

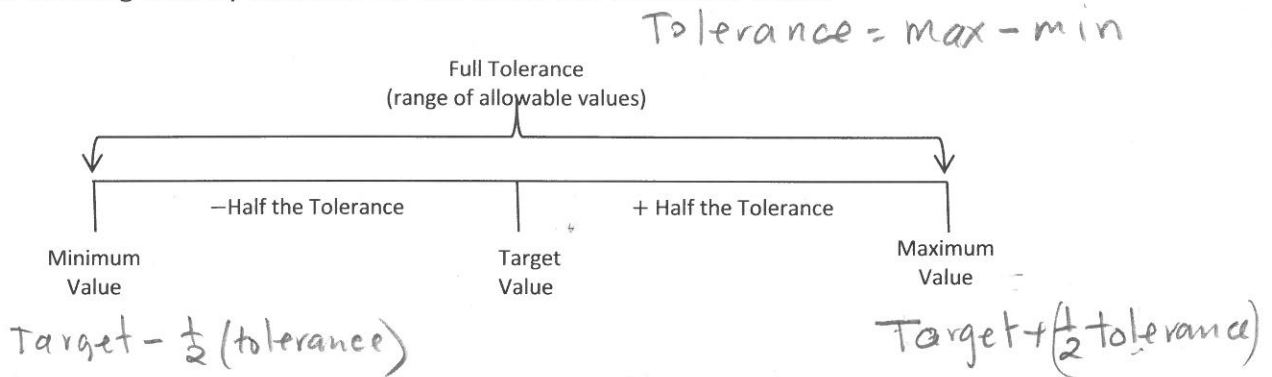
Lesson 4: Tolerance

Tolerance is different than precision and uncertainty. Both precision and uncertainty have to do with the device used for measuring. Tolerance is a **man made range** of acceptable values. It is used to determine if something will actually “fit” or be “acceptable”.

For example, a nut is manufactured to thread onto a bolt. If the nut is too small, it will not go onto the bolt. If the nut is too big, it will be loose and fall off the bolt. The nut will have an acceptable tolerance, or range, that will allow it to thread properly onto the bolt.

A ‘foot-long’ sub sandwich only needs to have a length that is “somewhere around” 12”. Most people are okay that there sub sandwich may be a little over or a little under 12”.

Because tolerance refers to an acceptable **range** of values, there will be a MINIMUM and a MAXIMUM allowable value. There is also the **target** value, which **usually*** falls halfway between the minimum and maximum allowable values. The diagram below may help with this concept; this diagram defines target values as being halfway between the maximum and minimum values.



Example 1

A ride at the Red River Exhibition has a desired ride time of 5 minutes. If the line ups are long, the carnival workers can shorten the ride by 2 minutes. If it is a slow day, they can add up to 2 minutes to the ride. Complete the diagram with the appropriate labels and values.

