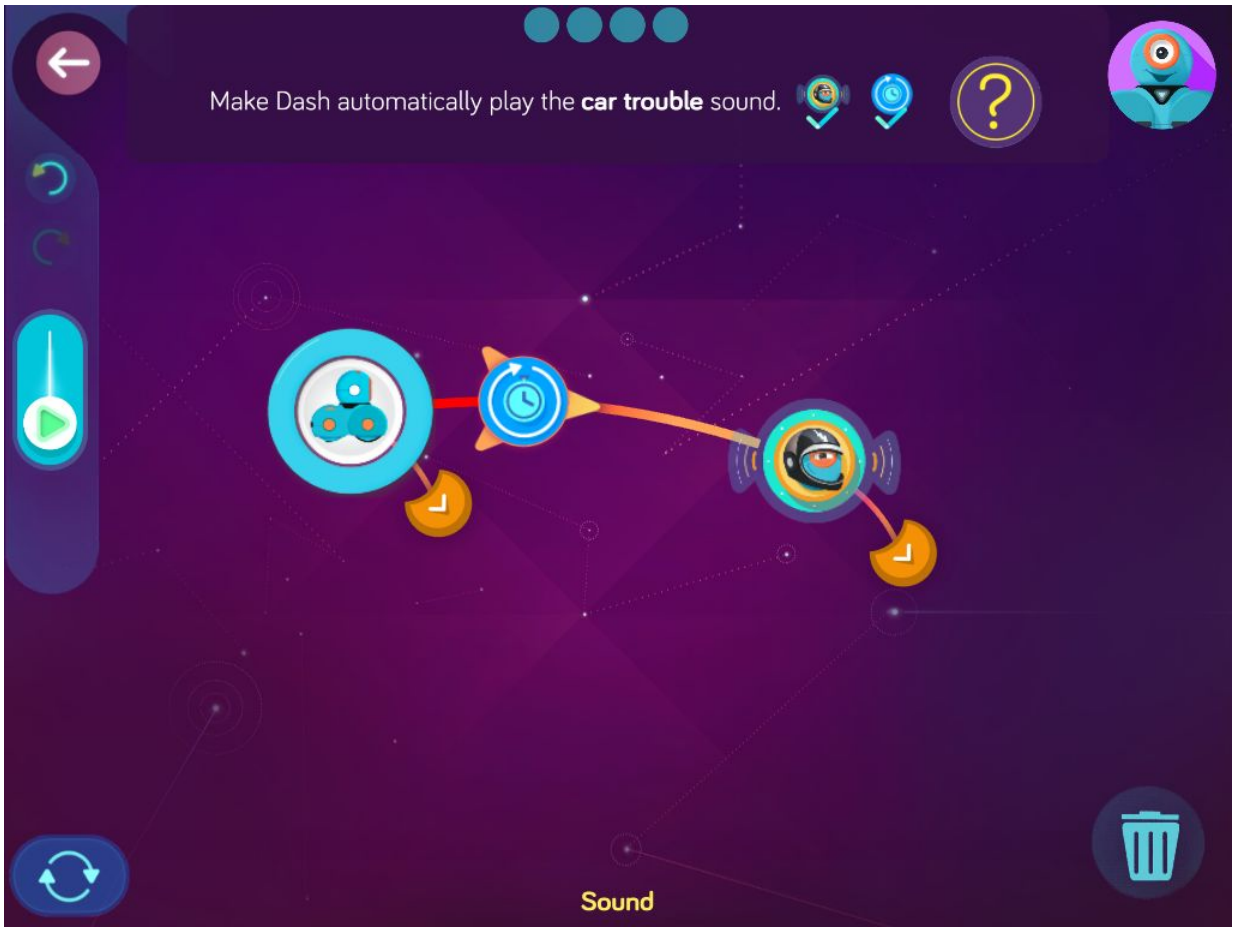

**Wonder Key**: ymyr

# Dune Buggy

Zone: Dry Gulch
Challenge Progression 3

## Solutions

**Step 1**: *Make Dash automatically play the car trouble sound.*



**Step 2**: *After playing the car trouble sound, make Dash automatically return to Start.*

**Step 3**: *While playing the car trouble sound, make Dash take off when Dash moves forward or moves backward.*

**Step 4**: *After taking off, make Dash automatically move forward at 80 cm/s. Then make Dash wait for 2.0 s and stop.*


**Wonder Key**: ndzb

# Level 10: Itchy Lion

## Concepts covered

Programming Dash to turn toward your voice when you speak
Programming Dash to sense obstacles seen from close behind and cue the next state

