Make It Smarter and Adaptable

Design, build and program a robotic creature that can sense light and dark conditions and respond with different behaviors.

Connect

Design Brief

Design, build and program a robotic creature that can:

• Sense light and dark conditions in the environment

• Responde with different behaviors to each condition

And a system that:

• Graphs the robotic creatures' behavior and environmental conditions.

Brainstorm

Discuss different solutions to the design brief.

Think about:

• What creatures behave differently in light and dark conditions?

• In addition to the Color Sensor to monitor light and dark, what other type of sensing and movement will your creature have?

• Using Graph Programming, you can program behavior zones. If Zone Star is the "light zone" and Zone Rectangle is the "dark" zone, what behavior will you program?

Select the Best Solution

Describe the solution that you have agreed to build and program.

Think about examples from your brainstorming discussion. Then explain why you chose this solution for the design brief.

Construct

Build and Program

Now you are ready to start building and programming your solution!

As you work on your solution:

1. Describe one part of your design that worked especially well.

2. Describe one design change that you had to make.

3. What will you try next?

As you test your design solution, use the table for recording your findings.

Contemplate

Graph and Analyze

Click the Graph Programming icon in the bottom left of the screen. You can have up to three zones in a graph program, but you only need two.

• What is the Threshold Value marking the difference between light and dark?

• What is the range for light on your graph?

• What is the range for dark?

Test and Analyze

How well does your solution satisfy the design brief? Record your data. Name the columns and rows, such as Trial Number, Robot Behavior, and Observations.

Review and Revise

Take a moment to reflect on your robot solution.

Think about:

• What other behaviors can you add to the robot to make it more realistic?

• How is your robot's behavior like a living creature?

• How is it different?

• Did the robot behave as you expected?

• Why or why not?

Describe two ways you could improve your robot.

Continue

Communicate

Here are some ideas:

• Create a video of your project, especially your final presentation and your robot's performance.

• Explain some important features of your software program.

• Produce a building guide for your model by taking a series of photographs as you deconstruct it.

• Include an image of your program with comments.

• Add a team photograph!

Congratulations! What will you design next?