

Unit 4

Root's Loops

Code uses loops (also called Repeat Statements) to make programs faster and more powerful. Learn how to create loops in Level 1 with Repeat Blocks.

In Unit 4, students will learn how to use the Repeat Block to play groups of code blocks multiple times. Learners will practice coding skills by looping music, testing your memory, and designing a shape wheel.

Objectives:

- Create Repeat Loops using the Repeat Block.
- Edit the Repeat Block to tell your project how many times to repeat your code.
- Use Forever Loops to create an infinite program.

Code Blocks Introduced:

Repeat Block
Repeat Block Editor

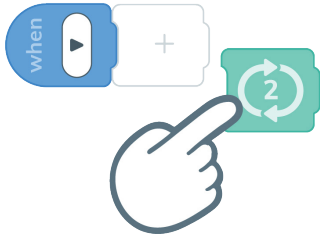
Coding Concepts:

Repeat Loops
Repeat Statements

Make Music with Repeats

LESSON 4.1

1



Drag out a Repeat Block and attach to the When Play Block.

2



Repeat Blocks tell Root to repeat code that is inside.

3



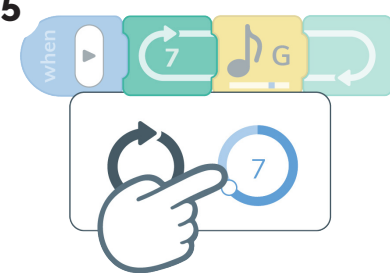
Add a Music Block inside the Repeat Block. This will tell Root to play music when it sees a Repeat Block.

4



Press Play. How many times did your music play?

5



Next, tap on the Repeat Block to change how many times Root will play music.

6



We can use the Repeat Block to play the same line of code over and over.

7



Press Play. How many times did your music play? Try adding another note within the Repeat Block.

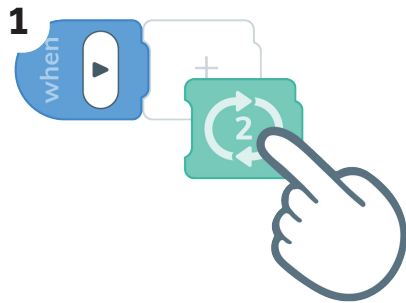
8



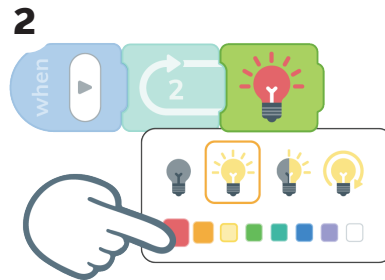
You earned the Repeat Block.

Infinite Rainbow

LESSON 4.2



Drag out a Repeat Block and snap it onto the When Play Block.



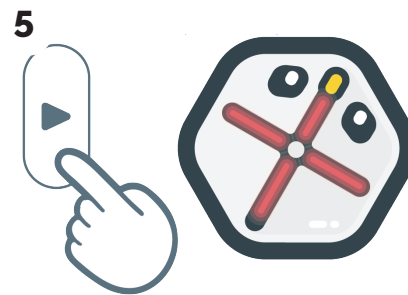
Add a Light Block inside the Repeat Block. Edit it to light up red.



Add a Wait Block after the red Light Block. Afterwards, add two more Light and Wait Blocks.



Tap on the Repeat Block to change it to infinite. This means Root will repeat the code forever until you press stop.



Press Play and watch Root shine like a rainbow.



The infinity sign on the Repeat Block creates an infinite loop, so your lights will keep flashing.



For an extra challenge, add more Light and Wait Blocks inside the Repeat Block.



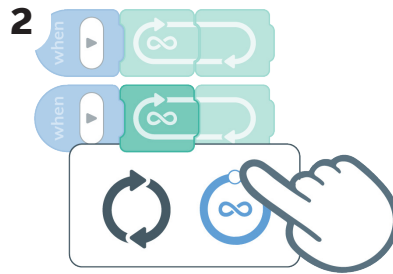
You coded Root to light up like a rainbow with an infinite Repeat Block!

