Acadiana Sky

Very Basic Celestial Objects for a Telescope

Originally developed for the Lafayette Science Museum Planetarium
Lafayette, LA

Aiming a telescope can be far more difficult than many people realize, especially for children. Part of the problem is that celestial objects are always moving as Earth turns! Start with these very basic objects before attempting the more subtle objects in the guidebook "Turn Left at Orion," by Guy Consolmagno (or similar books). Use your telescope's lowest power for *all* of this (that's the eyepiece with the *biggest* number on it).

Daytime

First, never, ever look through your telescope at the sun unless it has a professionally made solar filter on the front and you know exactly what you are doing. Being careless about this can literally cost you your eyesight *for the rest of your life!* In fact, don't point your telescope at the sun even if nobody looks through it because with some telescopes this can cause damage or even melting to telescope parts themselves.

Point your telescope at a variety of objects on Earth at least a quarter mile away. This will give you experience while you can see what you are doing in such basics as practicing the telescope motions and focusing. It will also allow you to see if your finder is really aligned with the main telescope (and if it is not, it will allow you to make the needed adjustments). Do this repeatedly even if you have to use the same object over and over—the idea is to get used to handling the telescope, not to see cool things. Don't be surprised if the image is upside-down, backward, or both. There are good reasons for that to happen and working in daylight again helps you get used to that.

Evening

Bright Stars: Telescopes "look at" a very small part of the sky and it can be hard to be sure if you are pointed correctly. Bright stars are obvious, though. They also give a chance to practice both tracking as Earth rotates and basic focusing skills. Focus until a star looks like the tiniest pinpoint your telescope will show. Do this until you are very good at it—most objects in a telescope are faint and small, and if you can't find easy stuff like bright stars, you have no chance of finding more interesting objects. Although any reasonably bright star will work for this, you can use star maps, planispheres, or apps to identify the brightest stars that are up when you are out.

Some suggested bright stars:

Betelgeuse and Rigel in the constellation Orion, the Hunter (winter and early spring)
Sirius in Canis Major, the Larger Dog (winter and early spring)
Capella in Auriga, the Chariot Driver (winter and spring)
Regulus in Leo, the Lion (spring)
Vega in Lyra the Harp (summer and fall)*(in the Summer Triangle with Deneb and Altair)*
Altair in Aquila the Eagle (summer and fall)*(in the Summer Triangle with Vega and Deneb)*
Deneb in Cygnus the Swan (summer and fall)*(in the Summer Triangle with Altair and Vega)*
Fomalhaut in Pisces Austrinus the Southern Fish (fall)

The Moon: If the moon is up, this is a great place to start. You'll have no doubt when you find it and you will have to learn to move the telescope to track it, a necessary skill. The link to the Lunar Top 10 for Backyard Telescopes at the Lafayette Science Museum web site can help you understand what you see.

Bright Planets: All the planets out to Saturn are easily visible to the unaided eye and resemble bright to very bright stars. In a telescope they look like small disks, however, rather than like star points. Mercury and Mars can be disappointing, but most telescopes will reveal the phases of Venus, the disk and 4 moons of Jupiter, and the disk and rings of Saturn. You'll need to use a current star map, sky software, or a sky app to know where to find the planets because they change their positions throughout every year as they orbit the sun. Once you learn the sky, you will be able to spot the unaided eye planets without help because they look like bright stars where there shouldn't be any! In fact, you may learn to identify which planet is which without help because they don't look exactly alike.

After locating the moon or a planet, try using a higher power eyepiece for more detail (that would be an eyepiece with a *lower* number, but very high power may not work at all). Remember this will make tracking the object more difficult. Always replace the higher power eyepiece with your lowest power eyepiece, and focus it, before attempting to find the next object.

Once you have mastered these basic objects and skills, try finding the objects in "Turn Left at Orion." This book may be available at your local library or through Interlibrary Loan. Other sources may be helpful, too, but may tempt you with objects that are simply too small or too faint for your telescope to reveal.