

Hacking STEM Lessons & Hands-On Activities

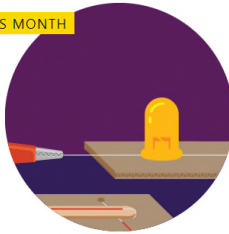
Build affordable inquiry and project-based activities to visualize data across science, technology, engineering, and math (STEM) curriculum. Middle school standards-based lesson plans written by teachers for teachers.

Lesson Plans, They're Free!

Translate this site to get the lessons in your preferred language

English - United States

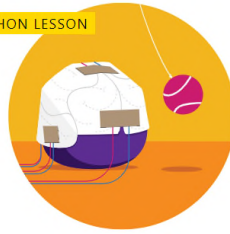
NEW THIS MONTH



Making party lights using circuits and switches
Students learn the basics of electrical circuits and switches by building a simple string of lights. Then using Excel, they choreograph their own light patterns that they can record and present.

[CREATE PARTY LIGHTS >](#)

HACKATHON LESSON



Building models to understand and mitigate brain injury
Students learn about the regions of the brain, their function and visualize what happens when the brain collides with the skull. Then, they design protection that mitigates the effects of the brain colliding with the skull. Finally, students are encouraged to take the [Think Taylor #TTPledge](#) to commit to protecting their brains.

[MAKE A BRAIN IMPACT SIMULATOR >](#)



How fast do humans run?
Students compare the running speeds of animals, conduct data analysis to compare the race times of peers ages 11-18, and use trend data to compare how their own speed will change with age. This data science lesson integrates physical education and math.

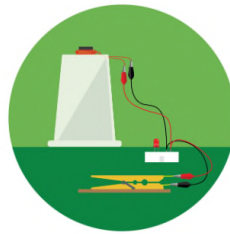
[COMPARE YOUR SPEED >](#)

PARTNER EDITION



How do sharks swim?
Students explore how sharks move within three-dimensional space. Working with physical and digital models, students learn how sharks change direction using rotations on the z, y, and x axes (i.e., yaw, pitch, and roll). Students can write code, build sensors, create in 3D, analyze data, and experience mixed reality.

[EXPLORE SHARK MOVEMENT >](#)



Harnessing electricity to communicate
Students build a telegraph out of everyday objects to understand electrical energy and its role in communications. Then, they use a customized workbook to send and receive information in Morse code using their telegraph.

[MAKE A TELEGRAPH >](#)



Building machines that emulate humans
Students build robotic models from cardboard and straws to understand the anatomy and biomechanics of the human hand. Then, they conduct trials visualizing data in Excel to generate new ideas for improving its performance.

[MAKE A ROBOTIC HAND >](#)

Want more lessons? Explore the Library!

[EXPLORE THE LIBRARY >](#)

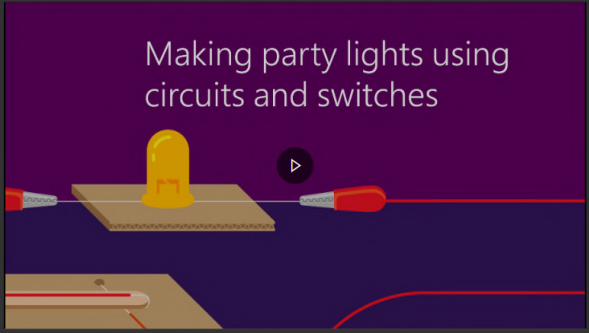
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[CREATE PARTY LIGHTS >](#)

Making party lights using circuits and switches



Hacking STEM is made possible by a partnership between the Education Workshop, Hack for Good and the Microsoft Garage



What is the Education Workshop?

A small incubation team inside of Microsoft that focuses on developing next generation hardware, software, and services for K-12 education. Our goal is to support teachers building inquiry and project-based activities that embed computational and design thinking into existing middle school curriculum. We want to democratize STEM for learners and demonstrate how all schools can provide affordable opportunities to bring 'making' and 21st century technical skills to the classroom. Hacking STEM was originally prototyped by the Education Workshop as a Hack For Good during Microsoft's 2016 //Oneweek Hackathon. Our 'hacked' version of Excel brings to life the fundamentals of science, opens the emerging world of IOT to the classroom and helps educators meet the NGSS and ISTE standards for data science.

Need Help? Have Questions?



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[SUBMIT YOUR IDEA >](#)

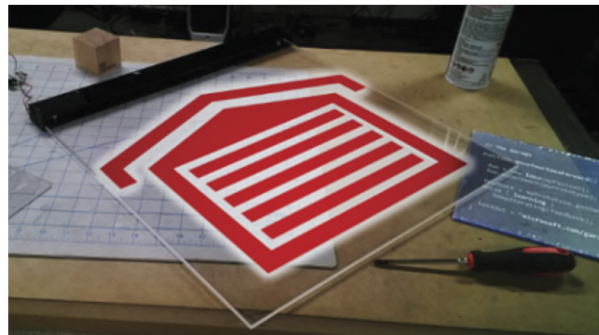
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Hack for Good

Hack for Good is the community of employees who want to use their technical and business hacking skills to help solve the world's greatest societal problems. The goal is to foster a community that will collaborate, create and build solutions that will empower every person and every organization on the planet to achieve more.

[MICROSOFT PHILANTHROPIES >](#)



The Microsoft Garage

The Microsoft Garage "Ship Channel" is Microsoft's official outlet for experimental projects from small teams across the company to test a hypothesis, receive early customer feedback, and determine product market fit. The Garage provides expert guidance and a lightweight release process to help teams get their experiments out quickly.

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