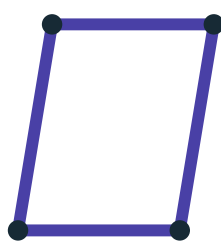
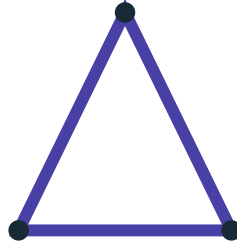


Build strength with triangles.

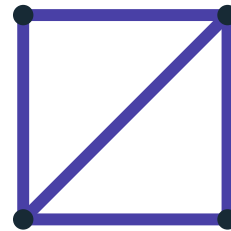
A diagonal brace helps a frame hold its shape.



Can lean



Holds shape



Add a brace

Use joints that can pivot.

TRY IT TODAY

Build a straw square. Test it. Add a brace.

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? **Question:** Why do so many bridges and roof frames contain triangles?

🗨️ **Answer:** A triangle made from rigid members holds its shape even when its joints can pivot. An unbraced four-sided frame can change shape more easily.

🕒 **History:** The Warren truss was patented in 1848. Its repeating triangles became a familiar feature of metal bridges, putting geometry to work in structures that carry people and goods across a span.

💡 **Example:** Push gently on a square made from straws with flexible tape joints. It can lean into a diamond-like shape. Add a diagonal brace, and you divide the square into triangles that resist that movement.

🔍 **Insight:** Shape is only part of good engineering. Materials, joints, loads, and supports also matter. Adding a triangle does not make every structure equally strong or safe.

🌐 **Connection:** Engineers use these ideas to design useful structures under real limits. A successful design must meet a need while respecting constraints such as cost, available materials, and safety.

🎯 **Challenge:** Build a square with four equal short straw pieces and flexible tape joints. Predict how it will move under a gentle push, then test it. Add a longer diagonal brace and repeat a similar push. Your goal: less sideways movement. What improved? What would you change next?