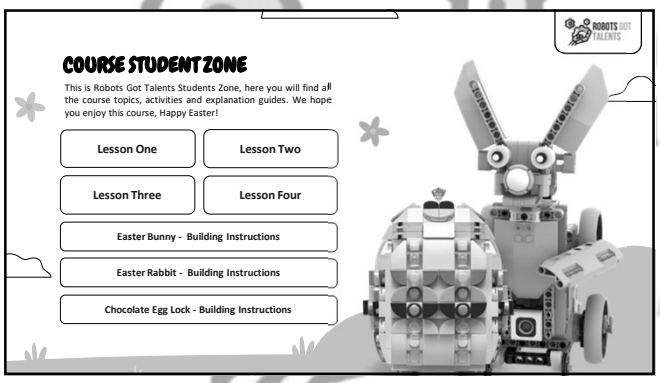

ROBOTS GOT TALENTS® 2026
MISSION EASTER
Spike Prime Classroom Camp

1


COURSE STUDENT ZONE
This is Robots Got Talents Students Zone, here you will find all the course topics, activities and explanation guides. We hope you enjoy this course, Happy Easter!
Lesson One
Lesson Two
Lesson Three
Lesson Four
Easter Bunny - Building Instructions
Easter Rabbit - Building Instructions
Chocolate Egg Lock - Building Instructions

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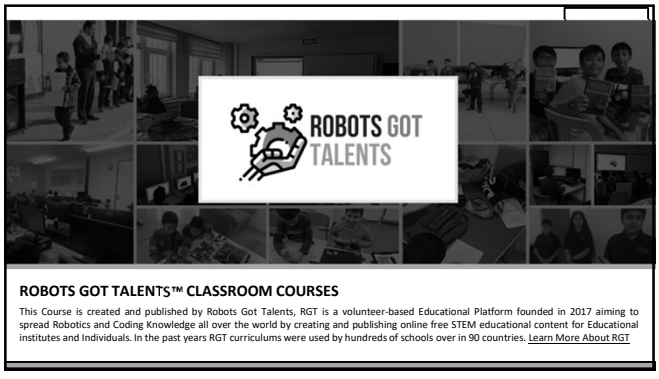
ROBOTS GOT TALENTS
ROBOTS GOT TALENTS™ CLASSROOM COURSES
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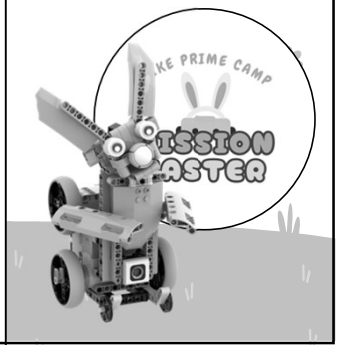
TOPICS COVERED:

- Characteristics of robots
- Introduction to Spike Prime
- Spike Prime Main Components
- Building Exercise 1 - Easter Bunny
- Introduction to Spike Word Blocks Programming & Spike App
- Blocks Categories
- Motor Blocks
- Programming Exercises 1-6



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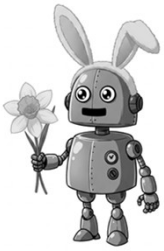
WHAT IS THE FIRST THING THAT COMES TO YOUR MIND WHEN YOU THINK OF A ROBOT ?

When we think about robots, we often imagine machines that are like humans or have special powers like the ones in Star Wars or Terminator movies. But most of these exciting robots only exist in stories and movies. You won't see them walking around outside soon. Still, people from all around the world are working on making robots that are a bit like humans, such as Asimo by Honda, Pepper by Softbank, and Atlas by Boston Dynamics. These robots are pretty cool, but they're not as amazing as the ones in movies or books yet.

The robots we actually see more often are the ones designed to do tasks that are too dangerous, boring, or repetitive for people. For instance, there are robots in factories that help with lifting heavy things or doing very accurate work. Even though they do similar jobs, each robot might look and work differently. Remember, robots have lots of different uses, from exploring space to being used in fun activities.



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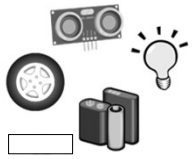
A ROBOT HAS THESE ESSENTIAL CHARACTERISTICS:

Robots don't have a single definition, but certain characteristics are necessary for a machine to be considered one. These characteristics help determine what components or capabilities a robot should have.



Sensing: It uses special tools called sensors to understand what's happening around it.

Movement: It can move from one point to another or move its parts using motors.

Power/ Energy: It has a way to get power, like a battery, solar energy or electricity.

Intelligence: It can think a bit on its own and make decisions based on its programming.

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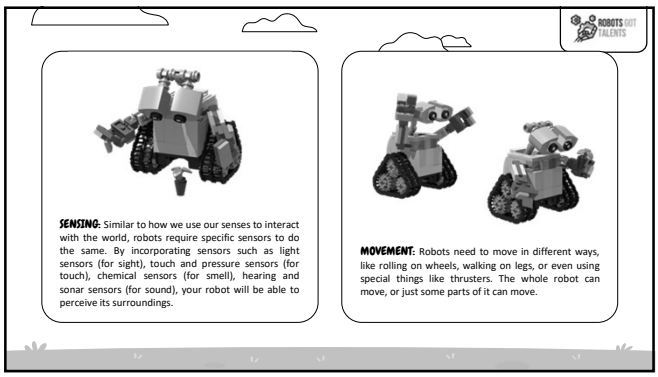
SENSING: Similar to how we use our senses to interact with the world, robots require specific sensors to do the same. By incorporating sensors such as light sensors (for sight), touch and pressure sensors (for touch), chemical sensors (for smell), hearing and sonar sensors (for sound), your robot will be able to perceive its surroundings.
MOVEMENT: Robots need to move in different ways, like rolling on wheels, walking on legs, or even using special things like thrusters. The whole robot can move, or just some parts of it can move.

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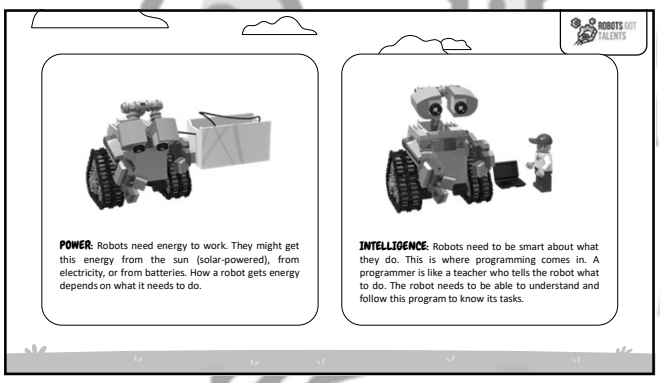
POWER: Robots need energy to work. They might get this energy from the sun (solar-powered), from electricity, or from batteries. How a robot gets energy depends on what it needs to do.
INTELLIGENCE: Robots need to be smart about what they do. This is where programming comes in. A programmer is like a teacher who tells the robot what to do. The robot needs to be able to understand and follow this program to know its tasks.

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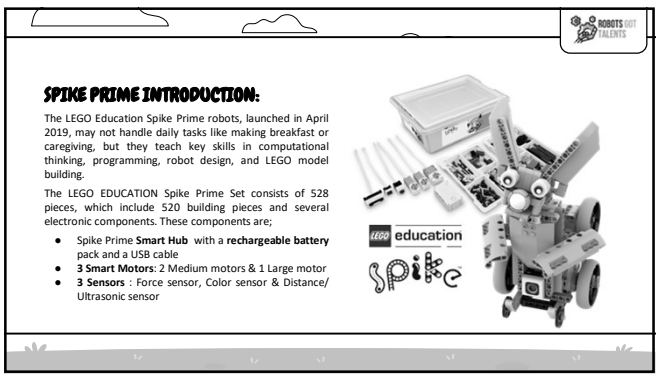
SPIKE PRIME INTRODUCTION:
The LEGO Education Spike Prime robots, launched in April 2019, may not handle daily tasks like making breakfast or caregiving, but they teach key skills in computational thinking, programming, robot design, and LEGO model building.
The LEGO EDUCATION Spike Prime Set consists of 528 pieces, which include 520 building pieces and several electronic components. These components are;
- Spike Prime **Smart Hub** with a **rechargeable battery** pack and a USB cable
- **3 Smart Motors**: 2 Medium motors & 1 Large motor
- **3 Sensors** : Force sensor, Color sensor & Distance/ Ultrasonic sensor
education
spike

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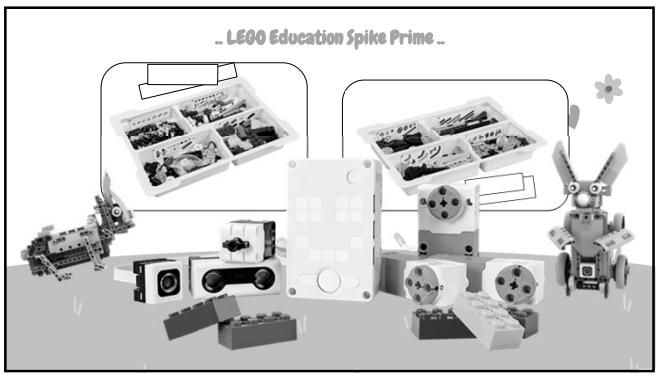
.. LEGO Education Spike Prime ..

