



Garden Claw to the Rescue!

Testing "The Claw"



School was not fun for Azure Searle (call her "Azzie") when she was nine. Azzie is smart and creative, but she has dyslexia. That's a learning disability that sometimes makes it hard to read, write, and spell.

Luckily, Azzie's teachers were open to finding different ways for her to learn at school. Azzie's mom suggested she try the Spark!Lab Invent It Challenge. By creating and submitting an invention, Azzie could use her creativity, solve a real-world problem, and use reading and writing for an important purpose. Azzie and her teachers said, "Let's do it!"

Think It: Describing the Problem

The first step of inventing is to find a problem that needs solving. Azzie brainstormed lists of problems, or what she calls "crazy ideas." She also talked to people, including her grandparents. Her grandparents liked to garden, but it had become hard for them to pick the fruits and vegetables they grew. It was difficult to reach down low and up high. It was especially hard to reach around their shed or around a tree. Azzie decided to invent something to help older people grab things in hard-to-reach places.

Explore It: Investigating Past Solutions

Azzie did a lot of research before she designed her tool. To get ideas for the grabbing part of her tool, she watched videos about robotic hands and robots. She looked at many images of garden tools online. This made her aware of tools already available. Maybe she could somehow modify, or improve on an existing device. Using what she learned, Azzie was ready to design.

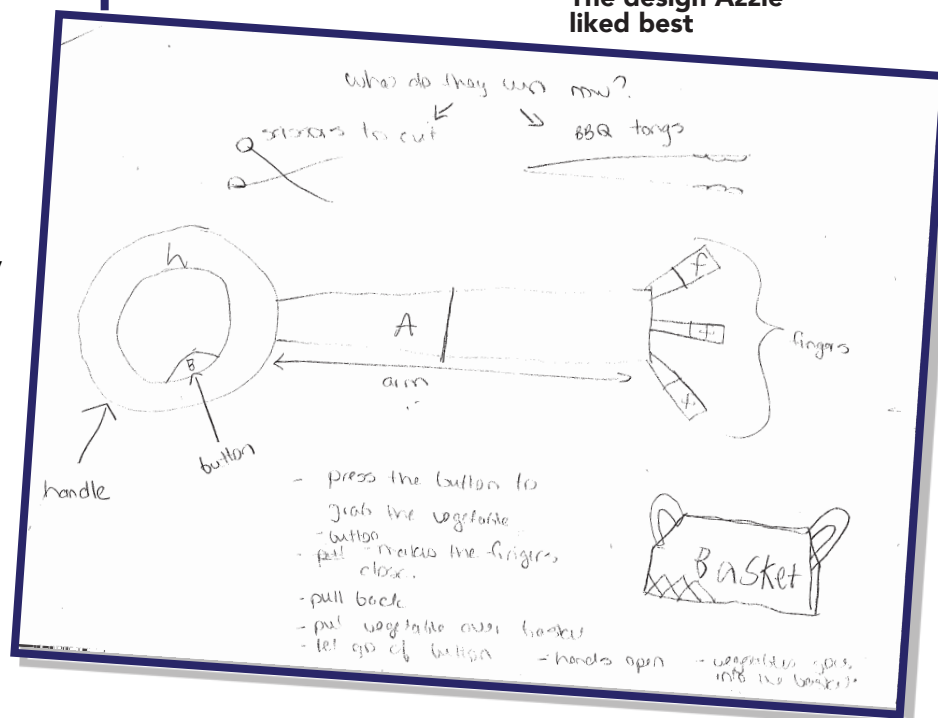
Identify a Problem			
Personal	School	Community	G
<ul style="list-style-type: none"> Getting out of cars Glasses cleaning Running out of cars If I got lost Not enough money Grandma and Grandpa can't bend down to garden Lost my key Lost all my toys 	<ul style="list-style-type: none"> Blocked toilets Too many children at school Bullies Not enough books Too many teachers sick Not enough books Not enough classrooms 	<ul style="list-style-type: none"> Find a friend to play with Getting electricity No parking Not enough water No gas Not enough houses No police 	<ul style="list-style-type: none"> What Putting the b Cutt man No the Too pol

The problems Azzie brainstormed

Sketch It: Drawing the Design

Azzie decided that her tool had to be big enough and simple enough for an older person to use. It had to be light and easy to hold. And it had to be long and able to bend around things. She drew three designs. Azzie's favorite idea used a plastic robotic hand to the end of a long, flexible pole.

The design Azzie liked best



Create It: Building a Prototype

Azzie gathered the parts she thought she needed— a pole that extends, a garden hose, a swivel joint, and a plastic robotic hand kit. The robotic hand worked by pulling on cords threaded through a plastic palm. The cords were attached to plastic fingers. With her stepbrother's help, Azzie built the hand. It took a long time.

