

# Leo Fender: An Inventor Who Transformed Popular Music

## OVERVIEW

### ESSENTIAL QUESTION

Who was Leo Fender, what iconic musical instruments did he invent, and how did his inventions transform musical instrument design and popular music?

### OVERVIEW

*In this lesson, students will be introduced to inventor Leo Fender and explore his lasting importance to popular music.*



In the spring of 1950, the first commercially available, mass-produced, solid-bodied electric guitar was introduced, the Fender Esquire. The Esquire's brand name, Fender, came from its inventor, Leo Fender, and with some later modifications the Esquire became the Broadcaster. After the musical instrument company Gretsch complained that the name "Broadcaster" was infringing on their line of drums called Broadcaster, the guitar's name was changed to "Telecaster" in 1951—Fender sought to relate the guitar to the new and increasingly popular medium of television. The success of the Fender Telecaster, as well as the other guitars and innovations Leo would create throughout his life, soon made Fender instruments ubiquitous in studios and on stages around the world. Leo's inventions would transform popular music.

Born in 1909 in Anaheim, California, Clarence Leo Fender was always a curious boy and showed an interest in tinkering with electronics. Known as Leo by family and friends, at age thirteen, his uncle sent him a box filled with discarded car radio parts and a battery. The following year, Leo visited his uncle and was fascinated by a radio his uncle had built from spare parts. Leo said years later that the loud music blasting from the speaker of that radio made a lasting impression on him. It wasn't long before he began repairing radios in a small shop in his parents' home. Leo never took an electronics course and had no formal training.

After graduating from college with an accounting degree, Leo was approached by a local bandleader and asked if he could build a public address (PA) system to help amplify the band during their shows at venues in Hollywood. Even though PA technology was in its infancy in the late 1920s, Leo accepted the challenge and soon built several systems. Struggling to find work in the mid-1930s due to the turbulent economic times of the Great Depression, Leo borrowed \$600 and started his own radio repair shop located in Fullerton, California. At "Fender Radio Service," musicians and band leaders soon began coming to Leo for PA systems and he also started building amplification for acoustic guitars and electric lap steel guitars.



After teaming-up with inventor and lap steel player, Doc Kaufman, the two started designing and building lap steel guitars and amplifiers at their K & F Manufacturing Corporation. In 1944, Leo and Doc patented a lap steel guitar that had an electric pickup. In 1945, they began selling the guitar, in a kit with an amplifier designed and patented by Leo. By the beginning of 1946, Leo had decided that building and selling musical instruments and amplifiers would be much more profitable than doing repair work. Doc did not agree and left the company. Leo renamed his company the Fender Electric Instrument Manufacturing Company, more commonly-known simply as Fender.

After its invention in the early 1950s, the Fender Telecaster soon caught-on with musicians. In a few short years, Leo would invent the Fender Stratocaster, employing all of the modifications and improvements that guitarists had conveyed to him when he asked how they liked the Telecaster. Although the Telecaster had been a hit and continues to be manufactured to this day, the Stratocaster transformed the music instrument industry. It became the standard for electric guitar design and sound. And soon Leo would do the same for bass players.

In 1951, Fender premiered the Precision Bass. It was aptly named because the company's electric and fretted bass guitar provided "precision" with intonation and louder volume than in comparison to its fretless elder, the upright and acoustic double bass from the violin family. Again, Leo's invention changed the industry and the Fender Precision bass, like its six-string relative the Stratocaster, became the standard for electric bass guitar design and sound.

As Leo's instruments became more popular, his company needed more employees to build the instruments. Various components make up a guitar, and one of the most important is the pickups—a device which converts vibrations from the instrument's strings to an electrical signal that is amplified. In the mid-1950s, Leo hired Abigail Ybarra to work at Fender and soon she was on the team assembling pickups to be installed in the guitars. Abigail was perfect for the skilled and meticulous work involved in winding the metal wire that was housed inside a pickup. She would work at Fender for over fifty years. In time, Abigail would be celebrated in her own right for her work as a master pickup winder and for her unique contribution to the sound of Fender guitars.

Leo usually worked late into the night, and often seven days a week. Fender would experience tremendous growth over the next several years, especially with the Rock and Roll boom of the 1950s and Beatlemania in the 1960s. In 1965, he sold Fender to the Columbia Broadcasting System (CBS) for \$13 million.

After selling Fender, he founded CLF Research in 1966 and was soon investing in and designing instruments for a new musical instrument company, Musicman. Leo eventually parted ways with Musicman in the 1970s but not before inventing guitar models and electronic components that are highly-regarded as industry standards and are still in production today.

