

Other Essentials

We've already covered a lot of ground, and hopefully the techtalk you may get from a salesperson or stargazer will make more sense now. But a few topics remain before we can set you loose on your hunt. Most of us picture the big things when we think of a telescope, and those stand out in catalogue's and ads. But just as you can't drive a new car off the lot without the keys, there are a few little things you'll need to use a telescope to journey among the stars.

Eyepieces: By bringing light from distant objects to a focus, a telescope forms an image. Now you need a way to view that image. That's what eyepieces are for. Swapping eyepieces lets you change a telescope's magnifying power, which simply equals the objective's focal length divided by that of the eyepiece. Every telescope owner should have several.

Eyepieces come in a bewildering variety of designs with exotic names. Generally speaking, the more expensive an eyepiece, the more lens elements it has. Complex multi-element designs can give a wider field of view, and they also can compensate to a degree for the aberrations that plague "fast" (low f /ratio) objectives. By contrast, many amateurs find that simpler designs like Kellners, Plössls, and Orthoscopes suffice for use on "slow" (high f /ratio) telescopes like the once-universal 6-inch $f/8$ Newtonian reflector. Most telescopes come supplied with one or two eyepieces.

Ideally, you'd like to have a set that spans a range of magnifications. You can expect to spend anywhere from \$25 to \$250 on a good eyepiece. A Barlow lens is worth considering, too: it will double or triple each eyepiece's power, effectively doubling the size of your eyepiece collection. One useful hint: try to avoid buying a telescope that uses eyepieces with stalks or barrels that are 0.96 inch (24 mm) wide. The better designs are generally not available in this size.

Finder scopes: You've got a telescope mounted with an eyepiece in place. Now what? Naturally, you'll want to point it toward celestial targets! Sighting alongside the tube may enable you to find the Moon and a few bright stars or planets with a small, wide-field scope. But, just as a hunter won't get far without a gun sight, a telescope can't be put to good use without a finder of some kind.

Three types, shown here, are commonly available. A few wide-field scopes come with lensless peep sights that encircle a patch of sky without magnifying or brightening it. The next step up is the so-called "reflex" sight. This device projects a red dot or circle on your naked-eye view of the sky; to set your telescope on a desired star or planet, you simply line that object up with the red dot or circle. Note that few telescopes are supplied with a reflex sight, you generally have to buy one separately. Most commercially available telescopes are sold with a real finder scope, a small refractor that rides piggyback upon the main telescope.

The finder scope's eyepiece has cross hairs that you set on your desired target as you look through the device. A finder scope has several advantages. Because its objective is larger than your eye's pupil, it brightens stars (and the larger models can actually show you some star clusters and nebulae directly). And, when properly aligned, a finder scope allows you to point a telescope more precisely than do peep sights or reflex finders. This is especially important for long-focus telescopes that have narrow fields of view. On the downside, most finder scopes turn the stars upside down, and many entry-level finders cannot be used by eyeglass wearers. In any case, you'll want to avoid (or replace) any finder that doesn't give sharp images.