

Relative Age: Painted, Cut, Screwed, Glued, and Taped Wooden Blocks

Abstract:

A series of sets of wooden blocks all contain varying records of the order in which the blocks have been painted, cut, screwed, glued, and taped. These blocks are used in introductory geology courses at the college level as well as with elementary, middle- and high-school teachers in workshops. Many teachers have made their own blocks. The blocks are used at the start of a 'unit' on relative age. Students use critical reasoning to determine the relative order of the steps involved in fabrication of 'their' block – and realize that the blocks record a variety of orders; students have to work together to compare and discuss how their blocks differ, and the evidence they have used. The concepts of 'relative age' as inferred from geologic cross-sections can then be applied as students equate the block events with geologic events (e.g. cutting = faulting). This activity brings all students a 'real-life' experience of relative age in multiple dimensions, which improves their confidence and skills when they advance to working with geological cross sections.

In-Class Use:

- I use these blocks as a 'warm-up' activity for a class in which determination of relative age is the topic; students already know the difference between absolute age and relative age
- Distribute blocks among students so similar blocks are not adjacent
- Ask students what they think of the blocks? What can they determine from them? What has 'happened' to the blocks (cut, glued, taped, screwed, painted)? What order? Are they all the same? How do you determine order? Review use of terms *before* and *after*
- Verify, compare order; Discuss blocks that provide alternative options, blocks that are glued before experiencing initial cut
- Why have I given you the blocks? How do they relate to relative age?
- Introduce and review principle(s) of cross-cutting relations
- Compare block events to geological events (cut = fault, glue = superposition, screw = dike)
- Introduce simple geologic cross sections; graduate to more complex geologic cross sections



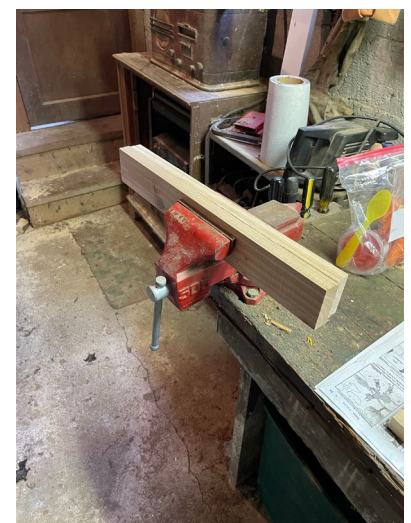
Color-coded blocks ready to go!



Blocks almost completed



Getting ready to assemble blocks



Gluing the 18" lengths together

Block 'types', Order of events:

Set 1: Green Tape, Pink Paint

- Blocks cut into 3" lengths
- Glued
- Painted
- Cut
- Taped
- Screwed

Set 2: White Tape, Orange & Pink Paint

- 18" wood lengths glued together THEN cut into 3" blocks
- Tape
- Paint (orange)
- Cut, Screwed
- Pink paint at any point post-*initial* cut into 3" blocks

Set 3: Yellow Tape, Blue Paint

- Blocks cut into 3" lengths
- Glued
- Cut
- Tape
- Paint
- Screw

Set 4: Yellow Tape, Green Paint

- Blocks cut into 3" lengths
- Cut each block
- Paint
- Glue
- Tape
- Screw

Set 5: Blue Tape, Yellow, Paint

- Blocks cut into 3" lengths
- Cut
- Glue
- Tape
- Screw
- Paint

Set 6: Blue & White Tape, Purple Paint

- Blocks cut into 3" lengths
- Tape
- Glue
- Paint
- Cut
- Screw

SUPPLIES / EQUIPMENT FOR MAKING 36 BLOCKS (6 SETS, 6 BLOCKS EACH)

