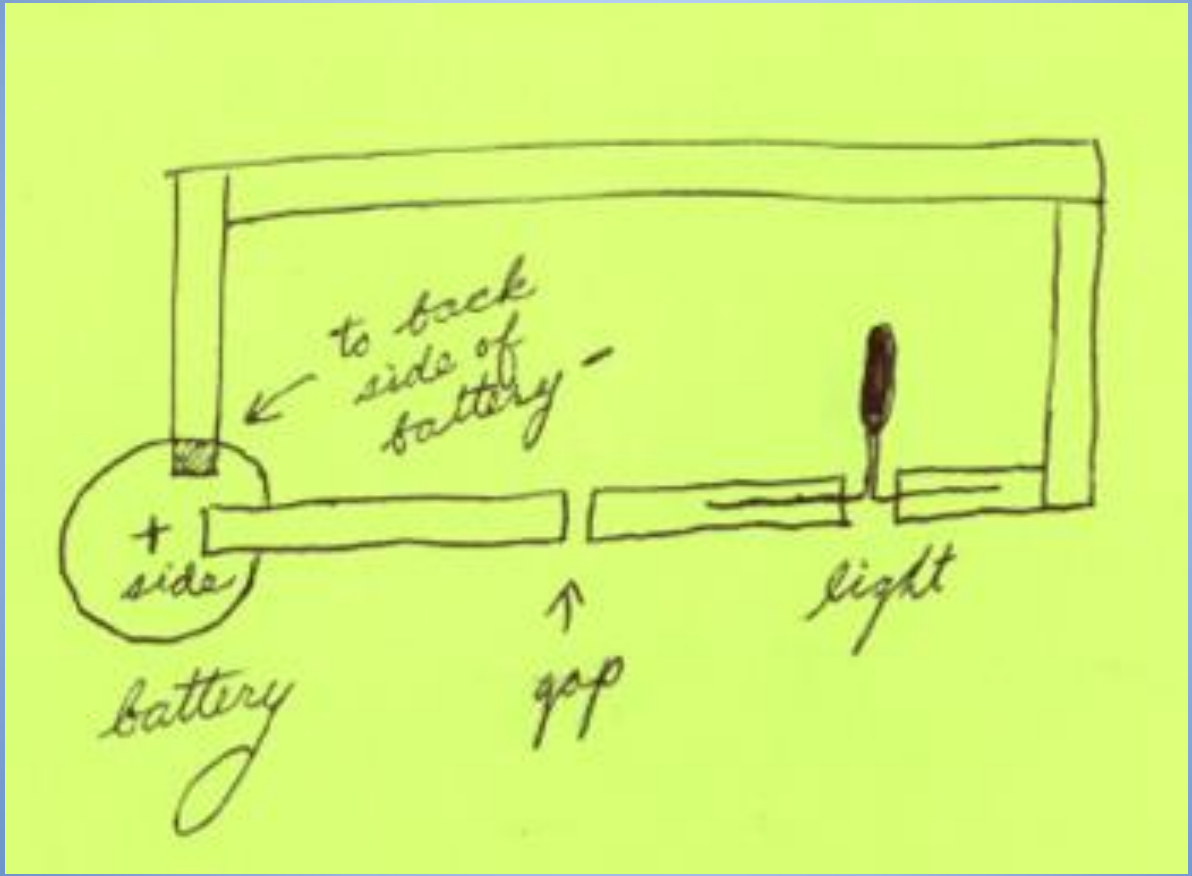
Exploring Science Through Historical Reconstruction

The work of FabLab - Curry School of Education UVA.