## Key Terms

**Obstacle**: an object or person blocking Dash in front or behind.

## Extension questions

1. How did you program the obstacle cue to detect what was close behind Dash?
2. Can you think of a situation in which this cue would be helpful in a program?
3. Which animal sound is NOT included in the animal sound menu that you think should be?
4. How could you record this animal sound to add to your own program?
5. In the final step of Itchy Lion, Dash instantly Dances Left. What would happen if Dash had been programmed to automatically Dance Left? How are the instant and auto cues different? Explain.

# Itchy Lion

Zone: Big Cat Canyon
Challenge Progression 1

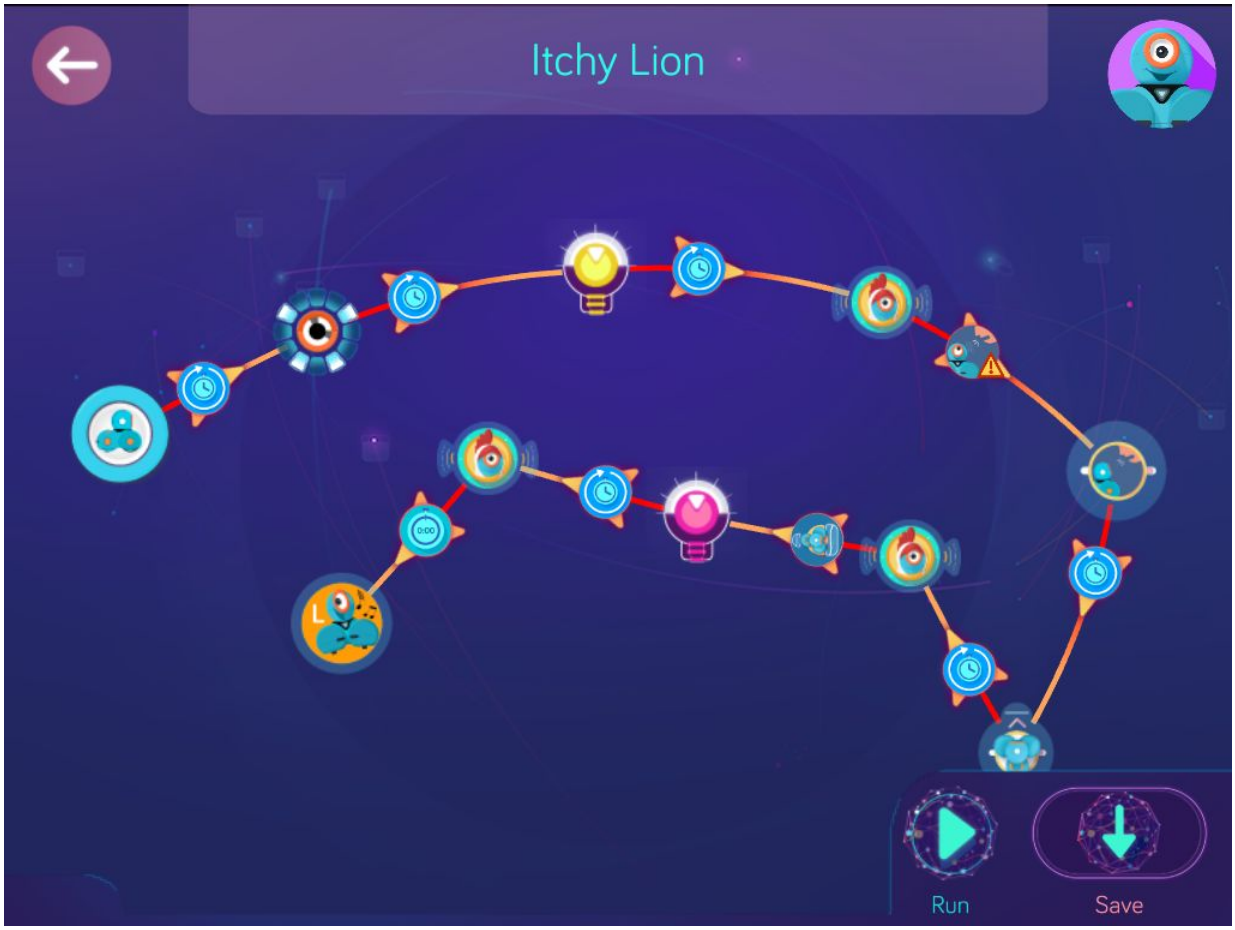
**Step 1:** *Make Dash automatically turn on yellow lights and automatically play the lion sound. Then make Dash instantly show the pattern in the eye ring.*

