

Santa Ana High School Article of the Week #2

Teens Give Boy a Helping Hand (960L)

Learning Target: *Students will generate questions about ideas, arguments, analyses, perspectives, or the rhetorical presentation of text for the purpose of making an informed response to what others say*

Instructions: READ and ANNOTATE using CLOSE reading strategies.

Step 1: Skim the article using these symbols as you read:

(+) agree, (-) disagree, (*) important, (!) surprising, (?) wondering

Step 2: Number the paragraphs. **Read** the article **carefully** and **make notes in the margin**.

Notes should include:

- Comments that show that you **understand** the article. (A summary or statement of the main idea of important sections may serve this purpose.)
- Questions you have that show what you are **wondering** about as you read.
- Notes that differentiate between **fact** and **opinion**.
- Observations about how the **writer's strategies** (organization, word choice, perspective, support) and choices affect the article.

Step 3: A reread noting anything you may have missed during the first read.

Teens give boy a helping hand

Use 3-D printer to build prosthetic



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*Notes on my thoughts,
reactions and questions as I
read:*

A small boy has a new hand, thanks to a group of brainy North Shore teens.

The 13 eighth-graders and one high school senior built a prosthetic hand for 3-year-old Max Lehrer, who has amniotic band syndrome and was born without fingers on his right hand. He tried on the new robohand last week. For the first time in his life, he used his right hand to pick up a ball and toss it.

“It was amazing, because he was doing something he couldn’t do before,” said his mother, Nicole Lehrer. “As a mom, you just want him to have the same opportunities other kids have to ride a bicycle, to pick up a ball, to shake someone’s hand.”

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Max's parents both work at Brookwood School in Manchester.

Rich Lehrer is a science teacher there. Last summer he started researching how to make a prosthetic hand for his son. He decided to involve his eighth-grade students, thinking it would be a good learning experience.

A couple of months later, Lehrer learned that Governor's Academy in Byfield had a 3-D printer, and a student named Arjun Bhatnagar, 17, knew how to work it. He asked Bhatnagar to help.

"I was all up for it," said Bhatnagar, of North Andover. "I thought it was a super cool project."

"I've always loved building things," added Bhatnagar, who knows 15 computer programming languages and has built websites and apps in the past.

Using a free design available online, Bhatnagar learned how to print the dozens of plastic pieces needed for the hand, with fingers that grip or release as Max moves his wrist. Lehrer's students worked on the metal components and assembly.

They spent less than \$150 on supplies and received a donation of one key material, thermoplastic, from a Boston prosthetics company. The project took months, but the finished product was a bargain compared to the tens of thousands of dollars that professionally made prosthetics can cost.

When little Max saw the completed hand last week, he shrieked, "Wow, that's cool!"

And his parents choked up with emotion. And the students felt a satisfaction they don't get from most school work.

"The stuff you do at school, sometimes it seems like it's for no reason," said Christian Blake, 14, one of the members of Lehrer's Robohand Club. "This actually made a difference."

Bhatnagar, who graduates in May and is college-bound this fall, wants to start a tech company someday — maybe, he said, a company that makes robotic hands for needy people in impoverished countries.

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Key Vocabulary:

Prosthetic *adjective* pros·thet·ic \präs-'the-tik\ the surgical or dental specialty concerned with the design, construction, and fitting of prostheses

Perseverance *noun* per·se·ver·ance \,pər-sə-'vir-ən(t)s\ the quality that allows someone to continue trying to do something even though it is difficult

Answer each question in one or more complete sentences and by providing complete explanations.

1. *What medical condition resulted in the need for the prosthetic in the first place?*

2. *What is the purpose of a 3-D printer?*

3. *Define **open source** as used in the article.*

4. *How did **perseverance** play a part in creating the prosthetic? Cite evidence from the text to support your response.*

5. *According to a Department of Veterans Affairs study (<http://health.costhelper.com/prosthetic-arms.html>), the average cost of a myoelectric prosthetic arm with a realistic looking, functioning hand is about \$30,000. Insurance typically covers 50% of this amount. Based on this information, how much more would a myoelectric prosthetic arm cost compared to the robohand?*