Unit 10: Technology/Inventions

THE DEVELOPMENT OF THE LIGHTBULB

Words

Write the letter of each definition with the word it defines. If you don't know the definition, use the context of the reading passage to help you. Look for the words in bold as you read the passage.

PARAGRAPHS 1–2

Words	Definitions
1 ..... inventor	**A** n., a flow of electricity, water, or air
2 ..... inspiration	**B** n., a person who creates new things
3 ..... derive	**C** n., improvement
4 ..... current	**D** v., to get from something; from something else; originate
5 ..... refinement	**E** n., a sudden good idea; a role model for creativity

PARAGRAPHS 2–3

Words	Definitions
6 ..... unveil	**F** v., to officially record something
7 ..... critical	**G** adv., exactly; for a particular reason
8 ..... device	**H** n., a right to an invention granted by the government
9 ..... file	**I** n., a machine or tool
10 ..... patent	**J** adj., very important
11 ..... specifically	**K** v., to make public; to uncover

PARAGRAPHS 3–4

Words	Definitions
12 ..... entrepreneur	**L** adj., appropriate; acceptable for something
13 ..... back	**M** v., to search thoroughly, often violently or carelessly
14 ..... investor	**N** v., to support, especially financially
15 ..... ransack	**O** n., somebody who starts a business
16 ..... suitable	**P** n., a person who puts money into a business

PARAGRAPHS 4–5

Words	Definitions
17 ..... clamp	**Q** n., an action that breaks a rule or law
18 ..... infringement	**R** v., to fasten or hold tightly
19 ..... invalid	**S** n., a legal decision
20 ..... ruling	**T** adj., not legally correct or acceptable

Reading

The Development of the Lightbulb

(1) 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.

(2) The first person to successfully produce light with an electric **current** 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.

The next **critical** idea was an invention by the Gemran chemist, Hermann Sprengel. This was 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.

(3) 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.

(4) 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.

(5) 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.

(6) 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.

backers	current	filed	refinement
clamped	device	inventors	unveiled

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.

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 refined his idea in 1880 with the development of

Word Families

A

Complete each sentence with the correct word from the word family chart. Make nouns plural where necessary. Use the correct form of verbs.

noun	noun	verb
invention	inventor	invent

1 People ..... new things every day.

2 Thomas Edison is probably the most well-known American ..... .

3 The computer is an ..... that has completely changed our way of life.

noun	noun	verb
investor	investment	invest

4 Keeping all your money in the bank is not a good ..... .

5 If you ..... wisely, you can make a good deal of money.

6 Every ..... hopes to get a good return on his or her money.

noun	verb	adjective	adverb
inspiration	inspire	inspiring	inspired

7 The work of previous inventors ..... Edison.

8 Edison's achievements have been an ..... to many people.

9 I felt ..... after my visit to the museum.

10 The work of great artists is ..... .

noun	verb	adjective
refinement	refine	refined

11 Any piece of work can always use ..... .

12 Edison worked very hard to ..... his inventions.

13 In 1880, Edison developed a lightbulb, which was a ..... version of his earlier lightbulb.

noun	verb	adjective	adverb
specification	specify	specific	specifically

14 According to the ....., you cannot put a bulb stronger than 60 watts in this lamp.

15 The professor gave ..... directions about how she wanted the assignment to be completed.

16 The customer ordered some lightbulbs, but he didn't ..... which kind he wanted.

17 Edison made an important contribution to the development of the lightbulb, ..., a long-lasting filament.

noun	verb	adjective	adverb
suitability	suit	suitable	suitably

18 They decided to rent the laboratory space because it was ..... located.

19 She is a solitary person, so it ..... her to work alone.

20 Many materials were not ..... for a lightbulb filament because they did not burn long enough.

21 Edison tested many materials for their ..... as a lightbulb filament.

Word Families

B

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

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

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.

Paraphrases

Read the sentence from the reading passage. Then, choose the sentence that has the same meaning.

1 *Other inventors worked on refinements of this idea.* (paragraph 2)
- **A** Other people improved on Davy's invention.
- **B** Other inventors copied Davy's idea.
- **C** Other scientists helped Davy make his electric light.

2 *Edison may not have been the actual inventor of the light bulb, but he was the man who had the genius, the business sense, and the financial backing to invent the first one that was commercially practical.* (paragraph 6)
- **A** If Edison had had more money, he would have been able to make a better light bulb.
- **B** Edison did not create the first light bulb, but he had the skills and money to make one that could be sold.
- **C** Edison was finally able to market his light bulb when he reduced the price.

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

Track 28

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**..... .

Writing (Task 2)

In your opinion, what has been the most important invention of the past 100 years?

Support your opinion with reasons and examples from your own knowledge or experience.

Write at least 250 words.

Speaking

Talk about the following topics.

Who was an inspiration to you when you were growing up?

Who is an inspiration to you now?

Do you find any type of music or art inspiring? How does it inspire you?