

# Inventor's Workshop: What is an Inventor?

**Grade Level:** K - 2nd grade

## **Unit Objectives:**

Students will.....

1. Learn about the life and scientific contribution of inventor Lewis Howard Latimer, through a virtual tour of the Lewis Latimer museum.
2. Compare Latimer's inventor workspace with other scientific laboratories, as well as with the modern day makerspace.
3. Build an understanding of the tools found in both Latimer's home laboratory and other scientific workspaces throughout history, while learning the importance of safety precautions, supplies, and equipment during the process of invention.
4. Develop a criteria to test the efficiency of a lab layout design, while studying its proportions and geometric measurements.
5. Work in a small group to create a paper prototype of (choose one):
  - a. An Industrial laboratory in the past and present.
  - b. An inventor's workshop in the past and present (makerspace).

## **Concepts/Skills:**

Understanding, brainstorming, drawing, and designing based on real-life observations and imagination.



# The Inventor

Learn about Lewis Latimer's Inventions

## Challenge

Create your own invention

## Learning Objective

Build an understanding of what inventors do, where they do it, and the importance of inventing!

## Duration

Suggestion time 60 minutes

## Lesson Outline

<b>Engage</b>	10 minutes
<b>Explore</b>	10 minutes
<b>Explain</b>	20 minutes
<b>Elaborate</b>	15 minutes
<b>Evaluate</b>	5 minutes

# ENGAGE

10 minutes

Students will be introduced to an inventor's workshop and design their own. Through an exploration of **Lewis Howard Latimer's** home workshop, students will notice the tools seen in a productive workspace. We will also think about what inventing at home looks like, and how we can create our own inventions in the classroom.

One of the best ways to capture and engage students is by starting with familiar ideas and images. Ask students where they see inventors in their favorite TV Shows, Movies, or Comic Books. **Where do people invent exciting things?**

However, integrating pop culture into your lesson does not mean that your entire discussion should focus on said reference. Instead, you can use these shows/movies/etc. to connect Latimer's Virtual House Tour with what students already know about laboratories.

## THINKING PROMPT:

*Think about the various spaces where scientists and inventors do their work. We call those spaces laboratories (labs), workshops or makerspaces.*

*Some examples of science labs or inventor workshops are in our television and media. Some popular culture examples include: Phineas and Ferb, Harry Potter and the Sorcerer's Stone, Despicable Me, and A Wrinkle in Time.*

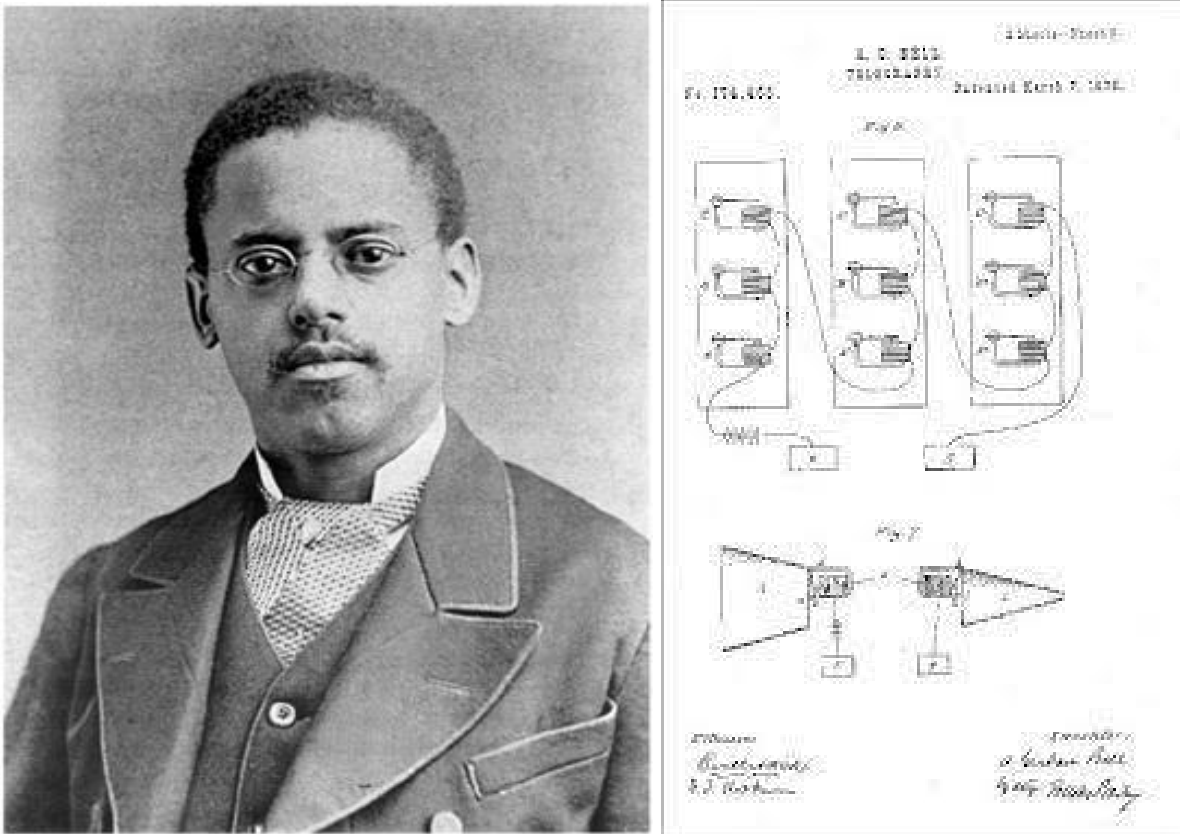
- *Have you seen a lab in a movie or television show?*
- *Have you ever visited a lab in real life?*
- *What did the lab look like? Who used the space? Can you remember what was explored?*

