Unit 3: Transportation

FIRST HEADLAMPS

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.

PARAGRAPH 1

Words	Definitions
1 ..... tricky	**A** v., to throw light on something
2 ..... cast	**B** n., a terrible event
3 ..... vulnerable	**C** adj., easy to carry
4 ..... disaster	**D** adj., difficult
5 ..... portable	**E** adj., weak; without defense[1]

PARAGRAPH 2

Words	Definitions
6 ..... freight	**F** n., cargo carried by a train, truck, or ship
7 ..... innovation	**G** n., an object that produces light
8 ..... illuminator	**H** n., a new idea or product
9 ..... knot	**I** n., the engine of a train
10 ..... locomotive	**J** n., a hard bump in wood

[1]BrE: defence

PARAGRAPH 3

Words	Definitions
11 ..... reflector	**K** v., to show or exhibit
12 ..... generate	**L** adj., very strong
13 ..... display	**M** v., to make or produce
14 ..... intense	**N** n., an object that sends light back or makes it stronger

PARAGRAPHS 4–5

Words	Definitions
15 ..... drawback	**O** n., a problem; disadvantage
16 ..... equip	**P** adj., able to work without waste
17 ..... efficient	**Q** v., to provide with something
18 ..... mode	**R** adj., strong; able to stand rough treatment
19 ..... stringent	**S** n., method
20 ..... rugged	**T** adj., strict; firm

Reading

First Headlamps

A

Before electricity, people relied on fire as a source of light. It was a **tricky** business. Flames **cast** limited light, are **vulnerable** to winds and weather, and can lead to **disaster**. Making fire **portable** and dependable was so difficult that lights on moving vehicles were hardly ever considered.

B

The early trains traveled[1] only during the day. The tracks were too dangerous during the dark of night, and passengers wanted to see where they were traveling anyway. In the late 1830s, railroad traffic became heavy enough for **freight** trains to delay passenger trains. To avoid these delays, railroads started running freight trains at night. Horatio Allen's 1831 **innovation**, the "Track **Illuminator**," was suddenly in demand. It was a pile of pine **knots** burning in an iron grate that sat in a box of sand on a platform car. The car was pushed ahead of the **locomotive**. The illuminator did not cast much light, but it warned of the approaching train and was the best technology available.

[1]BrE: travelled

C

In 1841, some trains used an oil[2] lamp backed by a curved **reflector**, an improvement, but oil lamps blew out easily in the wind, including the wind **generated** by the movement of the train. At about the same time, Schenectady and Troy Railroad trains **displayed** a whale oil lamp positioned between a reflector and a lens about twelve inches high; it threw light up to 100 feet ahead of the train. Although this was an improvement, the braking distance the trains required was more than the 100 feet of track that were illuminated. In 1849, a calcium lamp was developed that threw light 1,000 feet and lasted four hours; however, the only railroad company to use it was Camden and Amboy. Limelights, which were used to light theater[3] stages on both sides of the Atlantic, were considered too **intense** for trains. Eventually, acetylene, which did not extinguish in the wind, replaced oil in headlamps.

D

In 1851, the first electric headlamp was developed. This headlamp had two major **drawbacks**: It required its own generator, which did not become portable until the 1890s when steam generators became common, and the delicate parts broke easily as a result of the rough rails over which the trains traveled. Russia ran the first train **equipped** with a battery-powered electric headlamp. The French first used steam generators to power electric headlamps on trains. In the United States in 1897, George C. Pyle developed an **efficient** electric headlamp. By 1916, federal law required trains to have electric headlamps.

E

Automobiles, the exciting new **mode** of transportation[4] at that time, needed headlamps, too. The requirements for car headlamps were more **stringent** than those for trains: Because roads were even rougher than rails, cars required more **rugged** parts, and the steam generators had to be smaller than those in trains. Despite these tougher requirements, the Columbia Electric Car was equipped with electric headlamps in 1898.

F

Electric headlamps made travel at all hours and in almost all weather possible, something we take for granted today.

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[2]BrE: kerosene
[3]BrE: theatre
[4]BrE: transport

Answer the questions about **First Headlamps**.