**Step 2:** *After the eye ring, make Dash turn to your voice when you speak.*

**Step 3:** *After Dash turns to the voice, make Dash automatically move forward 30 cm. Then make Dash automatically play another lion sound.*

**Step 4:** *After Dash plays the second lion sound, make Dash turn on magenta lights when an obstacle is seen close behind.*

**Step 5:** *After Dash turns on magenta lights, make Dash automatically play a cat sound. Then make Dash instantly dance left.*




**Wonder Key**: vote

# Level 11: Dashlight, The Listener, Reacher Creature, Ogre of Darkness

## Concepts covered

Review of concepts covered in previous Scroll Quest Challenges:
Turning lights on and off
Turning eye lights on and off
Programming a spin using wheel differential
Programming using the top button: pushed or released as a cue
Programming the Listener cue

**New Concepts:**
Programming **Search** cue
Programming the Listener to **Do Nothing**

## Key Terms

**Listener**: this state waits until a cue causes it to put Dash into a new state.

## Extension questions

1. In Step 2 of Dashlight, you programmed Dash to spin by setting the left wheel to -20 cm/s and the right wheel set to 20 cm/s. What would have happened if you had set the left wheel to -20 and the right wheel to 40? Explain the results.
2. How would you rate Dash's speed at 20 cm/s? Fast? Slow? In between?
3. In The Listener, which cue prompted the Listener to move onto a new state?
4. In Step 3 of The Listener, when was the proper time to speak, so that Dash could hear you? (When the robot was paused. Dash cannot hear voice commands when its motor is running.)
5. In Step 3 of Reacher Creature, what was the purpose of the loop? Explain.
6. In Ogre of Darkness share some of the ways you programmed Dash to appear to be sleeping.

