

Will Your Vehicle Fit?



Grades
PreK-5



20-45
minutes

THE CHALLENGE

Students will explore how vehicles have different heights, how bridges have different clearances, and how drivers use warning signs and clearance information to avoid collisions.

GRADE LEVEL

Preschool and elementary

ACTIVITY DURATION

About 20 - 45 minutes

LEARNING OBJECTIVES

By the end of this activity, students will be able to:

- Understand that vehicles have different heights.
- Understand that bridges and tunnels have different clearance heights.
- Recognize that drivers need to know their vehicle's height.
- Identify warning signs and other methods used to alert drivers about low clearances.
- Explain why bridge strikes occur when a vehicle is too tall to fit underneath a structure.

MATERIALS

Vehicles

- Toy vehicles of varying heights (cars, vans, pickup trucks, buses, semi-trucks)

Bridge-Building Materials

Choose one or more:

- Cardboard
- Foam blocks
- Craft sticks
- Books
- Legos
- Wooden blocks
- Small boxes

Measuring Tools

- Rulers
- Index cards or sticky notes
- Tape measures
- Markers

Optional Items

- Printed photos of low-clearance signs
- Small clearance signs made from paper
- Worksheets for recording measurements
- Copy of the AASHTO Green Book or a chart of typical vehicle dimensions found online

ACTIVITY INSTRUCTIONS

Step 1: Introduce the Topic (5 Minutes)

Ask students:

- Have you ever driven under a bridge?
- Do you think every vehicle is the same height?
- What might happen if a truck is taller than the space under a bridge?



Teach children how bridge strikes occur and what can be done to prevent them.

Explain: "A bridge strike happens when a vehicle or something in a vehicle is too tall and hits a bridge or other overhead structure. Drivers need to know how tall their vehicles are and pay attention to clearance warnings." Show the students the photos in Attachment A of vehicles striking bridges because they are over-height. Be sure to explain that no one was hurt during these crashes, because the drivers and passengers are seated in a lower part of the vehicles.

Step 2: Sort the Vehicles (5 Minutes)

Have students arrange the toy vehicles from shortest to tallest, then ask:

- Which vehicle is the tallest?
- Which vehicle is the shortest?
- Would all of them fit under the same bridge?

Measure and record the vehicle heights.

Step 3: Build Bridges (10 Minutes)

Using the building materials provided, have students work individually or in teams to build several bridges with different clearances. Once built, measure the distance from the ground to the bottom of the bridge. Label each bridge with a clearance sign (2", 4", 6", or measurements appropriate for the models).

Step 4: Vehicle Testing (10 Minutes)

Before driving each vehicle under a bridge, ask:

- Will it fit?
- Why or why not?

Test the vehicles. If it fits, students can move it through. If it does not fit, stop before it reaches the bridge and discuss what would happen next in real life.



Clearance warning signs help alert drivers when their vehicle may be too tall to safely pass under a bridge.

Step 5: Discuss Warning Methods (5 Minutes)

Show examples of clearance warning signs in Attachment A.

Ask students:

- How could a driver know a bridge is too low?
- What information does the sign provide?
- What should drivers do if their vehicle is taller than the clearance?

Discuss real-world warning methods such as:

- Clearance signs on bridges
- Advance warning signs before the bridge
- GPS systems designed for trucks
- Height sensors and warning systems
- Route planning for oversized loads

Discussion Questions

- Why do bridge strikes happen?
- Is it enough to know the bridge height?
- Why is it important for drivers to know their vehicle height?
- Which vehicles are more likely to have problems with low bridges?
- What could happen if a truck hits a bridge?



OPTIONAL ACTIVITIES FOR OLDER STUDENTS

Activity A: Design Your Own Bridge

Students become bridge designers using the available materials.

Instructions

- Decide on a required vehicle that must fit beneath the bridge.
- Measure the vehicle height.
- Add extra clearance. (Discuss: why would you want to provide extra clearance? To accommodate something tall that a vehicle is hauling, to accommodate pavement overlays that have reduced the original clearance height, etc.).
- Draw a simple diagram of a bridge design that would use the provided materials. The diagram should show.
 - Bridge
 - Ground line
 - Vehicle
 - Clearance measurement
- Build the bridge using the materials in the diagram.
- Test whether the selected vehicle fits safely underneath.

Challenge Questions

- How much clearance should be added beyond the vehicle height?
- What happens if the bridge is built too low?
- Which vehicles can use the bridge?

Activity B: Clearance Engineering Challenge

Using page 1 of Attachment B, have students look at the six vehicles shown and the bridge pictures below them. Have them circle, under each vehicle, which of the bridges they believe the vehicle will be able to go under without striking the bridge.

Look up the dimensions of each of the vehicles in the AASHTO Green Book or elsewhere, and write the height next to each vehicle on the worksheet.

Reveal the clearance of each bridge (page 2 of Attachment B). See which ones they get right.

Key Takeaway

Drivers must know the height of their vehicles and pay attention to bridge clearance warnings. Bridges are built with different clearances, and when a vehicle is taller than the available space, a bridge strike can occur. Careful planning, proper signage, and knowing your vehicle's dimensions help prevent crashes and keep roads safe.

Bridge Strikes!



Bridge Strike Strategies



Bridge Strike Prevention

Which structures can each vehicle safely drive under?



ABCDE



ABCDE



ABCDE



ABCDE



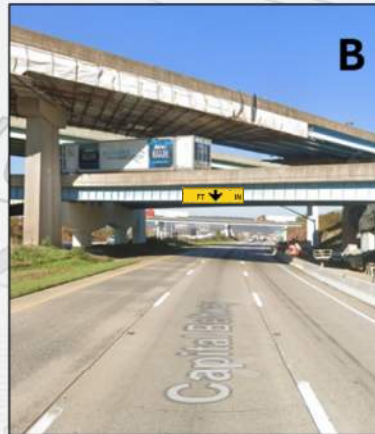
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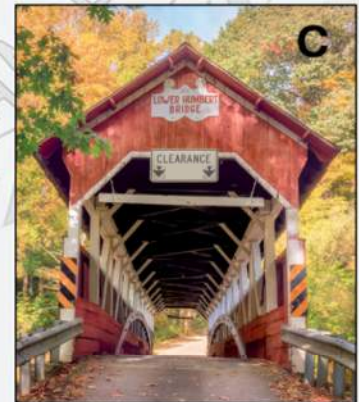
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A



B



C



D



E

Bridge Strike Prevention

Which structures can each vehicle safely drive under?



ABCDE



ABCDE



ABCDE



ABCDE



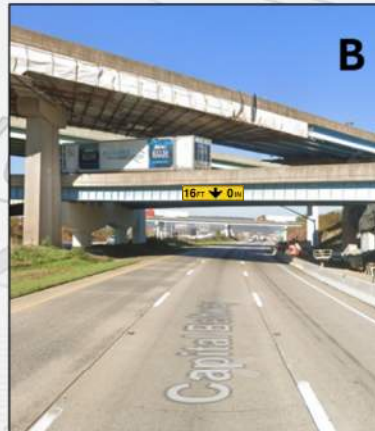
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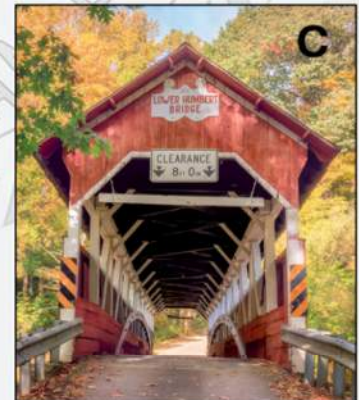
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A



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D



E