

### Visible Elements in Photo



- Two large curved metal arches forming an entryway structure over a landscaped median
- Palm trees (two visible) planted in the median with manicured hedges
- Brick buildings at street level with storefronts (Canyon Café, other businesses)
- Multi-story beige/concrete office tower in the background
- Paved street and organized landscaping with small round stones/rocks as ground cover

### Reasonable Inferences

- Metal arches: The curved design suggests a need to span an open space while being visually striking and weather-resistant; the arches distribute weight and wind load efficiently.
- Palm trees and landscaping: The planned arrangement indicates intentional design to create an inviting public space that requires structural support (planters) and protection for plants in an urban environment.
- Street-level placement: The structure serves a public wayfinding or aesthetic function, meaning it must be stable under pedestrian traffic, wind, and weather exposure.

### Engineering Task

#### K-2 Challenge:

Make a big arch door for your toy animals or figures to walk under. Use straws, sticks, or paper tubes to build curved arms that meet at the top. Your arch should be tall enough for a toy animal to walk under without falling over.

#### 3-5 Challenge:

Design and build a 30 cm-wide decorative archway that can support the weight of two water bottles (or 1 kg) placed on top without bending or collapsing. You may use only paper, cardboard tubes, and tape. Your arch must stand freely (no string or external supports) and span at least 25 cm. Test your design by slowly adding weight and measuring how much load it holds before failure. Which shape held the most weight—curved or angular?

### EDP Phase Targeted

Imagine / Plan

The photo shows a completed, visually successful structure. Students aren't solving an unknown problem; they're reverse-engineering and improving on a visible solution strategy. They can observe how curves distribute force and then plan their own version before building.

### Suggested Materials

- Paper towel or wrapping paper tubes
- Tape (masking or duct tape)
- Cardboard or poster board

- Water bottles or weights for testing (K-2: lightweight toys; 3-5: measurable loads)
- Ruler or measuring tape

### Estimated Time

K-2: 30–40 minutes (one session)

3-5: 50–60 minutes (one session, or two 30-minute sessions if including iterative testing)

### Why This Works for Teachers

This task directly addresses NGSS ETS1.A (defining and delimiting problems) and ETS1.B (developing possible solutions) by asking students to analyze how a real-world structure solves the dual problem of spanning space while remaining stable and visually functional.