Questions 1–8

The reading passage contains six paragraphs, ***A–F****. Which paragraphs discuss the following information?*

Write the correct letter, ***A–F****. Some letters may be used more than once.*

..... **1** a lamp that used burning wood

..... **2** lamps rugged enough to use with cars

..... **3** a lamp that generated its own electricity

..... **4** the drawbacks of using flames for light

..... **5** lamps that used reflectors to cast more intense light

..... **6** the year the first train was equipped with electric headlamps

..... **7** a reason why acetylene lamps are more efficient than oil lamps

..... **8** a reason why freight trains traveled at night

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	adjective	adverb
efficiency	efficient	efficiently

1 ..... is an important quality for any new product.

2 Candles do not light a room ..... .

3 ..... headlamps made safe travel at night possible.

noun	noun	verb
generator	generation	generate

4 There are a variety of ways to ..... electricity.

5 The ..... of electricity can cause air pollution.

6 If the power lines are down, you can use a gasoline ..... in order to have electricity in your house.

noun	noun	verb
illuminator	illumination	illuminate

7 The ..... of an electric lamp is stronger than that of a candle.

8 In the past, people used candles to ..... their houses.

9 An ..... can provide an area with light.

noun	noun	adjective
innovation	innovator	innovative

10 The electric headlamp was an important ..... for the safety of car and train travel.

11 The development of electric headlamps was the work of a number of ..... people.

12 Several ..... worked on the development of electric headlamps.

noun	verb	adjective	adverb
intensity	intensify	intense	intensely

13 Using a stronger battery will ..... light.

14 Some materials burn more ..... than others.

15 A locomotive needs a headlamp with high ..... .

16 The light from candles is not very ..... .

noun	noun	verb	adjective
reflector	reflection	reflect	reflective

17 A piece of metal can be used to ..... light.

18 You can see your ..... in a mirror.

19 A ..... on a lamp makes the light more intense.

20 If a lamp is coated with ..... material, it will cast a stronger light.

Word Families

B

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

1	efficiency	efficient	efficiently
2	innovators	innovations	innovative
3	illumination	illuminator	illuminated
4	reflector	reflect	reflective
5	intensity	intensify	intensely
6	generation	generators	generate

Traveling at night was tricky before people had developed headlamps that worked **1**..... . Early **2**..... for use on locomotives included lamps that **3**..... by burning pine knots or whale oil. Some of these lamps used metal as a **4**..... material to **5**..... the light. Later, electric headlamps were developed. The problem with these lamps involved finding a portable way to **6**..... the electricity that they used.

Paraphrases

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

1 *Flames cast limited light, are vulnerable to winds and weather, and can lead to disaster.* (paragraph 1)
- **A** Fire is not a good source of light during bad weather.
- **B** The lack of light from fire can lead to disaster.
- **C** Firelight is dim, dangerous, and not reliable.

2 *Limelights, which were used to light theater stages on both sides of the Atlantic, were considered too intense for trains.* (paragraph 3)
- **A** Both Europeans and Americans thought limelights were too small for trains.
- **B** The stage lights used in both America and Europe were too strong for trains.
- **C** Theater stages in many countries depended on the strong light of limelights.

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.

QUESTIONS 1–2

dis-play [dis-PLAY]
- **A** *noun.* a showing, an exhibit
- **B** *verb.* to show or exhibit

..... **1** The new, more efficient headlamps for use on trains were on *display*.

..... **2** Everyone was excited to see cars that *displayed* the new electric headlamps.

QUESTIONS 3–4

knot [NOT]
- **A** *noun.* a hard bump in wood
- **B** *verb.* tie something in a certain way

..... **3** Burning pine *knots* is a way to create light.

..... **4** If you *knot* your shoelaces well, they won't untie.

Listening

Track 7

*Listen to the lecture. Choose **FOUR** letters, **A–G**.*

Which **FOUR** drawbacks of early train travel does the lecturer mention?

A difficulty traveling at night
B frequent delays
C safety problems
D dirt
E cost of tickets
F uncomfortable rides
G crowded passenger cars

Writing (Task 2)

In your opinion, what has been the most significant transportation innovation of the past 200 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.

What modes of transportation are commonly used in your city? Which do you think are the most efficient?

What do you think are some of the advantages of train travel?

What do you think are some drawbacks of train travel?