# Dashlight

Zone: Castle Creepenstein
Challenge Progression 1

**Step 1:** *Make Dash automatically turn the lights off then automatically turn off all eye lights.*

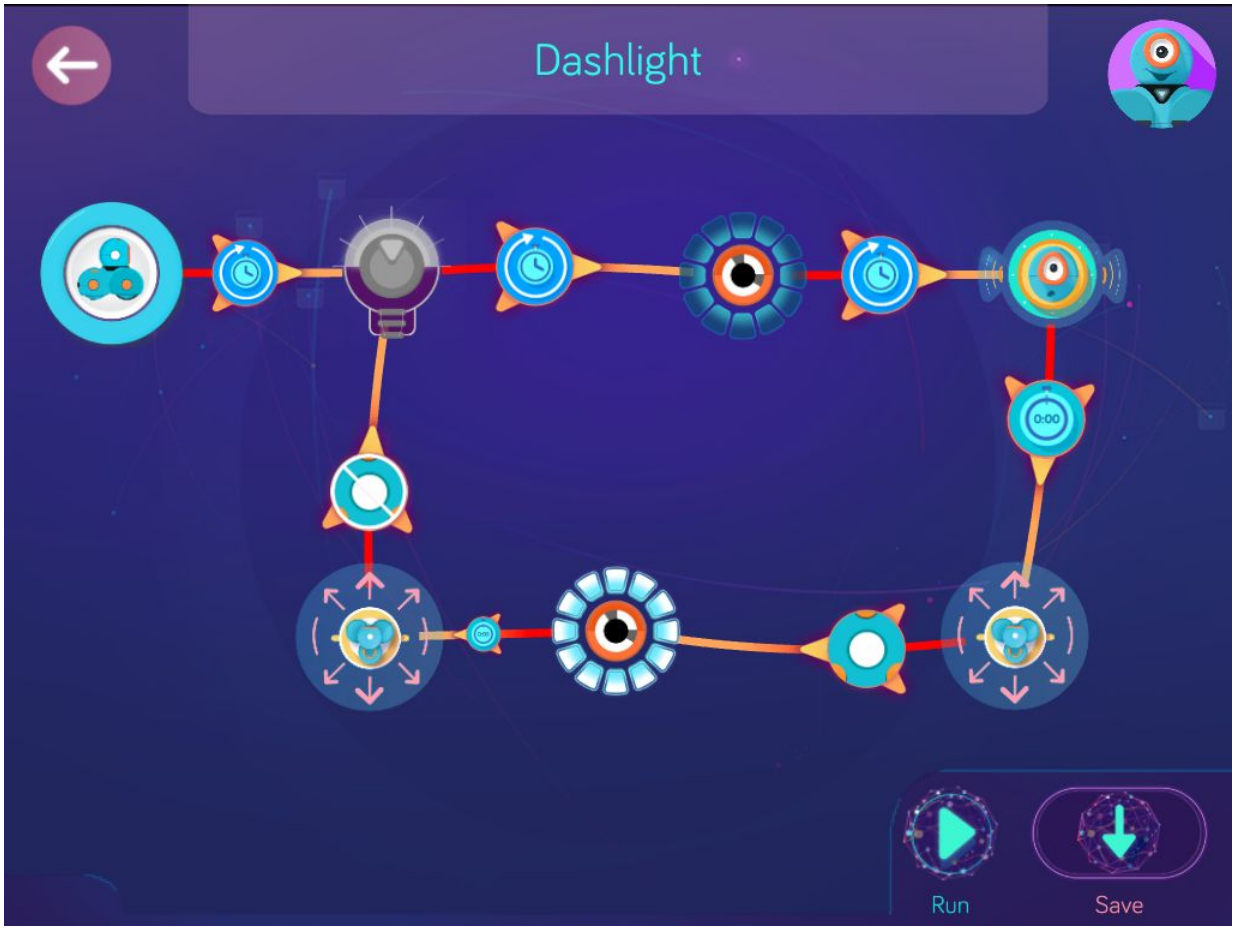
**Step 2:** *After turning off the eye lights, make Dash automatically say, “Oh no!”. Then make Dash instantly start spinning with the left wheel set to -20 cm/s and the right wheel set to 20 cm/s.*

**Step 3:** *After spinning, make Dash turn on all eye lights when the top button is pressed.*

**Step 4:** *After turning on the eye lights, make Dash instantly move forward with both wheels set to 20 cm/s.*

**Step 5:** *After moving forward, make Dash turn the lights off again when the top button is released.*

**Step 6:** *PLAY WITH DASH: Help Dash escape from Castle Creepenstein! Press the top button to make Dash move forward three times.*