Parallel Dancer

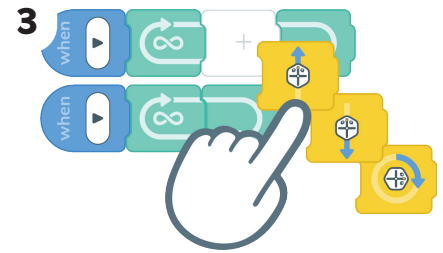
PROJECT 4.1



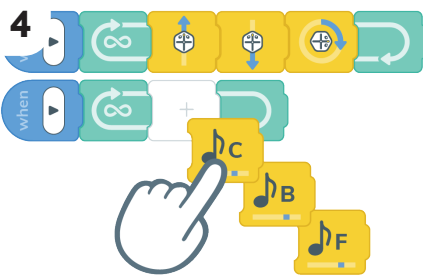
Let's make a dance for Root!
Use When Play Blocks to code Root to do different actions at the same time.



Drag out another When Play Block. Attach a Repeat Block to each When Play Block and edit to repeat infinitely.



Attach a Move Forward, Move Backward, and Turn Block inside the first Repeat Block.



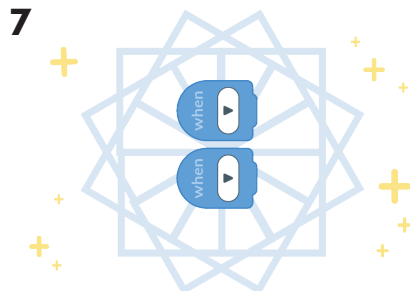
Add Music Blocks inside the second Repeat Block.



Press Play and watch Root dance and make music using two parallel lines of code!



Can you add a light show?
Add another When Play Block, Repeat Block, and Light Blocks to your code!

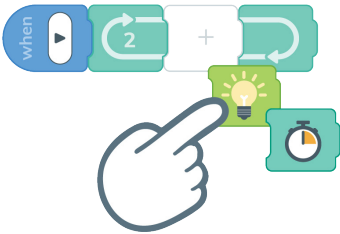


You coded Root to dance using parallelism!

Flashing Colors with Nested Repeats

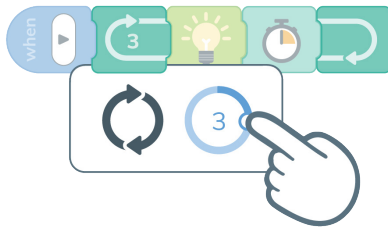
LESSON 4.3

1



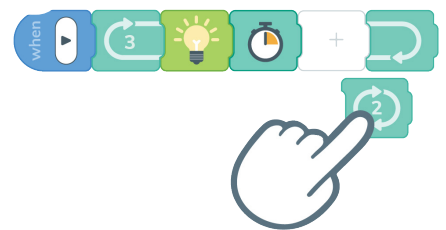
Drag out a Repeat Block to the beginning of your code. Add a Light and Wait Block inside.

2



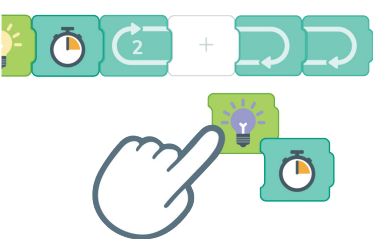
Edit the Repeat Block to repeat three times.

3



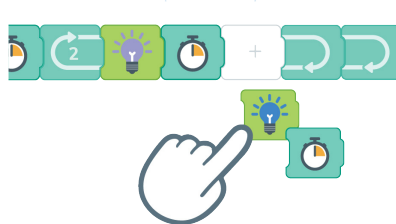
Add another Repeat Block inside the new Repeat Block after the Wait Block.

4



Add another Light and Wait Block inside the new Repeat Block. Edit the Light Block to light up purple.

5



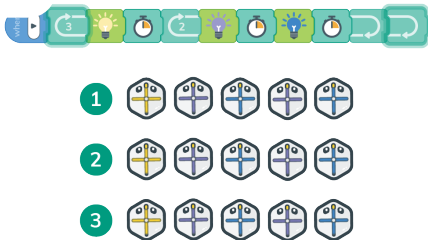
Now, add another Light and Wait Block inside the new Repeat Block. Edit the Light Block to light up blue.