# EXPLORE

20 minutes

## Watch Video:

[“Lewis H Latimer, Electrical Pioneer and Inventor, a Seldom Told History”](#)  
(6:45 Minutes)



Lewis Howard Latimer (1848-1928), is remembered as an important pioneer of invention. With no access to formal education, Latimer became skilled in mechanical drawing, eventually working with Thomas Edison in 1884. Latimer went on to draft and invent a variety of groundbreaking inventions, from his patented toilet design, to the modern day telephone and lightbulb.

After watching the following videos, spend time discussing the inventions of Latimer with your students, and think of where we can see the importance of those inventions today. Where would we be without the lightbulb? How about the telephone?

## KEY VOCABULARY

**Science Laboratory (lab):** A scientific space used to test important theories, measure properties, document findings, and explore useful experiments.

**Inventor's Workshop:** Home Based labs that provides flexibility for inventors to work when inspired.

**Makerspace:** A collaborative space where inventors share ideas about technology, equipment, and brainstorm on future innovations.

## PLACES FOR INVENTING & MAKING

For some students, the concept of a laboratory that is not a scientific one is difficult to understand. Guiding students to the realization that invention can happen in a variety of ways and settings is an important concept to explore.

### What is a science laboratory?

A **science laboratory (lab)** is a place or setting used to test scientific information. In this room, experiments are performed. Observations and investigations either agree or disagree with a beginning hypothesis.



## **What is an Inventor's Workshop?**

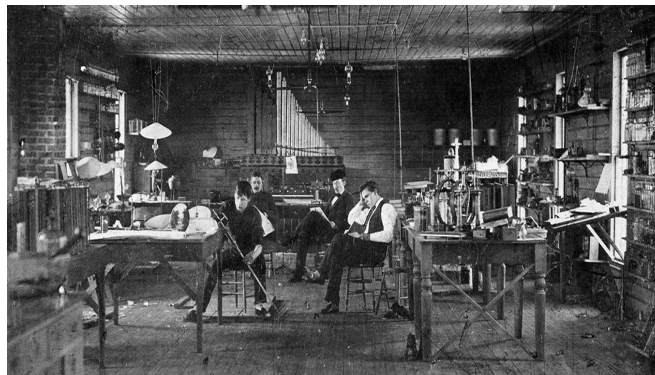
In the times of Lewis Latimer, many labs were based in homes. This provided flexibility for inventors, designers and engineers to work when they were inspired - whether it be early in the morning, or in the middle of the night.

