

# Beautiful Bridges

## 1. Question & Research Task

Help! The Gingerbread Man has a problem. He has come to a river and must cross it.

You are part of a team of [civil engineers](#). Engineers must make important decisions about bridges so that people and their cars, buses, and trucks can safely pass over them for many years.

Your mission is to learn about and construct a bridge so the Gingerbread Man can cross to safety. View the mission video on the right. →



Select the image above to view a Discovery Education video about helping the Gingerbread Man construct a bridge to cross the river.

Image Source: Discovery Education

In this Slam Dunk, you will conduct brief, focused research to respond to the inquiry question:

**How do landforms affect the structure of a bridge?**

## 2. Information Sources

### What are the different kinds of bridges?

Read this [article from World Book Kids](#) or watch the [BrainPOP video about bridges](#). Use this [graphic organizer](#) to record what you learn about different types of bridges. Research more using a few of the sources below.

#### Arched Bridges

[Kiddle: Arch Bridge Facts for Kids](#)

[Discovery Education: Arch Bridge animation](#)

[PBS.org: Arch Bridge](#)

#### Beamed Bridges

[Kiddle: Beam Bridge Facts for Kids](#)

[Discovery Education: Beam Bridge animation](#)

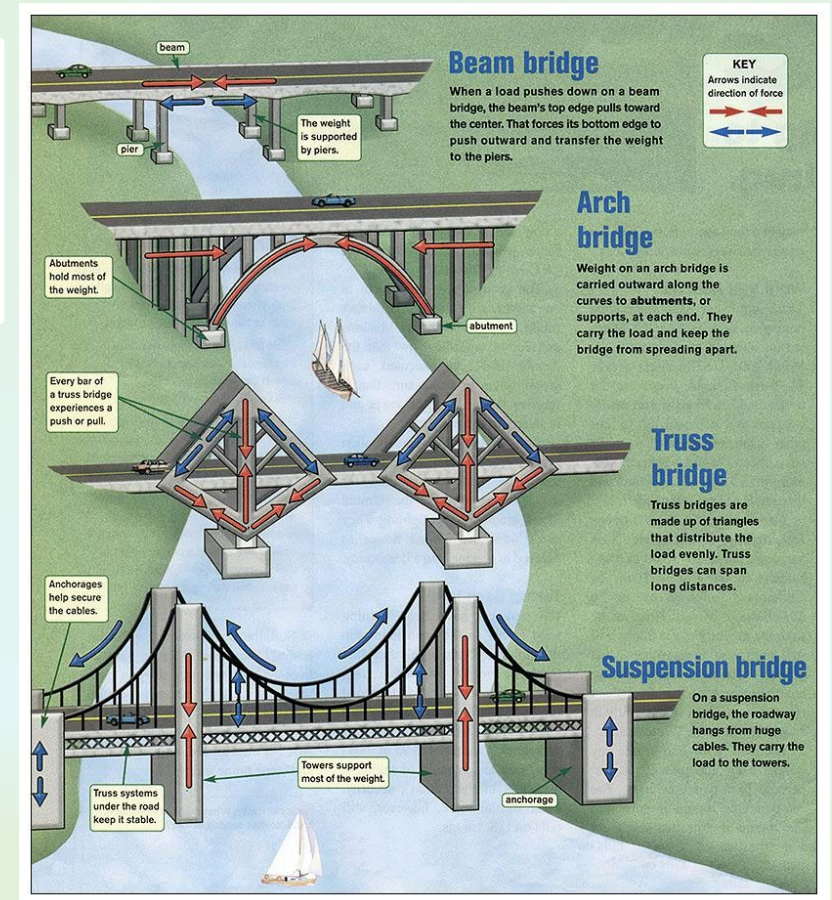
#### Suspension Bridges

[World Book Kids: Bridges](#)

[Discovery Education: Suspension Bridges animation](#)

[Discovery Education: Suspension Bridges](#)

**\*Your teacher/librarian will give you the database logins if needed.**



Click on the diagram to see a larger image from SIRS Discoverer.

### 3. Student Activity

As you use the resources on Slide 2, you should think about the [landforms](#) civil engineers might come across during their jobs. Use these resources to learn more about landforms.

