

Lesson 13 Nuts, bolts, screws, and triangles: Attaching things securely

Objectives: Students will get practical, hands-on experience attaching real materials together with real hardware and using real tools.

Students will understand ways in which they can make their structures more stable by using triangles.

Sponge: Design Challenge: Tool Safety

Initial

Discussion: Discuss tool safety. Today we will be using a wrench and screw drivers. Students will use goggles in case something breaks off. Mention that they could pinch their fingers when working with pegboard strips.

Materials: Tool safety handout, goggles, pegboard strips with nuts, bolts, and angle brackets, scrap wood with pre-drilled pilot holes, screws, screw drivers, cardboard triangles and squares sized to fit pegboard square.

Project: Hand out long, thin pegboard strips, hardware, and trays. Have students make two squares and one long strip.

Ask students to figure out how to make their squares stay square and how to make their long strip stay straight. Provide pegboard strips. After students work for a while, offer the following: wrenches, paint stir sticks with drilled ends, poster board triangles, large poster board squares.

Have students show how they made a strong square and strong strip, and to write in their notebooks what they learned.

Students create a sturdy structure as a team using the pegboard strips, nuts, bolts, and angle brackets.

While students are working, have one group at a time try out screwing into the scrap wood and using the wrench, if they haven't already.

Vocabulary: Wrench, screw driver, screws, bolts, nuts, angle brackets.

Final

Discussion: Students show their structures and tell how they made them sturdy.

Clean up: Count nuts and bolts to be sure that none are missing.