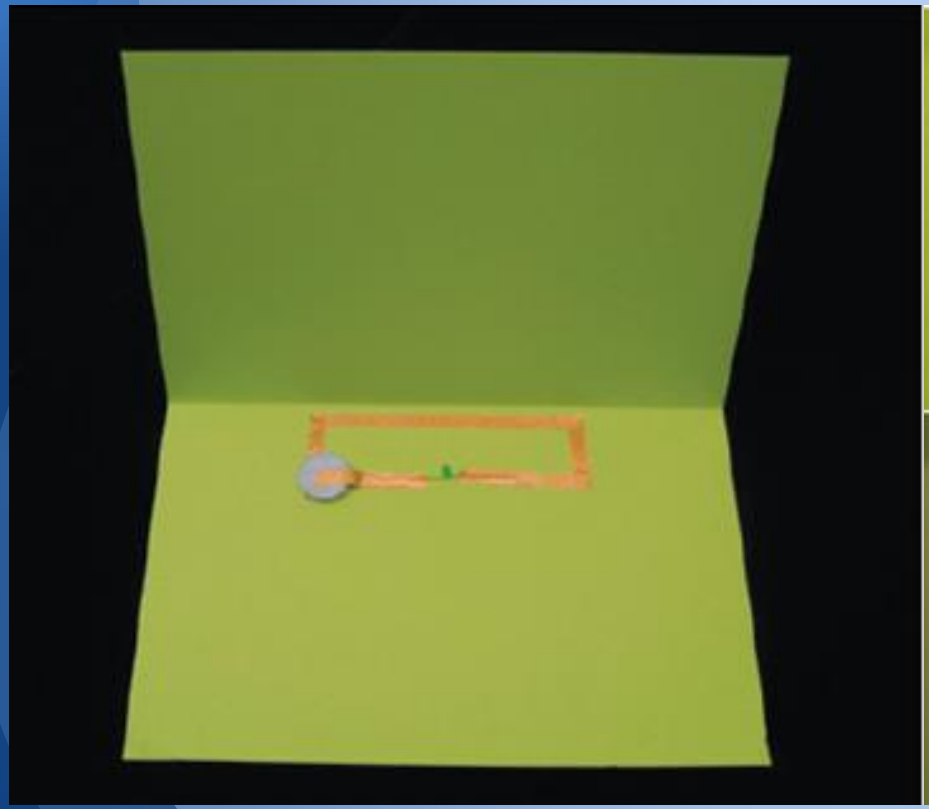
How Memorable Was It?

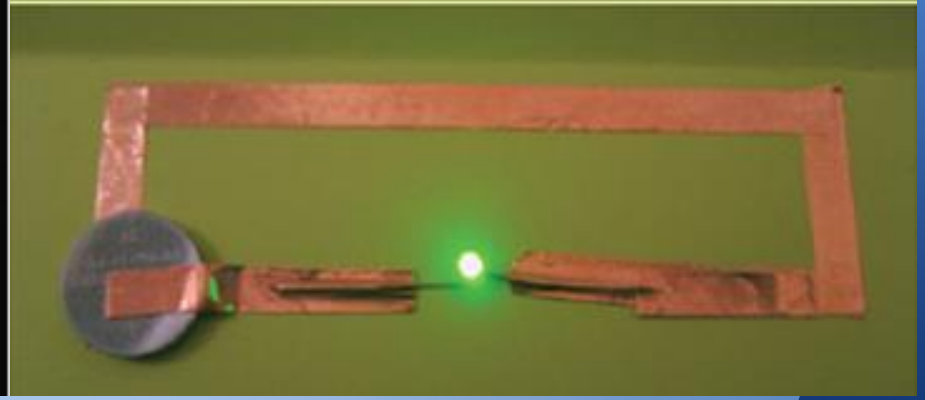
- Write down anything that you can remember about electricity and magnetism from your K12 learning experience.

