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Course: Structures

Unit Title: Woodworking

Materials: table saw, wood for cutting, safety glasses

**I. Lesson Title**

- a. Operation: Table Saw

**II. Situation**

- a. Students are beginning the table saw for the first time. Students are in grades 9<sup>th</sup>- 12<sup>th</sup>. Students will have little to some knowledge about the table saw.

**III. Teachers Objectives**

- a. Identify the major parts of the table saw with 85% accuracy.
- b. Identify the major cuts made on a table saw with 90% accuracy.
- c. Demonstrate proper safety measures given safety standards with 100% accuracy.

**IV. Teaching Procedures**

**a. Interest approach**

- i. Give students a table saw parts identification worksheet. Students should label the parts to the best of their abilities.
- ii. Instructor should go over the answers when discusses the table saw out in the laboratory.

**b. Reasons to Learn**

- i. Why is it important follow the safety rules?
- ii. Why should we understand the difference between a crosscut and a rip cut?

**c. Questions to Answer**

- i. What does a rip cut look like compared to a crosscut on a table saw?
- ii. What is the differences in the process of making a rip cut and a cross cut?

**d. Answers to Questions**

**i. Review Table Saw Safety**

1. Remove or fasten loose articles of clothing such as long sleeves, coats, neck ties, etc.
2. Gloves should not be worn when operating a table saw.
3. Remove rings, bracelets and other jewelry which have the potential for getting caught on the table saw or material.
4. Wear industrial quality eye and ear protection while using the table saw.
5. Keep the saw table and floor free of tools, wood stock scraps, sawdust, oil and grease.
6. Check the saw blade periodically for missing teeth and cracks.
7. When saw blades are changed, make certain the blade arbor nut is tightened securely.
8. Stand to one side of the saw blade when cutting; do not allow others to stand in direct line with the saw blade while the saw is operating.

9. Make certain the saw guard, splitter (if available with the guard), anti-kickback device and push stick are used for all possible sawing operations.
10. Never reach over the saw blade to remove or hold down a piece of stock.
11. Wait until the blade comes to a complete stop before leaving the table saw work area.
12. Devote your undivided attention to the work being performed on the table saw. Do not talk to others or be engaged in "horseplay" while using the table saw.
13. Avoid awkward work positions which may result in slips and contact with the saw blade.
14. Support long and wide stock when sawing. Always use a helper to off-bear when cutting large stock.
15. Disconnect the table saw electrical service at the circuit breaker or fuse box before changing blades or before making any service adjustments to the machine.
16. Never raise the saw blade more than  $\frac{1}{4}$  inch above the material being cut. Lower the blade below the table top before leaving the saw work area.
17. Round stock should not be ripped on a table saw.
18. When making bevel cuts, always keep hands and stock to the right of the saw blade.
19. Never remove small scraps from the saw until the blade has come to a complete stop. Use a push stick to remove all scrap from the saw blade.

In woodworking, a rip-cut is to sever or divide a piece of wood parallel to the grain. The cross-cut is a cut perpendicular to the grain.

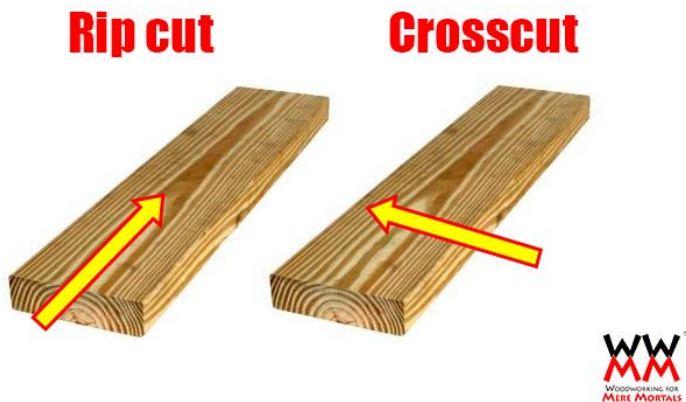


Image found at: <https://woodworking.formeremortals.net/wp-content/uploads/sites/2/2015/04/rip-cut-crosscut-diagram.png>

Explain the differences between the blades on the crosscut and rip saw blades.