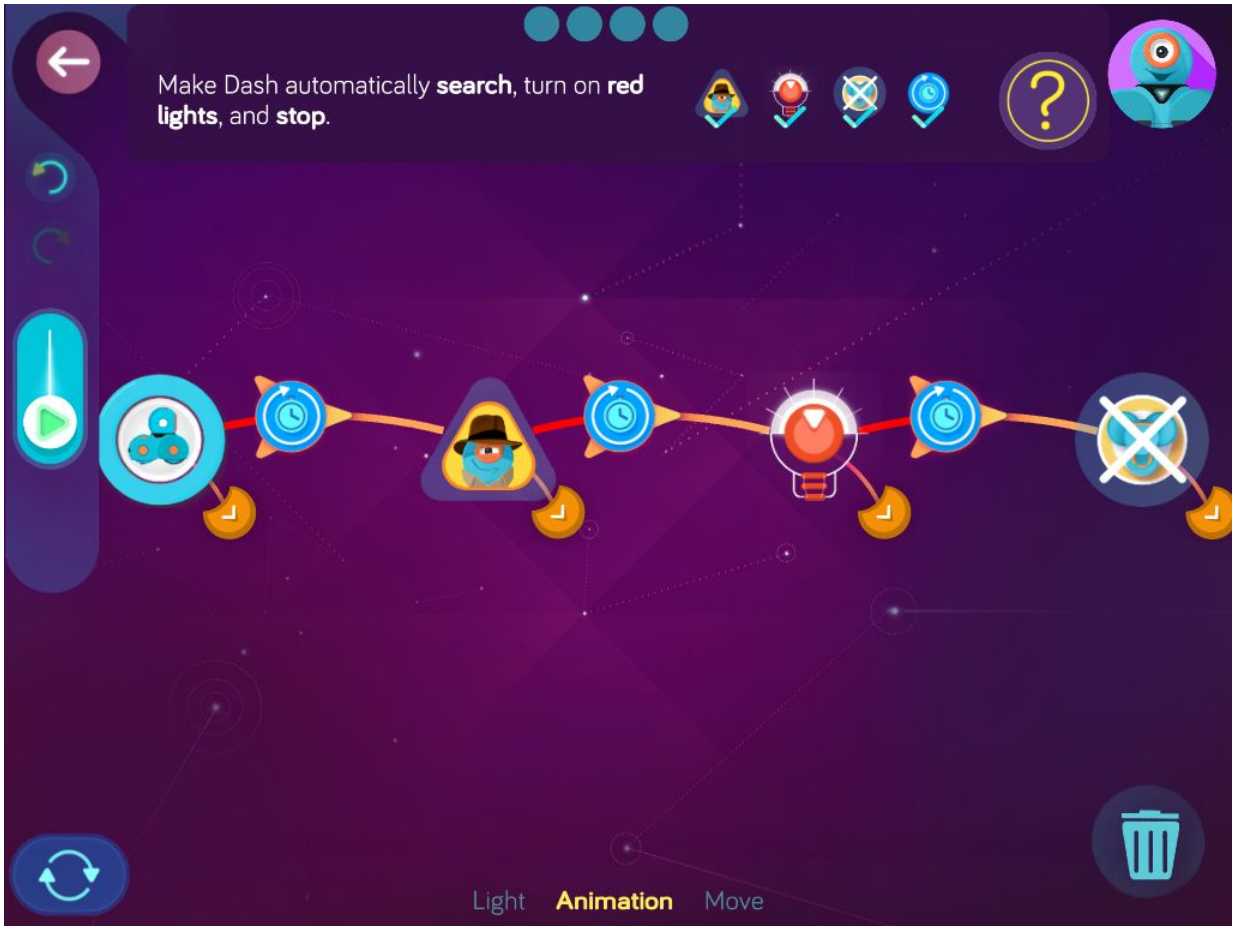



**Wonder Key**: u92f

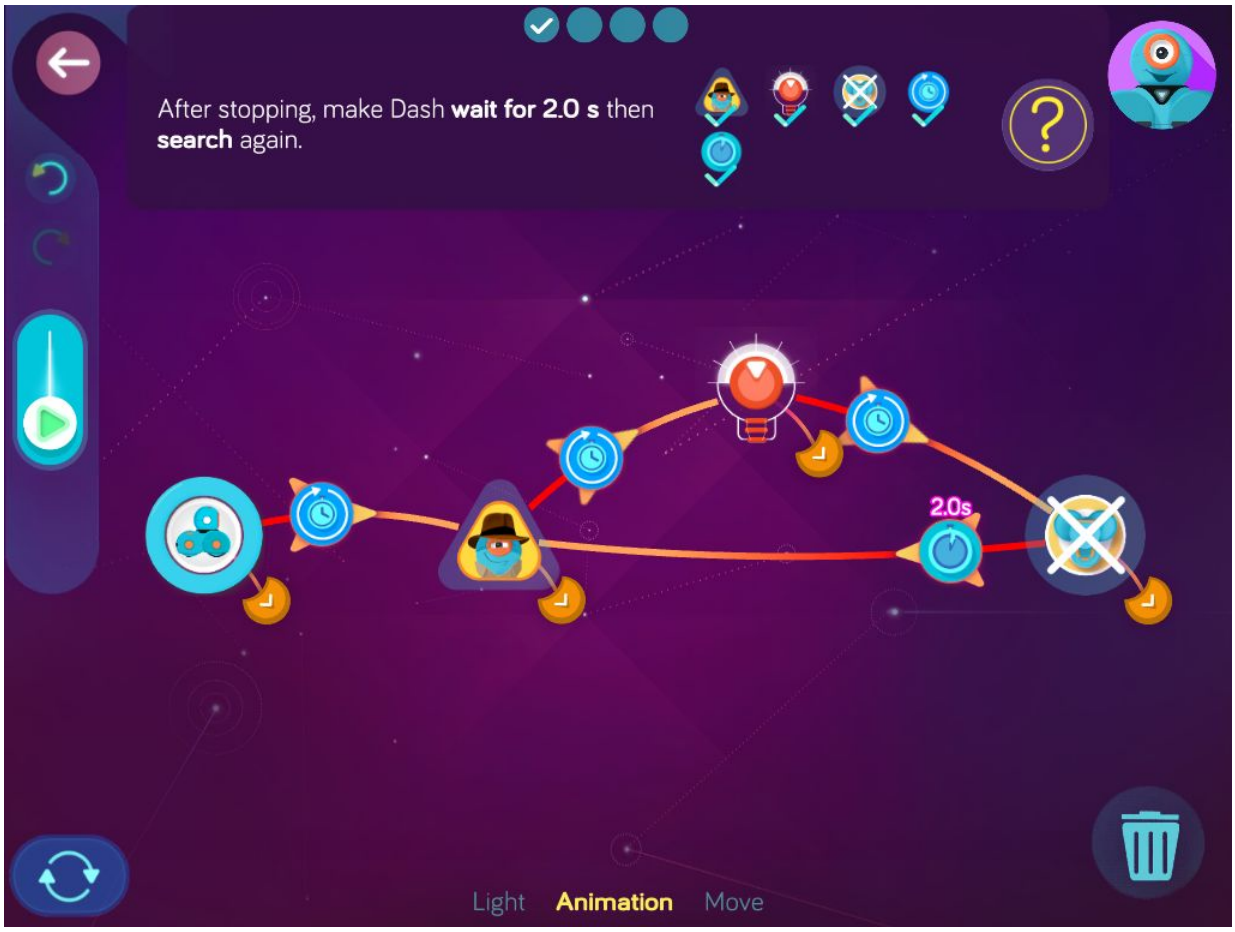
# The Listener

Zone: Castle Creepenstein
Challenge Progression 2

**Step 1:** *Make Dash automatically search, turn on red lights, and stop.*

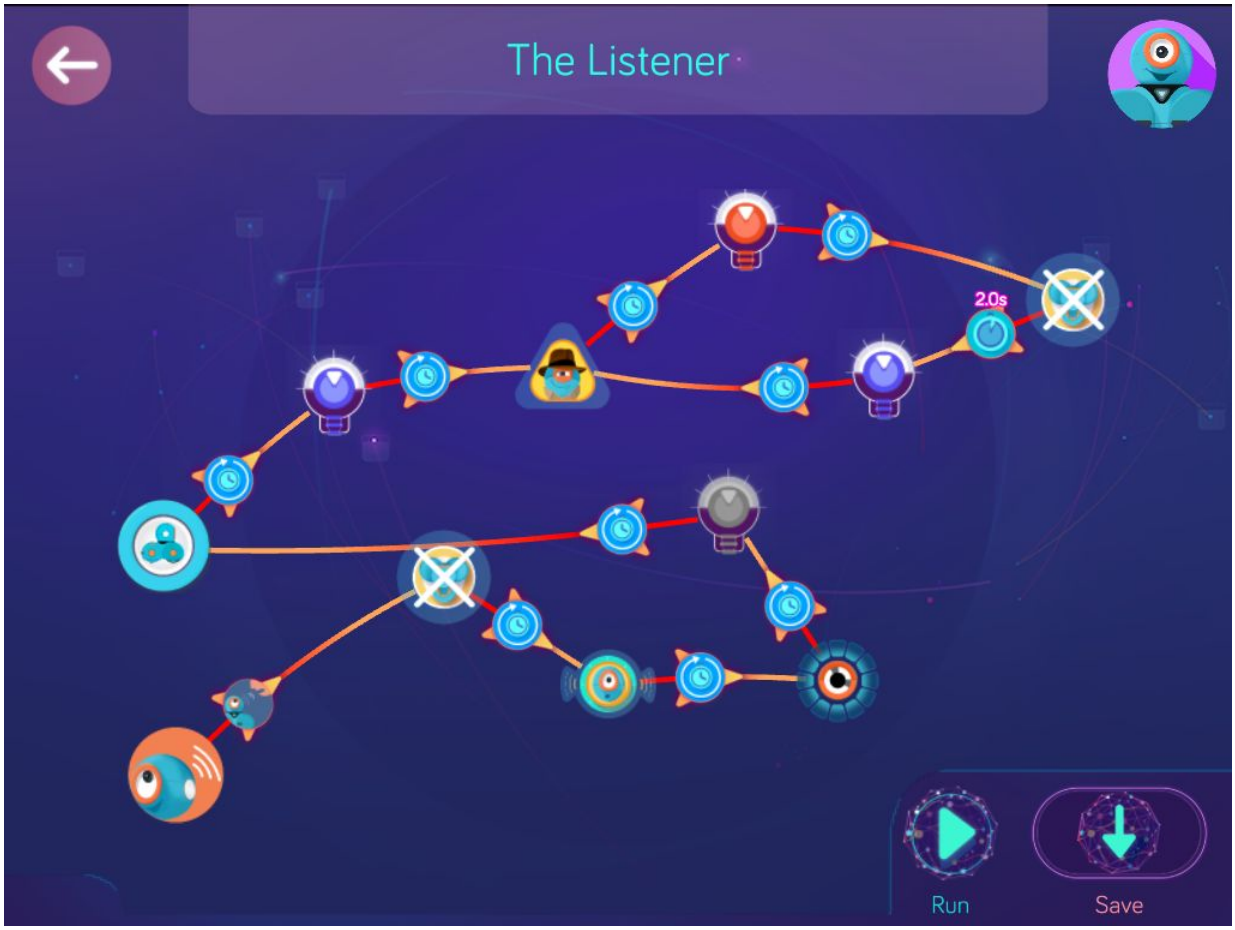


**Step 2:** *After stopping, make Dash wait for 2.0 s then search again.*



**Step 3**: *Make Dash use the Listener to turn the lights off when a voice is heard. Then make Dash automatically say, “Oh no!” and turn off all eye lights.*

**Step 4**: *After turning off the eye lights, make Dash wait for 3.0 s then look around. Then make Dash automatically search again.*




**Wonder Key**: i75a

# Reacher Creature

Zone: Castle Creepenstein
Challenge Progression 3

**Step 1:** *Make Dash automatically play the Whistle #1 sound then instantly move forward with both wheels set to 15 cm/s.*

**Step 2:** *When Dash is moving forward, if Dash is picked up, make Dash say, “Help!” and automatically push to try and get away.*

**Step 3:** *After pushing to get away, make Dash stop if Dash it put down. Then make Dash automatically say “Ahh” and play the Whistle #1 sound again.*


**Wonder Key**: tso4

# Ogre of Darkness

Zone: Castle Creepenstein
Challenge Progression 4

**Step 1:** *Make Dash automatically turn on red lights, show a pattern in the eye ring, play the growl sound, and move forward.*

