



Building Bridges

How far can you extend a bridge span before it collapses? We'd like you to work this out the old-fashioned way – by building your own bridges with LEGO® and watching them fall down until you find a design that works.

THE RECORD: Longest span of a LEGO brick bridge made in three minutes

THE CHALLENGE: Build a LEGO bridge in 3 min (with no help from anyone else) that is at least 10 cm (3.93 in) off the ground and that will stand for at least 10 sec.

This deceptively simple record requires you to manipulate LEGO at high speed. Just erect two towers and span them

with a bridge deck. Easy, right? Well, your ambition must be matched with a steady hand and a good understanding of the physics involved – if you're too quick, or if the span gets too long without sufficient support, it could all come crashing down.

This is a great record if you're planning on a career in engineering. Now's the time to put your designs to the test – before you start building *real* bridges!



FOR THE RECORD

The LEGO recreation of London's Tower Bridge is one of the largest sets available, with a dizzying 4,295 individual pieces to lose, accidentally eat or tread on in the dead of night. The set's complexity has made it a popular target for speed builders. The current record for **fastest time to complete the LEGO Tower Bridge set (team of five)** is held by British LEGO nerds Team Brickish – who put the whole thing together in just 1 hr 20 min 38 sec on 30 Nov 2014.



HOW DOES IT WORK?

In this record, you're fighting against the force of gravity. The longer you make the span, the more of its own weight the span has to support. The weight of the span puts pressure on the links between bricks in the centre of the span, and as they buckle, it stresses the joints between the span and the towers.

Compression (squeezing)

Tension (stretching)

Torsion (twisting force)

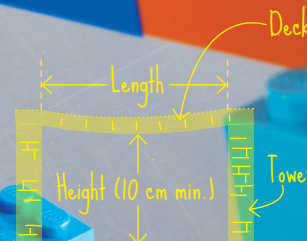
Lateral thrust (outward push)

--SHOPPING LIST--

YOU CAN USE:
- LEGO BRICKS -
NO LONGER THAN
4 cm or 1.57 in
- BASE PLATES
(OPTIONAL)

GUIDELINES

- The LEGO bricks used must be no longer than 4 cm (1.57 in).
- The bricks must be laid flat on a surface prior to the attempt, and may not be pre-joined in any way. Once laid out, the bricks may not be touched until the attempt begins.
- The bridge must have two towers on either side and a deck connecting the two.
- There must be at least 10 cm (3.93 in) clearance between the underside of the deck and the ground.
- You have 3 min to complete the bridge and it must stand unsupported for 10 sec after the time is up.



TII
TODAY I LEARNED
The oldest still-standing stone bridge over the Meles river near the city of Izmir (formerly Smyrna), in what is now western Turkey, was built by Ancient Greek settlers some time before 850 BCE, making it around 3,000 years old.



1

With the clock ticking, you're going to need to move fast. The first bits you should construct are the towers at either end. These must be big and strong, but you can't take too long to make them.



2

Next you'll need to make the bridge span. Here, you've got to balance stiffness with weight. More bricks means more strength, but are they fixed firmly enough to support their own weight?



3

Finally, join it all together and stand back. If it's still standing after 10 sec, then you've got yourself a valid record attempt. Be sure to film everything clearly, including the stopwatch used to time the attempt.