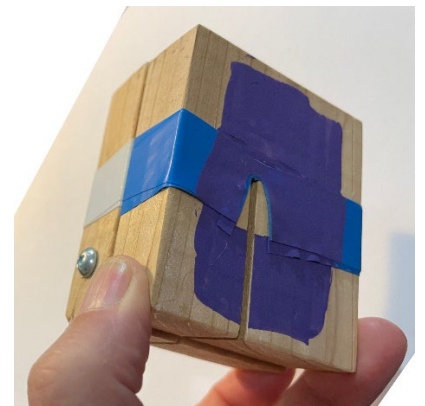
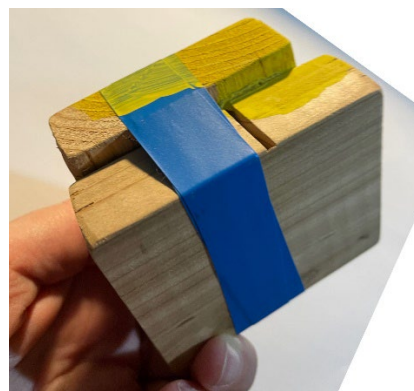
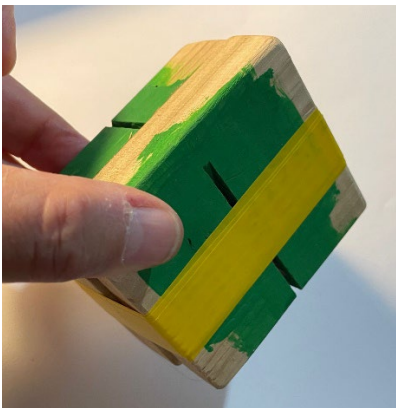
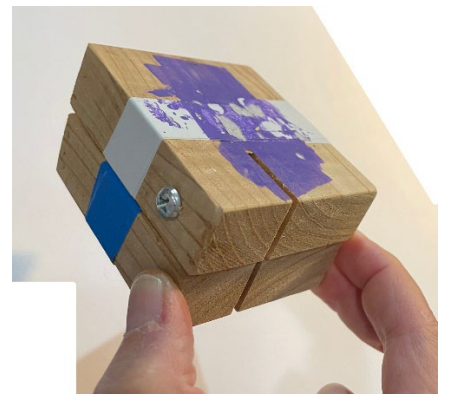
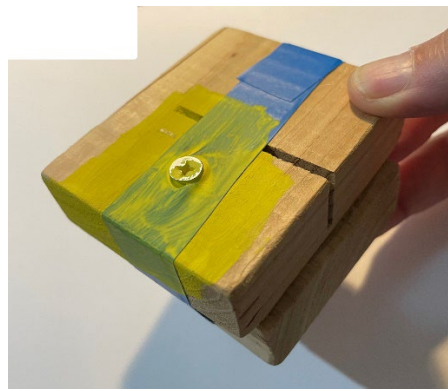
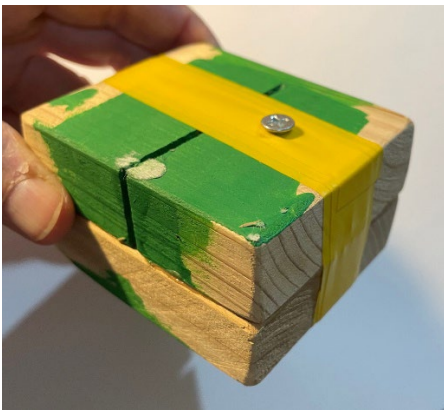
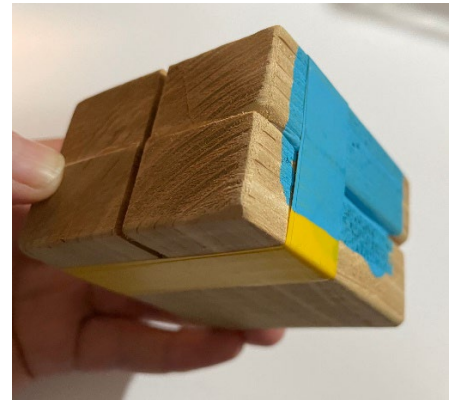
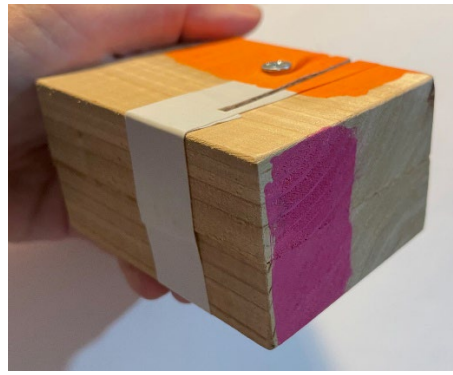
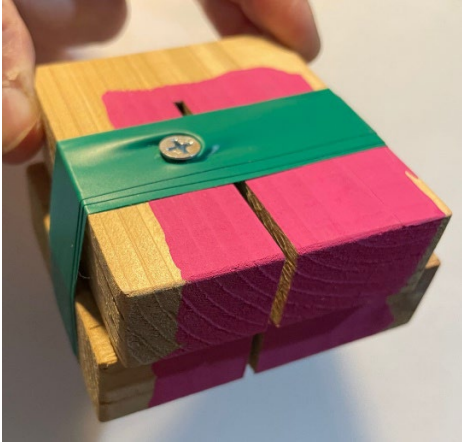
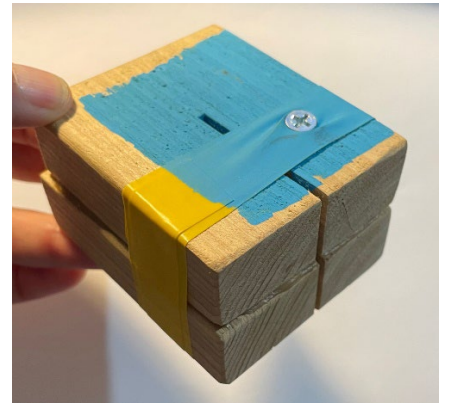
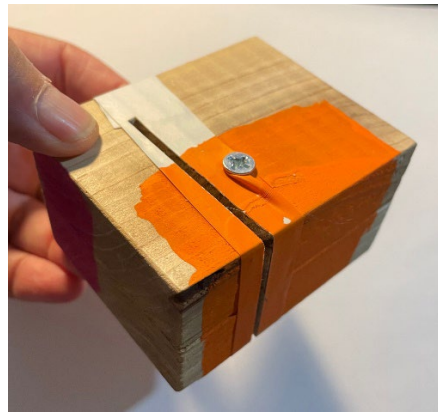
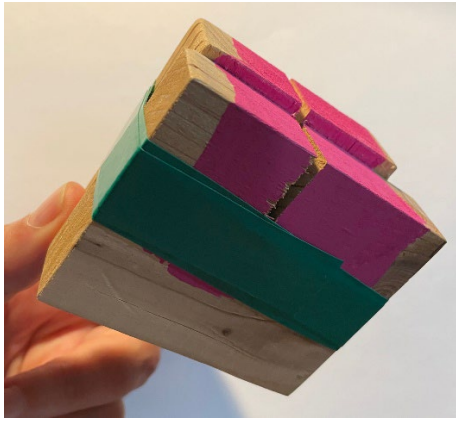
- Two 108" (3 yard) lengths of quality 7/8 " x 2½ " wood (check to make sure no knots, splits). I used oak.
- Rough and fine sandpaper
- Access to Table Saw (plus protective gear)
- Power drill
- Screwdriver
- Wood clamp(s) or vise
- Space to lay out the 36 blocks
- Wood super-glue or wood gorilla glue
- Electrical Tape (multiple colors)
- 36 1¼ -inch screws
- Acrylic paint (ideally ~ 6 colors – colors help keep block organized & make class discussions easier)
- Thick artist paintbrush
- Newspaper, rags
- Ruler/tape measure

