**Tools for Naturalists**

These tools are recommendations – it is not necessary to have these when you start out. As you gain more experience and become more focused on different subjects, these tools can be especially useful.

**Hand Lens or Loupe**

* Hand lens – also called loupe, geology loupe, or jeweler’s loupe - a great tool for naturalists.
* Tips on how to choose a hand lens:
	+ <http://thefieldstudent.com/best-hand-lenses-loupes/>
	+ <http://njminerals.org/loupes.html>
* Belomo 10X hand lens, good value, $30-$40 (the model with the lanyard is worth the higher price)

**Binoculars**

Several points to consider:

* How are you going to use them? Bird-watching, butterflies, or viewing other wildlife? If you want them for butterflies, you’ll want a pair of close-focusing binoculars (6-8 feet or less). Visit the NABA (North American Butterfly Association) website below for some excellent information.
* Weight? Over an extended period, your neck will get sore – although there are harnesses that will help distribute the weight
* Maximum power – the greater the magnification, the harder it will be to keep the image steady (where a tripod almost becomes necessary).
	+ Factors to consider (excerpted from Butterflies Through Binoculars – The West, by Jeffrey Glassberg): Power; Size; Weight; Field of View; Clarity; and Brightness
* How much money do you want to spend?

There are two types of binoculars: roof prism (more compact/lighter, more expensive) and porro prism (cheaper, usually bulkier, but still good quality).

All binoculars will have two numbers associated with each model: Power X Diameter of the Lens. Some examples are: 8X42; 10X50; 12X56; and 8X25. The first number is power – the amount of magnification (a power of 10 will make objects that are 10 feet away appear as if they’re 1 foot away). The higher the power, the narrower the field of view. The second number, the diameter of lens (in millimeters), affects the size of the binoculars and, more importantly, the amount of light collected by the binoculars (as the diameter increases, the brightness of the image generally increases). Note: a power of 10 would seem better than 8, but it will be noticeably harder to maintain a steady image.

There are relatively decent 8X42, light-weight binoculars available, ranging in price from $50 to $120. Better lens coatings, fog/waterproof capabilities, and other ergonomic features tend to result in higher prices. There’s a very wide range of prices for binoculars, with the upper limit reaching thousands of dollars.

Online Information on Binoculars:

<https://www.naba.org/binocs.html>

<https://deanoptics.com/why-are-binoculars-so-expensive/>

<https://www.allaboutbirds.org/news/six-steps-to-choosing-a-pair-of-binoculars-youll-love/>

<https://www.audubon.org/gear/binocular-guide>

<https://opticsmag.com/best-binoculars-for-birding/>

<https://binoexpert.com/binoculars-buying-guide-aw-lp>