Leo formed G&L with his former partner at Fender, George Fullerton in 1979, with the company named after George and Leo. At G&L, Leo continued his passionate pursuit of invention. Ensnared in his onsite laboratory, Leo tinkered with a multitude of new ideas, resulting in inventive new guitar designs, electronics, and hardware. With innovative vision and the stewardship of a trusted team of colleagues, G&L products illustrated that Leo's inventiveness knew no bounds and that he was always seeking new technical discoveries that would better serve musicians. The company continues to produce high-quality instruments that are celebrated within the industry and prized by musicians all around the world, and from a factory in Fullerton, CA on the now-named Fender Avenue.

Clarence Leo Fender would work at G&L until his death on March 21st, 1991. He was at his office until the day before he died. Although Leo never learned to play the many instruments he had invented, his creations transformed popular music and are the templates for design excellence in the industry he led and shaped for decades. Always an engineer, inventor, and tinkerer, it is said that he was buried wearing his plastic pocket protector.

## OBJECTIVES

Upon completion of this lesson, students will:

### 1. KNOW (KNOWLEDGE):

- The iconic musical instruments Leo Fender invented
- The contributions of Abigail Ybarra and Josefina Campos to the sound of Fender guitars
- The lasting impact and legacy of Leo Fender's inventions on musical instrument design and popular music
- Key historical events in Leo Fender's life  
Leo Fender's connection to his hometown, Fullerton, California

### 2. MASTERY OBJECTIVE:

- Students will be able to identify iconic musical instruments invented by Leo Fender, describe Abigail Ybarra and Josefina Campos's contributions to the sound of Fender guitars, and explain Leo Fender's legacy on musical instrument design and popular music through visual analysis, reading, and arts activities.

## ACTIVITIES

### MOTIVATIONAL ACTIVITY

1. Show **Image 1, Fender Instruments**. Ask students:
  - Are you familiar with the musical instruments in this image?
  - What similarities and differences do you notice between these instruments when you compare and contrast them?
  - Do you know the brand name of the instruments? What might be the significance of the brand name?
  - What do you know about the invention of the electric guitar?

### PROCEDURE

1. Pass out **Handout 1 - Vocabulary Terms**. Tell students to review the vocabulary terms and then ask students to answer the question for each term as a class.
2. Pass out **Handout 2 - Leo Fender Timeline** to each student. Ask students to take turns reading each entry as a class. After students have read the timeline, ask them to write three words that they feel describe Leo Fender and one question that they have or something that they are wondering about Leo.
3. Have students share their three words and their question with a partner. Then tell students they will be referring to their words and questions at the end of the lesson and to save their work.
4. Show **Image 1** once again. Ask students:
  - Where might these musical instruments have been invented and tested?
  - What might be the name for a space where things are invented?
5. Share with students the video, “Leo Fender’s Lab” (<https://youtu.be/4o36OqL-JO4>) (*Note to teachers: this is an offsite video, we suggest loading the video before class to avoid any delays or showing advertising during class.*) Then ask students:
  - What stood out to you about Leo’s lab?
  - How might Leo’s lab represent how he was a “person driven by this need to create something”?
  - Might his lab reflect his personal habits for how he needed to do his best work? What are your personal habits for doing your best work?
  - How do you organize yourself to get the best results when you start an assignment or a new project?
6. Pass out **Handout 3 - My Perfect Workspace**. Have students sketch on the handout their perfect workspace using the grid (*If needed, share with students the video, “How to Design your Room Floor Plan Step by Step,”*

(<https://youtu.be/2IzbSUNwZjs> ) which introduces the idea of drawing a “bird’s eye view” and can be used for a room sketch or the scale drawing. This is an offsite video, we suggest loading the video before class to avoid any delays or showing advertising during class.)