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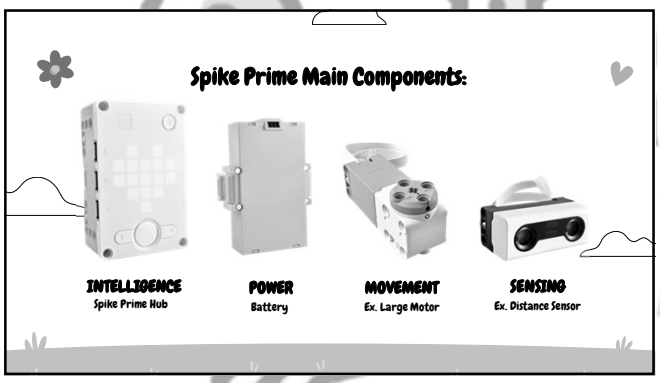
Spike Prime Main Components:
INTELLIGENCE
Spike Prime Hub
POWER
Battery
MOVEMENT
Ex. Large Motor
SENSING
Ex. Distance Sensor

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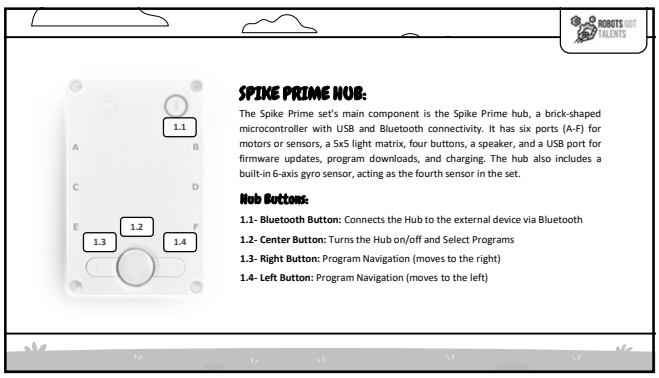
SPIKE PRIME HUB:
The Spike Prime set's main component is the Spike Prime hub, a brick-shaped microcontroller with USB and Bluetooth connectivity. It has six ports (A-F) for motors or sensors, a 5x5 light matrix, four buttons, a speaker, and a USB port for firmware updates, program downloads, and charging. The hub also includes a built-in 6-axis gyro sensor, acting as the fourth sensor in the set.
Hub Buttons:
1.1- Bluetooth Button: Connects the Hub to the external device via Bluetooth
1.2- Center Button: Turns the Hub on/off and Select Programs
1.3- Right Button: Program Navigation (moves to the right)
1.4- Left Button: Program Navigation (moves to the left)
1.1
1.2
1.3
1.4

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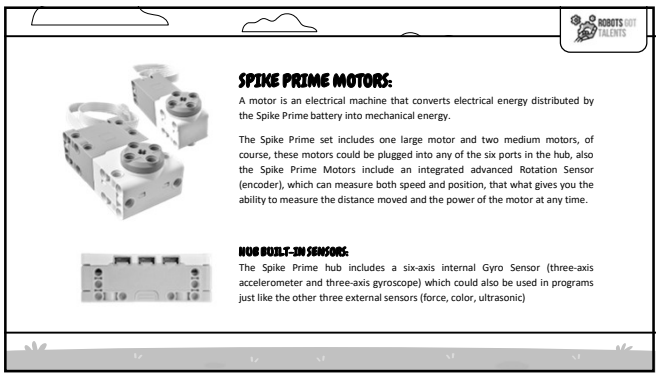
SPIKE PRIME MOTORS:
A motor is an electrical machine that converts electrical energy distributed by the Spike Prime battery into mechanical energy.
The Spike Prime set includes one large motor and two medium motors, of course, these motors could be plugged into any of the six ports in the hub, also the Spike Prime Motors include an integrated advanced Rotation Sensor (encoder), which can measure both speed and position, that what gives you the ability to measure the distance moved and the power of the motor at any time.
HUB BUILT-IN SENSORS:
The Spike Prime hub includes a six-axis internal Gyro Sensor (three-axis accelerometer and three-axis gyroscope) which could also be used in programs just like the other three external sensors (force, color, ultrasonic)

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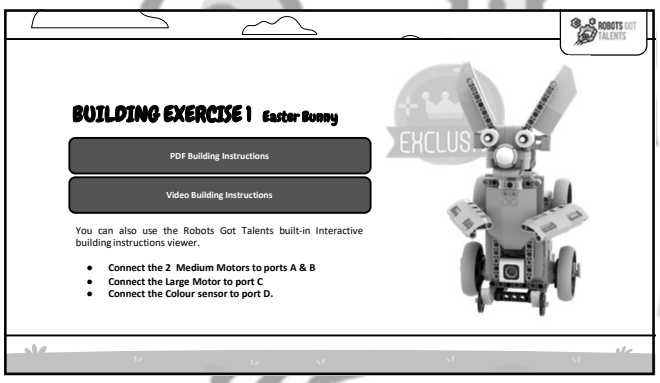
BUILDING EXERCISE 1 Easter Bunny
PDF Building Instructions
Video Building Instructions
You can also use the Robots Got Talents built-in Interactive building instructions viewer.
Connect the 2 Medium Motors to ports A & B
Connect the Large Motor to port C
Connect the Colour sensor to port D.

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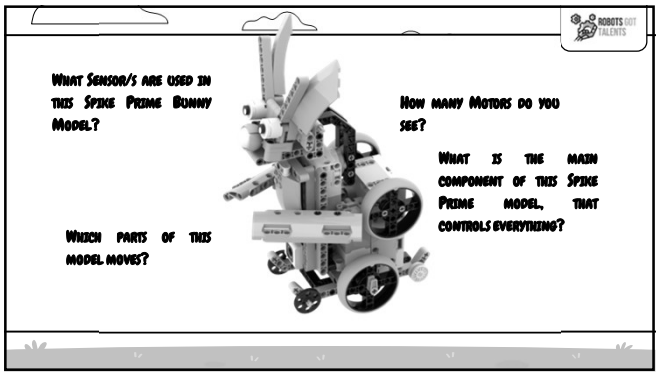
What Sensor/s are used in this Spike Prime Bunny Model?
Which parts of this model moves?
How many Motors do you see?
What is the main component of this Spike Prime model, that controls everything?

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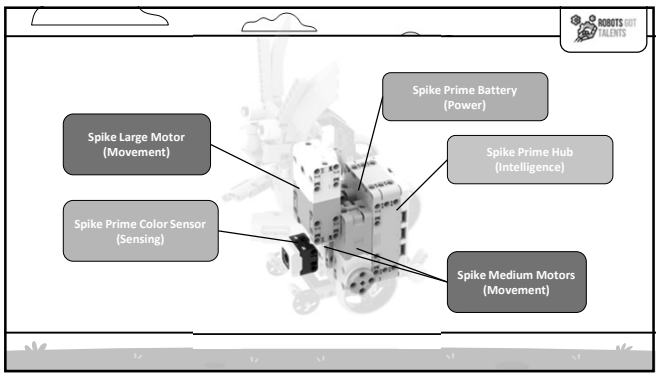
Spike Prime Battery (Power)
Spike Large Motor (Movement)
Spike Prime Hub (Intelligence)
Spike Prime Color Sensor (Sensing)
Spike Medium Motors (Movement)

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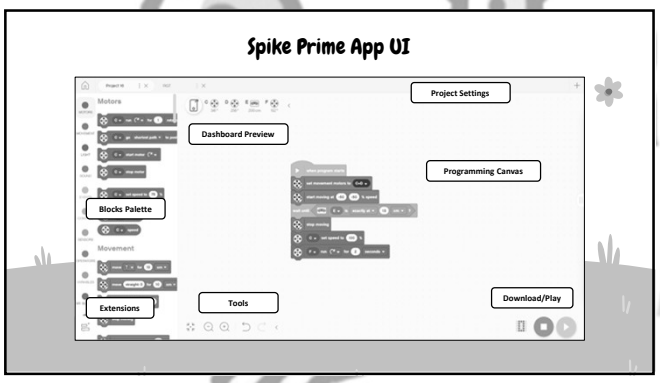
Spike Prime App UI
Project Settings
Dashboard Preview
Programming Canvas
Blocks Palette
Tools
Download/Play
Extensions

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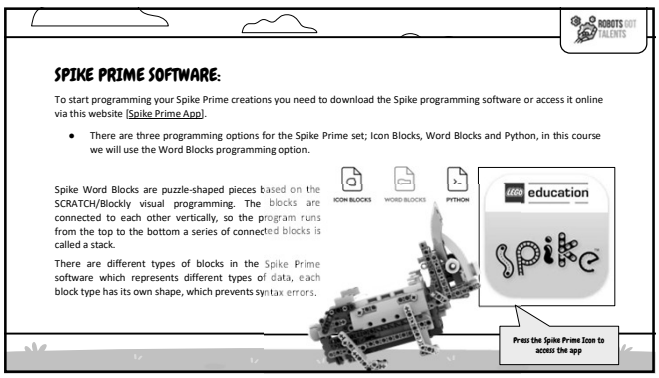
SPIKE PRIME SOFTWARE:
To start programming your Spike Prime creations you need to download the Spike programming software or access it online via this website [Spike Prime App].
There are three programming options for the Spike Prime set; Icon Blocks, Word Blocks and Python, in this course we will use the Word Blocks programming option.
Spike Word Blocks are puzzle-shaped pieces based on the SCRATCH/Blockly visual programming. The blocks are connected to each other vertically, so the program runs from the top to the bottom a series of connected blocks is called a stack.
There are different types of blocks in the Spike Prime software which represents different types of data, each block type has its own shape, which prevents syntax errors.
ICON BLOCKS
WORD BLOCKS
PYTHON
Press the Spike Prime Icon to access the app

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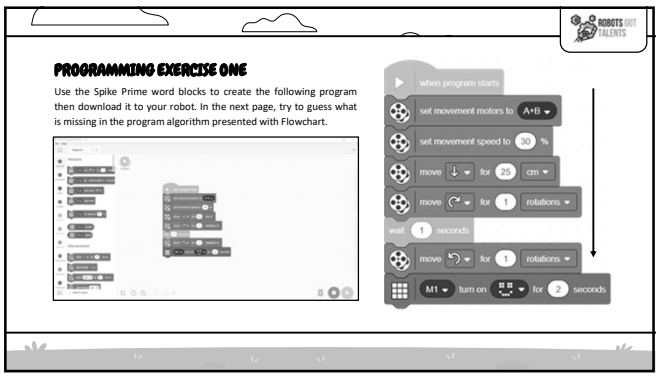
PROGRAMMING EXERCISE ONE
Use the Spike Prime word blocks to create the following program then download it to your robot. In the next page, try to guess what is missing in the program algorithm presented with Flowchart.
when program starts
set movement motors to A+B
set movement speed to 30 %
move for 25 cm
move for 1 rotations
wait 1 seconds
move for 1 rotations
M1 turn on for 2 seconds

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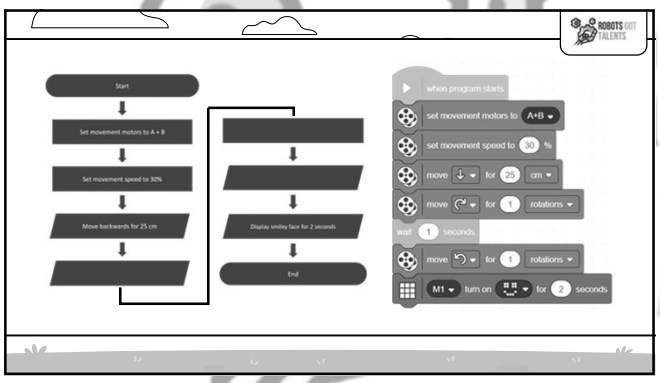
Start
Set movement motors to A + B
Set movement speed to 30%
Move backwards for 25 cm
Display smiley face for 2 seconds
End
when program starts
set movement motors to A+B
set movement speed to 30 %
move for 25 cm
move for 1 rotations
wait 1 seconds
move for 1 rotations
M1 turn on for 2 seconds

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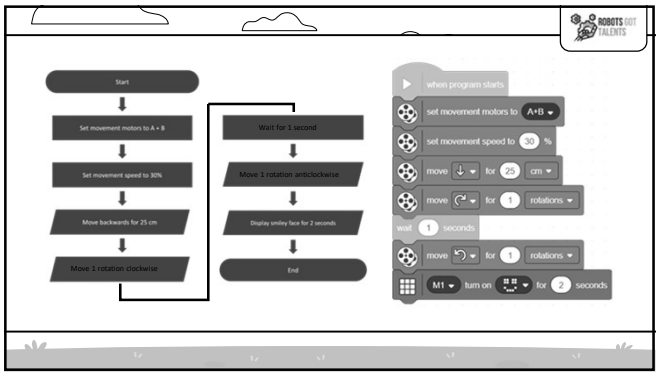
Start
Set movement motors to A + B
Set movement speed to 30%
Move backwards for 25 cm
Move 1 rotation clockwise
Wait for 1 second
Move 1 rotation anticlockwise
Display smiley face for 2 seconds
End
when program starts
set movement motors to A+B
set movement speed to 30 %
move for 25 cm
move for 1 rotations
wait 1 seconds
move for 1 rotations
M1 turn on for 2 seconds

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Blocks Categories:

In Spike Prime software, blocks are grouped into 10 categories based on functionality. Blocks within the same category share the same color for easy identification—for example, Motor Blocks are blue, and Event Blocks are yellow. This color-coding enhances project organization and makes it easier to access and distinguish different block functions.