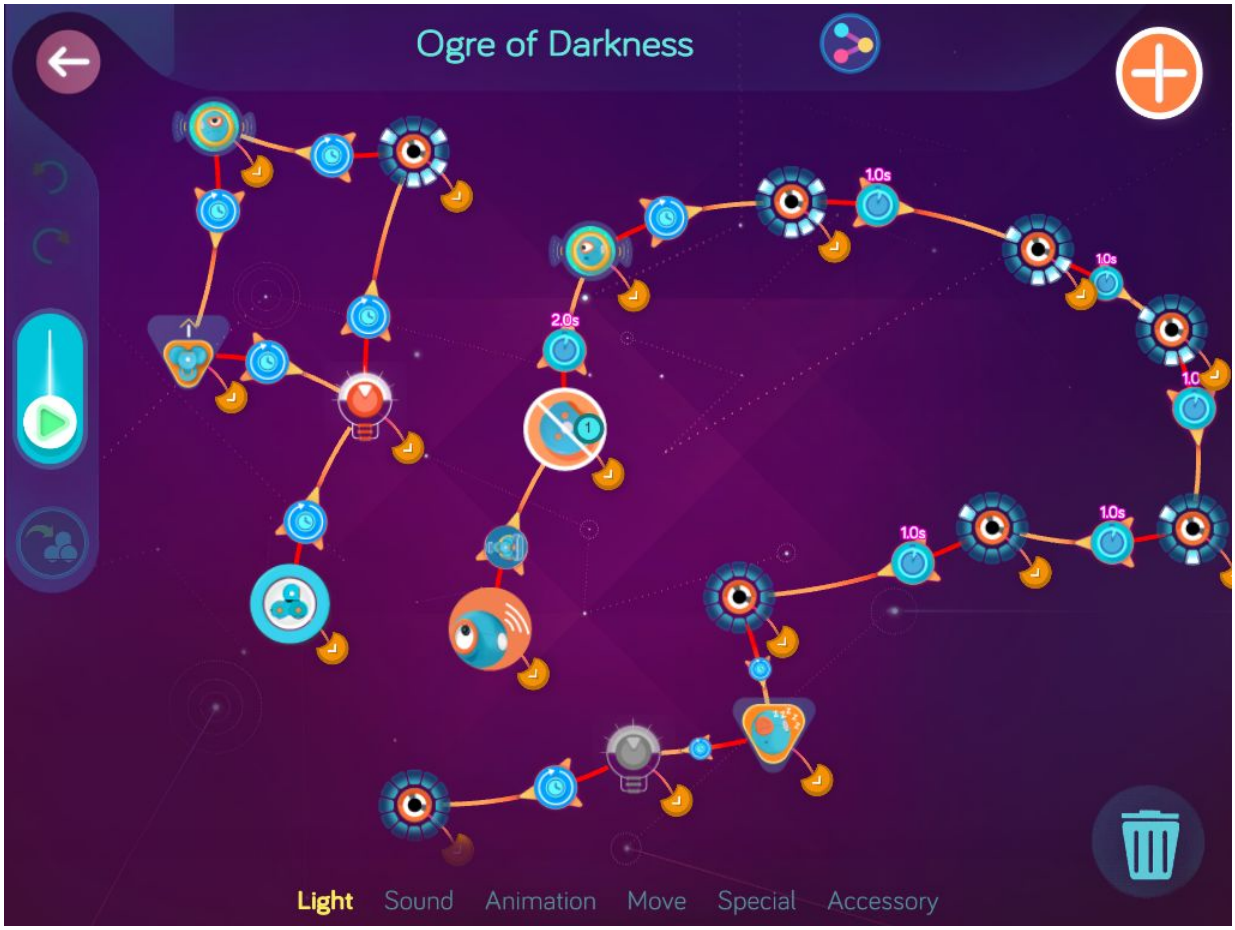
**Step 2:** *After moving forward, make Dash automatically turn on red lights again.*

**Step 3:** *Make Dash use the listener to do nothing when an obstacle is seen close behind Dash.*

**Step 4:** *After doing nothing, make Dash wait for 2.0 s then say, “Help!”.*

**Step 5:** *Make Dash turn off an eye light every 1.0 s. Make Dash finish with all of the eye lights turned off.*

**Step 6:** *After turning off the eye lights, make Dash automatically go to sleep. Then make Dash automatically turn the lights off and automatically turn off the eye lights again.*




**Wonder Key**: ewrx