TIME REQUIRED:

Approximately three days, 2 - 4 hours each day

Instructions (Note: this is a multi-day project because of time needed for glue to set and paint to dry; if you are organized you can work on multiple block sets at the same time)

1. Review the sequence needed for each set of blocks to identify where pauses will be needed.
2. Cut two 18" lengths (these are for the **Set 2 Blocks** that will be glued together before 'other events'); cut the remaining wood into 3" lengths. Sand all surfaces, edges, and vertices to remove splinter potential first using coarse sandpaper, then fine sandpaper.
3. **Set 1 Blocks:** Glue 3" blocks together with sides 'offset' (in different orientations). When glue has fully dried, paint (pink) across sides/top/bottom of block; after paint has dried, cut into both parts of block through paint (pink); wrap tape (green) around block across paint and cut; drill hole into tape and paint, and screw screw into hole.
4. **Set 2 Blocks:** Glue the 18" lengths together and use clamps or vise to hold in place. When glue has fully dried, cut the glued 18" length into six 3" lengths. Tape (white) around block; paint (orange) across tape and glued join, leave paint to dry; cut into both blocks where orange paint is on top of tape; drill hole into block through orange paint and tape, then screw screw into hole. Additional paint (pink) at any point post-initial cut into 3" blocks at location where does not provide relative age evidence.
5. **Set 3 Blocks:** Glue 3" blocks together aligning original lengths together and cut sides together. When glue has fully dried cut into both parts of the block; tape (yellow) around the block across the cut; paint (blue) on top, one side and bottom making sure paint gets into cut. When paint is dry, drill hole through paint and tape, and screw screw into hole.
6. **Set 4 Blocks:** Cut each 3" block halfway across. Paint (green) each block so paint clearly fills cut and extends part way on sides. When paint is fully dry, arrange blocks so cuts are on opposite sides (i.e. 'unrelated'), and glue blocks together. When glue has fully dried, tape (yellow) around two blocks, across both cuts and paint; drill hole through paint and tape, and screw screw into hole.
7. **Set 5 Blocks:** Cut each 3" block halfway across. Glue blocks together (with edges not matching, and with cuts in different orientations). When glue has fully dried, tape (blue) blocks together across cuts. Drill hole into block through tape, then screw screw into hole. Paint (yellow) across screw top, tape, and cut and glued join. Leave paint to dry. Extra paint on screw-top may be needed.
8. **Set 6 Blocks:** wrap six blocks in tape (white), and other six blocks in tape (blue). Glue blocks together. When glue is fully dried, paint (purple) across tape on top and bottom surface of block. When paint has fully dried, cut into block ensuring that cut cuts into both sets of tape and paint. Drill hole in one half of block so it cuts across cut, then screw screw into hole so it can be seen 'transecting' cut.



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