Threaded Fasteners

Fasteners are used throughout the guitar and in industry. There are a variety of fasteners on a guitar; being able to identify, size and drill the proper pilot holes is important ant as to not break the screw.

**Learning Objectives:**

1. Students will be able to identify machine threads, wood screw threads, and sheet metal threads.
2. Students will be able to identify different heads for threaded fasteners.
3. Students will be able to select drill sizes for through and threaded holes.
4. Students will be able to decode thread notation.
5. Students will be able to state the importance of selecting the proper tool for inserting and removing threaded fasteners.
6. Students will be able to outline the procedure for extracting a broken threaded fastener.

**Materials Required:**

* What materials are required to complete
* Screws: wood, sheet metal, and machine
* Screw drivers – variety of Phillips sizes (#00, #0, #1 recommended)
* Allen “wrenches” or keys
* Drill Index
* Drill & screw size chart

**Safety:**

**safetys:**

Safety glasses must be worn at all times in a lab environment.

Select the proper screwdriver when driving the screw, screw drivers too large or small with strip out the head of the screw.

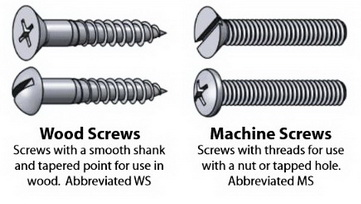
**References:**

* http://www.coolmath.com/decibels1.htm. Accessed April 2010.

**Learning Process:**

1. Review the accompanying PowerPoint
2. Review the document
3. Take the quiz

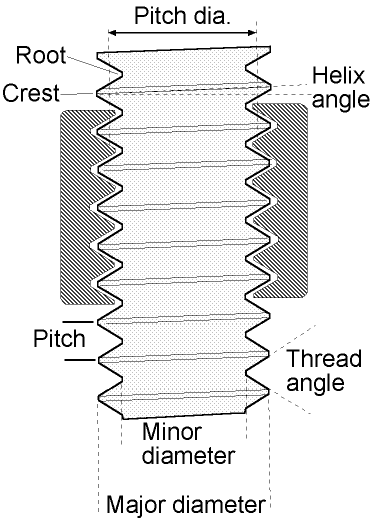
Thread types – Screws come in a variety of styles based on the type of fastening required



Wood screws are directly fastening into wood

Machine Screws must use another fastener (like a nut or a threaded hole) for applying the fastening torque

Sheet metal screws like wood screws fasten directly into the material you are fastening.

Thread Anatomy

Pitch: distance from crest to crest

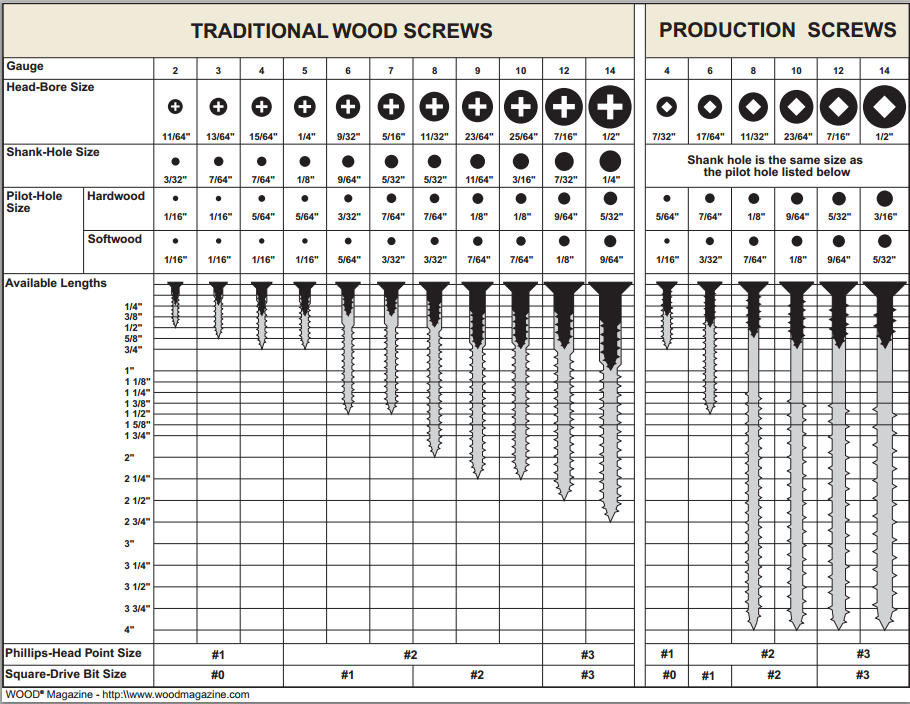
Major diameter is the overall size of the thread

