



Smithsonian
National Museum of American History

Lemelson Center for the Study of Invention and Innovation

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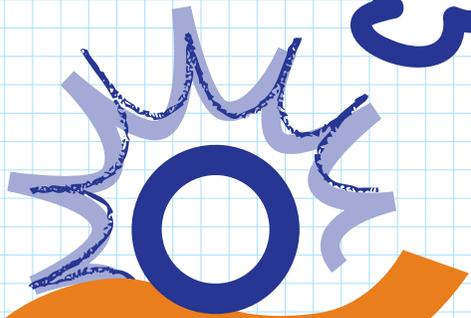
Spark!Lab at the Smithsonian's National Museum of American History is managed by the Lemelson Center for the Study of Invention and Innovation, which is dedicated to exploring invention in history and encouraging inventive creativity in young people. Learn more at invention.smithsonian.org.

Finding your way through your SPARK!LAB Inventor's Notebook!

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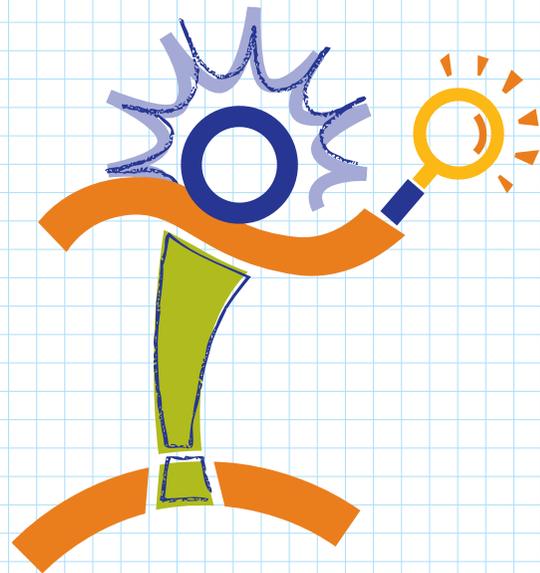
Welcome to **SPARK!LAB**, a hands-on activity center where you'll learn that invention is a **PROCESS**. You will also learn about each step of the process and all the **FUN** and **HARD WORK** that goes into **INVENTING**.



SPARKY

TO INVENT YOU HAVE TO:

-  **THINK IT** Have a great idea for an invention.
-  **EXPLORE IT** Investigate inventions and ideas of the past.
-  **SKETCH IT** Draw pictures and diagrams to figure out how your invention might work.
-  **CREATE IT** Build a prototype or model of your idea.
-  **TRY IT** Test your invention!
-  **TWEAK IT** Keep improving your idea.
-  **SELL IT** Market your invention to people who might buy it.



STAYING SAFE IN SPARK!LAB!

We want **SPARK!LAB** to be a safe and fun place for you to **EXPLORE** the invention process. Please follow these **SIMPLE** rules while you're here. These are also good rules to follow at home.

- 1 Wear safety goggles when conducting an experiment or working with tools. 
- 2 Handle all equipment, artifacts, and tools carefully.
- 3 Listen to **SPARK!LAB** instructors carefully before you begin any experiment at the lab bench.
- 4 If any chemical should splash into your eyes or on your skin, tell a **SPARK!LAB** instructor immediately and use plenty of water to wash off the affected area.
- 5 Do not eat, drink, chew gum, or run while in **SPARK!LAB**.





HOW TO USE YOUR NOTEBOOK!

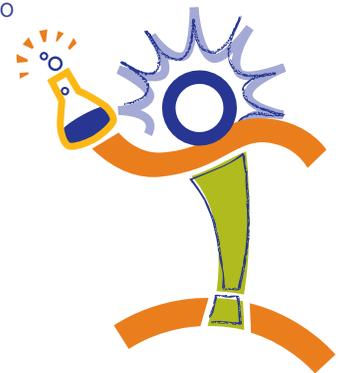
Inventors use lab notebooks to write down their **IDEAS**, record their **OBSERVATIONS**, and document the **RESULTS** of their tests and experiments.



They **WRITE** down things that work (and don't work), **SKETCH** ideas for new inventions, and **MAKE** notes about their invention process.



This **NOTEBOOK** will help you document the things you do and learn in **SPARK!LAB**. It also includes ideas for **INVENTING AT HOME**.



Record the DETAILS of your SPARK!LAB VISIT here.

