

# What Is a Barlow Lens? The Device That Doubles Magnification (and Your Eyepiece Collection)

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A Barlow lens is a type of lens that can **increase the magnification of your telescope**. The most common type is a **2x Barlow**, which doubles the magnification, but you can also find them in other magnifications, such as **3x** and **5x**.



As I explain in my article on [calculating magnification](#), each eyepiece can give a different magnification based on its focal length. By adding a Barlow lens into the mix, you'll have two magnification options for each eyepiece, effectively **doubling your eyepiece collection**.

## How to use a Barlow lens

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To use a Barlow lens, insert it into your telescope's focuser, then place an eyepiece into the Barlow and tighten the thumb screws to keep everything secure. That's it!



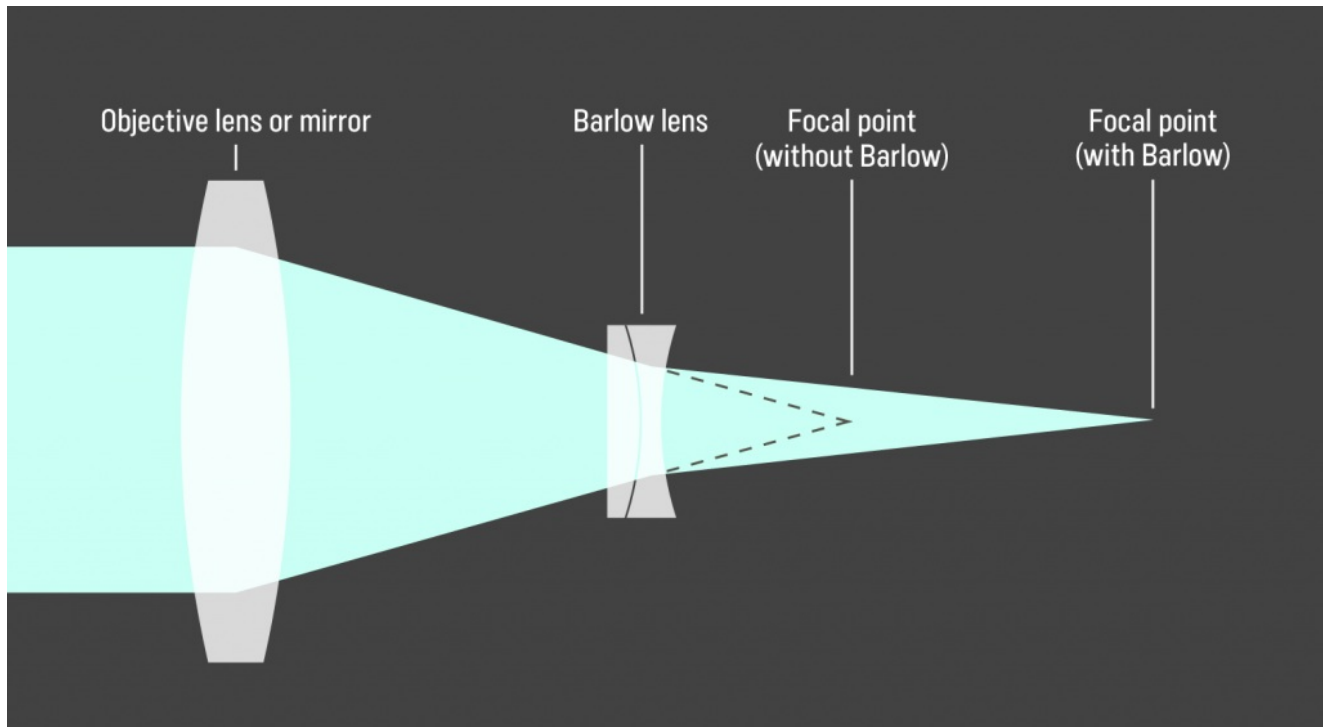
## Using a Barlow lens with a diagonal

If you have a refractor, Schmidt-Cassegrain, or Maksutov, you're probably using a **diagonal** between the focuser and eyepiece. In that case, you may have two options:

- Place the Barlow lens between the **diagonal** and the **eyepiece**. This option may only work with shorter Barlows, as longer ones may not fit and may even hit the diagonal's mirror or prism.
- Place the Barlow lens between the **focuser** and the **diagonal**. This option will result in a higher magnification; a 2x Barlow will often act like a 3x Barlow when in this position. It could also cause problems with heavier eyepieces since the Barlow may allow the diagonal to rotate.

## How a Barlow lens works

A Barlow is a **diverging lens**, which means it spreads the rays of light outward. As you can see in the diagram below, this causes the focal point to move farther away from the objective lens. The result is that the Barlow effectively increases the focal length of the telescope, which in turn boosts the magnification.



Let's say we're using a **2x Barlow** with a telescope that has a **1,200mm** focal length. The Barlow lens will cause the telescope to behave like it has a **2,400mm** focal length. This will double the magnification.

You can also think of the Barlow as decreasing the eyepiece's focal length (rather than increasing the telescope's). A 2x Barlow will cause your **20mm** eyepiece to act like a **10mm** eyepiece. Again, this doubles the magnification.