Minor diameter is the smallest diameter of the thread it is measuring.

Thread angle / helix angle: The angle of the of each thread to perpendicular, each thread is a continuous helix from top to bottom.

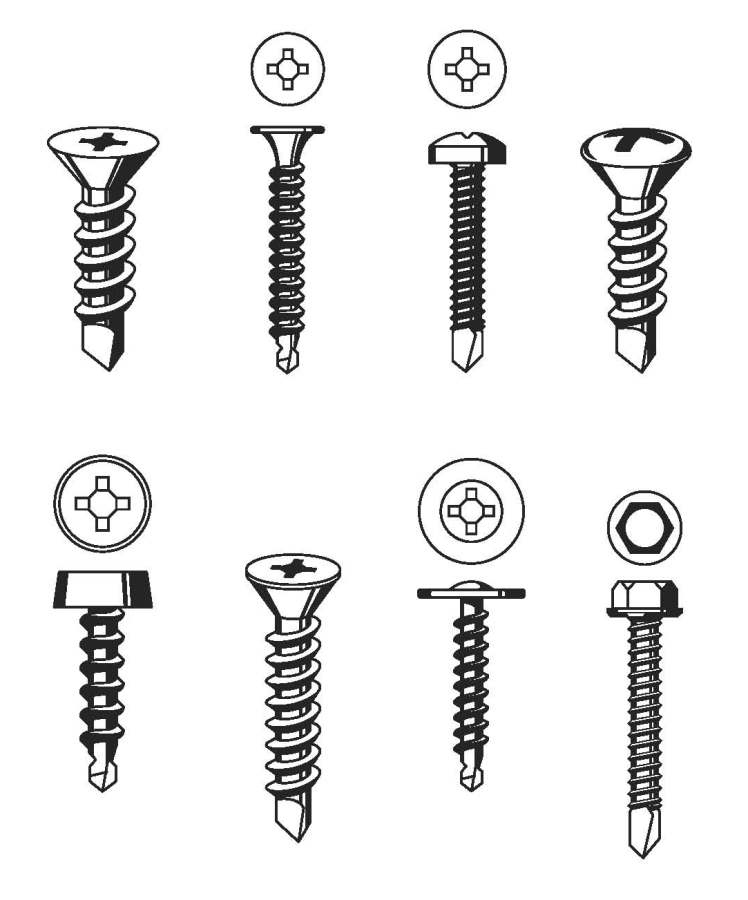
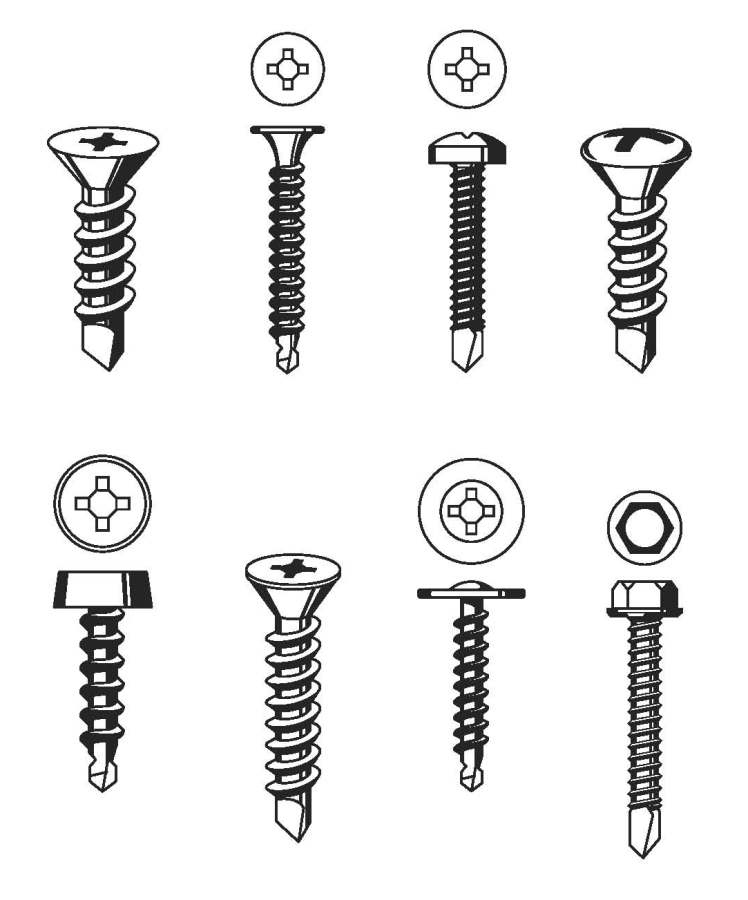
Wood Screws Sizing

