

# Auburn Journal

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## Full STEAM ahead: Summer camp puts students in the laboratory

By: Tricia Caspers of the Auburn Journal



### Build your own Bristlebot

Would you like to try a science project at home? Build your own toothbrush robot, also known as a Bristlebot. This project turns the head of a toothbrush into a bug-like robot that zips around on a flat surface.

**What you need:**

- One toothbrush (preferably one with bristles that are the same length or angled in one direction)
- Hefty scissors
- Regular scissors
- One pager motor (This can be removed from an old cell phone or purchased fairly inexpensively online.)

As an alternative, you may want to use the motor from a disassembled electric toothbrush.

- One watch battery (or any type of coin battery)
- Copper wire
- Electrical tape
- Foam tape

**Directions:**

- Cut the head off of the tooth brush.
- Use electrical tape to attach two copper wires to the pager motor.
- Use the foam tape to attach the motor to one end of the flat plastic side of the toothbrush with  
the motorized portion hanging over the end so that it can vibrate freely.
- Use foam tape to attach the watch battery to the other end of the toothbrush.
- Attach the battery to the motor with electrical tape.

If you are more skilled, have the tools and are working with older children, you may choose to solder the copper wires to the pager motor. Tinker with the placement of the wires to find the best placement. You may also want to experiment with different types of tape or twist ties to hold the battery in place.

Try clipping the bristles to see how the robot changes direction depending on the angle of bristles. Don't over clip, though, or the robot won't be able to stand.

Watch your robot zip!

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### **HOW TO SIGN UP FOR CAMP**

For more information about summer STEAM programs available this summer visit:

Auburn Parks and Recreation:  
Auburnrec.com

Boys and Girls Club: Bgcplacercounty.org

EDMO: Campedmo.org

*Editor's note: This is part of an intermittent series looking at the use of technology among the younger generation.*

School bells may have stopped ringing for summer break, but that doesn't mean students have quit learning. In fact the lessons in science, technology, engineering, arts and math (STEAM) that have become integrated in more traditional classroom curricula are now exploding on to the scene of summer camps like a concoction of vinegar and baking soda.

And kids across the foothills and beyond are lining up to don their safety goggles.

"Technology is always a huge draw," said Jennifer Cross, program director for the Boys and Girls Club.

That's because it's hands-on, it's active and immediate, she said, and it teaches the kids lessons about trial and error that they can take with them outside of the workspace.

The summer camp has about 180 attendees between its elementary and middle school sites.

Cross was looking at science programs to help prevent summer slide (stagnated learning during the off-school months) when she was approached by the Auburn Union School District to incorporate some of its STEAM curriculum.

"It seemed a perfect fit," Cross said. "We're always looking for new ways to engage our youth."

### Rockets and 'slimy things'

This summer the participants at the summer camp have made different kinds of rockets, learned, among other STEAM lessons, what happens when they mix crushed Mentos with Diet Coke and built robots that created art.

"They didn't want to stop," Cross said of one activity involving engineering with Popsicle sticks and Solo cups.

Up the hill at Colfax library, the science activities are equally popular said librarian Amy Toepfer. Local residents are asked to sign up in advance for projects such as "the science of slimy things," and the programs fill up quickly.

(Snail slime is sometimes used in medicine, in case you're curious.)

At another program, "excellent explosions" 75 attendees learned what happens during a chemical reaction.

"We definitely have seen a really big surge of interest in (STEAM)," Toepfer said.

Libraries are there to promote reading, and reading plays an important role in STEAM, so the library is the perfect place for it.

"It's another way for kids to learn," she said. "We're all about learning."

Tom Toy is all about learning, too. The high school science teacher spent a couple of weeks out of his summer break teaching robotics and engineering to children at Live Oak Waldorf in Meadow Vista through the Auburn Recreation District.

The class had 20 students on its waitlist almost before registration materials hit Auburn mailboxes.

"What we build doesn't have to come from a factory," Toy said as he helped his students engineer cranes out of tongue depressors, pipe cleaners and Dixie cups.

When one of the students is having trouble with his project, Toy gives him a pep talk and then asks his class, “What does FAIL stand for?”

“First Attempt in Learning,” they call back to him.

### Embracing the power of failure

It’s difficult to fail in front of other people, Toy said, but it’s also necessary. That’s why Toy believes it’s important to begin every STEAM class with team- and trust-building activities. If the students trust each other, they collaborate better, and when a project goes awry they’re more comfortable starting over.

Students do well, he said, when they set their own objectives and meet them.

“If adults set the objectives, students overshoot it or they fall short,” he said. “When they meet their own goals they feel incredible success.”

If your little engineer missed out on Toy’s class, there are more STEAM opportunities happening through ARD all over town.

Another STEAM option is EDMO, which is a camp being held at Sierra College for the first time this summer.

The parent program, Edventure More was so popular in the Bay Area that its founders invited Kate Hay to open a summer camp in Placer County.

Already, 275 kids have signed up for activities such as spy camp, backyard biology, animation and Minecraft map making.

Hay is a Rocklin mom who was looking for a maker camp or after-school classes for her youngest son but couldn’t find anything. Undaunted, she set about researching how to start her own.

That’s when she approached Edventure More, and it was an instant match....

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