**\*Your teacher/librarian will give you the database logins if needed.**

- [Discovery Education – Landforms](#)
- [GALE InContext Elementary - Landform](#)
- [PebbleGo- Landforms](#)

You should be thinking about:

- What are the characteristics of each landform?
- Which type of bridge is needed to successfully cross the landform?

Use this [graphic organizer](#) to take notes.



Image Source: BrainPOP Jr.

Select the picture above to see a BrainPOP Jr. video about Landforms



## 4. Assessment Activity

# How do landforms affect the structure of a bridge?

Now that you have completed your research, you will work with a team to **create a [prototype](#) of a bridge.**

- Watch this [video](#) that explains the Engineering Design process.
- For more information about Science and Engineering Methods, check out [PebbleGo](#).

**Then,**

- Decide on the landform you will be crossing with your bridge.
- Use this [planning sheet](#) to guide the process.
- Draw a diagram or design of your bridge.
- Using a variety of materials, create your bridge.
- Here is a [rubric](#) to determine how your bridge will be graded.



Examples of materials found in a MakerSpace.  
Image Source: [Pixabay](#), Public Domain

# 5. Enrichment Activities



An arched bridge

Image Source: PebbleGo

Try these fun activities about bridges and engineering:

[PBS Kids Engineering Games](#)

[PBS Kids Engineering Activities](#)

[Discovery Science Alliance: Building Bridges](#)

If you are interested in learning more about bridges:

- [Related reading about Bridges from BrainPop](#)
- [Read Pop's Bridge](#)
- [Discovery Education: Five – Bridges](#)
- [Building Big Bridges-PBS](#)

Check your school library or the public library for these books about bridges and engineering:

- Johnman, Carol, et al. *Bridges! : Amazing Structures to Design, Build & Test*. Charlotte, Vt., Williamson, 1999.
- Hurley, Michael. *The World's Most Amazing Bridges*. Chicago, Raintree, 2012. (An e-book).

# 6. Teacher Resources

<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>	<a href="#">4</a>	<a href="#">5</a>	<a href="#">6</a>
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## Learning Standards Alignment

### [Maryland State Curriculum /Content Standards – Grade 2 Science](#)

#### Standard 1: Skills and Processes

**A. CONSTRUCTING KNOWLEDGE 1.** Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out.

**D. TECHNOLOGY 1.** Design and make things with simple tools and a variety of materials.

#### [Common Core State Standards](#)

**Reading: 1.** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

**Writing: 7.** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

#### [AASL Standards for the 21<sup>st</sup> Century Learner](#)

**1.A.1** Learners display curiosity and initiative by formulating questions about a personal interest or a curricular topic.

**1.A.2** Learners display curiosity and initiative by recalling prior and background knowledge as context for new meaning.

**1.D.3** Learners participate in an on-going inquiry based process by enacting new understanding through real-world connections

**3.A.2** Learners identify collaborative opportunities by developing new understandings by engaging in a learning group.

**5.B.1** Learners construct new knowledge by problem solving through cycles of design, implementation, and reflection.

## Grade 2 Library Media: Unit 6

**Objective:** : Students will conduct brief, focused research in order to explain how landforms affect the structure of a bridge and then construct a bridge for a particular landform.

**Time Frame:** 3 50-minute periods

#### **Differentiation:**

- Have students use learning supports provided in any BCPS Digital Content in the [Apps Portal](#) included in this lesson.
- Refer to [Digital Content Snapshot/Support pages](#) as needed.

#### **Notes to the teacher:**

- Have students use learning supports provided in any BCPS Digital Content in the [Apps Portal](#) included in this lesson.
- Align with Grade 2 Science: Whack-a-Wall. Plan to utilize Make/Do Construction Kit in Elementary Maker Kits sent to schools.
- Use the PDF version to allow direct linking to TumbleBooks (slide 5)
- Teacher will need to print out all PDF graphic organizers (slides 2, 3, and 4) prior to instruction.
- Additional activities can be found at [PBSKids](#).
- Slide 5 may be edited to match your physical and eBook Destiny offerings.
- Consider [using the Schoology Assignment Apps feature](#) to assign Google documents and files for students to access, edit, and submit through Schoology.