It is very important to drill a pilot hole before you start using a crew into wood. This prevents the wood from splitting out and the screw from being bound up and then breaking. Shown below sia chart that has the most common wood screw sizes and lengths



Types of Screw heads:

Screw heads can come in different shapes

This package shows a #8 - 2” long wood screw, This screw is used to attach the neck to the body of the guitar. What should be the pilot drill size be if we were drilling into hardwoods?

Hexagon head Screw

Flange head Screw

Flat head Screw

Cheese head Screw

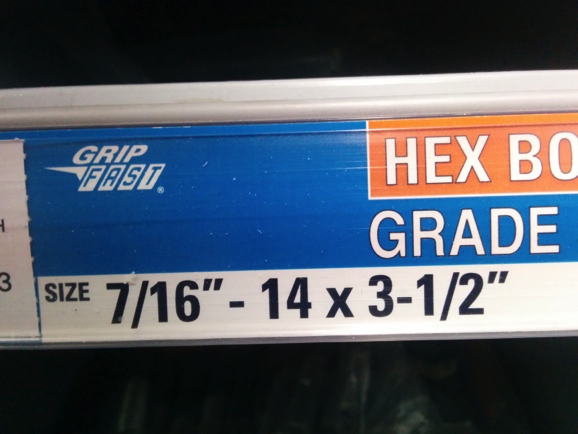
Flat head drywall Screw

Fillister head Screw

Pan head Screw

Flat head drywall Screw

Flat head Screw

This hex bolt is a 7/16” in Diameter by 3 ½” long, they are like machine screes in that they require additional hardware to complete the fastening effect. This is typically a nut or a threaded hole.

The 14 is the threads per inch designation. It determines the threading that the nut or tapped (threaded) hole requires to properly and smoothly fasten together. If you ever had a nut and the screw was the correct diameter but the threads per inch were not matched up to the nut then the nut would not thread more than a ¾ turn. The bolt would then stop turning since the threads do not mate well.

**Standards:**

List The Common Core Math or Next Generation Science Standard mapping:

[CCSS.MATH.CONTENT.HSG.GMD.B.4](http://www.corestandards.org/Math/Content/HSG/GMD/B/4/)  
Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.