MOTORS MOVEMENT LIGHT SOUND EVENTS CONTROL SENSORS OPERATORS VARIABLES MY BLOCKS

It is also very important not to mix up between the Types of Blocks and the Categories of Blocks, Some Categories might have different types of blocks like the Sensor Blocks, which include Boolean, reporter, and stack blocks.

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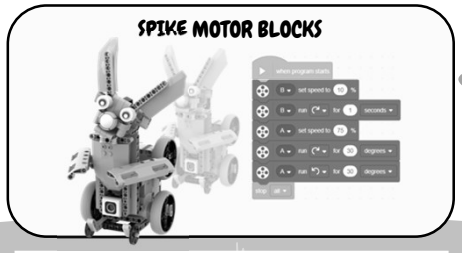
SPIKE MOTOR BLOCKS



The motor blocks are the blue colored blocks at the top of the blocks palette, these blocks are responsible for controlling single or multiple Spike Prime motors and getting their readings. Category consists of f 7 blocks; 5 stack blocks, and 2 reporter blocks.

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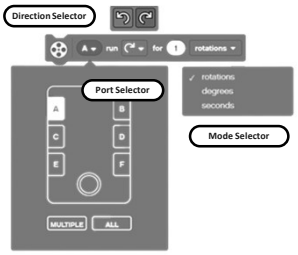
MOTOR BLOCKS STRUCTURE:

Port Selector: Use the port selector to select the motor/s which you want to control with the block, you can select one or more motors by pressing its letter.

Direction Selector: Use the direction selector to choose whether the motor/s should move clockwise or anti clockwise.

Mode Selector: Use the mode selector to choose how would you like the motor/s to operate. Motors Blocks has only three modes; rotations, degrees, and seconds.

Important Note: Motor Blocks with no speed input field will operate the motor/s in the default speed 75%, but the speed could be defined by placing a Set Motor Speed Block before the chosen block.



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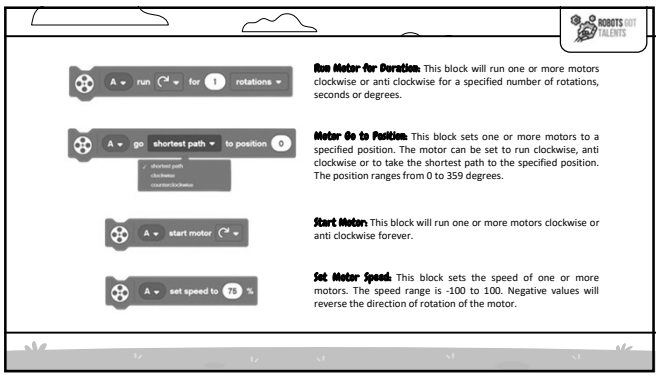
A run for 1 rotations
A go shortest path to position 0
shortest path
clockwise
counterclockwise
A start motor
A set speed to 75 %
Run Motor for Duration. This block will run one or more motors clockwise or anti clockwise for a specified number of rotations, seconds or degrees.
Motor Go to Position. This block sets one or more motors to a specified position. The motor can be set to run clockwise, anti clockwise or to take the shortest path to the specified position. The position ranges from 0 to 359 degrees.
Start Motor. This block will run one or more motors clockwise or anti clockwise forever.
Set Motor Speed. This block sets the speed of one or more motors. The speed range is -100 to 100. Negative values will reverse the direction of rotation of the motor.

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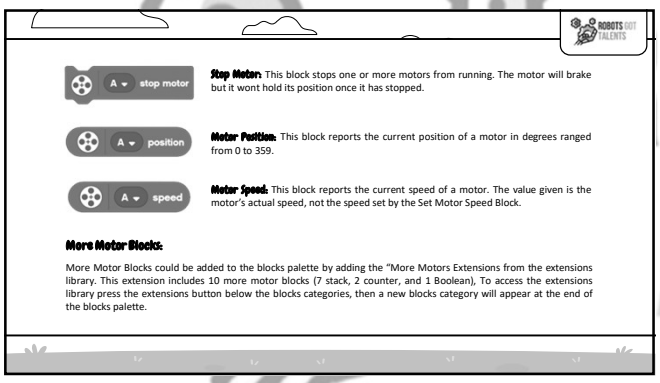
A stop motor
A position
A speed
Stop Motor: This block stops one or more motors from running. The motor will brake but it wont hold its position once it has stopped.
Motor Position: This block reports the current position of a motor in degrees ranged from 0 to 359.
Motor Speed: This block reports the current speed of a motor. The value given is the motor's actual speed, not the speed set by the Set Motor Speed Block.
More Motor Blocks:
More Motor Blocks could be added to the blocks palette by adding the "More Motors Extensions from the extensions library. This extension includes 10 more motor blocks (7 stack, 2 counter, and 1 Boolean), To access the extensions library press the extensions button below the blocks categories, then a new blocks category will appear at the end of the blocks palette.

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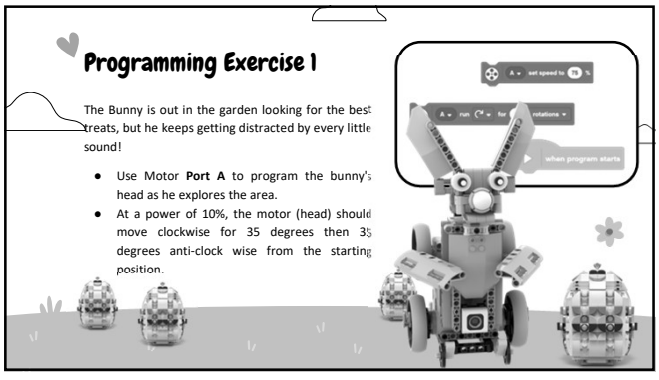
Programming Exercise 1
The Bunny is out in the garden looking for the best treats, but he keeps getting distracted by every little sound!
Use Motor Port A to program the bunny's head as he explores the area.
At a power of 10%, the motor (head) should move clockwise for 35 degrees then 35 degrees anti-clock wise from the starting position.
A set speed to 75 %
A run for rotations
when program starts

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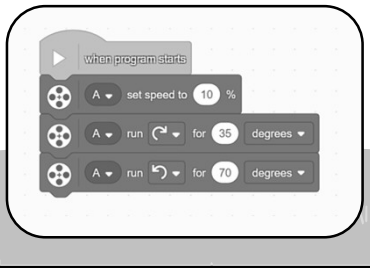
Programming Exercise 1
Answer:



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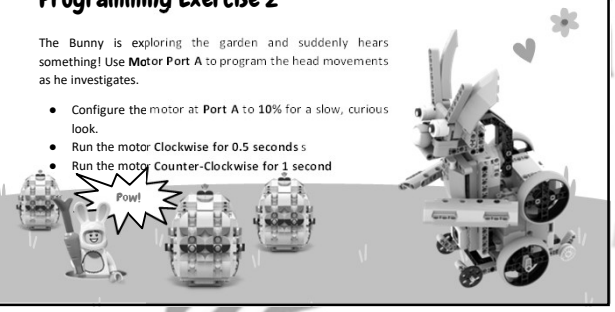
Programming Exercise 2

The Bunny is exploring the garden and suddenly hears something! Use **Motor Port A** to program the head movements as he investigates.

- Configure the motor at **Port A** to **10%** for a slow, curious look.
- Run the motor **Clockwise for 0.5 seconds** s
- Run the motor **Counter-Clockwise for 1 second**



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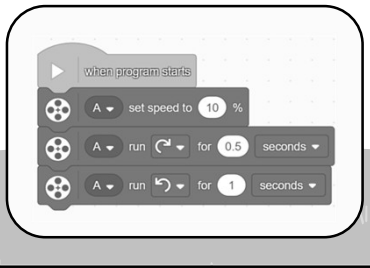
Programming Exercise 2
Answer:



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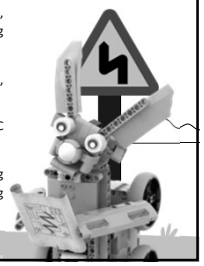
Programming Exercise 3

The Bunny is trying to navigate through a narrow path in the garden, but it's not as simple as driving in a straight line! Use your driving motors at Port B and Port C to help him move in a unique pattern.

- Configure both driving motors to a speed of 25% for a steady, controlled movement.
- Run motor B Clockwise for 0.5 rotations, then run motor C Counter-Clockwise for 0.5 rotations.
- Follow this exact sequence two more times! By alternating between the left and right motors, you'll create a zig-zagging motion as the Bunny moves forward.



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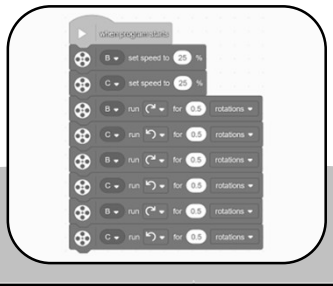
Programming Exercise 3 Answer:



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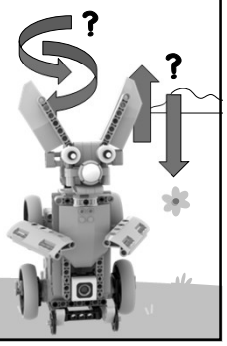
Programming Exercise 4

Now it's time to see how the bunny moves when we control both driving motors at once. By using the multi-select feature in the SPIKE Prime software, you can program Port C and Port B to act as a single unit.

- Speed Control: Set the grouped motor speed to 25%.
- The Clockwise Turn: Run the motors Clockwise for 1 rotation.
- The Counter-Turn: Run the motors Counter-Clockwise for 1 rotation.



