

# Building Bridges

As preschoolers start to take an interest in the neighborhoods around their schools and homes, they may be curious about the buildings and bridges they see. In this physics and engineering activity, students will practice problem-solving skills while building structures with a variety of classroom materials.

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## Before the activity...

Introduce the concept of bridges and bridge building by reading one of the suggested books below and leading a discussion with students, recording their questions and observations.

## Supplies

- Variety of wooden & foam blocks
- Pieces of cardboard cut 4–6 inches wide, 6–18 inches long. Bend and crease these cardboard pieces to weaken them.
- Variety of small cars and trucks
- Paper and crayons
- Picture book
- Chart paper and markers

## Procedure

- Divide students into groups, each facilitated by an adult if possible.
- Introduce your building materials to the group. You might choose to start with only small blocks and introduce taller blocks later in the activity, or start with all blocks at once. Once the group has built its first bridge, introduce large and small vehicles for stability and strength testing.
- Add bowls of the remaining ingredients (vinegar, dish soap) to the table one at a time for students to add. Give each student one or more fizzing color tablet to add to their mixtures. Students may then try color mixing by using a pipette to share a friend's colored water. Provide each table with a dumping bowl so that students may start their experiments over if they wish.

## Inquiry based questions

As students explore their materials and begin to build, guide their curiosity by asking open-ended questions that cannot be answered with one-word answers. Develop your own questions for this activity by trying it yourself first, recording what you know, want to know, and learned. Ask students to think of their own questions, and record them.

- How can cars and trucks get over hills, streams, or rivers?
- How can you keep your bridge from falling?
- Why do we use bridges?
- What are real bridges made of?
- Who do you think designs and builds bridges?
- How does wind affect a bridge?

## Extension activities

- Challenge students to repeat the activity, using new and different materials. How do they think the new materials will change their bridges?
- When finished building bridges as a group, consider adding your building materials to the block area for students who wish to explore further. You may wish to add building tools and hard hats to your dramatic play area, and make your bridge books available in the classroom library.
- Once students have an understanding of basic bridges, invite them to add new structures and build specific types of bridges – tunnels, ramps, and drawbridges, for example.
- Ask students to draw a bridge they built, and dictate the process. As an alternative, ask students to draw and dictate a plan for a bridge they would like to build, and then build it.

## Resources

Books:

*Bridges are to Cross* by Philemon Sturges

*Bridges: Amazing Structures to Design, Build and Test* by Carol A. Johman and Elizabeth J. Rieth

Websites:

<http://www.howstuffworks.com/engineering/civil/bridge.htm>

<http://pghbridges.com/alloverviewmap.htm>

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