



THINGS THAT ROLL ACTIVITIES

JULY-OCTOBER 2015

Adaptive Driving

Since the early days of Henry Ford's Model T, we have adapted the automobile to meet different needs. As technology has become less expensive, engineers and inventors have made automobiles more accessible to people of all abilities. Key components, such as steering wheel spinner knobs that allow drivers to steer using only one hand, and hand controls or drive-by-wire twist throttles that allow drivers to control speed by hand instead of foot, have made it possible for more Americans to drive.

Invent a way to control the car. How could you accelerate the car if you did not have the use of your legs? Can you find a way to control the car using only one arm and your head?

Fast and Far

"Are we there yet?" The 1865 wagon odometer patent model by H. R. Coburn gives some indication that this is not just a 21st-century question. Whether you are in a wagon, in a car, or on the Metro, an odometer can tell you how far you have traveled and allow you to calculate how much farther it is to your destination.

Invent a device that can help you determine how far or how fast the wheel is spinning. How can you tweak your invention so that it can easily fit on other types of wheels? How can you change your invention so that it can give you an actual speed or distance reading?

Gyro Powered

If you have ever ridden a bicycle, you know that it is a lot easier to maintain your balance on a moving bicycle than one that is at rest. Part of what keeps your bike upright is the gyroscopic force of the spinning wheels. As with your bicycle, gyroscopes have the power to propel and direct. Inventor Charles Stark “Doc” Draper harnessed this power to guide the Apollo astronauts to the moon! Today, gyroscopes can be found in toys, smartphones, video game controllers, and even innovative modes of transportation like the Segway.

Invent a way to use the forces of a gyroscope to guide a vehicle. What can you add to your vehicle to make it more stable? How could a gyroscope-powered vehicle look different from a traditional rolling vehicle?

High Wire Driver

We see overhead telephone and electrical wires every day, but what else can wires carry? In the 1890s you might have watched your money zip overhead in a Lamson Cash Carrier at the department store. Or if you become a pro surfer, your best moves may be filmed from a high wire driving camera. Maybe you’ll ride a cart on a long cable to transport you to a high mountain peak with an amazing view.

Invent a device that is capable of rolling along the wire. What can your device carry as it travels? How can you make your device change direction as it travels?



Invent a skateboard in Spark!Lab. How will your skateboard be innovative or different from others? © 2015 Smithsonian Institution; photo by Tim Pula.

Invent A Skateboard

The first skateboards were like 2x4 sleds with roller skating metal wheels and were ridden barefoot. Soon surfboard companies started to make skateboards and skateboarding's popularity peaked around 1964 with most riders competing in downhill races. Then its popularity plummeted, but the invention of urethane skateboard wheels in 1972 revived skateboarding and was followed by

inventions like grip tape on the deck and improvements in trucks, axels, and bearings.

Invent a skateboard. How is your skateboard innovative or different from others? Can you make your skateboard roll faster?

Roll and Shape

Rolling objects don't only move us from place to place, they can also shape the materials around us. Julia Child used rolling pins to transform dough into pies, cakes, cookies, and other yummy treats. The Krispy Kreme doughnut company used rolling devices to create its famous Long John doughnuts. (Look for Julia Child's rolling pins and the Krispy Kreme cutter on display in Spark!Lab!)

Invent a device that makes shapes or symbols as it rolls. What different shapes or symbols can you make with a rolling invention? Could you make a food product with writing using an invention like yours?

Roller Coaster Ride

Gravity pulls roller coaster cars along tracks full of twists and turns. Some coaster cars ride on top of the tracks, while others hang below. No matter how they are designed, roller coasters are sure to take your breath away!

Invent a roller coaster ride. What can you do to make your roller coaster more exciting? How can you make your roller coaster safer for riders?

Rolling Robots

The coolest robots don't just sit there—they go places and do things! Robotic Ants inventor James McLurkin creates groups of robots that work together to get things done. Like McLurkin's ants, Star Wars' R2D2, the Mars rover Curiosity, and the Roomba vacuum use rolling movement to get work done. (Look for rolling robots on display in Spark!Lab!)

Invent a robot that rolls. What types of tasks can your rolling robot perform? How can you tweak your robot so that it is more responsive to the things around it?

