

What Kind of Telescope Should I Get?

This is the number one question asked at public astronomy nights. The following article is an attempt to answer that question. Thinking about getting a telescope for you or a loved one? Don't know where to start? Read on.

First a little disclaimer: I'm a volunteer at Penn Dixie. I have a "day" job with a local company that is not related to astronomy in any way. The opinions expressed in this article are mine and any products mentioned in this article are recommended based on my experience with them.

OK, now that we have that out of the way, let's get down to business.

Maybe you've always wanted a telescope. Maybe you looked through one of our scopes after digging for fossils and feel inspired. Maybe you've had a scope for years but never got it to work and you have not taken it out in many years. Where to start?

The three most important things when considering buying a telescope for the first time are as follows:

- 1.) Attend public astronomy nights or star parties.
- 2.) Attend public astronomy nights or star parties.
- 3.) Attend public astronomy nights or star parties.

All kidding aside, this is the single most important thing you can do to give yourself the best chance of ending up with the best scope that meets your needs. No matter where you go, any amateur astronomer at any public astronomy night or star party will be more than willing to take time to provide some recommendations. It's what we do. It's one of the reasons we do this. We love to share our hobby with other people and we love it even more when someone is interested in pursuing it further. We'll help you avoid common pitfalls, help you avoid wasting money, and help learn to use it when you finally get one.

What do we need to know? First of all, what do you want to do? Do you want to observe visually or do you want to get into astrophotography? This article will focus on visual astronomy because that is the most common path into the hobby. Astrophotography requires more gear than visual astronomy and will result in having to buy more equipment, with a higher degree of complexity, and the equipment is typically more expensive than visual observing gear. In order to produce beautiful images of deep space objects and planets, a telescope that can track (move the scope to compensate for the rotation of the earth) is required. You'll also need a camera and a computer. Things start to add up fast. Having said that, you may be able to capture decent images of the moon, the sun (with proper filter), and even some of the brighter planets (Venus, Jupiter and Saturn) with visual observing gear.

Before we talk about equipment, you can get started with nothing more than your eyes and a star chart. Learning the constellations is key to being able to find objects in the night sky. You can print a star chart at various places on the Internet. Orion Telescopes have a monthly star chart at their website and Sky and Telescope magazine has an interactive sky chart you can print out from your own PC from their website. There is a monthly All Sky Chart in the center of Sky & Telescope magazine and Astronomy magazine has a chart too. You can also download a free planetarium program called Stellarium for your home computer. This program will work on a MAC or PC. Last, but not least, there are a multitude of smartphone/tablet apps for iOS or Android. I like Sky Safari and Star Walk. You can get a decent app starting for free and up to a few bucks (the pro versions can control telescopes with go-to capability and are over \$20). There are two books that I highly recommend. Either book will provide great insight into the hobby and be useful to you for years to come. The first book is Turn Left at Orion: Hundreds of Night Sky Objects to See in a Home Telescope - and How to Find Them by Guy Consolmagno. The second book is NightWatch: A Practical Guide to Viewing the Universe by Terence Dickinson. Both books come in a spiral bound edition with moisture resistant paper, features that are useful in the field.

Do you have a decent pair of binoculars or a small scope for terrestrial observing (bird watching or target shooting)? If you have a decent pair of 10 x 50 binoculars, you will be amazed at what you will be able to see. In fact many open star clusters (like the Pliedes) are best observed in binoculars due to the wide field of view. You can also get excellent views of the moon with a small scope or binoculars.

So now let's talk telescopes. Some important advice - don't buy a telescope from a big box store. The quality of these products is low and they are often difficult to use. You will end up frustrated and will feel like you have wasted your hard earned money. Don't buy anything that features the word "magnification" on the box. This is a dead give away that it is a toy and not worth the money. Also, avoid tabletop scopes. They are very unstable, diminishing the observing experience.

There are many reputable companies that sell telescopes (Meade, Celestron, Orion, Skywatcher etc...). They all have pretty good catalogs/websites. There is a lot of good information on the Internet (particularly on YouTube). Do some research! It will pay off when you are ready to make your purchase.

Telescopes come in two basic forms, reflecting telescopes and refracting telescopes. Speaking in the simplest way possible, reflecting telescopes have mirrors and refracting telescopes have lenses. Reflecting telescopes tend to be more affordable than refracting telescopes. This is important because you will be able to buy a bigger diameter scope (aperture). In telescopes, size matters. The larger the diameter of the scope the more light the scope collects. More light equals more detail and the ability to see objects that are fainter and/or farther away.

The type of reflecting telescope that we recommend is a telescope referred to as a Dobsonian telescope (or Dob for short). The telescope is named after the mount. A typical Dob consists of a telescope tube and the Dobsonian mount. The mount is simple, cheap, and very stable. Classic Dobsonians made by Orion (www.telescope.com) are typically an excellent value (I have an Orion 8" Classic Dob). You can buy this scope for around \$390. The 6" model is around \$310 and the 10" model is just about \$630. You will be able to see the moon, the planets, and many awesome deep space objects (star clusters, nebulae, and galaxies) with these telescopes. Buy the biggest one you can afford and are comfortable using. Yes, a bigger scope is better, unless it is sitting in closet because you don't use it.

Once you get your telescope, learn to use it in the daytime (NEVER point it at the Sun!!!!). Look at trees, cell phone towers, and building and so on. Get yourself familiar with setting it up, the controls, and how to align the finder scope. This is much easier to do in the daylight. Again, never look at the Sun through your telescope without the proper filter in place. The damage will be instant and permanent. Bring it to one of our Astronomy Nights. We'll be glad to show you how to set it up and use it. Show up well before dark, so we can set it up in daylight.

Ernie Jacobs
Penn Dixie
Good luck and Clear Skies!

Appendix A – High Level Summary

- Stay away from Department store telescopes!
- Attend public astronomy nights or star parties. Ask questions and look through various types of scopes.
- Research telescopes on the Internet.
- Turn Left at Orion and Nightwatch two very useful books.
- Use your naked eyes and star charts to learn major constellations (begin to learn to navigate night sky).
- Use Binoculars and Small scopes if you already have them (Moon, bright planets, bright deep space objects like M42, M44, M45, etc...).
- We recommend a Dobsonian style telescope for visual astronomy (6" – 10") from manufacturers like Orion and Skywatcher.
- Once you get a telescope practice setting it up and using it during the day. **Don't ever point it at the sun without a proper filter!!!!!!**
- Bring your telescope to a Penn Dixie Astronomy Night. Show up before dark and we'll show you how to set it up and use it.
- Get out with your telescope and enjoy the night sky!

Appendix B – Useful Websites

Telescope Companies:

- Orion Telescopes: www.telescope.com
- Celestron Telescopes: www.celestron.com
- Meade Telescopes: www.meade.com
- Skywatcher Telescopes: www.skywatcherusa.com

Other Links:

- Sky and Telescope Magazine: www.skyandtelescope.com
- Astronomy Magazine:
- Stellarium (Desktop Planetarium Program): www.stellarium.org
- Cloudy Nights Astronomy Forum: www.cloudynights.com
- Heaven's Above (Good for finding things like satellites, the space station, comets, and printing sky charts): www.heavens-above.com
- Space Weather (Sun spots, Aurora's etc...): www.spaceweather.com