

How Do I Use Binoculars?

History: Before prisms were available, lens barrels had to be very long to increase the distance between eyepiece lens and objective lens to achieve magnification. These are the traditional "pirate scopes". With the introduction of prisms, the light could be bent and barrels made shorter. Binocular vision allows two images to become one for depth perception. Monoculars are like binoculars, but made for one eye and provide no depth perception.

Structure: There are four main components of binoculars. Power is a function of these components. A 65 30 binocular has 65 magnification and a 30-millimeter objective lens. A larger lens lets in more light.

- **Eyepiece lens:** there are several convex lenses here for magnification. This is the lens closest to your eyes.
- **Prism:** Bends light rays and returns reverse image to normal.
- **Lens barrel:** Keeps distance between eyepiece lens and objective lens; blocks side lighting and protects from dirt.
- **Objective lens:** Gathers light in a convex lens. This is the lens that has a millimeter measurement (i.e., 65 30).

How do I get binoculars to work specifically for me?

Taking care of binoculars:

- Always keep them attached around your neck so they aren't accidentally dropped.
- While you are focusing binoculars, stand still. It would be easy to fall while focusing and walking.
- Clean binoculars properly.

If you wear eyeglasses:

- Keep your eyeglasses on.
- There is usually an "eye cup" rubber piece that folds back where your eyeglasses meet the eyepiece lens.

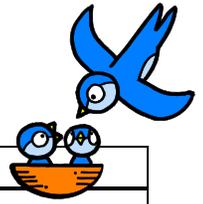
Things you adjust once:

- **Barrel distance:** The two barrels can be moved closer or further apart depending on the distance between your eyes.
- **Right eyepiece focus:** There is a knob on the right eye piece that corrects for visual differences between your two eyes. If you are seeing more than one image, adjust the right eyepiece until there is one image.

Things you need to adjust with each observation:

- **Center focus:** Adjust the center focus with each observation to bring image into view.





Focusing on an image:



- Adjust barrel distance and right eyepiece
- Locate the image with your eyes. Are there any landmarks or reference points next to the image? These may help you find the image using the binoculars.
- Focus your eyes on the image. Without looking down, place the binoculars directly in front of your eyes. The rubber cup surrounding the eyepiece lens should rest against your eyebrow (unless you are wearing eyeglasses).
- Focus image into view with center focus.
- Keep elbows tucked in close to your body and both hands on binoculars to avoid a shaky image.

Practice using binoculars.

Focus on a stationary object.

- Pick an object that doesn't move. Choose one near and one more distant. Use center focus.

Focus on moving objects in class.

- Right/ left: While someone walks slowly across the room, keep them in view with the binoculars. Then speed up the walker to add a challenge.
- Away/ toward: Choose a student to move toward and away binoculars. Discuss range that binoculars will work. At some point, the object is too close to focus.

Focus on wildlife.

- Be patient, slow and steady with your movements. Practice makes perfect.

Reference:

Modified from: Creating Coastal Stewardship Through Science: Discovering Northern Elephant Seals at Point Reyes National Seashore. 2001 Ed.

http://www.nps.gov/pore/curriculum_guides/eleph_seals/pre_binoculars.html. Accessed: May 19, 2004.

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