6



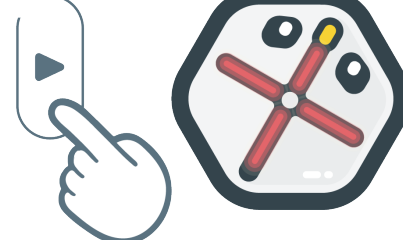
The second Repeat Block tells Root to light up blue and purple two times. It is nested inside the first Repeat Block.

7



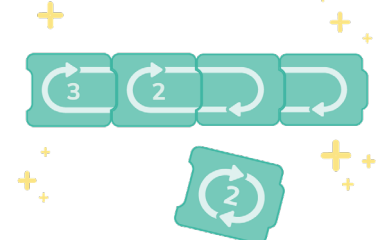
The first Repeat Block tells Root how many times to repeat the entire sequence.

8



Press Play. What is happening?

9

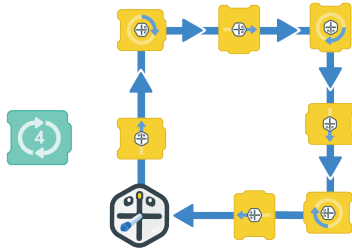


You made a light show using nested Repeat Blocks!

Drawing a Square with Repeats

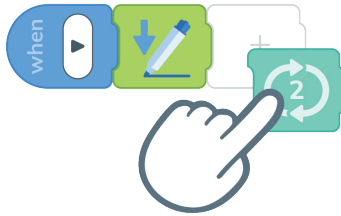
LESSON 4.4

1



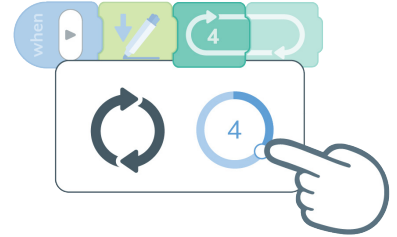
Let's build a square with a Repeat Block!

2



Drag out a Marker and Repeat Block to the beginning of your code.

3



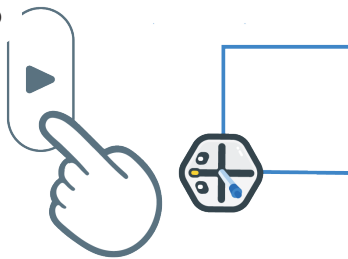
Since a square has four sides, let's edit the Repeat Block to repeat four times.

4



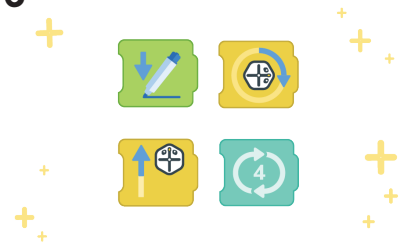
Add a Move and Turn Block inside the Repeat Block.

5



Press Play and watch Root draw a square!

6

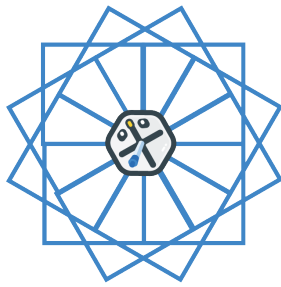


You made a square with a Repeat Block!

Drawing Shape Wheels

PROJECT 4.2

1



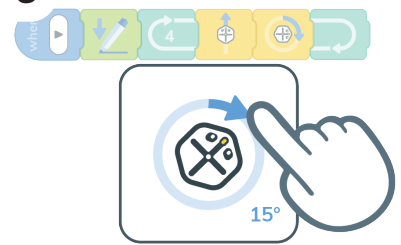
When Root draws a simple shape and turns slightly, repeating those steps over and over, it creates a pattern we'll call a shape wheel.

2



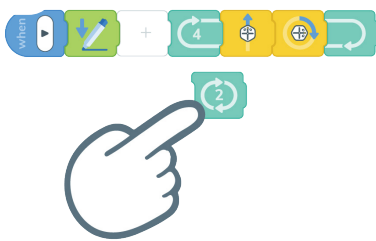
Let's start with your code from Lesson 4.4. This tells Root to draw a square.

