

Bookshelf

Category: Design & Construction; Friction

Type: Make & Take

Rough Parts List:

| | |
|---|--------------------------------------|
| 3 | 6' Dowels, 5/16" thick |
| | Wood pieces, at least 1/2" thick |
| | Drill with bits of 19/64" and 11/32" |
| | Decorations and paint |



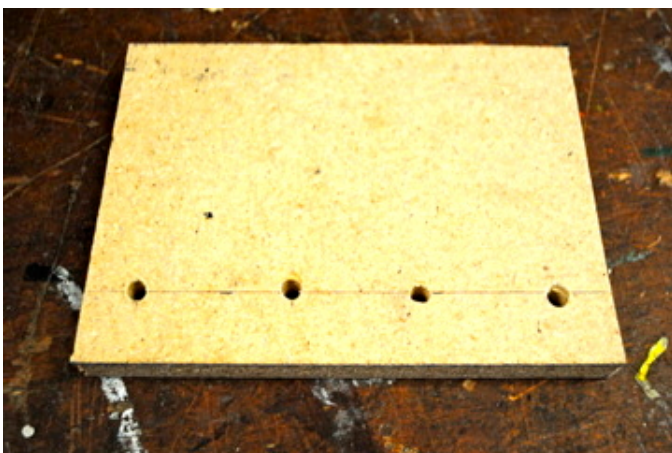
How To:



Cut 3 pieces of wood to form the sides of the bookcase.



Stack the wood pieces and drill 4 holes along the bottom edge.



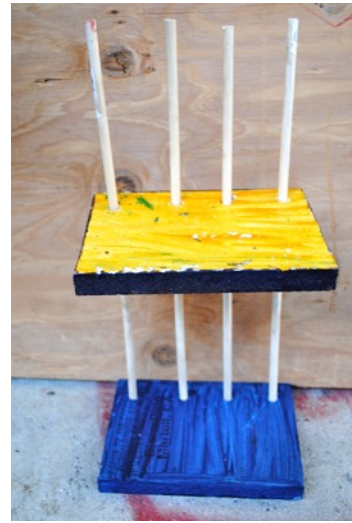
With the larger drill bit, enlarge the holes in one of the wood pieces so that a dowel can easily slide through them.



Determine how wide to make the bookcase and cut four dowels with the same measurement.



Hammer dowels into the holes in one wood piece.



Slide on the piece with the enlarged holes.



Hammer the dowels into the holes on the 3rd wood piece.



Paint and decorate it. Put in the books.

Fine Points:

- Make sure to cut the wood into pieces that are big enough to support your books.
- Shelf works with books on the dowels, or dowels in back of the books.

Concepts Involved:

- Friction depends on orientation; sliding the middle wood piece depends on holding it at the right angle.
- Properties of materials are key to the function of the project. These dowels are hardwood and can hold some weight and result in a solid bookshelf with just four in parallel.

Links to k-12 California Content Standards:

Grades k-8 Standard Set Investigation and Experimentation

Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other strands, students should develop their own questions and perform investigations.

Grades k-12 Mathematical Reasoning:

1.0 Students make decisions about how to approach problems:

1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.

1.2 Determine when and how to break a problem into simpler parts.

2.0 Students use strategies, skills, and concepts in finding solutions:

2.1 Use estimation to verify the reasonableness of calculated results.

2.2 Apply strategies and results from simpler problems to more complex problems.

2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

3.0 Students move beyond a particular problem by generalizing to other situations:

3.1 Evaluate the reasonableness of the solution in the context of the original situation.

3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.

3.3 Develop generalizations of the results obtained and apply them in other circumstances.