

Astronomy Binocular Guide – by David Moutard, WSU Planetarium Staff

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When looking at binoculars, they are typically described as something like *10x50* or *8x30*. The first number refers to the **magnification**; that is, how much larger it will make an object appear. The second number is the size of the **objective or aperture**; the size of the lens at the front, which collects light. The objective size is usually given in millimeters (mm). So, *10x50* binoculars make things appear ten times larger than normal with 50mm objective lenses.

Many people think that magnification would be the more important number when talking astronomy- after all, the targets are very, very far away. But in reality, *the more important task telescopes and binoculars do is make dim objects brighter*. The objective of a binocular or telescope essentially takes the size of your pupil (which is pretty small and can therefore only collect a little bit of light) and makes it bigger, so more light can get in. Many astronomical objects are very large, but too dim to be seen naked eye. For example, the Orion Nebula is about twice the size of the moon, but is too dim to see without the aid of some larger surface to collect the faint light. Now, here are a few tips for buying your own binoculars.

- As suggested, bigger tends to be better- *the bigger the objective the more light you can collect and the dimmer objects you can see*.
- While bigger is better, *a common turn of phrase in the astronomy community is “the best telescope is the one you use most often”- this applies to binoculars too*. Sure, it would be great to have the biggest binos on the block, but if it is a pain to lug them out, and you need to set up a tripod every time you use them because they’re just so heavy and unstable, you’re less likely to get outside and enjoy the stars- make sure you consider

this! People (including myself) tend to underestimate their laziness, and their telescopes and binoculars wind up sitting inside more often than they get to see stars.

- ***Weight is an important factor.*** When I bought my binoculars, I got a pair of 10x50s that weighed just about 6 pounds. This doesn't seem super heavy, but ***remember that when you are magnified, every little movement or instability is also magnified.*** 6 pounds proved to be just a little too heavy and unstable for use without a tripod or monopod.
- ***Consider what else you may want to use them for.*** Many deep sky objects (like nebulae and galaxies) are dim, so aperture size will dominate for these. Planets have a very small **angular or apparent size**, meaning they take up a very tiny piece of sky. If you want to see bands on Jupiter, you may want more magnification- but remember the more magnification the less stable, so you will probably also want a tripod or monopod. If you also want to use them for birdwatching, aperture is less important, so again, more magnification would be better.
- There's no "best size" for binoculars, because everyone is different, ***but a very general rule is 10x magnification is the absolute highest one can go without needing some sort of extra brace like a tripod.*** Again, mine, being 10x and on the heavy side, have proven to need that extra support.
- ***Lower your expectations.*** This may seem harsh, but you are buying binoculars, not the Hubble Telescope. This goes for telescopes as well – your eye can not pick up the colors of deep-sky objects – it requires long exposure photos. The color you see in beautiful pictures from the Hubble Telescope is added in the processing of the images – the Hubble takes pictures in greyscale. Detail will also be difficult to see. Often, galaxies just look like a star that has been smeared on the sky a little bit, just a fuzzy gray patch. Think

of it this way- if you wanted to see beautiful color images, NASA has thousands for you. The real beauty lies in knowing that these photons, these little particles of light, have travelled millions upon millions of miles just to strike your eye. You are taking in this light, and *you* know that you are looking at the light from a distant galaxy or a stellar birthplace.

I hope this helps in choosing a pair of binoculars that is right for you. I also encourage you do your own research and comparison shop, look at the different types and sizes of binoculars and make a choice that is right for you. Clear skies!