

A Bridge Going Up and Down

Chicago River Classroom Activity

Summary

Students look at photos of bridges and sing a song about Chicago's famous bascule trunnion bridge to understand how moveable bridges work.

Background

Built in 1920, the Michigan Avenue Bridge is a double leaf, double decker, fixed counterweight bascule trunnion bridge. The bridge's two leaves are the two spans that come from either bridge tower and meet in the middle. Each leaf is also double decker, allowing for traffic to move on two levels. The leaves are actually part of Michigan Avenue itself.

The word bascule is French for see saw. The bridge works in just that way. Each leaf balances on a trunnion (the same things used to fix a cannon to its stand). A trunnion is like a big pin sticking through the bridge leaf so it can pivot. Because the pivot point is not in the middle of the leaf, but rather close to one end, a counter weight is needed on the shorter end to balance the bridge. The counterweight is stored in a great underground pit. The bridge is so accurately balanced that if the bridge is painted, it could become unbalanced.

When the bridge opens to let boats through, each leaf moves up into an almost vertical position. Each leaf weighs 3, 750 tons. The bridge is lifted by a series of gears, which allow for a very small motor (108 horse power per leaf). The work is displaced throughout the gear system so that the bridge takes 1 minute to open, but since the force needed to lift it is spread out over the distance of the gear train, the motor can open the bridge without burning out.

Grade Level: K-3rd

Duration: 45 min

Objectives:

1. Students will understand the purpose of the Michigan Avenue Bascule Trunnion Bridge.
2. Students will understand the basic way these bridges operate.

Materials:

- ◆ Pictures of various bridges (www.bridgesite.com)
- ◆ Copies of bridge coloring sheets (1 of each for every student)

Standards:

4.A.1a, 4.A.1b, 4.A.1c, 4.A.1d,
11.B.1a, 13.B.1D



Procedure

- ◆ Ask the students if they know how people and animals can cross a river. (Accept all answers but be sure that they realize that a bridge is a good way.)
- ◆ Show the students some pictures of different types of bridges.
- ◆ Explain to the students that bridges present a problem. People need to cross the river on the bridge, while boats need to travel along the river without running into the bridge. This is especially true for sailboats, which have tall masts.
- ◆ What to do? In Chicago, we developed and perfected a special kind of a bridge - movable bridges!
- ◆ These bridges allow people to walk and drive over the river on the bridge but also allow boats with tall sails to move under the bridge without bumping into it. When boats need to pass under, the bridges lift up.
- ◆ Pass out the pictures of the bridges.
- ◆ Tell students to draw cars on the bridge when they think it would be safe for them to cross over the bridge and to draw sailboats in the river when they think it would be safe to cross under the bridge.
- ◆ Have the students color the pictures.
- ◆ Sing the “Bascule Trunnion” Song



A Bridge Going Up and Down: Song

The Bascule Trunnion Song

Sing to the tune of “Oh Susanna”, following the diagrams for the accompanying hand movements.

Verse 1

In the City of Chicago,
Over the Chicago River blue
Is a bridge that can move up and down
To let the boats go through



Chorus

Bascule Trunnion!
A bridge moving up and down
You're important to the whole wide world
And so special to our town!



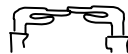
Verse 2

A car stops at the river bank
Can't get to the other side
Without a bascule trunnion
It's a wet and bumpy ride

Chorus

Verse 3

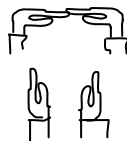
Boats move down the river too
Going to and from the lake
But boats can't fit beneath the bridge
Or their tops and sails will break!



Chorus

Verse 4

The bascule trunnion bridge is there
But just what does it do?
It stays down for the cars to cross
And opens to let the boats through



Verse 5

Chicago is the city
Of the bascule trunnion's birth
It was born a hundred years ago
And now's built all over earth

Friends of the Chicago River



Chicago River Schools Network