Building Circuits



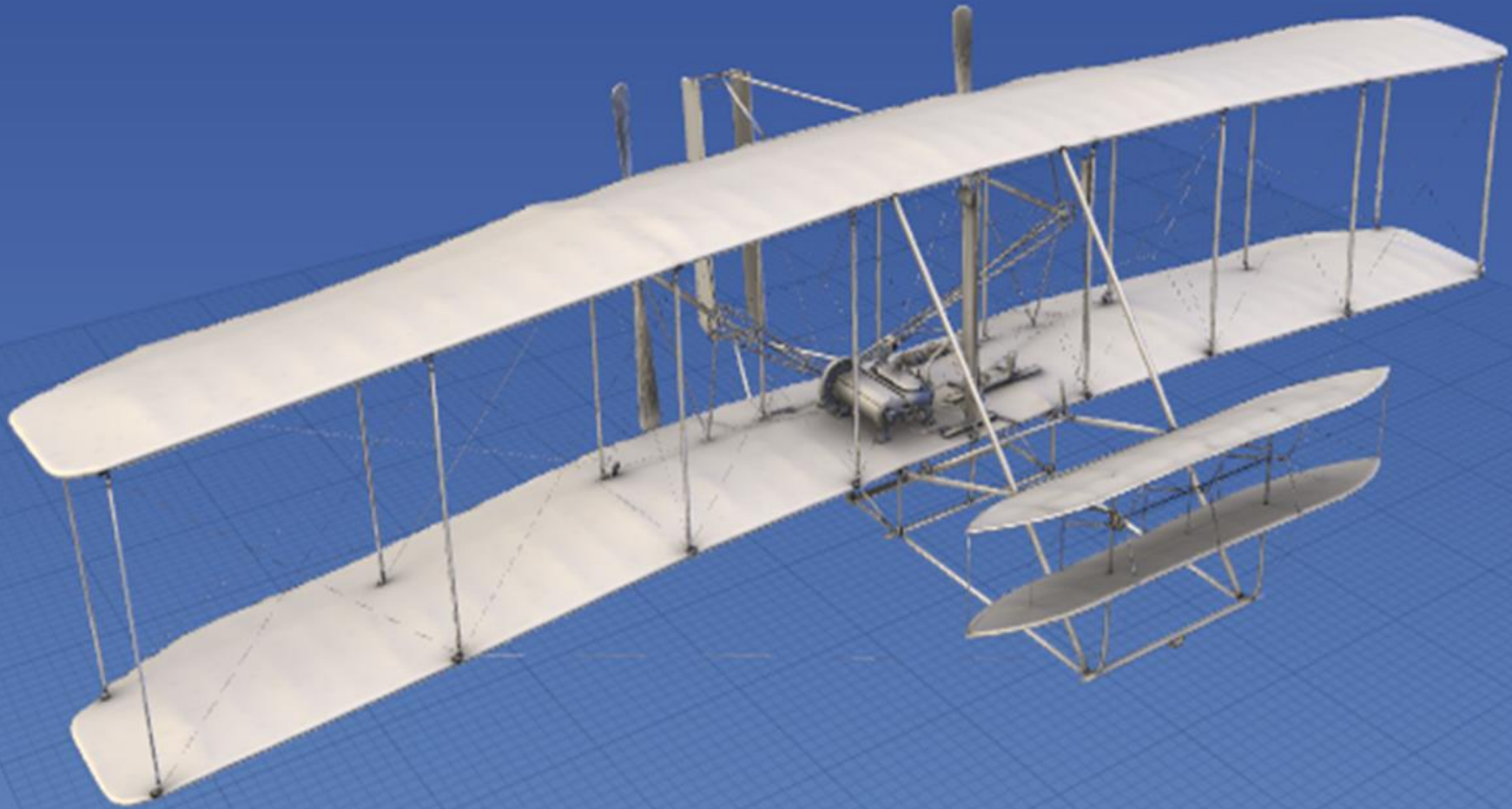
Building Circuits





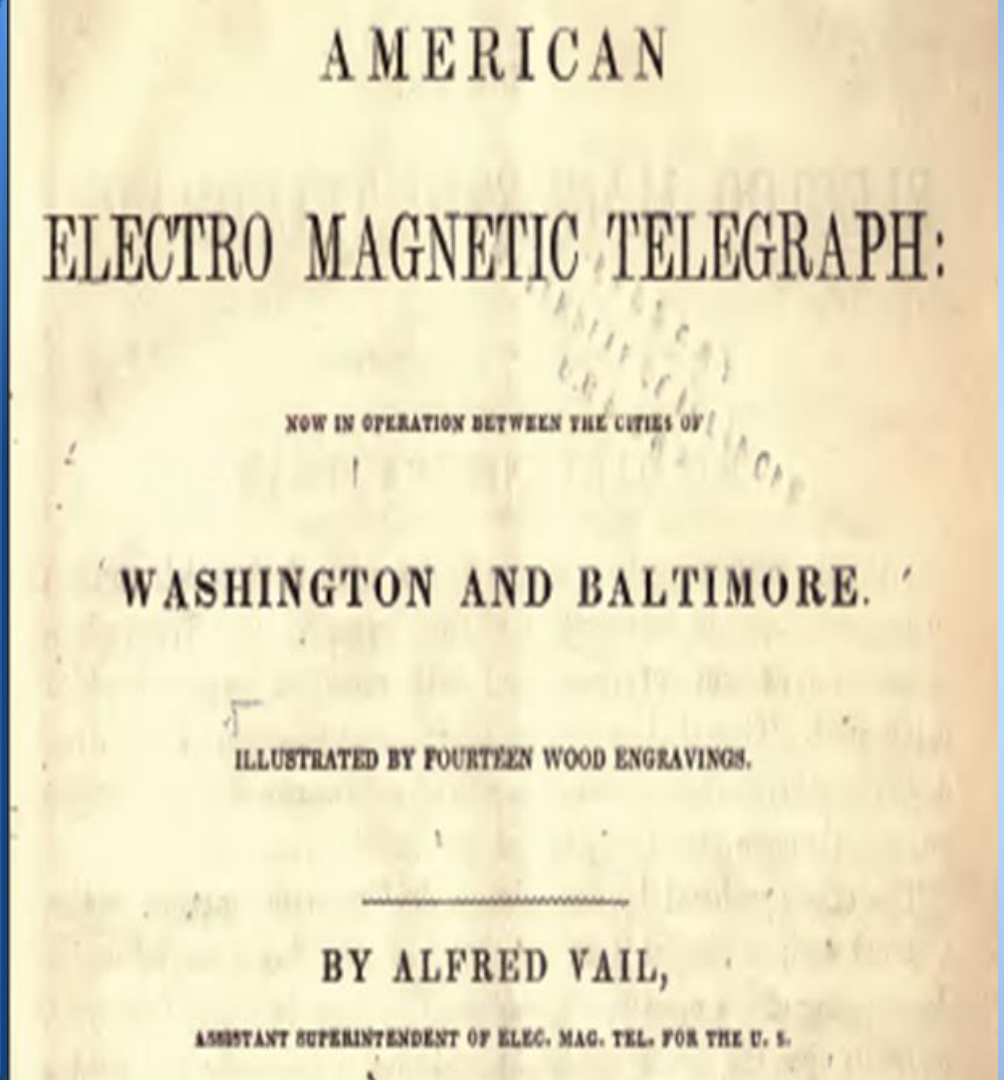
Work of the Smithsonian

"Hailed by many a new K-12 STEM Model. Students can use the same tools as professionals to become creators themselves. Whether students are printing invaluable museum objects or inventions of their own design, we hope that the chance to bring objects to life will give stu the opportunity to create imaginat and innovative work."



How it all started - The Challenge

Can middle school students understand an historic technological object by studying the inventor's original publications? Then using modern 3D CAD Modeling and Printing Tools, are they able to recreate the original proof of concept device?



AMERICAN

ELECTRO MAGNETIC TELEGRAPH:

NOW IN OPERATION BETWEEN THE CITIES OF

WASHINGTON AND BALTIMORE.

