ENGINEERING CONTEST

CHALLENGE

To design and build a sturdy and stable bridge using the provided materials

REQUIREMENTS

- Bridge must span an 8 inch gap
- Bridge must be a minimum of 2 inches wide
- Bridge must hold at least 6 ounces (Note: one stick of butter is 4 ounces)
- Child(ren) should be the primary engineer(s) of the bridge; adults may assist with the process
- Children may work individually OR with a partner in the same age group

SUPPLIES

- Kit: tape measure, glue, pipe cleaners, rubber bands, wooden skewers, popsicle sticks, play dough, thread, bobbins, paper
- Home: crayons, markers, colored pencils, scissors
- Special Notes:
  - You may only use the materials from inside the kit to build your bridge.
  - You do NOT need to use all the materials.
  - You may use crayons, markers, and colored pencils to decorate the bridge. These items cannot be used in the structural design.oYou may modify, cut, and change the materials using scissors. Scissors cannot be used in the structural design.
  - If working with a partner, supplies from only one kit may be used. (1 kit = 1 bridge)

QUESTIONS TO CONSIDER

- Did you go through the engineering design process?
- How will your supply pieces stay together in your design?
- What type of extra support will your bridge need at the ends or in the middle?
- How long will your bridge be?
- How tall will your bridge be?
- Will your bridge have sides?
- Will your complete bridge be stationary (still) or be able to move?
- How will you decorate your bridge?
- How much weight can your bridge hold?
- Was your bridge inspired by an existing bridge?

ENGINEERING CONTEST

CONTEST DATES and TIMES

Saturday, January 31st @ 2:00-4:00pm
Sunday, February 1st @ 10:00am-12:00pm
Saturday, February 7th @ 2:00-4:00pm
Sunday, February 8th @ 10:00am-12:00pm

AGE GROUPS and CATEGORIES

2nd – 5th grade (individual and/or partner)
6th – 8th grade (individual and/or partner)

REGISTRATION

Please register for the Engineering Contest by scanning the QR code or visiting our website at www.gbchildrensmuseum.org. Please rank the dates/times based on your preference, and indicate any special circumstances or information that you would like us to take into consideration. We will do our best to accommodate requests. Your scheduled contest date/time will be sent via email by January 15th. Registrations received after January 15th will be sent their scheduled date/time within 3 business days.

Registration deadline: Monday, January 26th

Museum admission is FREE on your scheduled contest day for participating children and 2 adults per participating child. Additional guests (children and adults) will be charged standard museum admission.

PRESENTATION and EVALUATION

Participants will be asked to share the following with the judges:

- What is the name of your bridge?
- What was your inspiration for this bridge?
- Tell us about your design and building process.
- What challenges or problems did you encounter while building?
- For Partners: share how you worked together to divide tasks

Volunteer judges will evaluate your bridge on the following:

- Bridge meets the minimum requirements (span, width, weight)
- Bridge's overall appearance
- Bridge has creative and/or unique features
- Explanation of bridge inspiration, challenges overcome, and building process

POTENTIAL PRIZES

- Camp at The Children's Museum of Green Bay, UWGB, Michigan Tech University
- Membership at The Children's Museum of Green Bay
- 3-D printer
- 3-D doodle pen
- Snap circuits kit
- Robotics kit
- Lego kit
- Monetary gift card

Register Here

Bridges of Green Bay

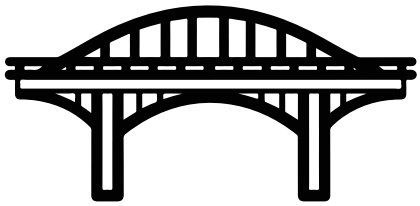
1-43 Interstate Highway Bridge
Name: Leo Frigo Memorial Bridge
Bridge Type: Tied-Arch Bridge
Span Length: 450.2 feet
Total Length: 7,973 feet

Walnut Street Bridge
Name: Bart Starr Memorial Bridge
Bridge Type: Bascule Bridge (Drawbridge)
Span Length: 160.1 feet
Total Length: 183.1 feet

Canadian National Railroad Bridge
Name: Phoebe Street Swing Bridge
Bridge Type: Truss Swing Bridge
Span Length: 225 feet
Total Length: 625 feet

Duck Creek Bridge
Name: Talú?kowanhné Bridge
Bridge Type: Truss Bridge
Span Length: 110 feet
Total Length: 145 feet

Types of Bridges and Important Vocabulary



Tied Arch Bridge

- Has a large arch above the deck.
- A tie beam keeps the arch from spreading apart.
- Works well for fluctuating weight.

Suspension Bridge

- Held up by long cables that hang between tall towers.
- The deck is suspended by cables.
- Can span very long distances.

Truss Bridge

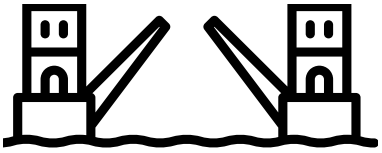
- Made with triangle shapes to distribute weight.
- Very strong and sturdy.
- Often used for roads or railways.

Beam Bridge

- One of the simplest bridge types.
- Held up by beams.
- Works best for short distances with stable ground.

Arch Bridge

- The curve shape pushes the force down making it good at holding a lot of weight.
- Works well for long-lasting structures.



Bascule Bridge

- Can open to let boats pass through.
- Like a seesaw, it opens with a counterweight.
- Often found over waterways in cities.

Bridge - A structure that helps people, animals, or vehicles cross over something like water, a road, or a gap.

Deck - The surface of the bridge that people, vehicles, or objects travel on.

Span - The length of the space a bridge covers from one support to another.

Arch - A curved shape that pushes weight down and outward. This shape helps the bridge stay strong.

Beam - A long, strong piece that helps hold up the deck.

Tie Beam - A horizontal beam that connects an arch's ends, counteracting the arch's tension, much like a bowstring

Truss - A framework made of triangles. Triangles make structures strong because they do not bend easily.

Support - Parts of a bridge that keep it standing. Supports help carry the load and keep the bridge balance.

Load - The weight a bridge must hold. Loads can be things like cars, people, or even the bridge's own weight.

Tension - A force that pulls on a material and stretches it. Cables on suspension bridges work in tension.

Compression - A force that pushes on a material and squishes it. Arches and beams often work in compression.