## **What are some historic and modern inventor's workspaces?**

Thomas Edison was the founder of the Edison Company (now known as General Electric). In 1884, Latimer was employed by Edison alongside a team of other scientists - men and women with a variety of skills and educational backgrounds - to invent electrical advancements meant to improve the quality of life.



Modern labs are found in colleges, universities, and companies helping to reimagine everyday inventions - from pharmaceuticals creating a new toothpaste flavor, to the motor industry designing self-driving electric cars. Scientists are working in laboratories all over the world, discovering new and exciting ways to fix today's biggest problems.



## What is a Makerspace?

A **makerspace** is a place in which people with shared interests and scientific perspectives gather to share ideas, brainstorm new projects, and collaborate. Through an extensive process of trial-and-error, these makerspace projects may or may not bring important scientific advancements.



### THINKING PROMPT:

Lewis Howard Latimer was an inventor who worked with other scientists including Thomas Alva Edison to create a **better light bulb**. That laboratory was called the **Edison Lab (General Electric)**. There, Latimer worked extremely hard to improve Edison's invention, making it more suitable for people's needs.

Sometimes, Latimer had ideas that he wanted to work on in the middle of the night. This is when he became inspired to work on new ideas for new inventions of his own.

***Did Latimer work in a laboratory all the time? Why or why not?***

*“He liked to work at home because he had ideas that were different from others. He wanted to think about his ideas and solve problems in his own space.”*

***What are the good opportunities when working from home?***

*“No travel, take a rest, work early or late....”*

- *What are some challenges about working from home?*

*“Interruptions, responsibilities, missing important time with family, not having the proper tools, danger/fire/explosion....”*