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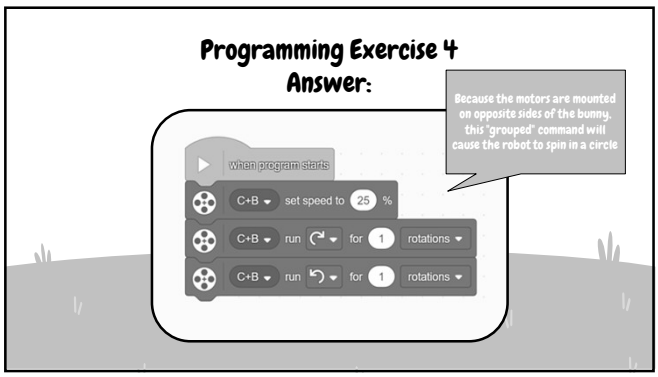
Programming Exercise 4
Answer:



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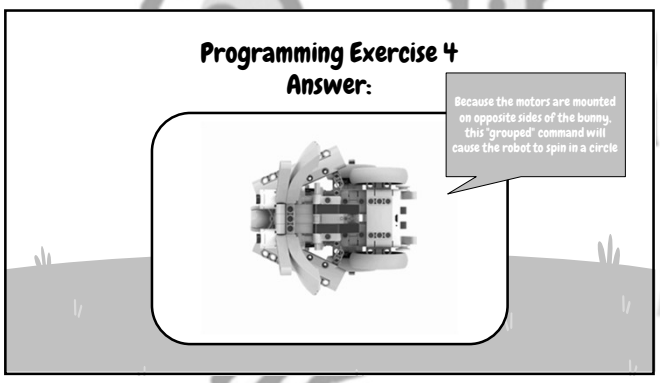
Programming Exercise 4
Answer:



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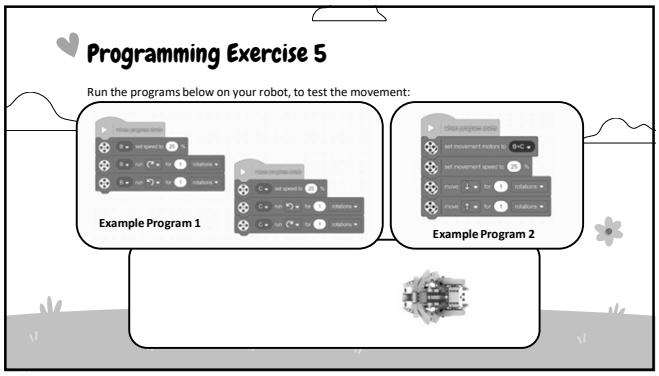
Programming Exercise 5

Run the programs below on your robot, to test the movement:



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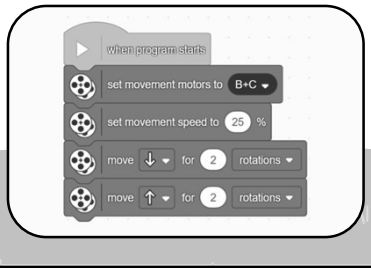
Programming Exercise 6

Now , it's time to get the bunny moving across the floor! This program uses the Pink Movement Blocks, which are specifically designed to make driving easier by synchronizing your motors.

- Movement Setup: First, tell the Hub that your Movement Motors are plugged into Ports B and C.
- Speed Control: Set the driving speed to 25% for a safe and steady pace.
- Use the Move Backward (Down Arrow) block to make the bunny move forward for 2 rotations.
- Use the Move Forward (Up Arrow) block to have the bunny drive forward for 2 rotations, returning right back to where he started.

37

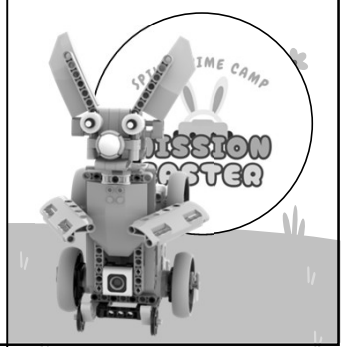
Programming Exercise 6 Answer:



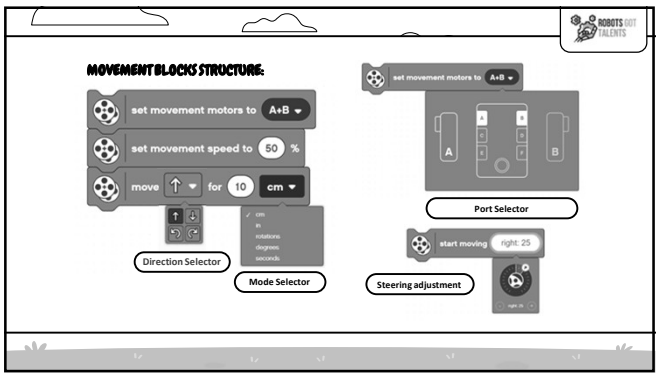
38

TOPICS COVERED:

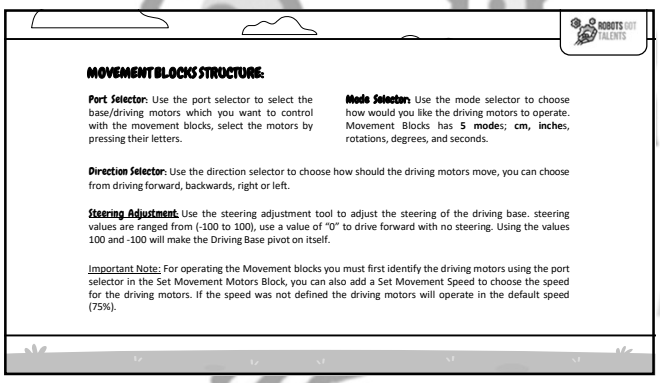
- **Movement Blocks**
- **Programming Exercises 7-8**
- **Spike Prime Sensors - Introduction**
- **Colour Sensor**
- **Spike Prime Blocks Types**
- **Spike Prime App UI**
- **Programming Exercise 9**



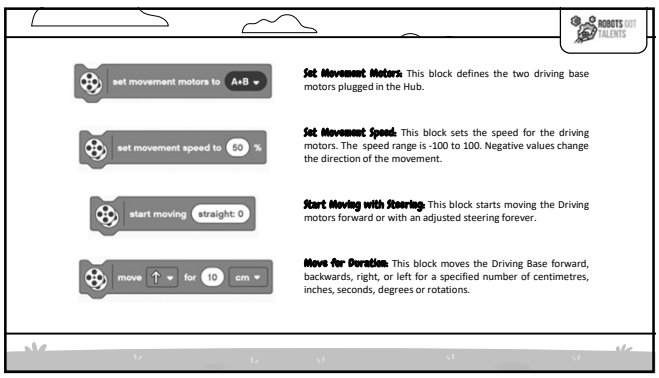
39


MOVEMENT BLOCKS STRUCTURE:
set movement motors to A+B
set movement speed to 50 %
move for 10 cm
cm
in
rotations
degrees
seconds
Direction Selector
Mode Selector
set movement motors to A+B
Port Selector
start moving right: 25
Steering adjustment

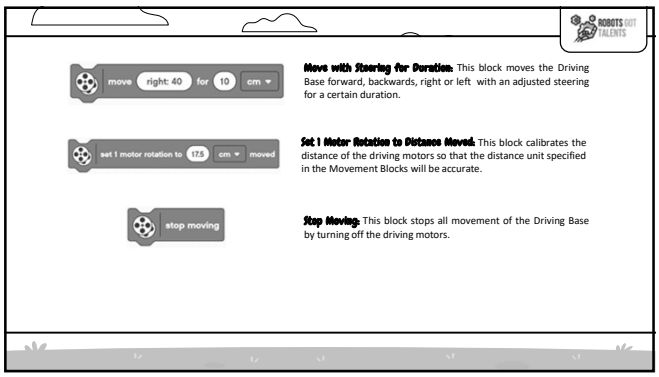
40


MOVEMENT BLOCKS STRUCTURE:
Port Selector: Use the port selector to select the base/driving motors which you want to control with the movement blocks, select the motors by pressing their letters.
Mode Selector: Use the mode selector to choose how would you like the driving motors to operate. Movement Blocks has 5 modes; cm, inches, rotations, degrees, and seconds.
Direction Selector: Use the direction selector to choose how should the driving motors move, you can choose from driving forward, backwards, right or left.
Steering Adjustment: Use the steering adjustment tool to adjust the steering of the driving base. steering values are ranged from (-100 to 100), use a value of "0" to drive forward with no steering. Using the values 100 and -100 will make the Driving Base pivot on itself.
Important Note: For operating the Movement blocks you must first identify the driving motors using the port selector in the Set Movement Motors Block, you can also add a Set Movement Speed to choose the speed for the driving motors. If the speed was not defined the driving motors will operate in the default speed (75%).

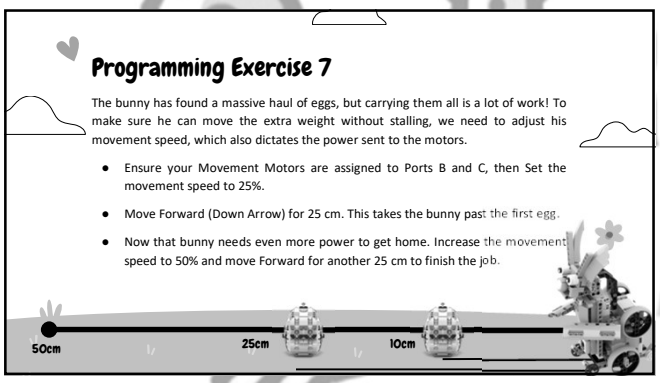
41


set movement motors to A+B
Set Movement Motors: This block defines the two driving base motors plugged in the Hub.
set movement speed to 50 %
Set Movement Speed: This block sets the speed for the driving motors. The speed range is -100 to 100. Negative values change the direction of the movement.
start moving straight: 0
Start Moving with Steering: This block starts moving the Driving motors forward or with an adjusted steering forever.
move for 10 cm
Move for Duration: This block moves the Driving Base forward, backwards, right, or left for a specified number of centimetres, inches, seconds, degrees or rotations.

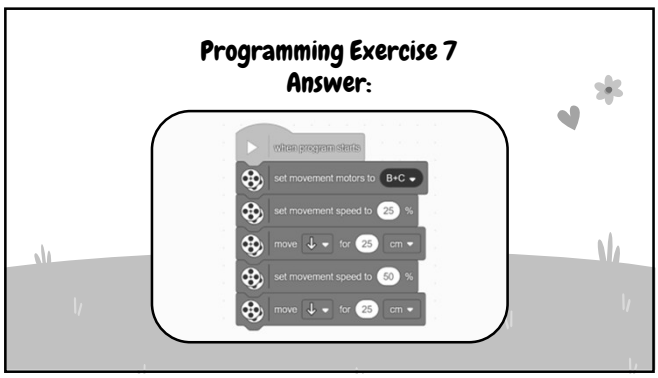
42


move right: 40 for 10 cm
Move with Steering for Duration. This block moves the Driving Base forward, backwards, right or left with an adjusted steering for a certain duration.
set 1 motor rotation to 17.5 cm moved
Set 1 Motor Rotation to Distance Moved. This block calibrates the distance of the driving motors so that the distance unit specified in the Movement Blocks will be accurate.
stop moving
Stop Moving. This block stops all movement of the Driving Base by turning off the driving motors.