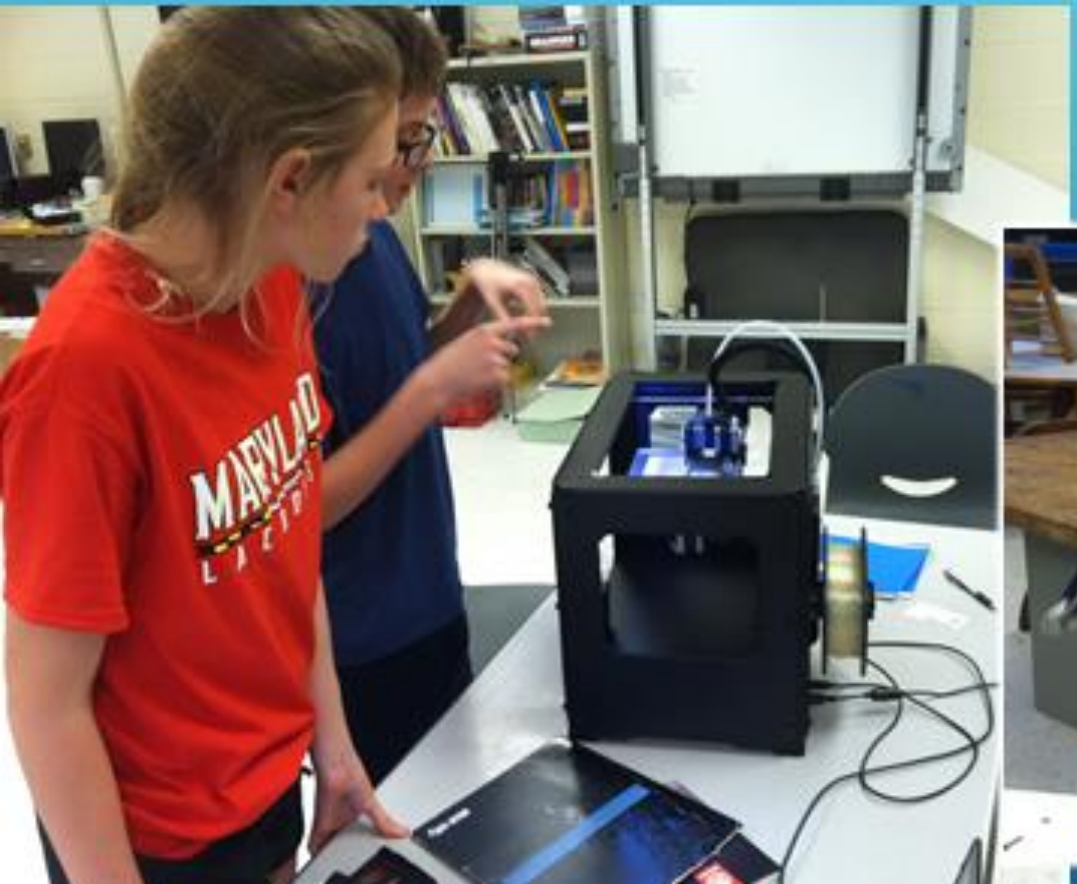
ILLUSTRATED BY FOURTEEN WOOD ENGRAVINGS.

