Be wary of ...

Ads pushing high powers.

Theoretically there is no limit to magnification. However, there is a useful limit to magnification. A good rule of thumb is 50 to 60x per inch of aperture (diameter).

Ads showing colorful sky objects.

Most objects in the night sky are dim, too dim in fact to stimulate the color receptive cones in your eyes. Expect objects to appear in shades of gray. Color can be recorded only on camera time-lapse exposures and requires rigid mountings with precision drives to track the sky movement.

14,000 Object Computerized Telescopes.

These telescopes still require the user to be able to identify bright reference stars by name to set them up for use. Also, in most cases, the number of objects in the database far exceeds the useful capability of the telescope itself.

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For more info ...

The Norfolk Astronomical Society offers its member advice and expertise free of charge. Once you buy a telescope, please consider the fact that you also need to understand how to properly care for and maintain it.

Visit the NAS web site. There you will not only find online calculators for various telescope parameters, but you will also find a listing of some of the events visible in your sky tonight. Also be sure to visit the web sites of the various telescope manufacturers.

Norfolk Astronomical Society
http://groups.hamptonroads.com/NAS/

MRO Computers & Astronomy
http://www.mroca.com/

Celestron International
http://www.celestron.com/

Meade Instruments
http://www.meade.com/

Orion Telescopes
http://www.telescope.com/

Buying Your First Telescope

Norfolk Astronomical Society
http://groups.hamptonroads.com/NAS/

Telescope Jargon and Useful Formulae

Aperture (d) - the diameter of the primary image forming component of a telescope. This, not magnification is the most important specification of a telescope (the larger the better). It directly affects light grasp (how bright the image will be), and resolution (ability to distinguish objects clearly).

Focal Length (FL) - the distance away from the primary image forming component that a distant object comes to focus at.

Focal Ratio (f) - the ratio of focal length to aperture, it can be thought of as a magnification vs. light ratio.
Telescopes with f-ratios lower than 8 are more suited for low power observing requiring high light grasp (faint galaxies, etc.). Ratios between 8-12 are general purpose telescopes, while those higher that 12 are more suited for high magnification observations of fairly bright objects like the Sun, Moon, and planets.

$$f = FL / d$$

Light Grasp (LG) - how many times more light is collected than the unaided eye dialated to 7mm. Think of a telescope as a funnel collecting rain (star light). The bigger the collecting area of the funnel, the more that is collected. It is thus the ratio of the collecting area of the telescope primary to the collecting area of the eye. For aperture expressed in mm,

$$LG = (d \times d) / 49$$

Resolution (RES) - how close two objects can be together and still be distinguished as separate. It is directly dependent upon aperture. For aperture d in mm,

$$RES = 120 / d$$

Magification (MAG) - how much bigger an object appears than the unaided eye. It is often but not alway limited by the atmosphere to below 200x. Magnification varies with the eyepiece (ocular) used, and is the ratio of the primary's focal length FL to the focal length of the ocular FLoc. Special lenses called barlows can multiply magnification further.

Telescope Types

Refractors - Use lenses to produce the image and are generally the most expensive.

Reflectors - Use mirrors to produce the image and are generally cheapest.

Catadiopic - combination mirror - lens telescopes a little more expensive than reflectors.

Telescope Mounts

Altitude-Azimuth - Mounting moves parallel to the horizon (azimuth) and up and down (altitude). Cheapest, most stable type of mounting, best suited to terrestrial sight-seeing. Must move both axes to track sky object. Auto-tracking systems using this type require computer.

Equatorial - Mounting is tilted parallel to Earth's poles of rotation so tracking on a sky object is greatly simplified by movement in only one axis.