43


Programming Exercise 7
The bunny has found a massive haul of eggs, but carrying them all is a lot of work! To make sure he can move the extra weight without stalling, we need to adjust his movement speed, which also dictates the power sent to the motors.
Ensure your Movement Motors are assigned to Ports B and C, then Set the movement speed to 25%.
Move Forward (Down Arrow) for 25 cm. This takes the bunny past the first egg.
Now that bunny needs even more power to get home. Increase the movement speed to 50% and move Forward for another 25 cm to finish the job.
50cm
25cm
10cm

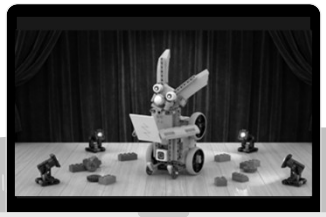
44

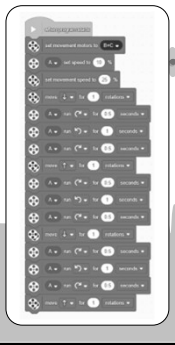

Programming Exercise 7
Answer:
when program starts
set movement motors to B+C
set movement speed to 25 %
move for 25 cm
set movement speed to 50 %
move for 25 cm

45

Programming Exercise 8

The Bunny has a full stage routine ready to go! In this dance, he combines his head-nodding with smooth floor work.





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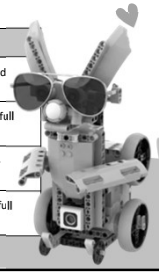
Programming Exercise 8

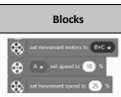
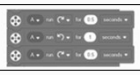
Look at the program from the previous page and match the following dance moves to the correct groups of blocks.

Dance Move	Description
The "Stage Setup"	The Hub assigns the motors to their roles and prepares the dance speed.
The "Slide Forward"	The Bunny glides toward the audience for 1 full rotation.
The "Double Take"	The Bunny tilts his head clockwise then anti-clockwise
The "Slide Backward"	The Bunny smoothly moves backward for 1 full rotation to reset for his next move.



47

Programming Exercise 8 Answer:

Dance Move	Description	Blocks
The "Stage Setup"	The Hub assigns the motors to their roles and prepares the dance speed.	
The "Slide Forward"	The Bunny glides toward the audience for 1 full rotation.	
The "Double Take"	The Bunny tilts his head clockwise then anti-clockwise	
The "Slide Backward"	The Bunny smoothly moves backward for 1 full rotation to reset for his next move.	

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SPIKE PRIME SENSORS:

COLOUR SENSOR

The Spike Prime Color Sensor can distinguish between 8 different colors (Blue, Light Blue, Violet, Green, Yellow, Red, White, and Black), the sensor is also capable of measuring reflected and ambient light, using the three built-in LEDs the color sensor could be used as an output source.

FORCE SENSOR

The Spike Prime force sensor could detect simple touch (Single tap, Quick tap, Press and hold) and measure the force. The Sensor is able to measure force ranged between 2.5-10 Newton, with an output accuracy: +/- 0.65 newton.

DISTANCE SENSOR

The Spike Prime distance measures distance in centimetres and inches. It is capable of measuring distances from 50-2000 mm with a precision of +/- 20 mm.

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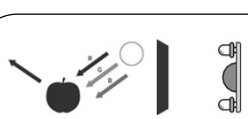
Colour Sensor



The **SPIKE Prime Color Sensor** works by shining a white light and measuring the reflection to identify colors or brightness.

Working Principle:

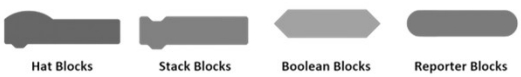
- Emit: A small LED shines white light onto a surface.
- Reflect: The surface absorbs some colors and reflects others back.
- Detect: Internal sensors (photodiodes) measure the intensity of Red, Green, and Blue light to determine the exact color

// Remember to Keep the sensor 8–16mm from the surface for accurate readings!

50

PROGRAMMING BLOCKS

Blocks in Spike Prime software are puzzle-shaped pieces used to build programs. They connect vertically, forming a "stack" that runs from top to bottom. Each block type has a unique shape, representing different data and preventing syntax errors. Spike software includes 6 types of blocks.



Hat Blocks | Stack Blocks | Boolean Blocks | Reporter Blocks

Types of Blocks:

Hat Block: A block that starts a program when a specific event occurs. All hat blocks are from the Events blocks categories. An example of the hat blocks is the "When program starts" block which exist in all the new Spike Prime projects.

Stack Block: A block that is shaped to fit above and below other blocks. Stack blocks make up the majority of the blocks available in the Spike Prime Software, being available in almost all categories.

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PROGRAMMING BLOCKS

Blocks in Spike Prime software are puzzle-shaped pieces used to build programs. They connect vertically, forming a "stack" that runs from top to bottom. Each block type has a unique shape, representing different data and preventing syntax errors. Spike software includes 6 types of blocks.

Hat Blocks | Stack Blocks | Boolean Blocks | Reporter Blocks

Types of Blocks:

Reporter Block: A block that reports a sensor, motor, variable reading/values to the program. values could be anything from strings and numbers to sensors readings.

Boolean Block: A block that reports Boolean values. When this block is used, it acts as a reporter block, reporting "true" or "false" values or "1" and "0".

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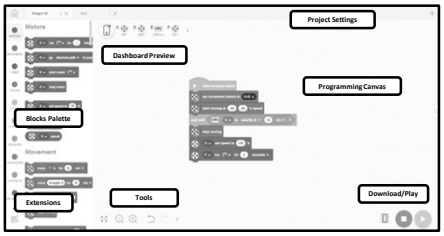
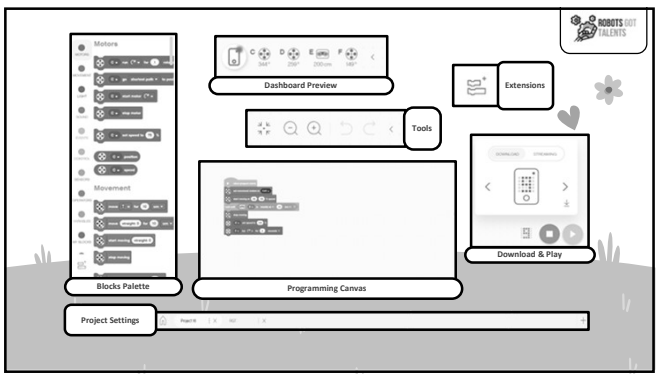
Spike Prime App UI



53



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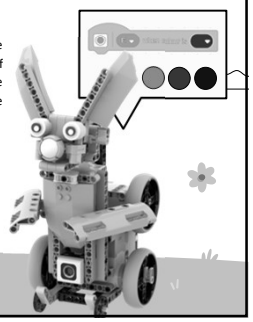
Programming Exercise 9

Your Bunny is now a smart explorer! In this exercise, we are using the Color Sensor (Port E) to act as a set of remote commands. Instead of following a fixed path, the Bunny waits for you to show it a specific color to decide what to do (using Event Blocks).

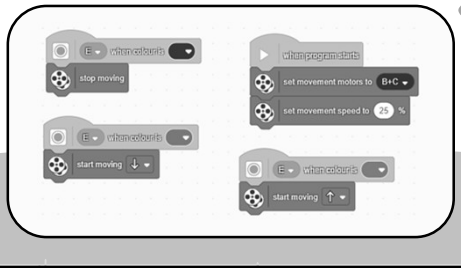
- Blue: Glides Forward
- Green: Glides Backward
- Red: Stop Moving

// Movement Motors (B&C) - Movement Speed: 25%



55

Programming Exercise 9 Answer:



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TOPICS COVERED:

- **Spike Prime Building Parts**
- **Building Exercise 2 - Easter Rabbit**
- **Programming Exercises 10-12**
- **Spike Event Blocks**
- **Building Exercise 2.1 - Add Sensor**
- **Programming Exercise 13**
- **Building Exercise 2.2 - Add Sensor**
- **Programming Exercise 14**

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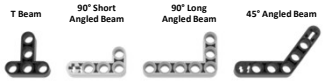
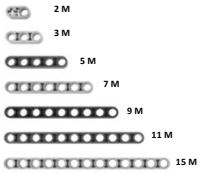
BEAMS/ LIFT ARMS: Beams also known as lift arms are the framework of most LEGO TECHNIC®, MINDSTORMS® and Spike Prime models, they are used to hold cross-axles, connector pegs and other LEGO® technic components together. There are 2 main types of beams; Straight and Angular. Straight beams are usually found only with circular holes except for the two module beam, while the angular beams contain both circular and cross holes, in most angular beams the cross-shaped holes are at either ends. The straight beams included in the Spike Prime Set are from 2 to 15 modules.

To measure straight beams you can count the number of circular or cross shaped holes in the beam, these are known as modules each hole is counted as an module a one module is about 8 mm. For angular beams, they are defined by the angles not modules, for example there are 90 degrees long and short angular beams, 45 degrees angular beams, T angled beam and C shaped beams.





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CONNECTOR PEGS: Connector pegs are used to hold many LEGO® TECHNIC constructions together. There are 3 types of connector pegs: Round Pegs, Cross-shaped Pegs and Half-half Pegs.

The round long and short pegs can be used to connect beams together so that they can swing freely. The cross-shaped pegs can be used to hold two angular beams or technic parts with cross holes together so that they cannot move, the cross shaped pegs could also be defined as 2 module cross axles, a longer version of the cross-shaped peg is an axle. The half-half peg can be used to connect a free-spinning beam with a circular hole to a fixed angular beam with a cross hole. The black, red and blue connectors are friction connector pegs, while the other pegs are smooth.

CROSS AXLES: Cross-Axles are cross-shaped rods that can be used to hold wheels, gears beams etc. The axles can be measured by counting the holes of a beam the same size, even numbered lengths (2M,4M,12M etc) are black colored while odd numbered lengths (3M,5M,11M etc) are grey or yellow. You can place a cross-axle through a circular hole so it can spin freely, this is a handy connection for building with gears and wheels.