Date of visit:



What I did in Spark!Lab:

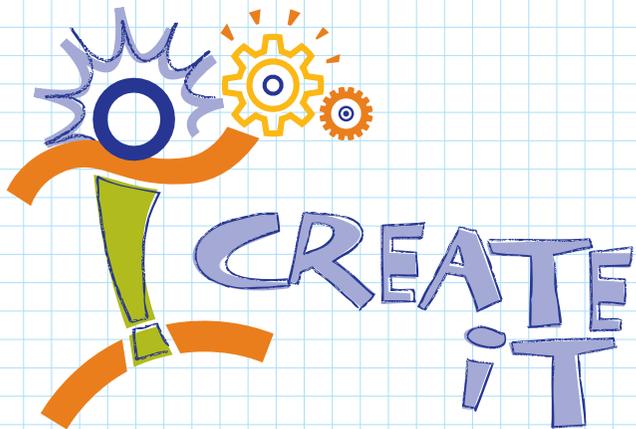
What I learned:

My favorite Spark!Lab activity:

Name and signature:

print

sign





What happened during the experiment? What did you observe?



Sketch one of the tools you used in the experiment. Remember to label your drawing.



What did you learn from this experiment?

Write down one question you still have about the experiment.



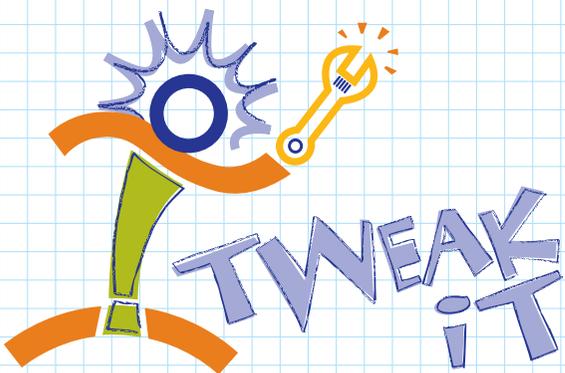
IMAGINE you are a museum curator. Curators COLLECT and CARE for objects, and use artifacts to LEARN about the past. What can you learn by LOOKING at the objects in the box? How has this invention CHANGED throughout history?

Type of object:



	object #1	object #2	object #3
Does this object look like anything you have seen before?			
Can you tell what it is made of?			
How big is the object?			
How much does it weigh?			
Is this object old or new?			
What was or is this object used for?			



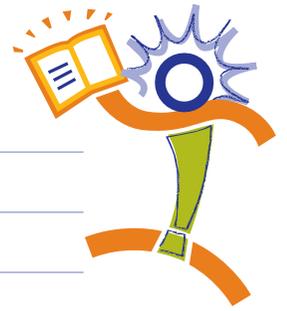


How are the objects similar?

In what ways are they different?

If you had to choose one of these objects to use, which would it be?

How do you think you could make the object better? Draw a picture of your idea below. You can also use the graph paper to the left for extra space.



Imagine you are an ARCHIVIST. Archivists PRESERVE documents and keep them SAFE. They also use them to LEARN about the past. What can these documents tell YOU about this inventor and his or her invention?

What types of documents did the inventor create during the invention process? Circle the documents you find.



PATENT

PHOTOGRAPH

LETTER

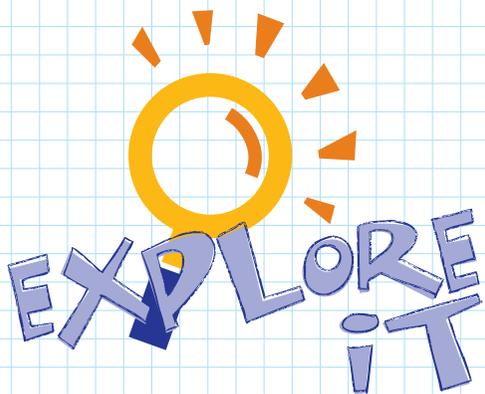
SKETCH

ADVERTISEMENT

NOTES

List two things you think are important about this inventor or invention.

Use the space below or to the left to draw or record other discoveries you make while exploring this invention.



Inventors keep detailed RECORDS of their IDEAS and the steps they take to create their INVENTIONS. Document your INVENTION PROCESS here. Use this in SPARK!LAB or when you're inventing at home!



