

Reading

The Development of the Lightbulb

Thomas Edison is generally credited with the **invention** of the lightbulb. In fact, he was just one **inventor** among many involved in the process of moving the concept of incandescent light from **inspiration** to marketable reality. What he actually **invented** in 1879 was a carbon filament that lasted for forty hours. In 1880, he improved his idea, producing a filament **derived** from bamboo that burned for 1,200 hours.

The first person to successfully produce light with electricity was Humphry Davy, who connected a carbon filament to a battery in 1809. Other **inventors** worked on **refinements** of this idea. In 1835, James Lindsay **unveiled** an electric lamp, which cast enough light to read a book one and a half feet away. In 1854, Henrich Globel created the first actual lightbulb—a glass bulb containing a filament that glowed when electrical **current** passed through it. However, it burned out too quickly to have any commercial value. Then, Hermann Sprengel developed the Sprengel Pump, a **device** that used mercury to create a vacuum. Reducing the oxygen in the bulb allowed the filament to glow longer before burning out.

In 1874, Henry Woodward and Matthew Evans **filed** a **patent** for a light **specifically** described as “a shaped piece of carbon held between two electrodes enclosed in a glass vessel.” Woodward and Evans attempted to raise the necessary money to improve and market their **invention**; however, as **entrepreneurs**, they had little success finding anyone to **back** them financially. Eventually they sold the rights to their **patents** to Thomas Edison.

Edison had already been working on the same idea, but for him money was not a **critical** issue. He was no longer a solitary **inventor** working in his basement, but the head of a laboratory with the support of **investors**. He worked to refine the Woodward and Evans light because its filament burned out too quickly. Edison set about testing every material possible for use as a filament. “Before I got through,” Edison recalled, “I tested no fewer than 6,000 vegetable growths, and **ransacked** the world for the most **suitable** filament material.” He even considered using tungsten, which is the material **currently** used. Eventually, Edison tried a carbonized cotton thread filament **clamped** to platinum wires. When tested, it lasted forty hours. In 1880, he received a **patent** for this **invention**. By the end of the year, Edison had perfected a sixteen-watt bulb that lasted for 1,500 hours.

At the same time, Sir Joseph Swan was working on similar ideas in England. In 1860, he obtained a **patent** for a carbon filament incandescent lamp, and in 1878, another for an improved version of his lightbulb.

He presented it in a public lecture in 1879. In 1882, Swan sued Edison for patent **infringement**. As part of the settlement, Edison had to take Swan as a partner in his British electric works. Also, in 1877 and 1878, William Edward Sawyer and Albon Man were granted **patents** for electric lamps. Based on these **patents**, the U.S. Patent Office ruled in 1883 that Edison's patents were **invalid**. Edison fought to appeal that **ruling**, and in 1889, the court determined that his patents were indeed valid.

Edison is famous for having said, "Genius is one percent inspiration and ninety-nine percent perspiration." It is an understandable statement coming from someone whose laboratory tested more than 6,000 filament possibilities. Nevertheless, one might also consider the adage "History is written by the winners." Edison may not have been the actual **inventor** of the lightbulb, but he was the man who had the genius, the business sense, and the financial **backing** to invent the first one that was commercially viable.

Answer the questions about **The Development of the Lightbulb**.

Questions 1-5

Complete the summary using the list of words below.

In the 1800s, many **1**..... experimented with using electrical **2**..... to produce light. James Lindsay **3**..... his version of an electric light in 1835. It was bright enough for reading a book. Henrich Globel developed the first lightbulb in 1854. His **4**....., unfortunately, did not have commercial value. It needed **5**..... because it burned out very quickly.

backers
clamped

current
device

filed
inventors

refinement
unveiled

Questions 6–9

Choose an ending from the list to complete each sentence. There are more endings than sentences, so you will not use them all.

- A** a cotton thread filament that he clamped to wires.
- B** a filament derived from bamboo.
- C** a tungsten filament like those used today.
- D** a long-lasting lightbulb filament.
- E** a filament that burned out very quickly.
- F** the most suitable material for a lightbulb filament.

- _____ 6. Edison did not invent the lightbulb in 1879; he invented
- _____ 7. Edison ransacked the world searching for
- _____ 8. Edison's first lightbulb consisted of
- _____ 9. Edison later refined his idea with the development of

My Words

Write the words that are new to you. Look them up in the dictionary and write their definitions.

Words

Definitions

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Word Families

noun	inventor	Thomas Edison is probably the most well-known American inventor.
noun	invention	The computer is an invention that has completely changed our way of life.
verb	invent	People invent new things every day.

noun	investor	Every investor hopes to get a good return on his or her money.
noun	investment	Keeping all your money in the bank is not a good investment.
verb	invest	If you invest wisely, you can make a good deal of money.

noun	inspiration	Edison's achievements have been an inspiration to many people.
verb	inspire	The president's speech inspired people to action.
adjective	inspiring	It is inspiring to look at the work of great artists.
adverb	inspired	I felt inspired after my visit to the museum.

noun	refinement	Any piece of work can always use refinement.
verb	refine	Edison worked very hard to refine his inventions.
adjective	refined	In 1880, Edison developed a lightbulb that was a refined version of his earlier lightbulb.

noun	specification	The customer changed the specifications for the new lightbulbs.
verb	specify	The customer ordered some lightbulbs, but he didn't specify which kind he wanted.
adjective	specific	The professor gave specific directions about how she wanted the assignment to be done.
adverb	specifically	Edison made an important contribution to the development of the lightbulb, specifically, a long-lasting filament.

noun	suitability	There were doubts about the suitability of the new location.
verb	suit	She is a solitary person, so it suits her to work alone.
adjective	suitable	It's important to wear suitable clothes to a job interview so that you give the right impression.
adverb	suitably	They decided to rent the office because it was suitably located.

Word Family Practice

Choose the correct word family member from the list below to complete each blank.

It takes a creative person to come up with ideas for new products. However, **1**..... is not enough. It takes more than good ideas to develop an **2**..... into a product that is practical and useful and can be successfully marketed. It takes hard work and determination. Teams must test new products and then **3**..... the design, again and again, until there are no improvements to be made. Once the design is perfected, the new product is ready for mass production. This takes money. It takes finding people who believe in the product enough to **4**..... money in it. **5**..... people should be found, that is, people who not only can provide the financing, but are interested in the product and in the business. In addition, market research needs to be done to target the **6**..... groups of people who might be interested in buying the product. Marketing to certain types of people rather than to a general audience can be a very successful approach.

- | | | |
|----------------|------------|--------------|
| 1. inspiration | inspire | inspiring |
| 2. inventor | invention | invent |
| 3. refinement | refine | refined |
| 4. investor | investment | invest |
| 5. Suit | Suitable | Suitably |
| 6. specify | specific | specifically |

Dictionary Skill

Different Meanings

Many words have more than one meaning.

Read the definitions below. Then read the sentences and write the letter of the correct definition for each sentence.

cur-rent [KUR-uhnt]

A noun. a flow of electricity, water, or air

B adjective. of the present time

- _____ 1. Don't touch a wire that has an electric *current* running through it.
- _____ 2. We are able to do many things now that were difficult just a few years ago because of the *current* state of technology.

Listening

CD 1
Track
29

Listen to the talk. Complete the notes below.

Write **NO MORE THAN THREE WORDS** for each answer.

Getting Ready to Market Your Invention

First, do a **1**.....

Next, file **2**.....

At the same time, you will have to **3**.....

Look for financial **4**.....