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GEARS: A gear is a piece that conveys rotational force to another gear or appliance. Gears are used to change speed, torque or direction. There are different types of LEGO technic gears like the rack gears, bevel gears, crown gears and worm gears. The Spike Prime set includes only Double Bevel Gears, and Rack Gears. Double Bevel Gears are all 1 Module thick and could be placed next to each other to change the speed and torque of rotation or placed with a 90 degrees angle to change the direction of rotation. The set only include two rack 13 M Rack Gears which are used to convert rotational motion to linear motor

Gears circular motion

Gears bevel motion

Gears linear motion

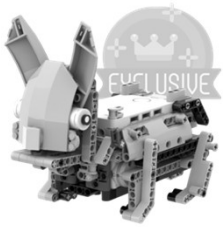
60

BUILDING EXERCISE 2 Easter Rabbit

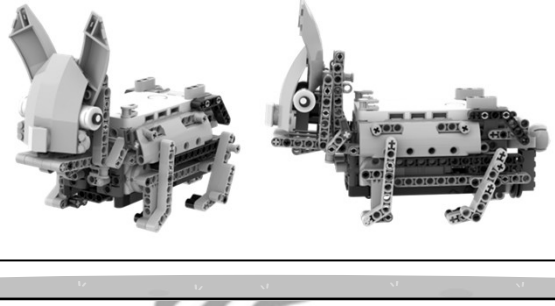
PDF Building Instructions

Video Building Instructions

You can also use the Robots Got Talents built-in Interactive building instructions viewer.



61



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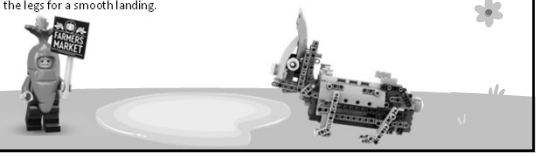
Programming Exercise 10

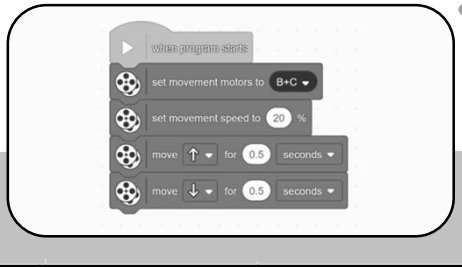
The Rabbit has reached a puddle in the garden and needs to hop over it! Your mission is to program the leg-popping sequence he needs to bound across.

- **Setup:** Set **Movement Motors to B+C** and **Speed to 20%**.
- **The Leap:** Use the **Move Forward** block for **0.5 seconds** . This rapid recoil pops the rabbit upward.
- **The Landing:** Immediately use the **Move Backwards** block for **0.5 seconds** to reset the legs for a smooth landing.



63

Programming Exercise 10
Answer:



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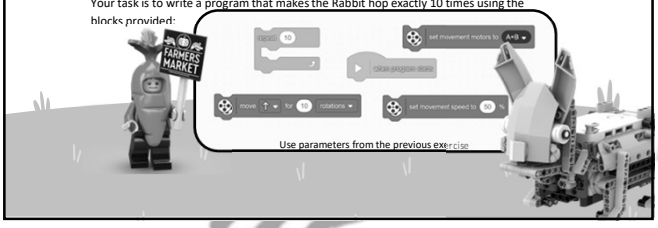
Programming Exercise 11

The Rabbit is heading to the Farmer's Market for some carrots! To get there, he needs to perform a series of continuous hops to cover the distance.

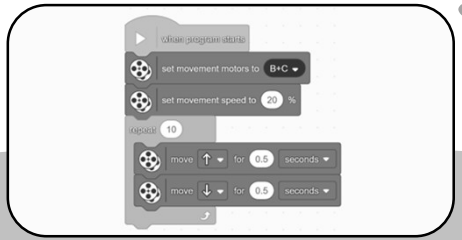
Your task is to write a program that makes the Rabbit hop exactly 10 times using the blocks provided:



Use parameters from the previous exercise

65

Programming Exercise 11
Answer:

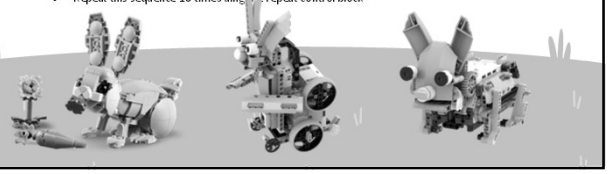


66

Programming Exercise 12

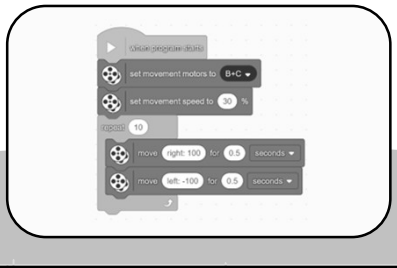
The Bunny is joining the local Easter Parade! Instead of just hopping, he wants to show off a fancy "Waddle Walk" to greet everyone. By using the **Steering Blocks** inside a loop, you can make him sway left and right as he moves down the parade route.

- Set the Movement Motors to ports B & C + Movement Speed to 30%
- Use the Move steering Blocks to Move right for 0.5 seconds then Left for 0.5 seconds
- Repeat this sequence 10 times using the repeat control block



67

Programming Exercise 12 Answer:



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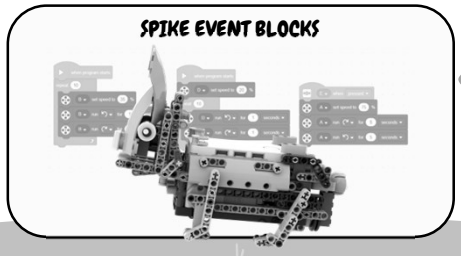
SPIKE EVENT BLOCKS



The event blocks are fifth category in the blocks palette that have a yellow color code, these blocks are responsible for starting a stack or a program when a specific event occurs and broadcasting messages. Block category consists of 12 blocks; 10 hat blocks, 2 stack blocks

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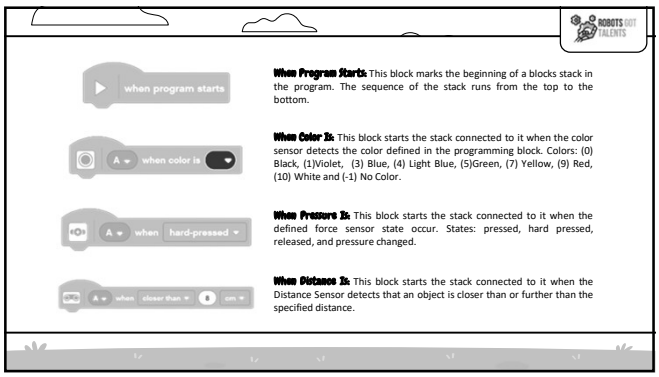
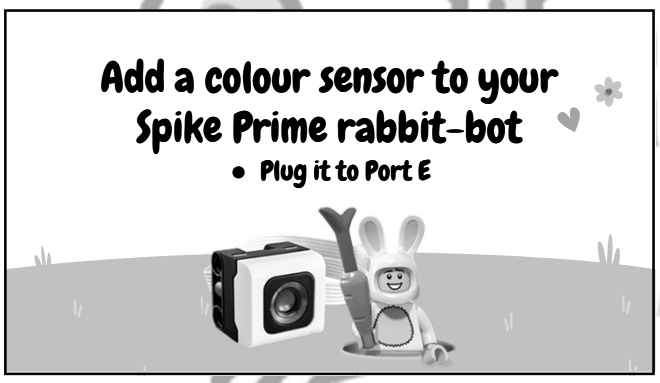
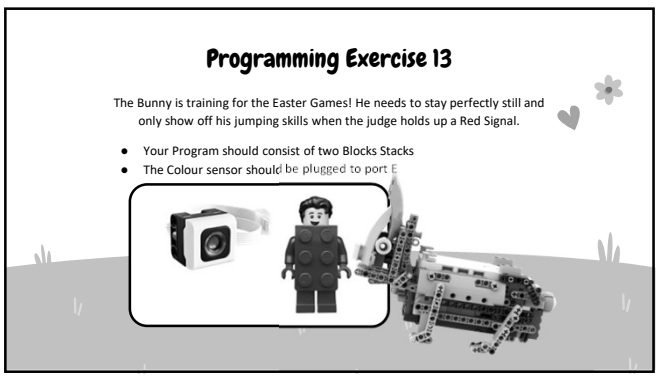

when program starts
A when color is
A when hard-pressed
A when closer than 8 cm
When Program Starts: This block marks the beginning of a blocks stack in the program. The sequence of the stack runs from the top to the bottom.
When Color Is: This block starts the stack connected to it when the color sensor detects the color defined in the programming block. Colors: (0) Black, (1)Violet, (3) Blue, (4) Light Blue, (5)Green, (7) Yellow, (9) Red, (10) White and (-1) No Color.
When Pressure Is: This block starts the stack connected to it when the defined force sensor state occur. States: pressed, hard pressed, released, and pressure changed.
When Distance Is: This block starts the stack connected to it when the Distance Sensor detects that an object is closer than or further than the specified distance.

70

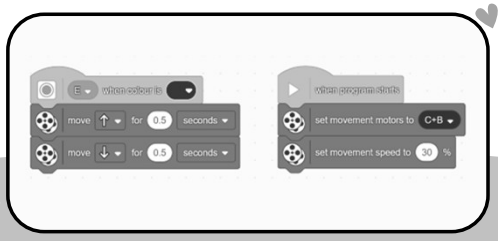

Add a colour sensor to your Spike Prime rabbit-bot
Plug it to Port E

71


Programming Exercise 13
The Bunny is training for the Easter Games! He needs to stay perfectly still and only show off his jumping skills when the judge holds up a Red Signal.
Your Program should consist of two Blocks Stacks
The Colour sensor should be plugged to port E

72

Programming Exercise 13
Answer:



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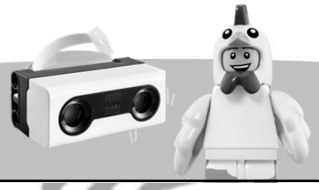
Add a distance sensor to your Spike rabbit-bot

- Plug it to Port F

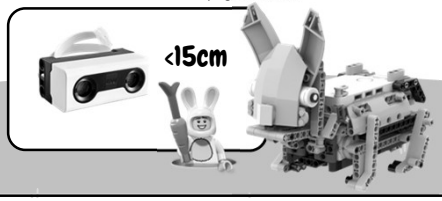


74

Programming Exercise 14

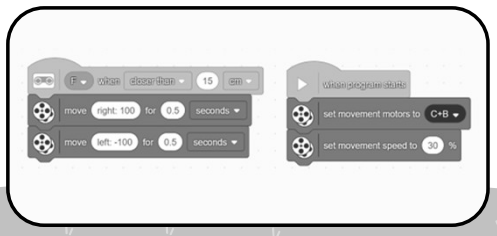
The Bunny is waiting at the end of the Easter Parade route to greet his friends! He is a bit shy, so he will only perform his special "Walk" if someone gets close enough (closer than 15cm) to say hello.