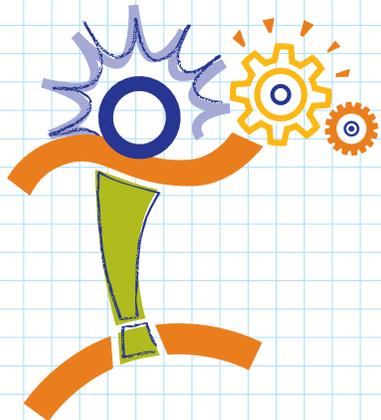
THINK IT

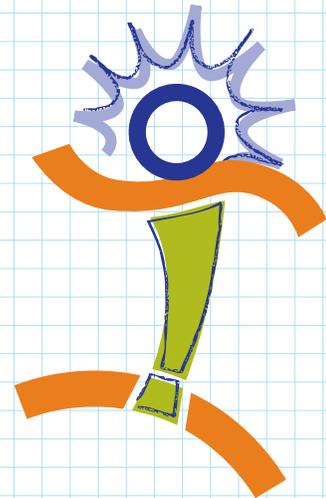
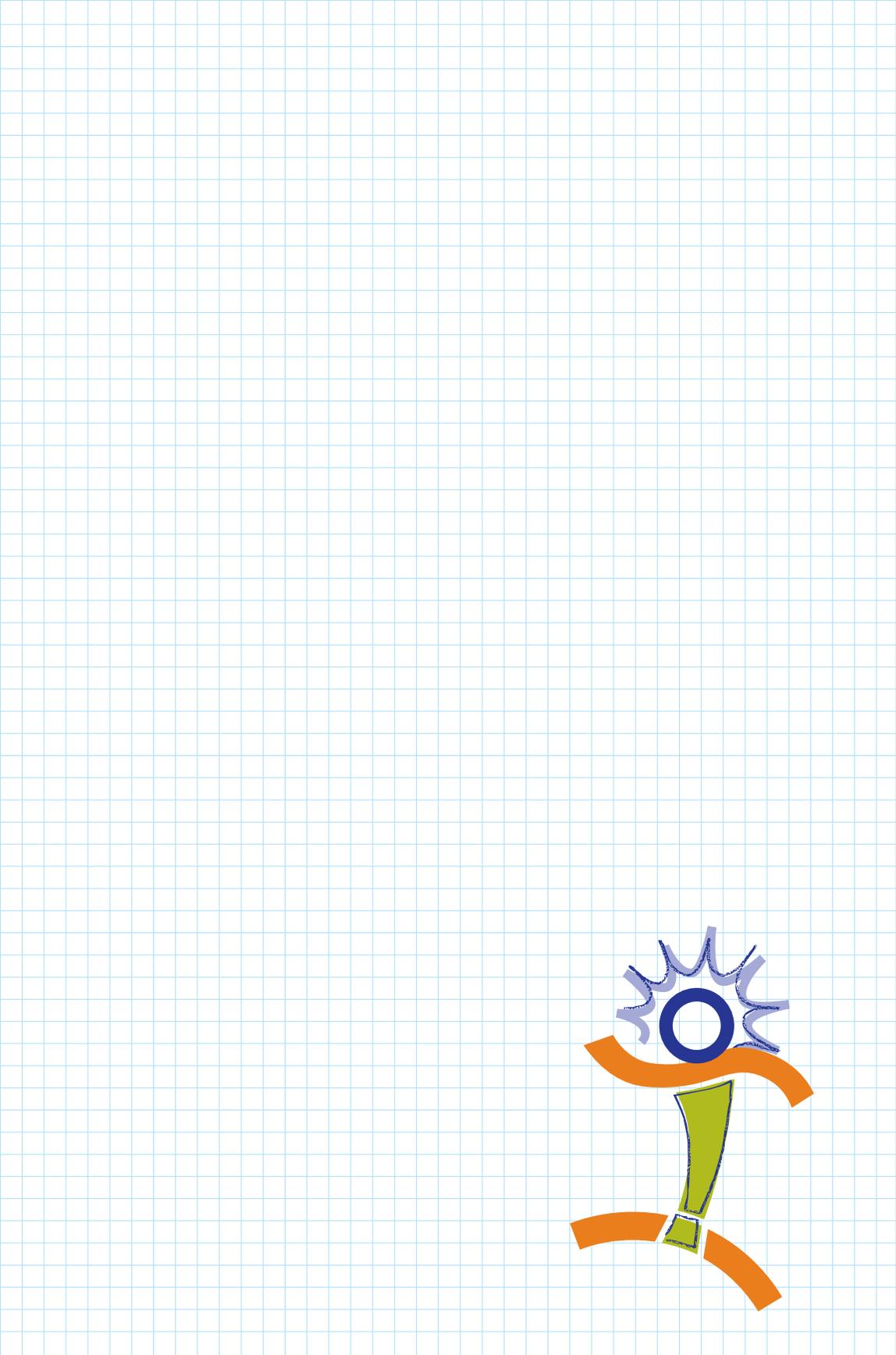
Describe the problem you want to solve.