7. After finishing their workspace, have students share their drawings and describe the details to a partner. Then have the class come back together as a large group, and ask students:
  - How is your perfect workspace the same or different than Leo Fender’s Lab?
  - Why do you think that Leo arranged his space the way he did?
8. Remind students that, as outlined on the Leo Fender Timeline handout, Leo went to work every day up until the day before he died. After he was gone, his lab was left untouched for many many years and was eventually moved to the Fullerton Museum Center in Fullerton, CA. Ask students:
  - Why do you think that Leo’s Lab was left in place for so long?
  - What do you think about Leo’s Lab being moved to the Fullerton Museum Center?
  - After seeing the video, how might you imagine Leo building electric guitars and inventing in that space?
9. Tell students that they will be discussing how electric guitars are manufactured. Ask students:
  - How do you think electric guitars are manufactured once they have been invented?
- Might there be differences between how electric guitars were manufactured in the 1950s compared to today? What might some of those differences be? (Guide students to recognize that a significant portion of the manufacturing back in the 1950s, and for the next few decades, was by hand with the use of machines, not computerized automation as is becoming much commonplace today.)
10. Pass out **Handout 4 - Abigail Ybarra**. Have students read silently or take turns reading the paragraphs. (As an alternative, you may read the page aloud to students.) Ask students:
  - Had you ever heard of Abigail Ybarra?
  - What was Abigail’s role with Fender?
  - What unique assets did Abigail bring to her job?
  - What unique skills and knowledge did she acquire from her decades-long career?
  - Who trained Abigail and how did she pass along her skills and knowledge?
  - What are Abigail’s contributions to Leo Fender’s inventions?
  - Why do you think that Abigail became so well known? Do you think she was always well known?
  - What is Abigail’s legacy with Fender musical instruments and electric guitar manufacturing in general?
11. Share with students the video, “Josefina Campos at Fender.” (<https://youtu.be/lqQOwSlwcxc>) (This is an offsite video, we suggest loading the video before class to

*avoid any delays or showing advertising during class.*) Ask students:

- How do you think Josefina feels, knowing that the pickups she builds are cherished and appreciated by so many musicians and music fans?
- How has Josefina carried on the legacy of Abigail's contributions to Fender pickups?
- What might be the legacy of Josefina's contributions to Fender musical instruments and electric guitar manufacturing in general?
- Considering the handout and these videos, what have you noticed about this work at Fender and the staff who wind pickups?

## SUMMARY ACTIVITY

1. Have students refer back to the words and question that they wrote at the beginning of the lesson, then ask students:
  - Would they still use these words to describe Leo Fender?
  - Are there new words that they would use to describe him?
  - Was their question about Leo Fender answered?
  - Do they have any other questions about him?
2. Pass out **Handout 5 - Leo Fender Infographic** to guide students in their work. Students may use **Handout 2 - Leo Fender Timeline**, use facts presented in this lesson, or conduct additional research to create an infographic highlighting Leo's life, accomplishments, impact on popular culture. *(As an alternative, teachers can substitute Abigail Ybarra's story: having students create an infographic based on her and referring to the handout, videos, facts presented in the lesson, and any extra research.*

## EXTENSION ACTIVITIES

1. **Illustrated Timeline Presentation:** Pass out **Handout 5 - Leo Fender Infographic**. Students create a collaborative timeline of Leo's life. Organize students into pairs and assign each group one of the Leo Fender Timeline entries to illustrate. When students are finished illustrating, have students order themselves with their illustrations chronologically and share their timeline entries. Please consider videotaping and sharing your class timeline presentation with [info@teachrock.org](mailto:info@teachrock.org). This activity will also make a great classroom display.



## STANDARDS

**COMMON CORE STATE STANDARDS***College and Career Readiness Anchor Standards for Reading (K-12)*

Reading 1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Craft and Structure 4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Integration of Knowledge and Ideas 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Range of Reading and Level of Text Complexity 10: Read and comprehend complex literary and informational texts independently and proficiently.

*College and Career Readiness Anchor Standards for Writing (K-12)*

Production and Distribution of Writing 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge 9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

*College and Career Readiness Anchor Standards for Language (K-12)*

Language 1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Language 2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Language 3: Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use 4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Vocabulary Acquisition and Use 5: Demonstrate understanding of figurative language, word relationships, and nuances in a word meaning.



Vocabulary Acquisition and Use 6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

### *College and Career Readiness Anchor Standards for Speaking and Listening (K-12)*

Speaking and Listening 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Speaking and Listening 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Presentation of Knowledge 4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

## **SOCIAL STUDIES – NATIONAL COUNCIL FOR THE SOCIAL STUDIES (NCSS)**

Theme 2: Time, Continuity, and Change

Theme 3: People, Place, and Environments

Theme 7: Production, Distributions, and Consumption

Theme 8: Science, Technology, and Society

## **NATIONAL STANDARDS FOR MUSIC EDUCATION**

### *Core Music Standard: Responding*

Interpret: Support interpretations of musical works that reflect creators' and/or performers' expressive intent.

Evaluate: Support evaluations of musical works and performances based on analysis, interpretation, and established criteria.

### *Core Music Standard: Connecting*

Connecting 11: Relate musical ideas and works to varied contexts and daily life to deepen understanding.



## RESOURCES

### HANDOUTS

- Handout 1 - Vocabulary Terms
- Handout 2 - Leo Fender Timeline
- Handout 3 - My Perfect Workspace
- Handout 3 - Abigail Ybarra
- Handout 5 - Leo Fender Infographic