

ART-O-MATIC INTELLIGENCE

EXPERIMENT: SCRIBBLE BOT

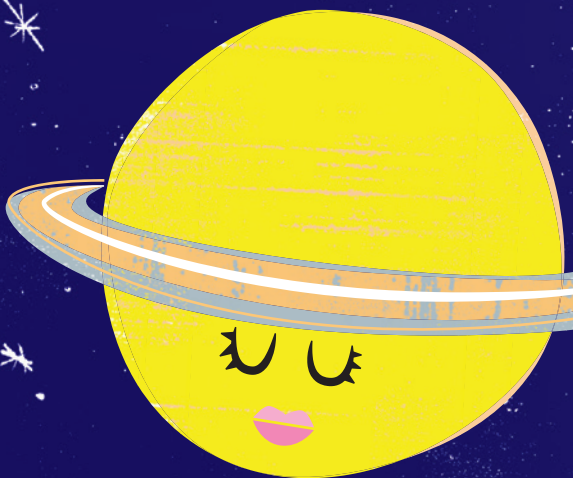
One way that you can explore hard-to-reach places is by using a robot. Robots are sophisticated machines that can sense, plan and act. The Curiosity rover is a robot that's exploring Mars. Make a simple drawing machine that uses vibrations to move and see what artistic patterns it creates.

MATERIALS

- Batteries
- Pool noodle
- Markers
- Rubber bands
- Tape
- Paper
- Battery-powered toothbrush
- Scissors or utility knife
- Cardboard and paper clips (optional)
- Craft supplies, like pipe cleaners, construction paper, craft sticks, googly eyes, feathers, etc.

SATURN

You probably recognize me because of my spectacular rings. They're mostly made of chunks of ice and dust, and were discovered by the famous astronomer Galileo Galilei in 1610.



INSTRUCTIONS

Cut a piece of pool noodle that's a bit longer than the battery-powered toothbrush. Insert the toothbrush into



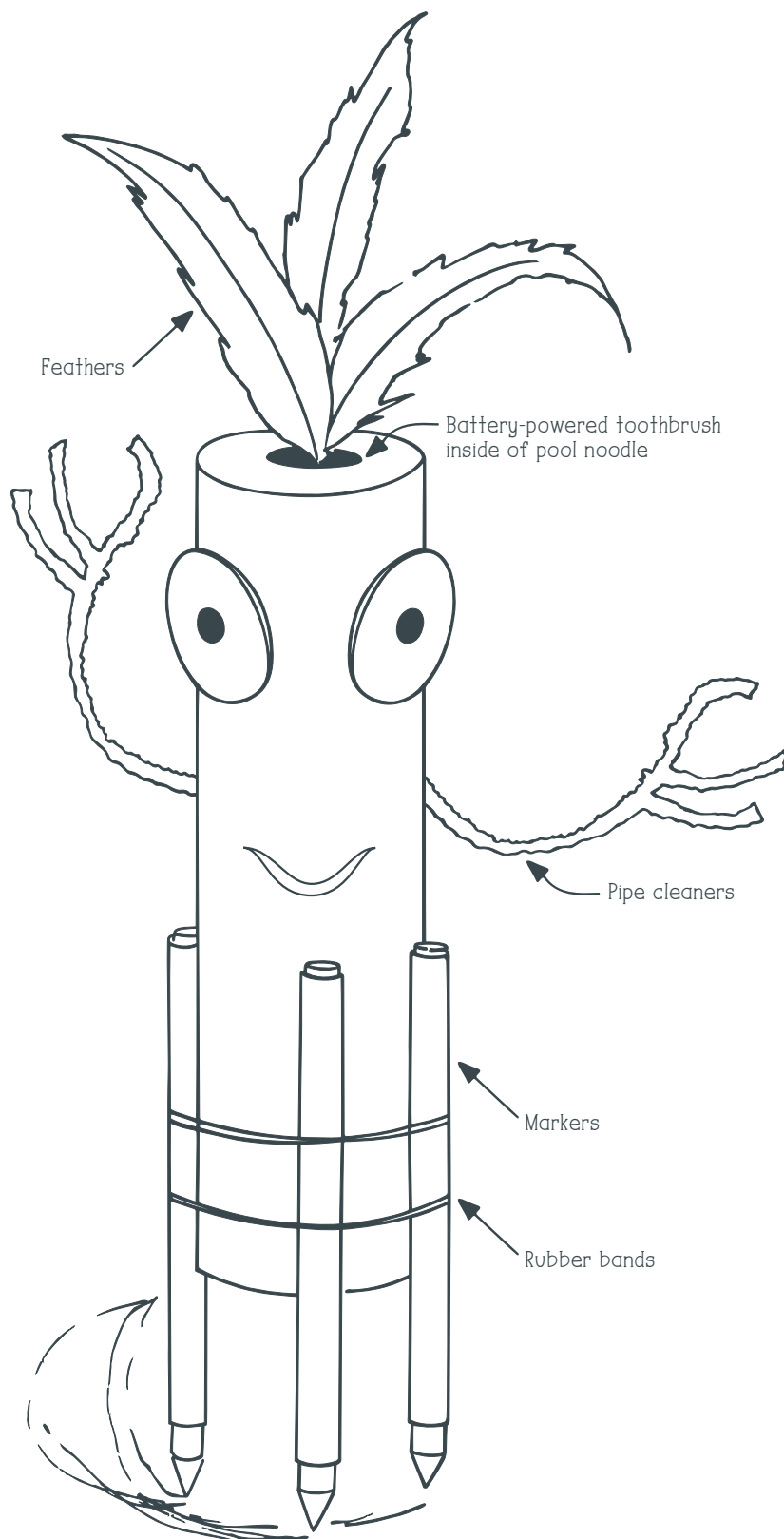
the middle of the pool noodle. Make sure you can reach the on/off switch. This is the body of your scribble 'bot. Make the legs by attaching several markers to one end of the pool noodle with rubber bands. The markers should point outward and extend past the pool noodle body.

Personalize your scribble 'bot by using craft supplies to give it hands, a face, hair, clothing - be creative! Attach arms by making small slits on the sides of the pool noodle and inserting bent pipe cleaners.

Put some paper down on the table and uncap the markers. Turn on the toothbrush and set the scribble 'bot on the paper. You may need to adjust the marker "legs" if it's unbalanced. Watch it go, and see what designs it makes.

WHAT'S HAPPENING?

The scribble 'bot is a type of bristlebot, which is a simple robot easily built with a brush and other household items. The vibration of the toothbrush causes the pool noodle to move. This energy of motion is called kinetic energy.



GAME ON

Try making a different vibrating robot by removing the brush and neck from your battery-powered toothbrush (this is easily done on models with twist-off tops). Cut a square of cardboard big enough to fit the toothbrush base. Shape four feet from paper clips and attach them to the corners, bending them to point down and angling them slightly in the same direction. Tape the toothbrush base on top and decorate it to look like a bug. When you turn on the battery, the vibrations will make your bug skitter around.

TIPS

Affordable battery-powered toothbrushes are available at dollar stores. A more powerful motor means the scribble 'bot will vibrate and move more vigorously. A body that's too heavy makes it harder to move.

MORE WAYS TO PLAY WITH ROBOTS

Step into a visionary world where robots are not just a curiosity, but a vital asset, in MSI's world-premiere exhibit *Robot Revolution*, supported by Google.org.

RECOMMENDED READING

"Curiosity's Mission on Mars: Exploring the Red Planet"
by Ron Miller

"Ricky Ricotta's Mighty Robot"
by Dav Pilkey