EXPLORE IT

Make a list of possible ways to solve this problem.

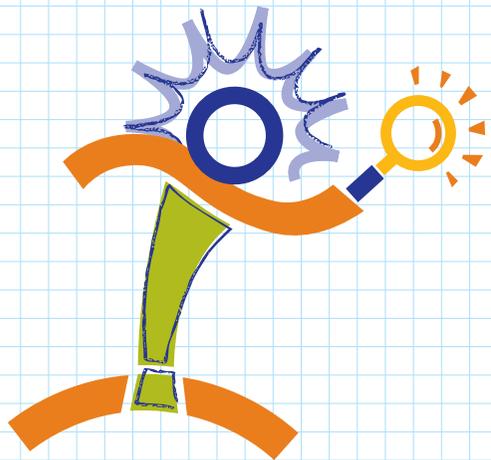





SKETCH IT
Draw a picture of your idea.


CREATE IT

Build your prototype. Write down each step so that you will remember exactly how you built your model.



Perform some experiments to find out how well your prototype works. Write down the results of each test:

EXPERIMENT #1

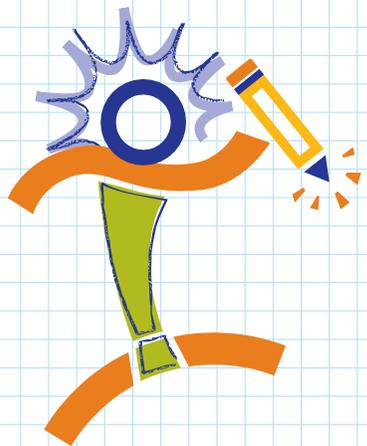
EXPERIMENT #2



How can you improve your prototype?



Give your invention a name.



INVENTING AT HOME!



EXPLORE SIMPLE MACHINES

Take apart a mechanical device that no longer works. Broken clocks and discarded toys are great choices. Remember to get permission before taking anything apart, and ask a parent or adult to assist you with your experiment. Always wear safety goggles!

How many simple machines, such as wheels, gears, or pulleys can you find inside? Can you create something new out of these old parts?



TAKE AN INVENTION WALK

Go on an invention walk around your neighborhood or school with your family, friends, or classmates. As you walk, call out things that have been invented. When you get home or back to school, talk about what you saw and ways to improve your neighborhood or school. Have each person pick one invention to redesign to help make the community better. Share your ideas and drawings as a group.



INVENTING AT HOME!

TRY THIS ARMONICA ACTIVITY

When you hear Ben Franklin's name, you probably think about his famous kite experiment to conduct electricity. But did you know that he was the creator of an instrument called the armonica? (Armonica is the Italian word for harmony.) With some drinking glasses and water, you can create your own armonica!

HERE'S How:

1. Clean your finger and wet it with water.
2. Gently rub your finger on the top rim of an empty glass.
3. Move your finger smoothly in a circular motion, making sure to cover the entire rim.
4. As you move your finger over the rim, notice the pitch of the sound produced.
5. Now, add water to the glass and repeat the same procedure. Listen for the pitch. Does it sound the same as when the glass was empty?
6. Experiment with different glasses and water levels and create your own armonica band!

For more at-home invention activities, visit sparklab.si.edu.



SHARE YOUR INVENTION!

Have a great **IDEA** for an invention after you leave **SPARK!LAB?**

Think it, explore it, sketch it, create it, try it, tweak it...and then **TELL US** about it! Take a **PICTURE** of your invention and ask a parent or guardian to **E-MAIL** it to sparklab@si.edu.

Be sure to **INCLUDE** your first name, age, hometown, and a brief description of your invention, and we'll **DISPLAY** the photo of your invention in **SPARK!LAB!** If you are under 13, you must have parental permission to submit your photo.



SPARK!LAB is made possible by the **GENEROUS CONTRIBUTIONS** of:

THE LEMELSON FOUNDATION
improving lives through invention



The Rice Family Foundation