- The Distance Sensor should be plugged to port F



75

Programming Exercise 14 Answer:



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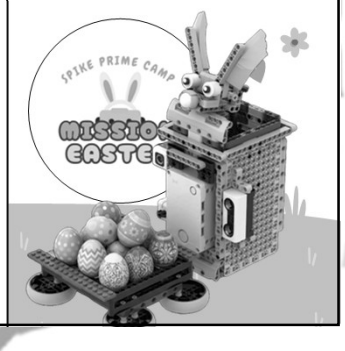
TOPICS COVERED:

- Building Exercise 3
- Linear Motion
- Spike Control Blocks
- Programming Exercises 15-16
- Distance Sensor
- Programming Exercises 17-19



77

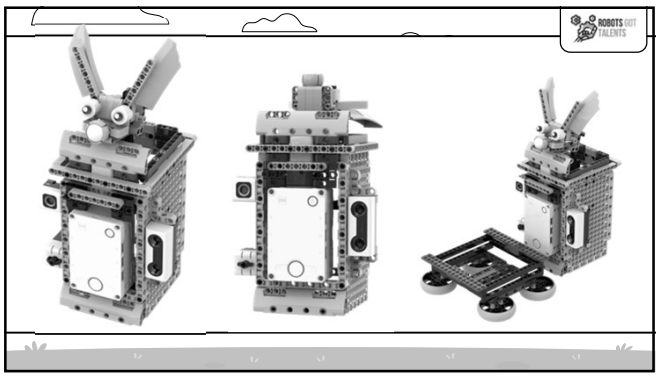
BUILDING EXERCISE 2 Easter Rabbit

PDF Building Instructions

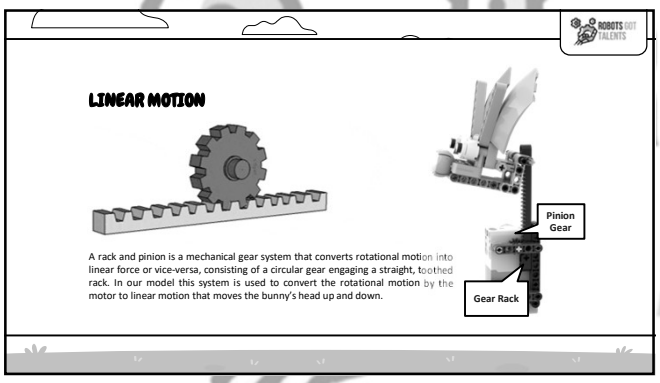
Video Building Instructions

You can also use the Robots Got Talents built-in interactive building instructions viewer.

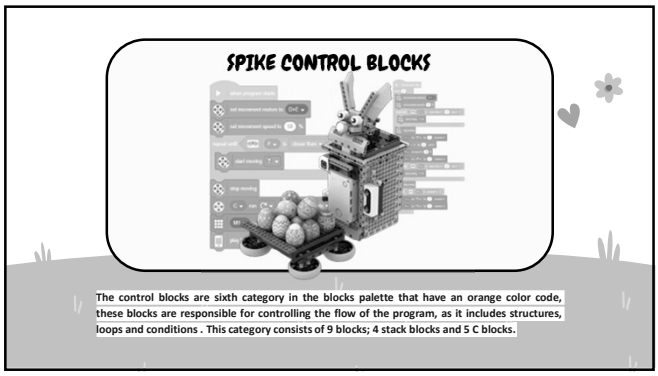
78



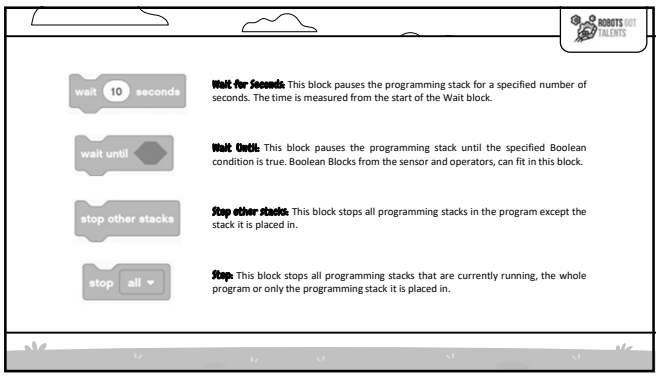
79


LINEAR MOTION
A rack and pinion is a mechanical gear system that converts rotational motion into linear force or vice-versa, consisting of a circular gear engaging a straight, toothed rack. In our model this system is used to convert the rotational motion by the motor to linear motion that moves the bunny's head up and down.
Pinion Gear
Gear Rack

80


SPIKE CONTROL BLOCKS
The control blocks are sixth category in the blocks palette that have an orange color code, these blocks are responsible for controlling the flow of the program, as it includes structures, loops and conditions . This category consists of 9 blocks; 4 stack blocks and 5 C blocks.

81



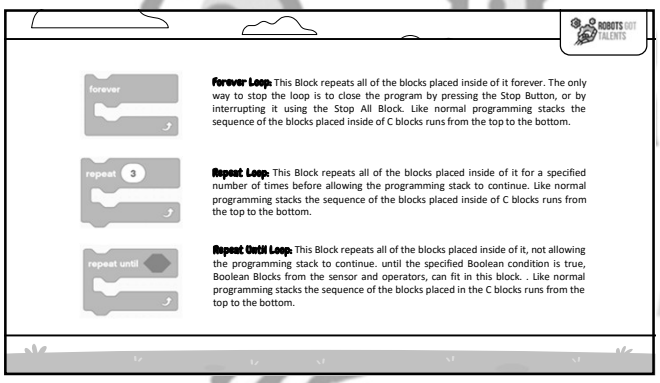
Wait for Seconds: This block pauses the programming stack for a specified number of seconds. The time is measured from the start of the Wait block.

Wait Until: This block pauses the programming stack until the specified Boolean condition is true. Boolean Blocks from the sensor and operators, can fit in this block.

Stop other stacks: This block stops all programming stacks in the program except the stack it is placed in.

Stop: This block stops all programming stacks that are currently running, the whole program or only the programming stack it is placed in.

82

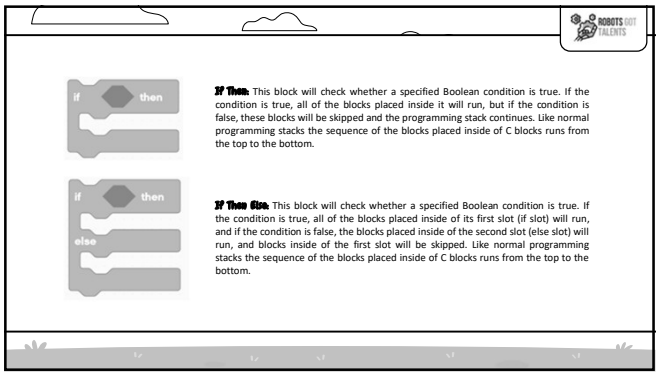


Forever Loop: This Block repeats all of the blocks placed inside of it forever. The only way to stop the loop is to close the program by pressing the Stop Button, or by interrupting it using the Stop All Block. Like normal programming stacks the sequence of the blocks placed inside of C blocks runs from the top to the bottom.

Repeat Loop: This Block repeats all of the blocks placed inside of it for a specified number of times before allowing the programming stack to continue. Like normal programming stacks the sequence of the blocks placed inside of C blocks runs from the top to the bottom.

Repeat Until Loop: This Block repeats all of the blocks placed inside of it, not allowing the programming stack to continue. until the specified Boolean condition is true, Boolean Blocks from the sensor and operators, can fit in this block. . Like normal programming stacks the sequence of the blocks placed in the C blocks runs from the top to the bottom.

83



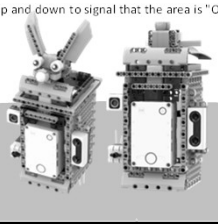
If Then: This block will check whether a specified Boolean condition is true. If the condition is true, all of the blocks placed inside it will run, but if the condition is false, these blocks will be skipped and the programming stack continues. Like normal programming stacks the sequence of the blocks placed inside of C blocks runs from the top to the bottom.

If Then Else: This block will check whether a specified Boolean condition is true. If the condition is true, all of the blocks placed inside of its first slot (if slot) will run, and if the condition is false, the blocks placed inside of the second slot (else slot) will run, and blocks inside of the first slot will be skipped. Like normal programming stacks the sequence of the blocks placed inside of C blocks runs from the top to the bottom.

84

Programming Exercise 15

Oh no! The Easter Bunny has been put in charge of guarding the legendary **Giant Easter Egg**, but some curious kids are trying to sneak a peek! To keep them away, the Bunny needs to act like a moving security gate, constantly moving up and down to signal that the area is "Off Limits.



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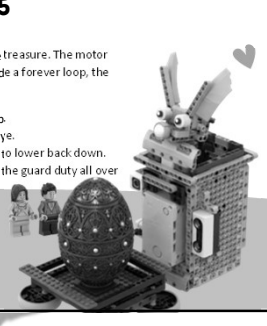
Programming Exercise 15

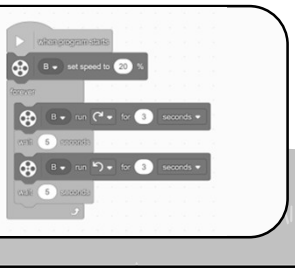
Create a program to help the Bunny guard the treasure. The motor needs to be set to a steady speed of **20%**. Inside a forever loop, the Bunny "Jumpiii" should:

1. Move **Clockwise** for **3 seconds** to rise up.
2. Wait for **5 seconds** to keep a watchful eye.
3. Move **Counter-Clockwise** for **3 seconds** to lower back down.
4. Wait another **5 seconds** before starting the guard duty all over again.



86

Programming Exercise 15 Answer:



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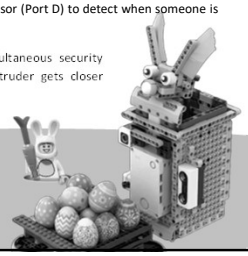
Programming Exercise 16

The Easter Bunny has upgraded his security system! Instead of just moving forever, he now uses a Distance Sensor (Port D) to detect when someone is trying to sneak a chocolate egg.

Your task is to program two simultaneous security protocols that trigger when an intruder gets closer than 50% to the sensor.



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Distance Sensor

The Distance Sensor acts like a bat's echolocation to measure distance. It uses a transducer to send out high-frequency sound waves and a receiver to "listen" for the echo.

Working Principle:

- Emit: The sensor sends a pulse.
- Reflect: The pulse hits an object and bounces back.
- Calculate: The sensor measures the "time of flight" and uses the speed of sound to determine distance: Distance = Speed of Time x Time / 2

89

Programming Exercise 16

Help the Bunny jump up to surprise the intruder! When the Distance sensor at **Port D** sees someone closer than **50%**:

- Set the motor at **Port B** to a speed of **20%**.
- Run the motor **Clockwise** for **2.5 seconds** (to pop the Bunny up).
- **Wait 1 second** to stare down the intruder.
- Run the motor **Counter-Clockwise** for **2.5 seconds** (to hide back in the box).
- **Wait 1 second** before the system is ready to "jump" again.