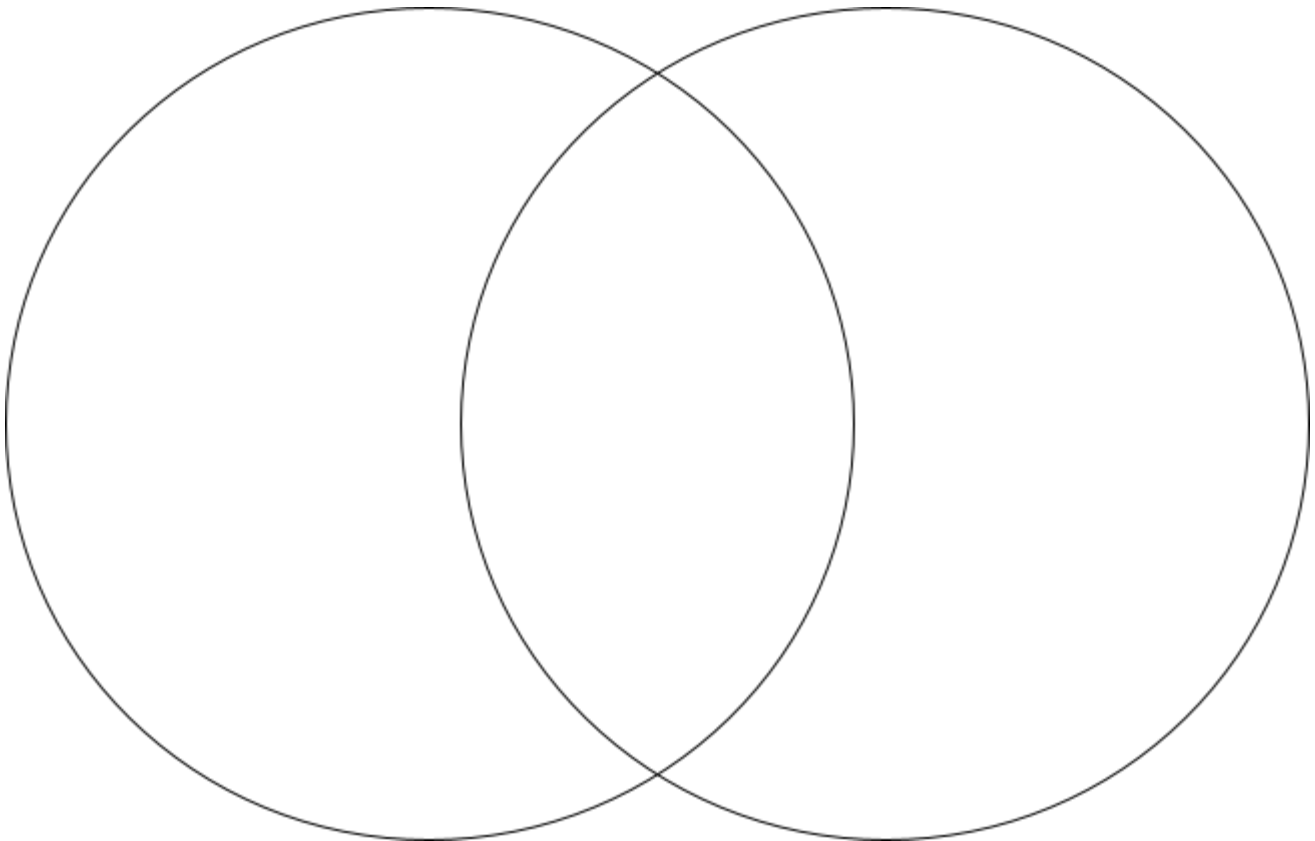
## WORKSHEET

**NAME**  
**GRADE**

**DATE**  
**TEACHER**

### ACTIVITY:

Mr. Lewis Howrad Latimer's home Inventor's Workshop was a great place for discovery. Here, he designed a variety of inventions that are still used today! What is an invention today that we discussed earlier that is similar and/or different to an invention that Mr. Latimer designed? Explain below!





DISCUSSION QUESTIONS:

What do these two inventions have in common?

Why do you think the new invention was created?

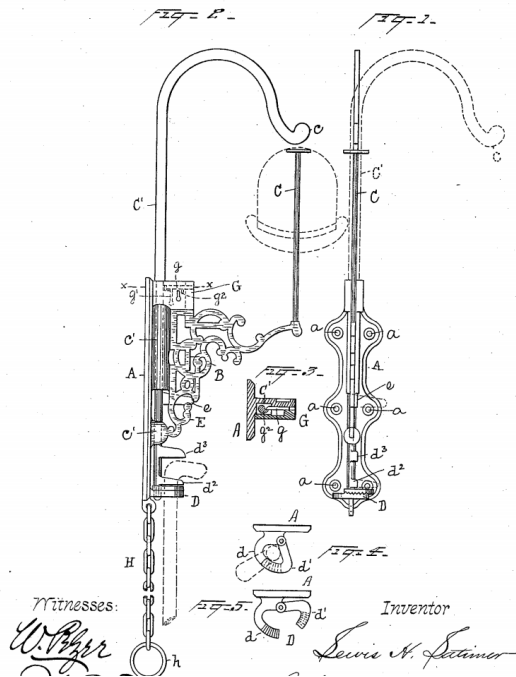
Where have you seen Latimer's invention? Have you seen the new invention you chose in a similar place?

In what ways do you think the invention was improved?

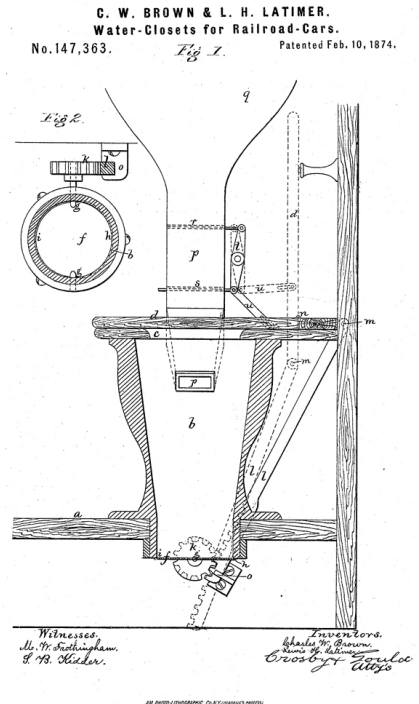
Do you think the newer version of the invention will be improved again in the future? If so, how?