3



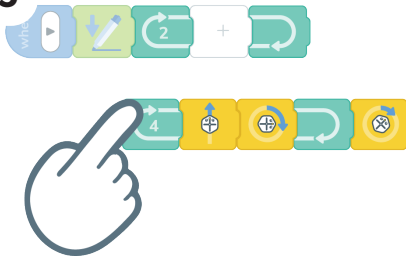
Add a Turn Block to change Root's angle.

4



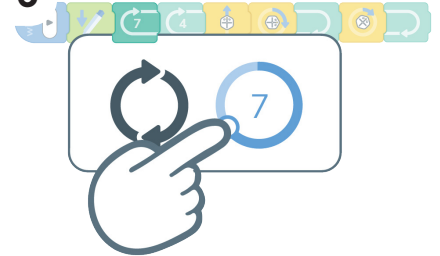
Add another Repeat Block after the Marker Block. This will tell Root how many times to draw a square and create a circular pattern.

5



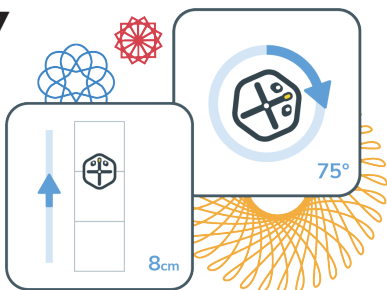
Move or nest your code inside of the new Repeat Block.

6



You can change how many times Root repeats code by tapping on the first Repeat Block.

7



You can experiment with shape wheels by changing the angles Root turns and the distance Root moves. Try using the Virtual Arena!

8

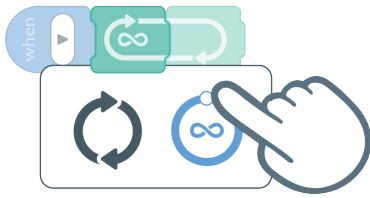


You coded Root to draw patterns with the Repeat, Move, Turn, and Marker Blocks.

Root's Wheel of Coding

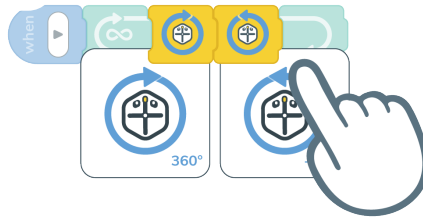
PROJECT 4.3

1



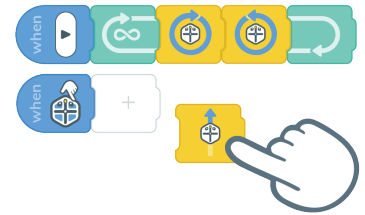
Drag out a Repeat Block and snap it to the When Play Block. Tap and edit the Repeat Block to infinite times.

2



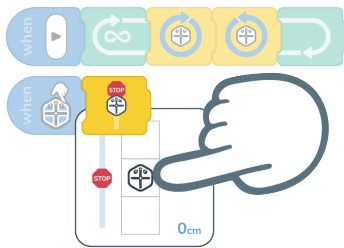
Add two Turn Blocks inside the Repeat Block. Tap and edit each to 360° so Root will make two complete turns.

3



Drag out a When Touch Block and attach a Move Block.

4



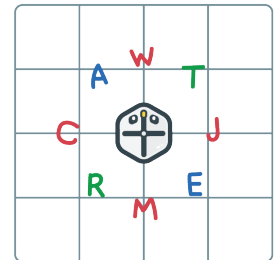
Edit the Move Block so Root will stop.

5



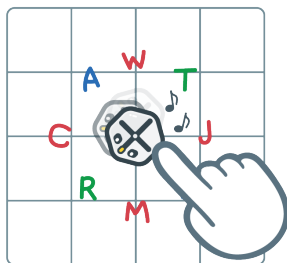
Attach a Music Block to the Move Block.

6



Put Root on the whiteboard grid and write letters around it.

7



Press Play. As Root turns, try to stop it on a letter!

8



You made a game by creating and interrupting a Repeat Loop!