BY ALFRED VAIL,

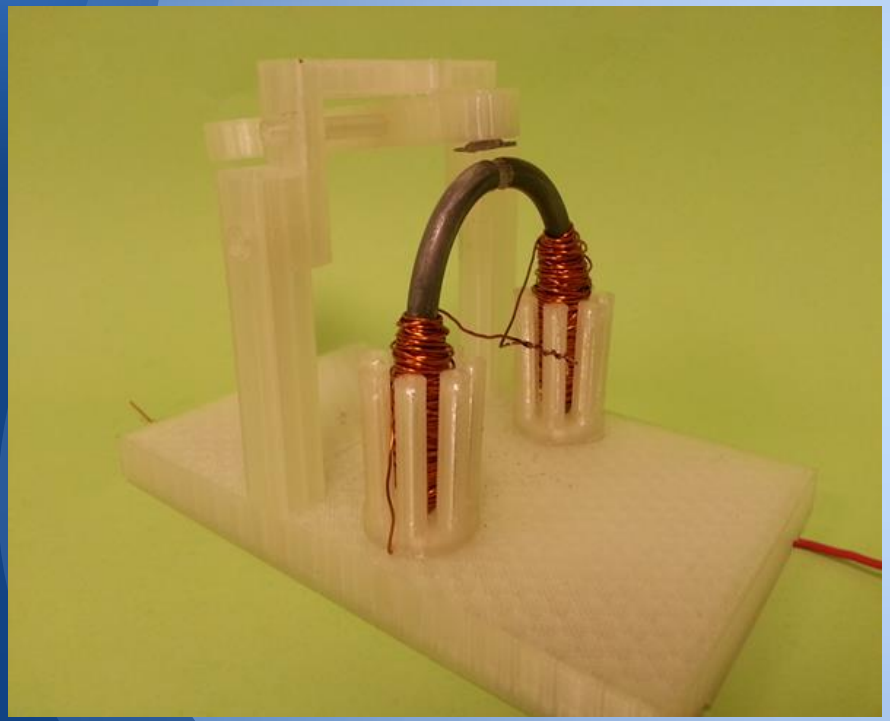
ASSISTANT SUPERINTENDENT OF ELEC. MAG. TEL. FOR THE U. S.

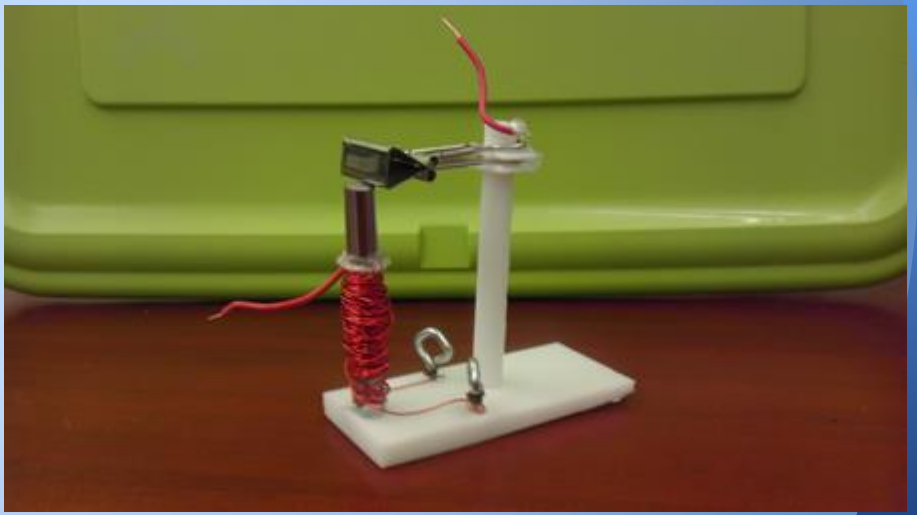
The manuscript "American Electromagnetic Telegraph" published in 1845 by Alfred Vail is serving as the template for this project.

The Process



New vs Old





Telegraph

https://www.youtube.com/watch?v=9NIoU7xkhgA&feature=youtu.be

Modern Day Text-Messaging

This is where the video will go

Integrating the Curriculum

- Ties to math, science, history, technology, and language arts
- Using design skills in engineering class to enhance science class

Science

Electricity
Magnetism
Electromagnets
Circuits
Properties
Energy

Engineering

CAD Design
3D printing
Circuitry
Relays

Historical Sequencing

Here can talk about the sequence and then demonstrate the other projects…

Galvanometer

https://www.youtube.com/watch?v=nkX1SC-0diw

Electric Motor

https://www.youtube.com/watch?v=-mRQWC2mk-g&feature=youtu.be

Engineering Concepts

On Meeting Standards….

The National Research Council calls for the integration of engineering design into science teaching:

…the framework notes that engineering and technology provide opportunities for students to deepen their understanding of science by applying their developing scientific knowledge to the solution of practical problems.

On Meeting Standards….

Both positions converge on the powerful idea that by integrating technology and engineering into the science curriculum, teachers can empower their students to use what they learn in their everyday lives.