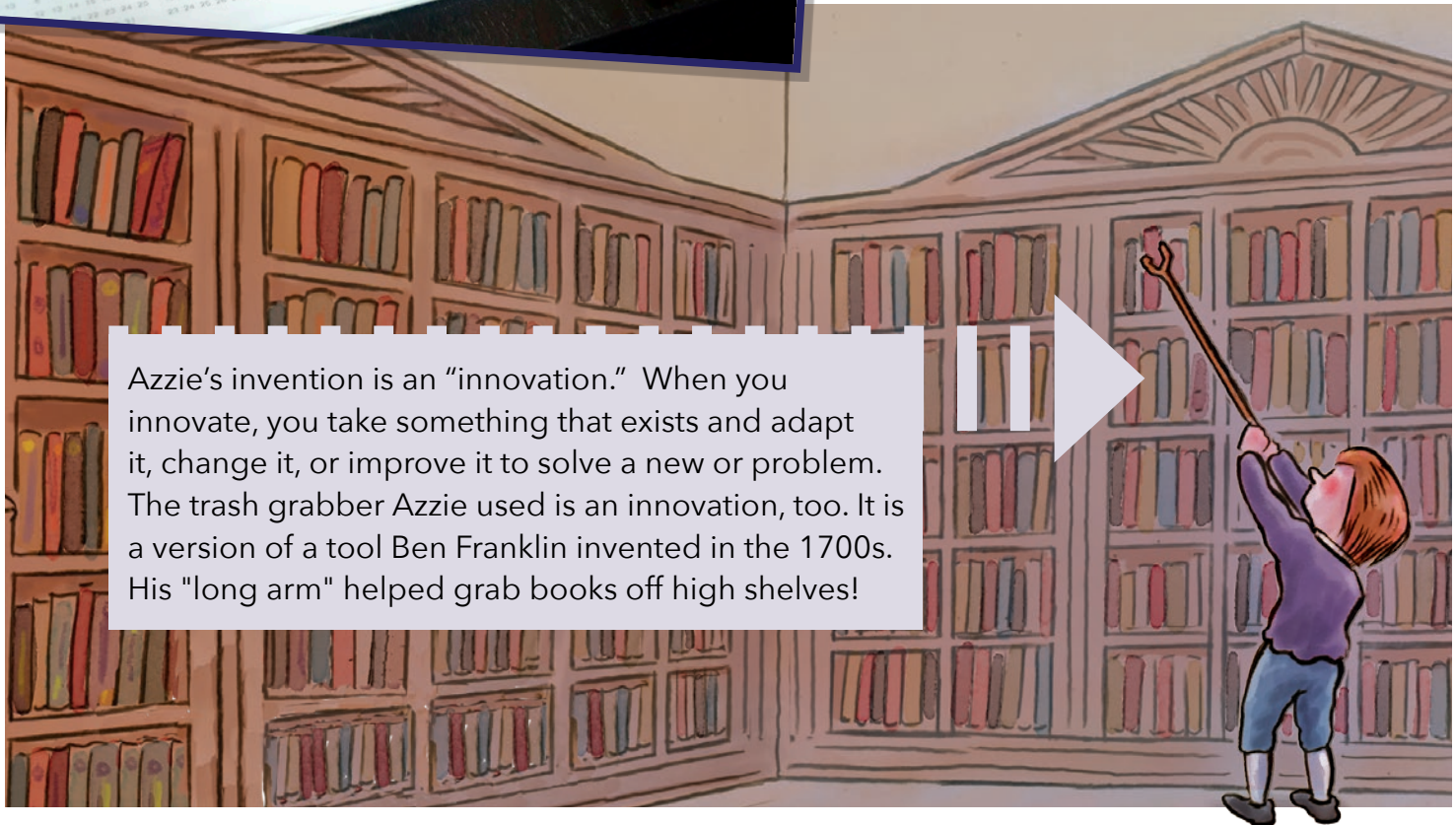


Try It: Testing it Out

Azzie wanted to test the hand before she attached it to the pole. She tried to make it pick up an apple. But the hand could not lift it! Azzie wanted to understand why.

Azzie compared the robotic hand to a human hand. She realized that to pick something up, you don't need a whole hand. You only need a thumb and one other finger. And the tips of those fingers must be able to touch in order to pinch or grasp something. The flat palm of the robotic hand couldn't curve. The fingers could not touch or grip. So Azzie gave up on the idea of the robotic hand. She looked for a different tool she could adapt and improve.

Azzie's invention is an "innovation." When you innovate, you take something that exists and adapt it, change it, or improve it to solve a new or problem. The trash grabber Azzie used is an innovation, too. It is a version of a tool Ben Franklin invented in the 1700s. His "long arm" helped grab books off high shelves!



Tweak It: Making it Better

Azzie found a grabbing tool that's often used to pick up trash. Azzie took apart the trash grabber to see how it works. It has two curved "fingers" at one end of a plastic tube. A cord runs through the tube from the fingers to a handle with a lever. When you squeeze the lever, it pulls the cord and makes the fingers pinch.

To help her grandparents, this tool would need a longer reach. It would also need to bend around corners.

Azzie cut the tube and inserted a length of garden hose midway. She used fishing line to connect the fingers to the lever. But the fishing line kept stretching. If the fishing line was loose, the fingers would not move.

Azzie tried a cord from a weed-cutting machine. That cord held its shape and didn't stretch. Now the tool could pick up fruit! At last, Azzie felt ready for the final testers—her grandparents. They loved Azzie's invention. They were so pleased that Azzie had made something to meet their special needs.

Taking apart the trash grabber



Azzie is from
New South Wales,
Australia

Sell It: Getting Customers

Azzie named her invention "The Claw." She planned to make it in different colors and offer free samples. With her friend Tony, she created an eye-catching advertisement. But in the end, she simply gave the claw to her grandfather. Knowing that she had helped someone was all the reward Azzie needed.



Azzie Now

Azzie loved inventing. It was hard for her to keep trying when her ideas didn't work. But, she told herself she would soon find a solution – and she did! Inventing gave Azzie confidence in her ability to learn and do well in school. It also inspired her teachers to build learning around projects.

Now Azzie is 13 years old. Since winning the Spark!Lab Invent It Challenge, she's taken up cello, piano and singing. And these days, she's inventing with

music! For a school geology project, she composed a song called "Eruption" to share what she learned about volcanoes.

Azzie encourages other kids to get into inventing. "It doesn't matter how smart you are," she says. "It's super fun to try!"

