

# Simple Frame Structures: Primary Grades

## Understanding Structures and Mechanisms - Materials, Objects, and Everyday Structures

**Introduction:** During the primary years students discover that there are different types of structures around them. As they begin to design and make different structures using a variety of materials it is important the students understand the techniques which will make their structures stable. Once the student understands how to build a simple frame, this process can be used repeatedly throughout various design activities ( i.e. bridges, houses, vehicles etc.)

### Instructions:

Students use craft sticks, gussets, glue, and a joiner to make a square frame (see illustrated instructions below) that is square (i.e., right angle corners) and strong (i.e., holds together when dropped from a one meter height onto a hard floor).

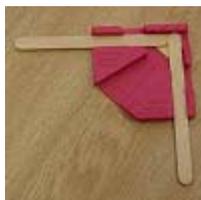
1. Spread a **thin** layer of carpenter's glue on a gusset and place (glue side up) in a joiner.



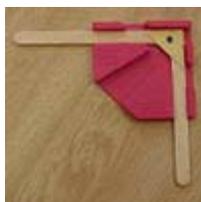
2. Place craft stick in joiner so that it butts up against the closed edge of the joiner.



3. Place another craft stick in joiner to make the corner, making sure that the two craft sticks are snug together (not overlapping).

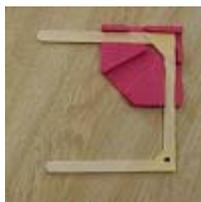


4. Spread a thin layer of carpenter's glue on another gusset and place it (glue side down) on top of the sticks in the joiner; hold gusset down and count to ten. Mark the top gusset with a **dot**.



5. Remove corner from joiner

• Prepare another gusset: students spread a **thin** layer of carpenter's glue on a gusset and place (glue side up) in joiner.



• Turn the first corner ¼ turn clockwise from

the original position, and put it back in the joiner, butting it up against the closed edge of the joiner (making sure you can see the dot below the joiner).

• Place another craft stick in the joiner to make the second corner, making sure that the two craft sticks are snug together (not overlapping); place another prepared gusset (glue side down) onto the craft stick corner, hold it down, and count to ten.

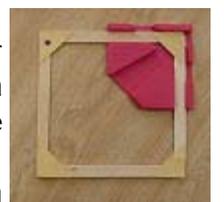
6. Remove fastened sticks (U shape) from joiner

• Prepare another gusset: students spread a **thin** layer of carpenter's glue on a gusset and place (glue side up) in joiner.



• Turn U shape ¼ turn clockwise from the previous position, and put it back in the joiner, butting it up against the closed edge of the joiner (making sure you can see the dot). Place the fourth craft stick in the joiner to make the third corner (and a square shape), making sure that the two craft sticks are snug together (not overlapping); place another prepared gusset (glue side down) onto the craft stick corner, hold it down, and count to ten.

7. Prepare another gusset: students spread a **thin** layer of carpenter's glue on a gusset and place (glue side up) in joiner.



• Turn the square shape ¼ turn clockwise from the previous position, putting the unfastened corner in the joiner; place another prepared gusset (glue side down) onto the craft stick corner, hold it down, and count to ten.