

Bridge

Connection Between Two Sides

Keywords:

bridge, construction, engineering, structure, load-bearing, transport, accessibility

Target group:

primary school pupils
(ages 6-11)

Objectives:

In this activity, pupils explore the world of bridges as both technical structures and symbols of connection. They will learn about different types of bridges, how they function, and what makes them stable. At the same time, they will reflect on how a bridge can serve not just people, but also animals, cyclists, and nature. The goal is to create a model of a bridge that is strong, accessible, environmentally respectful, and adapted to its context.



General Guideline on Time Allocation:

The duration needed to carry out this activity may vary depending on the specific group of children. Teachers are encouraged to adapt the implementation according to the needs, interests, and dynamics of the group.

In the preparatory phase, teachers may use a variety of activities to introduce and contextualize the chosen topic. These can include discussions, videos, drawings, storytelling, or even a field trip, depending on the age and background knowledge of the children.

The main construction phase, during which children plan and build their urban element using LEGO bricks, should typically not exceed 45 to 60 minutes. However, this phase often stimulates further curiosity and questions among the children, potentially leading to extended engagement or follow-up activities. For more detailed instructions and pedagogical support on how to implement activities of INNO-kids project, please download the Teacher's Methodological Guide.



Materials and Resources Needed:

- 38 flat wooden sticks of equal size (per group)
- Dispersive glue
- Masking tape
- LEGO bricks (optional – for vehicles, people, animals)
- Cardboard base or two raised platforms (books or boxes to simulate riverbanks)
- Natural or recycled materials for decorative and structural elements
- Ruler or measuring tape
- Bricks or books to check strength (optional)
- Photos of bridges from around the world

Note: Encourage pupils to repurpose available materials creatively. If LEGO bricks are not available, pupils may use basic craft supplies to bring their ideas to life through drawings and handmade models.

Introduction:

Begin by showing pictures of bridges from around the world — some modern, some ancient, some made of steel, others of wood or rope.

Ask:

- What are bridges used for?
- Who or what crosses them—people, bikes, cars, animals?
- Have you ever crossed a bridge that felt exciting or scary?
- What happens if there's no bridge?

Explain that today's challenge is to design a bridge that connects two sides, is strong and safe, and at the same time kind to nature.

Pupils will build a small-scale model of a bridge using wooden sticks and other materials. Later, they will test its strength and present how it fits into a bigger sustainable environment.

Procedure:

Preparation

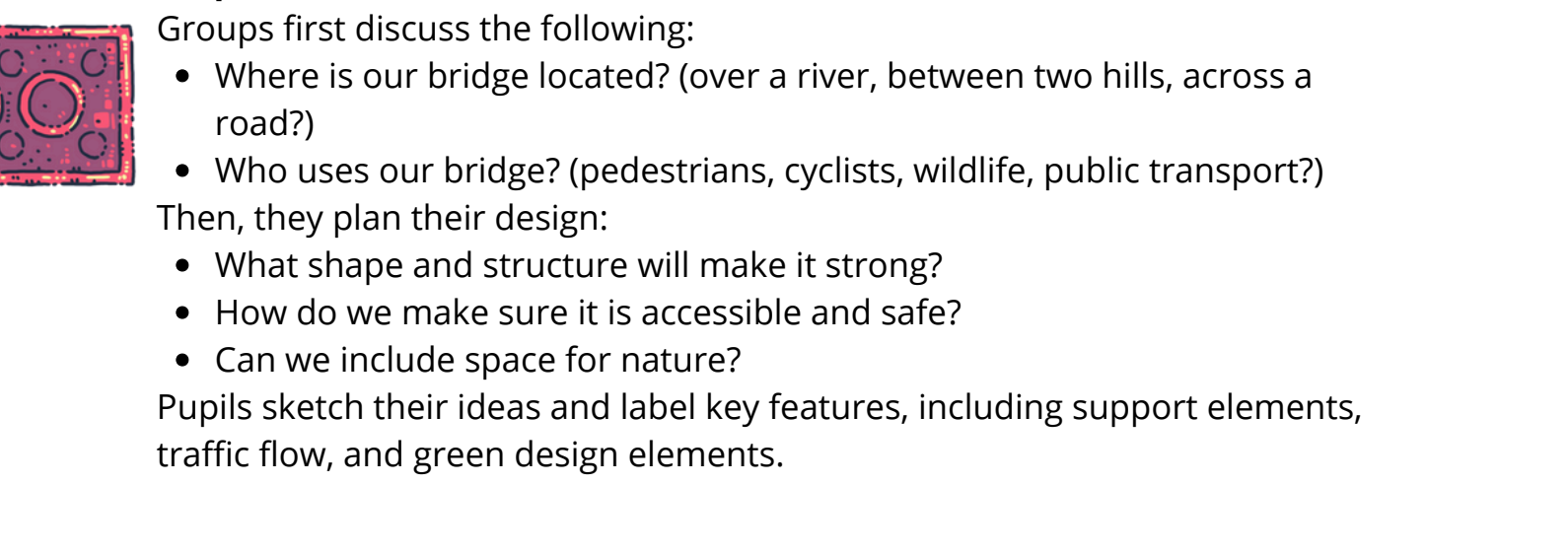
Groups first discuss the following:

- Where is our bridge located? (over a river, between two hills, across a road?)
- Who uses our bridge? (pedestrians, cyclists, wildlife, public transport?)

Then, they plan their design:

- What shape and structure will make it strong?
- How do we make sure it is accessible and safe?
- Can we include space for nature?

Pupils sketch their ideas and label key features, including support elements, traffic flow, and green design elements.





Construction

Working as a team, pupils follow this construction process:

- Begin by assembling the side frames: form triangles from wooden sticks to ensure stability
- Build connected rows of triangles or squares, depending on the planned shape
- Reinforce key joints with masking tape and allow time to dry properly
- Carefully connect the top and bottom parts using the same technique
- Add optional features: bike lanes, walking paths, green elements

They place their bridge between two stable platforms and check that it stands without help. Pupils then gradually add weight to test its strength and reflect on how design choices influence stability.

Details

Now it's time to add the features that show who the bridge is for and what values it carries:

- Walkways with railings for safety
- Dedicated paths for bikes or wheelchair users
- Viewing areas or resting spots
- Greenery such as moss, leaves, or "planter boxes"

Pupils label parts of the model and add signs or symbols that express respect for nature and people.

Stories

Invite each group to create a short story of someone using the bridge. It could be a cyclist commuting to school, a fox crossing safely under the structure, or a family watching the sunset from a bench on the bridge.

Presentation

Each group presents their bridge models to the class, highlighting key structural choices, sustainable features, who the bridge was designed for, and test results of weight-bearing capacity.



Tips:

- Encourage pupils to experiment but also be precise. Ask "What makes your bridge special?" or "How is it better for the environment than a typical road bridge?"
- The class can compare different bridges and discuss what worked well and what could be improved.



Additional Considerations:

Differentiation:

Provide additional support or simplified instructions for pupils who may require extra assistance. For advanced pupils, offer extension tasks such as researching further sustainable practices or designing more complex models.

Assessment:

Assess pupils based on their participation and engagement during discussions and hands-on activities. Evaluate the creativity, effort, collaboration, depth of understanding demonstrated in their models, critical thinking, ability to provide constructive feedback and presentation skills.

Extension Activities:

- Research famous bridges and their stories
- Explore bridges made for wildlife — "green bridges" over highways



Curriculum Connections:

This activity integrates:

Science (*forces, structures, testing materials*)

Mathematics (*symmetry, geometry, measurement*)

Art (*design, creativity, construction*)

Language (*storytelling, discussion, presentation skills*)

Social studies (*accessibility, community needs*)

SDG Connections:

- **SDG 9:** Industry, Innovation and Infrastructure – Pupils create useful infrastructure that solves real-world problems.
- **SDG 11:** Sustainable Cities and Communities – Pupils design inclusive and safe public structures.
- **SDG 12:** Responsible Consumption and Production – Pupils use materials consciously and reflect on reuse.
- **SDG 13:** Climate Action – Pupils design bridges that integrate nature and reduce environmental impact.
- **SDG 15:** Life on Land – Pupils make room for wildlife and support biodiversity through design choices.



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