# EXPLAIN

20 minutes



Lewis



Latimer was an inventor who lived and invented in the late 1800's. His ideas brought new inventions to people in the United States and around the world. His innovations are the foundation of a few machines we have today.



RESOURCES:

### **THOUGHTCO**

“He also helped Alexander Graham Bell obtain the patent for the first telephone. Latimer was in great demand for his expertise later in his career as electric light spread across the country.”

[\(read more\)](#)

### **MASS MOMENTS**

“Lewis Latimer was instrumental in helping Thomas Alva Edison develop the incandescent light bulb. He was awarded patents for ten of his own inventions and published a layman's guide to the once mysterious, now ubiquitous, electric light bulb.”

[\(read more\)](#)

### **LEMELSON CENTER**

“Edison’s light bulb used a carbonized bamboo filament, which unfortunately burnt out rather quickly. Latimer created a way to make the carbon filament more durable by encasing it in cardboard.”

[\(read more\)](#)

## BRAINSTORM

Explain to your students that inventions come from ideas, and that the best inventions are developed in teams that work together. Ask your students to also consider the differences of working in a large industrial **Science Laboratory**, a home-based **Inventor's Workshop**, and the various unit measures needed to develop a working makerspace.

### **Inventing Something New:** 3 minutes discussion

Take notes on a board or Padlet. Exploring Lewis Latimer's workspace will support students as they gain an understanding that there were many inventions that changed the world. Where would we be without Latimer? What are other cool inventions that have changed our lives?

*Examples: Perhaps a car that could fly? Or maybe small pods for living under the water?*

### **Classroom Workspace for Inventing:** 3 minutes discussion

Students can also brainstorm how creation can be sparked in their classrooms. Whether at home or with their peers, have your students discuss what their ideal workspace might look like. Are there pictures of inventions they want to create? Are there workspace safety rules?

*Examples: Making sure that one inventor's workspace is not messy, or distracting from another's experiment.*

# ELABORATE

15 minutes

After learning about Lewis Latimer's home, we will ask students to complete a short design challenge to consider the idea that Latimer was very successful as an inventor by working in his at-home workspaces, and improving on already-existing inventions.

Work with students to complete a simple design of a space they would work in to fix a problem and design a new solution.

**What would you invent in your workshop? Is there any new technology or machine that you would like to improve?**

Remember students should consider:

1. Inventing something new or rethinking something old
2. What is a useful and safe workspace for inventing

*Examples: a robotic arm, a chemical/bacteria that kills a new virus, a new cell phone with features that do not yet exist.*

The sky's the limit for this activity. Encourage students to think big. Many students will not know the names of the tools they need, that is not important for this assignment. The focus is demonstrating an understanding that there are different workspaces and they are better suited for different types of invention.



## WORKSHEET

**NAME**  
**GRADE**

**DATE**  
**TEACHER**

### ACTIVITY

Your challenge is to imagine something new! What would you invent? It could be an improvement on an invention that already exists or you could invent something completely new!

In the space below, draw a picture of your invention:

### My New Invention/My Improved Invention

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# EVALUATE

5 minutes

## ASSESSMENT RUBRIC

Use the students' design and written descriptions to evaluate students' ability to determine their understanding of an invention and its potential impacts.

Evaluate their description for the use of descriptive adjectives, voice, and organization.

	<b>Excellent</b>	<b>Good</b>	<b>Satisfactory</b>	<b>Needs Improvement</b>
Student demonstrated understanding the purpose of an invention and its importance in society				
Student provided a clear understanding of the what innovation means				
Student shared their work successfully.				
Student clearly depicted their invention using grade level descriptive language.				
Student shared their work confidently to the class and were able to communicate with others.				



# Common Core Standards

Literacy

**W.K.8, W.1.8**

With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Literacy

**W.2.8**

Recall information from experiences or gather information from provided sources to answer a question.

Speaking & Listening

**SL.K.3**

Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Speaking & Listening

**SL.1.4**

Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

Speaking & Listening

**SL.1.5**

Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

## **NEXT GENERATION SCIENCE STANDARDS**

**K-2-ETS1-1**

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

**K-2-ETS1-2**

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.