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## Wild Robot Guide for Edison EdVentures

Anchor Book: The Wild Robot by Peter Brown

Technology: Edison Robots <https://meet Edison.com/>

Workshop provided by: The STEMAZing Project  
Guide developed by Sherrie Dennis – 4<sup>th</sup> Grade Teacher

### **Read Chapters 1-3 (Roz's box is shipwrecked. The otters accidentally activate her.)**

Make a #STEMontheCheap journal. (<https://stemazing.org/stemazing-journal-hack/>)

Draw your own robot. What does a robot look like (preconceived notions)?

Create your own robot design using building bricks. Draw it in your journal.

Gallery walk of student work – building brick robot designs.

#### Potential cross-curricular tie-ins:

Science: open and closed circuit, function of a switch

STEM: creating a water-tight crate

### **Read Chapter 4-5 (Roz emerges from the crate and begins to survey the land.)**

Open Edison box.

Make a scientific drawing of Edison and label buttons, sensors, and other parts.

Customize Edison with googly eyes and building bricks.

What do you notice about Edison?

What do you wonder about Edison?

What are the Structures and Functions at play with each part of the Edison

Put batteries in. (Be sure to save the EdComm cable.)

Discuss barcodes – what are they and how are they used in the real world from buying stuff to tracking inventory and even making sure a doctor doesn't leave something inside you during surgery.

Learn to control Edison using a line – electrical tape with Line Tracking barcode.

Write three observations about how Edison follows a line.

Discuss the sensors and the computer program used to make Edison follow a line.

How do structure and function impact the design of Edison and the sensors it has?

What questions do you have?

#### Potential cross-curricular tie-ins:

Social Studies: landforms, mapping Roz on island

Writing: journal entry of what Roz "sees" or create an island and describe the landforms and inhabitants



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**Read chapters 6-10 (Roz encounters a sea cliff, pinecones and a mountain and has to adapt.)**

Use building bricks to create a “sea cliff” and several other obstacles.

Control Edison using Avoid obstacles barcode.

Use hands and feet as obstacles as well.

Make and record observations in journal.

Refer back to the scientific drawing of Edison and again discuss structure and function.

Real world applications – what else uses obstacle avoidance programming? Roomba, new cars that brake on their own, etc.

Potential cross-curricular tie-ins:

STEM: Engineering Design Challenge: imagine and describe structures robots might have to give them the ability to climb a sea cliff wall.

Mathematics: How steep of an incline can Edison climb? Create a ramp and increase the angle of incline systematically until you find the angle at which Edison can no longer climb?

What variables impact the steepest angle Edison can climb? (material of ramp, etc)

Science and Engineering: Does traction matter? Repeat the last experiment using wheels with different sizes and widths.

**Read chapter 11-13 (Roz turns on her headlights and then afterward dims and sleeps. The storm and flood happen which carry Roz downhill.)**

Have class create a rainstorm.

Use the Light Following barcode and reenact Roz in the storm traveling down the flood stream using a flashlight for Roz to follow.

Record observations about best strategies for getting Edison to successfully track the light.

Wonder if... Are there other light sources you can use for Edison to follow?

Experiment with other light sources (laser pointer, light on phone, etc) and record observations.

Potential cross-curricular tie-ins:

Science Practices: Investigation of variables like distance of light source away from Edison and how well it tracks the light.

Science and Engineering: Erosion control in flash flood.

Reading: Monsoons or weather related disasters.

Social Studies: current events of floods and landslides. How this impacts people, politics and environments

Science: Moth attraction to light (living organism) vs. Robot attraction to light (non-living)

Intelligence of living and Artificial intelligence organisms being attracted to light compare/contrast organisms



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**Read chapters 14-15 (Roz encounters the bears and a chase ensues.)**

Use Clap Controlled Driving barcode with two Edisons.

Race with two Edison's – one as Roz and one as the bear.

Try it twice – one time clapping and second time tapping Edison.

Wonder... What is the best way to race the Edisons using clap controlled driving?

**Brain Pop Video**

<https://www.brainpop.com/technology/computerscience/computerprogramming/>

**Read chapter 20 (Roz learns how to observe and understand the language of the animals)**

Introduce EdBlocks <https://www.edblocksapp.com/>

Challenge: Coding Edison to sing Bambi song- April Showers challenge send message to other Edison's for a round.

Potential cross-curricular tie-ins:

Writing/Research: How do animals communicate with each other?

Excellent book on bird intelligence: The Genius of Birds by Jennifer Ackerman

<http://bit.ly/GeniusBirdsJA>

Resource article and embedded videos by Owlcation: <http://bit.ly/Owlcation>

Robot animals: <https://bit.ly/RoboticAnimals>

**Read chapters 24-27 (Roz has an accident, saves the egg, and the gosling meets Roz.)**

Make a tree using building bricks, which is at least 9x9x3 bricks.

Place two trees on your desk and create a program to S-turn around them.

Refer back to your notes on distance and write in journal about the structure you were asked to code vs the function(s) developed in the creation of the S-turn.

Gallery Walk

Potential cross-curricular tie-ins:

STEM build and code a path for Roz to get around obstacles.

Math: Measuring in metric system and using decimals

**\*Chapters 28-34 recap of these-not read (The gosling gets a name, the need for a home, Roz barter work for nest/home and the creatures get a garden)**

Coding and Math-program Edison to travel the perimeter of the garden in cm and then use the perimeter to find the area.

Potential cross-curricular tie-ins:

Social Studies: Economics and bartering

Science: importance of "nutrients" in the soil

ELA: Character Analysis of Change over time of character

Engineering: Creating a bulldozer to clear area with Edison



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**\*Chapter 35 The First Swim (Roz can't swim and needs to try to protect Brightbill)**

Using 1 Edison (Brightbill in the water), a remote control (solution for Roz who cannot get wet) and a piece of butcher paper with a large pond drawn in the center of the paper help get Brightbill out of the "water" safely.

**\*Chapter 39 The First Flight**

Cross-Curricular tie-in: Engineering the "World's Best Glider" See the STEMAZing Project website (<https://stemazing.org/engineering-worlds-best-glider/>)

**\*Chapters 46-48 The New Foot**

Engineering a new wheel using a technic axle and "recyclable items" The goal is to engineer the new wheel to run as close to a perfect line for 90 cm using electrical tape for your line.

## A Wheeley Good Leg (wheel) Engineering Design Challenge

**Problem:**

- Roz has lost her foot and now we need to engineer a new one to take its place. How can you fashion a wheel out of recyclable materials in order for Edison Roz to follow the 90 cm electrical tape line as close as possible?

**Criteria:**

- Roz must follow the line for 90 cm using code (not line following) from EdBlocks, EdScratch, or EdPy.

**Constraints:**

- Time limit of 20 minutes
- Must use recyclable materials and a technic axle to fashion the foot.
- Cannot use a ready-made wheel from something else.