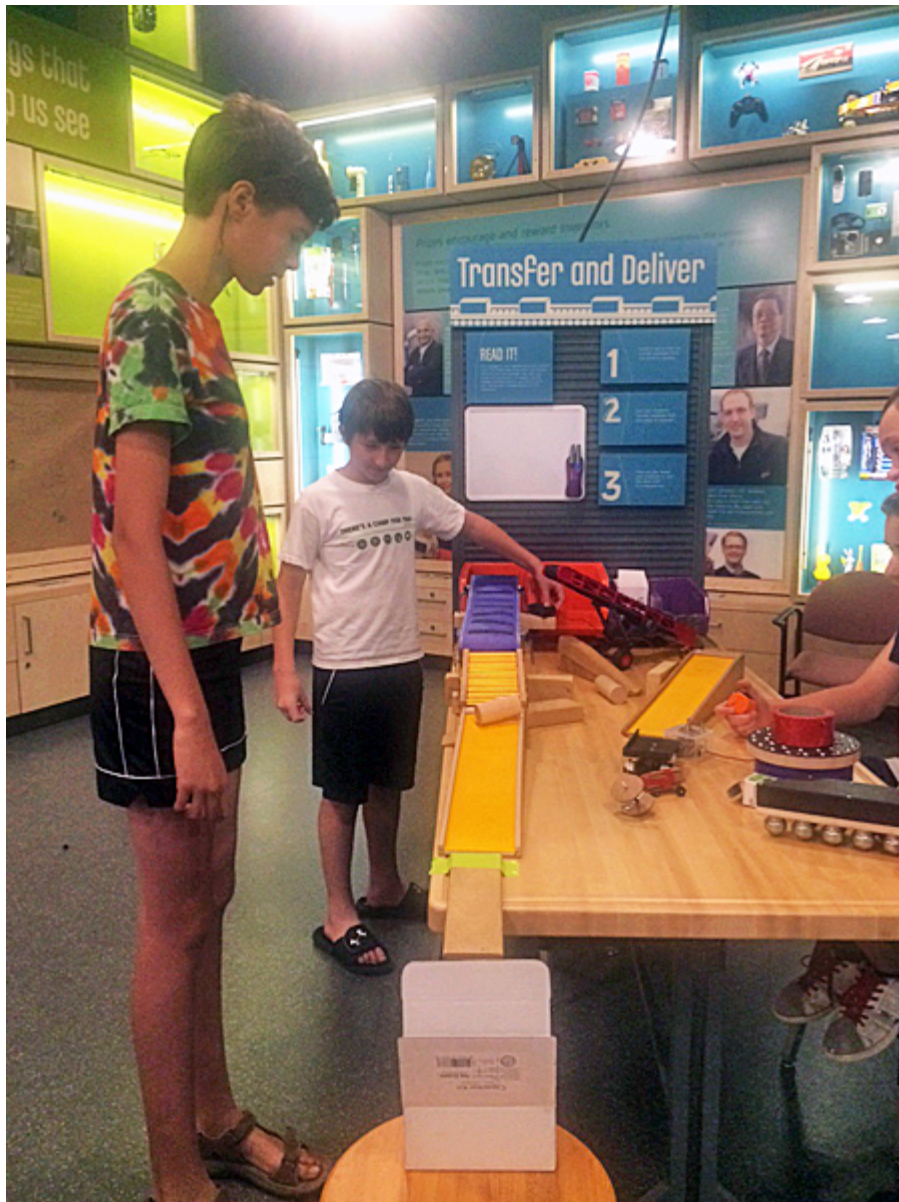


Invent a robot that rolls at Spark!Lab.. What types of tasks will your rolling robot perform? Photo by Jamia Eaton.

Toys on the Move

Mr. Machine rolled its way out of the 1961 Sears catalog and into homes across America. With its transparent body this rolling toy revealed its inner workings. During the early 20th century, rolling toys took us to market and carried our baby dolls. Toys on wheels, from cast-iron figures on horses to remote-controlled robots, continue to capture our imaginations.

Invent a rolling toy. What features can you add to the toy to make it more fun? How can you make your rolling toy stronger so that it can last for generations to come?



In Spark!Lab, you can invent a device that can transfer packages from one place to another. © 2015 Smithsonian Institution; photo by Tricia Edwards.

Transfer and Deliver

The package on your doorstep may have started out on the other side of the world. Somewhere along the way your package was rolled and sorted in a warehouse. Conveyors like the Speaker conveyor system are used to move, sort, and tip your package toward its final destination.

Invent a device that can transfer packages from one place to another. Can your invention transfer different types of packages? How can you tweak your invention to sort the items that it is transferring?

Virtual Navigation

In 1967 Douglas Engelbart invented the computer mouse. He made it possible for us to surf and click through virtual space. He also created some of the first hyperlinks. In 1980 Apple made the first consumer mouse available with its Lisa computer. (Look for Engelbart's mouse on display in the Places of Invention exhibition!)

Invent a rolling device that allows you to navigate the virtual space on the computer screen. How can you make your invention more fun to use? How can you make your device easier for others to use?