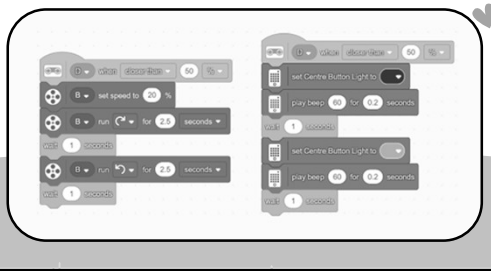
While the Bunny is moving, the Hub needs to sound the alarm!

- Turn the **Center Button Light** to **Red**.
- Play a **Beep** for **0.2 seconds**.
- **Wait 1 second**.
- Change the **Center Button Light** to **Orange**.
- Play another **Beep** (note 60) for **0.2 seconds**.
- **Wait 1 second** before resetting the alarm.

Note: Your program will consist of two stacks.

90

Programming Exercise 16 Answer:



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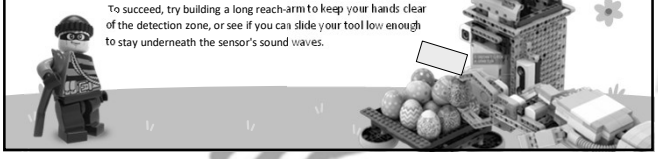
Mission: The Great Egg Heist (Little Game)

Using the remaining pieces from your SPIKE Prime set, design and build a custom LEGO tool to secretly remove a chocolate egg without being caught!

Your challenge is to approach from the side where the Ultrasonic **Sensor** is mounted; if your tool is detected closer than 50%, the bunny will jump and the alarm will sound

To succeed, try building a long reach-arm to keep your hands clear of the detection zone, or see if you can slide your tool low enough to stay underneath the sensor's sound waves.



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Programming Exercise 17

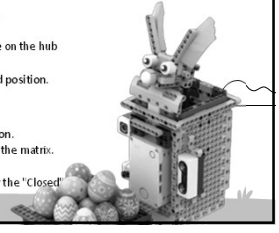
The Bunny has decided to share! Instead of just being a guard, he is now a **Friendship Dispenser**. You need to program the **Force Sensor (Port C)** to act as a "request button" for your friends to get an egg.

When the program starts, the Bunny should be in "Guard Mode."

- Set the **Center Button Light** to **Red**, and Display a Sad Face on the hub matrix
- Run the motor at **Port B** to move the Bunny into the raised position.

When a friend presses the **Force Sensor (Request Button)**:

- Run the motor to move the Bunny into the lowered position.
- Change the **Hub Light to Green** and show a happy face on the matrix.
- **Wait 5 seconds** for your friend to take their gift.
- Return to **Guard Mode**: Switch the light back to Red, show the "Closed" pattern, and return the Bunny to the raised position.



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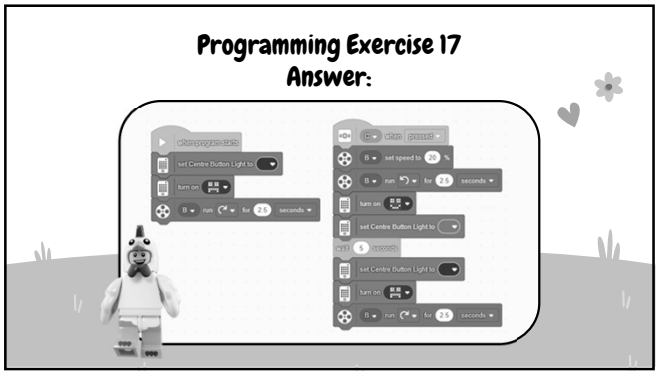
Programming Exercise 17
Answer:



94

Programming Exercise 18

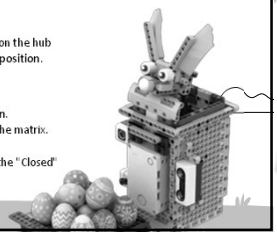
The Bunny has decided to share! Instead of just being a guard, he is now a **Friendship Dispenser**. You need to program the **Force Sensor (Port C)** to act as a "request button" for your friends to get an egg.

When the program starts, the Bunny should be in "Guard Mode":

- Set the **Center Button Light** to **Red**, and Display a Sad Face on the hub
- Run the motor at **Port B** to move the Bunny into the raised position.

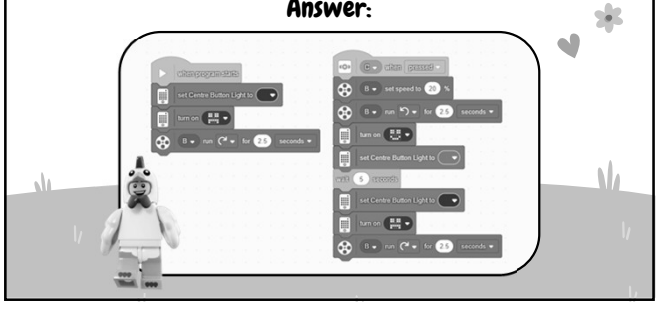
When a friend presses the **Force Sensor (Request Button)**:

- Run the motor to move the Bunny into the lowered position.
- Change the **Hub Light to Green** and show a happy face on the matrix.
- **Wait 5 seconds** for your friend to take their gift.
- Return to **Guard Mode**: Switch the light back to Red, show the "Closed" pattern, and return the Bunny to the raised position.



95

Programming Exercise 18
Answer:



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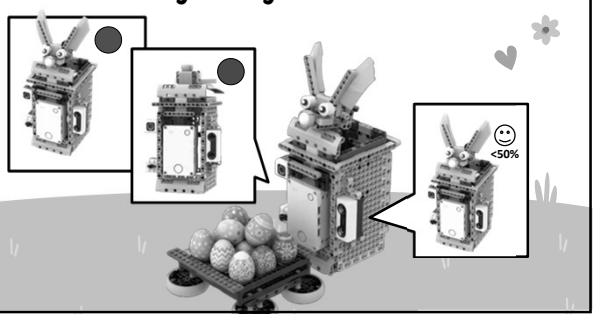
Programming Exercise 19



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Programming Exercise 19

The Easter Bunny has combined his sensors to create a high-tech vault. Use the **Ultrasonic Sensor** and the **Color Sensor (Port A)** to manage your security.

Perimeter Alarm:

Set your motor to 20% speed. Program the Bunny to stay lowered until the Ultrasonic Sensor detects someone closer than 50%. Once triggered, the Bunny must Pop Up, turn the Hub Light Red, and show a warning icon (sad face) on Matrix.

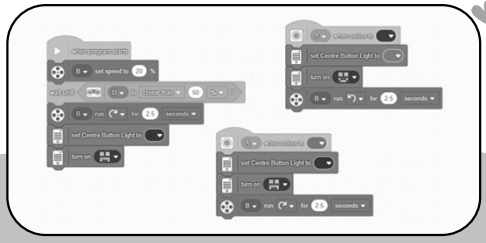
The Color Keys:

Now that the alarm is active, use the Color Sensor to control the gate:

- **Access Granted:** Use Pink to turn the light Green, show a happy face, and Lower the Bunny.
- **Lock:** Use Blue to immediately turn the light Red, show the warning icon, and Raise the Bunny

98

Programming Exercise 19 Answer:



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ROBOTS GOT TALENTS® 2026
MISSION EASTER
SPIKE PRIME CLASSROOM CAMP

100


SPIKE PRIME CAMP
MISSION EASTER
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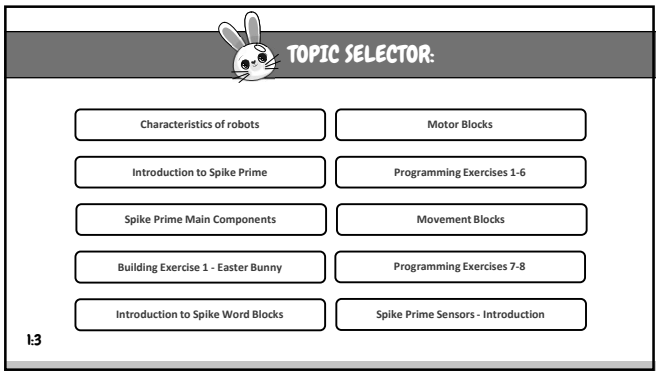
TOPIC SELECTOR:
Characteristics of robots
Motor Blocks
Introduction to Spike Prime
Programming Exercises 1-6
Spike Prime Main Components
Movement Blocks
Building Exercise 1 - Easter Bunny
Programming Exercises 7-8
Introduction to Spike Word Blocks
Spike Prime Sensors - Introduction
1:3

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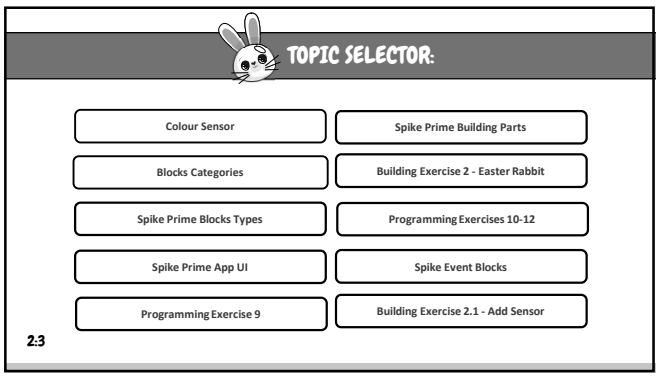
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Colour Sensor
Spike Prime Building Parts
Blocks Categories
Building Exercise 2 - Easter Rabbit
Spike Prime Blocks Types
Programming Exercises 10-12
Spike Prime App UI
Spike Event Blocks
Programming Exercise 9
Building Exercise 2.1 - Add Sensor
2:3

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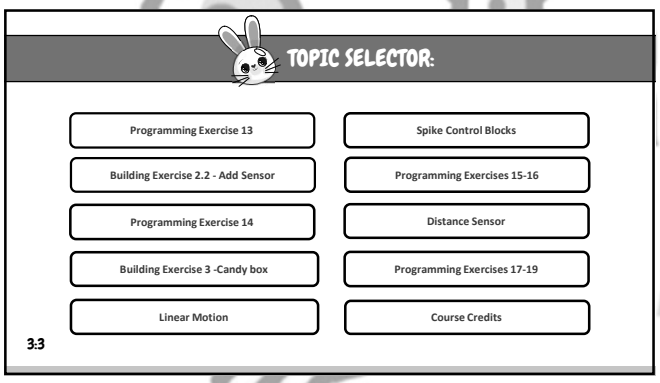
TOPIC SELECTOR:
Programming Exercise 13
Spike Control Blocks
Building Exercise 2.2 - Add Sensor
Programming Exercises 15-16
Programming Exercise 14
Distance Sensor
Building Exercise 3 -Candy box
Programming Exercises 17-19
Linear Motion
Course Credits
3:3

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