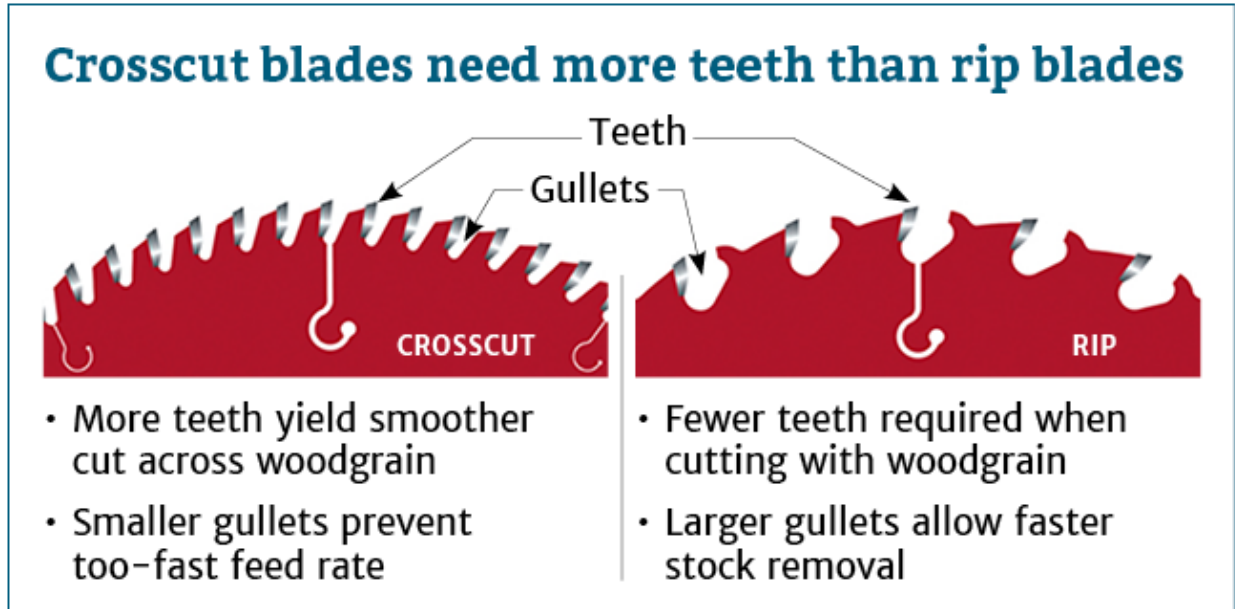


Image found at: <http://assets.rockler.com/media/wysiwyg/skill-builders/crosscut-blades-need-more-teeth.jpg>

How to set the fence, blade, and cut at an angle with a taper guide:

<https://www.youtube.com/watch?v=MfqvVhP3Fes>

ii. Ripping

1. Always use the saw guard, splitter (if equipped), and anti-kickback device. If a splitter is available, make sure it is aligned with the blade before being used.
2. Before making cuts, align and lock the rip fence in position. When possible position the rip fence to the right of the saw blade.
3. If the work piece does not have a straight edge, fasten an auxiliary board to the top of the work piece to provide a straight edge for the first cut.
4. Set the rip fence for desired width of cut using the scale on the front rail or, for more accurate cuts, measure the distance between the blade teeth and the fence.
5. Use the left hand to hold the board against the fence and table. Use the right hand to push the material through the saw. When the stock is less than 6 inches in width, use a push stick to push the trailing end through the saw. Never allow the hands to come closer than 12 inches to the saw blade. Position the right hand so it is NOT in direct line with the saw blade. Remove the hand holding the stock down as it approaches the saw blade guard. For narrow ripping cuts, where a push stick cannot be

used, use a push block or an auxiliary fence. (Use reverse procedure for left handed persons).

6. Always push the work piece completely past the blade at the end of a cut to reduce the possibility of kickback.
7. When ripping long boards use a support at the front of the table or an off-bearer to support the cut stock as it comes through the saw. The off-bearer never pulls the stock, he/she only supports and move with the stock as it comes through the saw.
8. For materials shorter than 12 inches or narrower than 6 inches always use a push stick or push block to push material between the fence and the saw blade.
9. Never attempt to set the rip fence when the carriage extends beyond the end of the front rail.
10. Make sure the correct blade is used for ripping cuts.
11. If the lumber is warped, turn the curved side down when ripping.

iii. Crosscutting

1. Make sure the saw guard and splitter are in place when crosscutting.
2. Always use the miter gauge when crosscutting. Be sure the miter head is set at the proper angle for the desired cut and securely clamped.
3. Most workers prefer to use the left table slot for the miter gauge when crosscutting.
4. Hold the stock against the miter head with the left hand and use the right hand to advance the miter gauge and material through the cut.
5. Use the right table slot for making bevel or chamfer cuts. The right table slot is used for this operation so the blade will tilt away from the operator's hands and the miter gauge.
6. Always hold the material firmly against the miter head to prevent vibration and binding when the cut is made.
7. To improve the effectiveness of the miter head, some workers mount an auxiliary extension to the miter head. This extension should not extend beyond the left edge of the saw table.
8. Provide support for any material which extends beyond the edge(s) of the saw table.
9. The miter head should be used when making cuts from 90 degrees to 45 degrees. The miter head should be adjusted relative to the slot in the saw table. If needed, change the position of the pointer and stops on the miter head gauge to accurately read the degrees for miter cuts.

**V. Testing Solution Through Application**

- a. Students will practice making both a crosscut and rip cut on the table saw. Instructor will monitor the students throughout the entire process making sure that safety measures are met as well as the quality of cut.
- b. Students will evaluate peers work.

**VI. Closure**

- a. What does a rip cut look like compared to a crosscut on a table saw?
  - i. *Answer: Crosscut saw is used for cuts across or perpendicular to the grain of the wood. The saw has a wide set in its teeth, creating a wide gap. This gap allows the blade to pass through the wood without binding. Binding occurs when the wood closes against the saw blade, causing it to be stuck in place. Ripsaws are used to cut wood lengthwise or parallel to the grain with the saw held at an angle of about 60° between the blade and the wood.*
- b. What are the differences in the process of making a rip cut and a cross cut?
  - i. *Using the crosscut saw, you would cut across the grain of the wood. Whereas, the rip saw cuts with the grain.*

*Allow time for discussion*

### Table Saw Parts Identification

Match the number of each table saw part with the correct part name.

\_\_\_ A. Switch

\_\_\_ B. Fence carriage

\_\_\_ C. Table

\_\_\_ D. Fence

\_\_\_ E. Blade tilt hand wheel

\_\_\_ F. Fence lock

\_\_\_ G. Front Rail

\_\_\_ H. Blade guard

\_\_\_ I. Blade lowering and raising hand wheel

\_\_\_ J. Table slot

\_\_\_ K. Miter head

\_\_\_ L. Table insert

