

Why bridges collapse

Read a civil engineering article about why bridges fall to practise and improve your reading skills.

Before reading

Do the preparation task first. Then read the text and do the exercises.

Preparation task

Match the definitions (a–j) with the vocabulary (1–10).

Vocabulary

1. susceptible to something
2. scrutiny
3. to collapse
4. tragic
5. a defect
6. to bring about
7. to occur
8. crucial
9. to prevent
10. a gorge

Definitions

- a. extremely important
- b. a deep valley with high sides
- c. careful examination of something
- d. to fall down suddenly
- e. causing great sadness
- f. to stop something from happening
- g. easily affected by something
- h. to happen
- i. a fault in something
- j. to make something happen

Reading text: Why bridges collapse

Some of the biggest and most expensive transportation projects in the world have involved building bridges. Bridges are crucial links that carry cars, trucks and trains across bodies of water, mountain gorges or other roads. As a result, they are one of the most important aspects of civil engineering and are subject to intense scrutiny, especially when they collapse.

Bridge collapses can be tragic events, leading to loss of life and serious property damage. That's why bridge engineers, designers and builders must always take their jobs very seriously. The best way for them to prevent these accidents is to understand why bridges collapse in the first place. Understanding bridge collapses can lead to major changes in the design, construction and safety of future building projects. The following are main reasons why bridges fall.

Fire

Historically, more bridges were made of wood and were much more susceptible to fire. This was particularly true of old-fashioned train bridges, where the spark created by the steel wheels and steel tracks could sometimes cause a bridge to catch fire and burn to the ground.

During construction

A large number of bridge accidents occur during the construction of the bridge itself. These accidents are often due to an error made by the engineers, such as a miscalculation. The bridge collapses under its own weight, and this can be deadly for the workers on it at the time.

Earthquakes

Earthquakes damage all structures, including bridges. Luckily, this kind of collapse is relatively infrequent, especially with modern bridges. Engineers have learned to design bridges in earthquake zones on areas that are much more resistant to movement.

By defect

Some bridge collapses are mysteries, and engineers only realise why after they conduct a complete investigation. In some cases, this could happen because inferior-quality material was used in the construction, or because of a defect in a key piece of the bridge. In other cases, the bridge was designed only to support a certain amount of weight and no more.

Boat or train crash

Both of these kinds of accidents are extremely rare, but boats and trains can cause a bridge to collapse for different reasons. With trains, it's the velocity of the impact that can bring a bridge down. With boats, it's the very large mass they have that can bring about the collapse, even if they are moving very slowly when it occurs.

The best way to avoid bridge failures is to plan for them. Modern technologies that can detect structural weakness, safer working environments and better designs can all help to reduce these terrible accidents.

Tasks

Task 1

Circle the correct answer.

1. Why are bridges considered so important according to the article?
 - a. They are important parts of a transportation network.
 - b. They cost a lot of money.
 - c. When they collapse it's a serious problem.
2. How can the people who make bridges stop collapse?
 - a. By studying for longer at university
 - b. By asking engineering experts to check their work
 - c. By studying the reasons for a collapse
3. Which of the following reasons is given as the cause of a bridge catching fire?
 - a. A lightning strike
 - b. The contact between train tracks and train wheels
 - c. The extreme heat of a train
4. Which is an example of an error during construction?
 - a. The bridge catches fire.
 - b. A mistake is made in the calculations.
 - c. There is a natural disaster.
5. How common is it for an earthquake to destroy a bridge?
 - a. Very common in earthquakes zones
 - b. Relatively common
 - c. Relatively uncommon
6. Which of the following is not mentioned as a defect in bridge construction?
 - a. A badly made part
 - b. Inexperienced designers or engineers
 - c. Poor-quality materials
7. How does a train cause a bridge to collapse?
 - a. By being too heavy for a bridge to support
 - b. By being very big
 - c. By hitting a bridge very fast
8. What role can modern technology have in reducing bridge accidents?
 - a. It can detect weak spots in the construction.
 - b. It can stop human error.
 - c. It can select higher-quality materials.

Task 2

Circle the correct word to complete the sentences.

1. _____ a result, civil engineers study collapses closely.
 - a. As
 - b. For
 - c. In
2. The accident was subject _____ a full investigation.
 - a. for
 - b. of
 - c. to
3. Luckily there was no _____ of life in the accident.
 - a. lose
 - b. loss
 - c. lost
4. Young children are susceptible _____ illness.
 - a. for
 - b. of
 - c. to
5. It only takes a few minutes for the leaves to _____ fire.
 - a. catch
 - b. get
 - c. start
6. The accident was _____ to an error in construction.
 - a. cause
 - b. due
 - c. find
7. The bridge could collapse _____ its own weight.
 - a. below
 - b. in
 - c. under
8. The police will _____ an investigation.
 - a. conduct
 - b. do
 - c. make

Discussion

What are some of the most famous bridges you know? Have you ever visited them?

Answers

Preparation task

1. g
2. c
3. d
4. e
5. i
6. j
7. h
8. a
9. f
10. b

Task 1

1. a
2. c
3. b
4. b
5. c
6. b
7. c
8. a

Task 2

1. a
2. c
3. b
4. c
5. a
6. b
7. c
8. a