

## **Binocular Basics** **(from Iowa NatureMapping Program)**

### How to use Binoculars

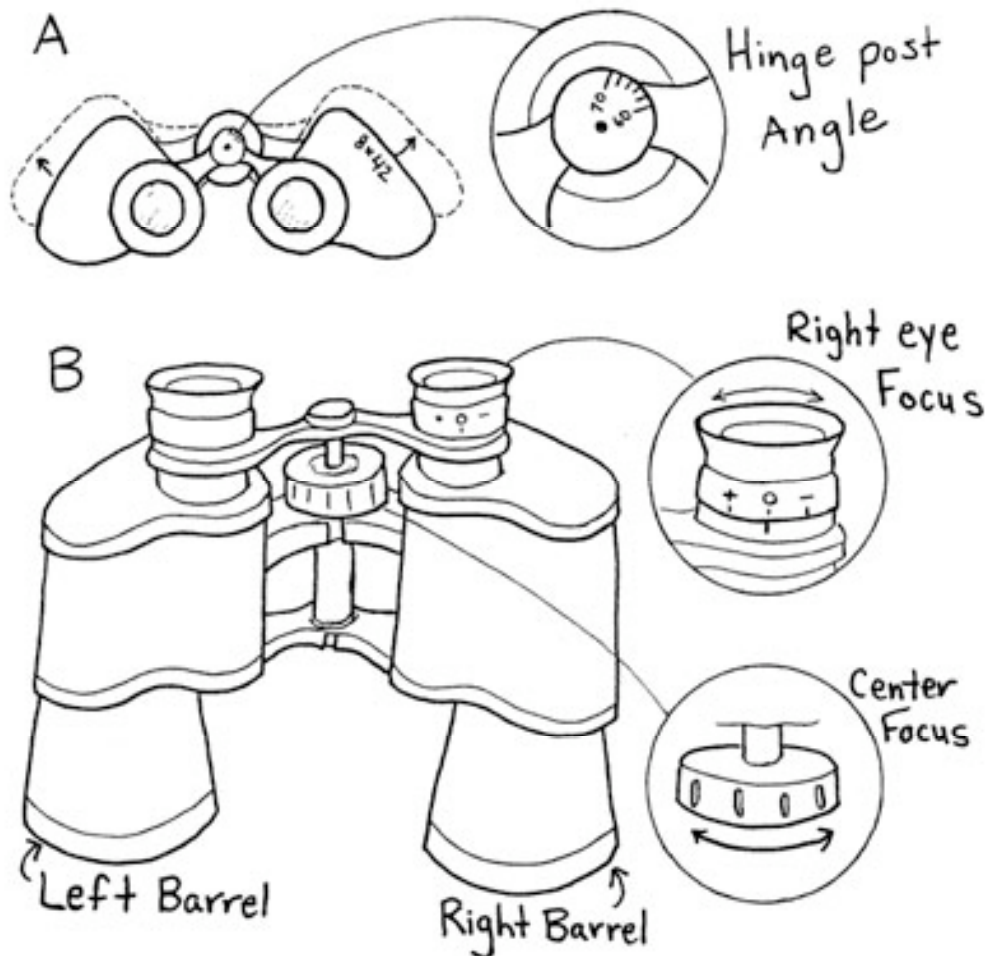
Binoculars are an extension of your eyes. First, use your naked eye to find the animal you are observing. Once you have detected movement and can see the wildlife, use the details of the animal's "field marks". Everyone's eyes are different, so before you raise the binoculars, you must calibrate them for your eyes.

### How to Calibrate Binoculars

1. Binoculars hinge at the center between the two large "barrels", allowing the eyepieces to fit the width of your eyes (Illustration A).
2. Pivot the hinged barrels so you see a single circle-shaped image, rather than a double-image when looking through them. If the barrels are as close together as they go and you still see two images, you may need to find another pair of binoculars.
3. The distance between the eyepieces is called the "interpupillary distance". It is too large if you see two images. The number on the hinge post (angle) will always be the same for your eyes, no matter which binocular you use (A).
4. Each of your eyes has slightly different vision, so your binoculars must be calibrated to accommodate them (Illustration B). Calibrating binoculars brings both eyepieces into sharp focus. Most binoculars have a focusing wheel in the center. It adjusts the focus of both eyepieces (what you see with both eyes) at the same time.
5. Most binoculars also have a separate "diopter" adjustment, which allows you to focus (turn) one eyepiece independently, to accommodate the differences in your eyes (B). Depending on the binoculars, this adjustment can be on the left or right eyepieces (usually on the right). Marks similar to the following symbols (+ ...O ...-) are on the eyepiece. *Note: The remainder of these instructions assumes you are using binoculars with a right-eye diopter adjustment. For binoculars with a left-eye adjustments, reverse the side of the binoculars indicated.*
6. Turn the center focusing wheel to the right as far as it will go (if it is an external focus binocular, like Illustration B).
7. Turn the adjustable eyepiece (diopter adjustment counterclockwise, moving it as far out from the body as possible (B). Both eyepieces should now be out of focus.
8. Stand about 30 feet from a sign (street signs work well) with clear lettering.
9. Cover the end of the right binocular barrel with your hand (B).
10. With both eyes open, turn the center focusing wheel until the lettering comes into sharp focus. Turn the center focus wheel past sharpest focus and back again to ensure you have the sharpest image.
11. Next, cover the left barrel with your left hand, keeping both eyes open, and turn the right eyepiece clockwise to bring the lettering into focus (B). Again, turn the eyepiece beyond the point of sharp focus and back to find the sharpest image.

Remember to keep the center focus wheel in the exact position you left it in Step 10.

12. Uncover the left barrel. Your binoculars should be in perfect focus and calibrated to your eyes. Remember the position that the right eyepiece is set. This will not have to be changed unless your vision changes. You may want to place masking tape around the eyepiece so it can't be turned. From now on, you will only need to use the center focus wheel to adjust both eyepieces.



Note: This exercise will greatly enhance the experience of watching wildlife, and taking time to teach students this method is passing on an important skill. However, it may be preferable to keep the right eyepiece in the center (no adjusted) for younger students. Most young people have little or no need to adjust the eyepieces independently. This will reduce confusion for younger students, but the decision is up to you.

**Binocular Basics:** Information take from Classroom BirdWatch, Teacher's Guide, FeederWatch Module, Copyright, 2001, Cornell Lab of Ornithology; adapted from "How to Calibrate Binoculars For Your Eyes" by Steve W. Kress, National Audubon Society biologist. Binocular drawings by Jason O'Brien, 2002, Iowa *NatureMapping*.