



Lesson Plan: **Binoculars**

How are binoculars used to identify birds?

Alignment with STEM Framework

Investigator 

Overview

In this lesson, the facilitator introduces youth to a birder's most important piece of equipment – binoculars. Birds can be difficult to see without extending our eyesight and we use binoculars to bring objects that are far away much closer. There are techniques that youth can use to make binocular use more successful.

Practice Goals

- Creating methods for data collection
- Identifying birds
- Using binoculars to identify birds
- Obtaining, evaluating, and communicating information about backyard birds

Content Goals

- How do I use binoculars to identify birds?

Purpose

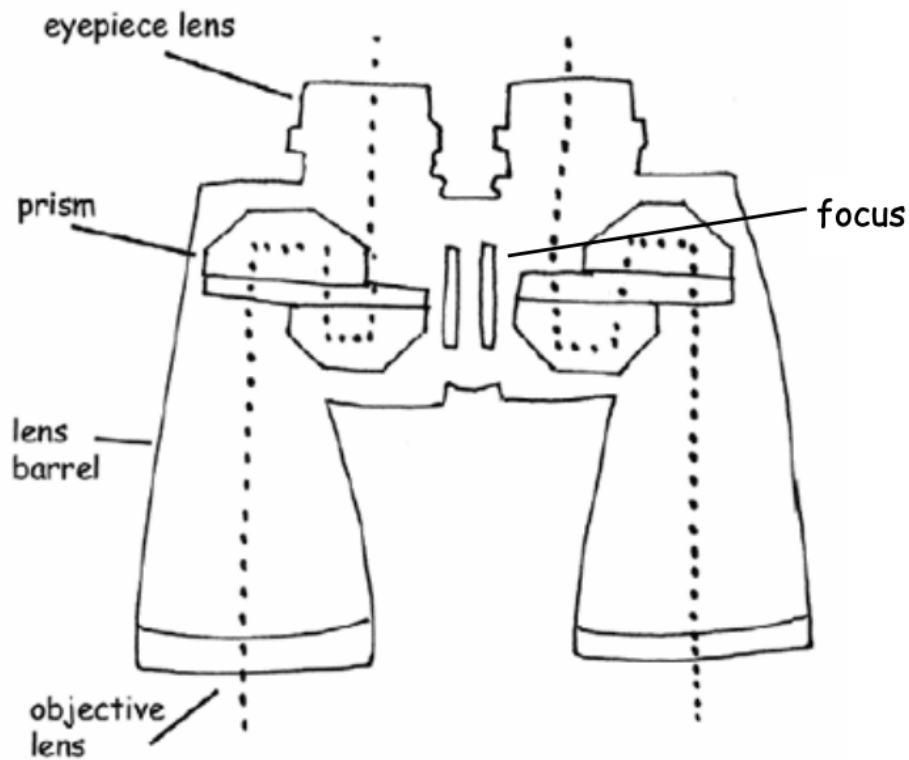
The purpose of this lesson is to learn to use binoculars to see birds more closely and clearly, allowing one to notice characteristics that help in identification of species. This lesson provides opportunities to engage in scientific practices such as questioning, observing, predicting, and organizing for data collection, as well as using tools/equipment that scientists use.

Teacher Background Information

Bird watching is a very popular hobby and of course some bird watchers become naturalists or ornithologists. Critical to becoming a good bird watcher is mastering the art of using binoculars.



Diagram of Binocular Design



Affinity Goals



I can act like an **Investigator** by using binoculars to identify birds in my yard and neighborhood and on my school grounds, noticing their colors, size, beak size and shape, flight patterns and calls.

Materials

- Binoculars for each student
- Prisms

Time Needed

45 Minutes

Instructional Sequence

Facilitator will:

- Engage students in design and engineering. Facilitator will share prisms with them and discuss how binoculars actually work.
 - What are the scientific and engineering principles that have been engaged?
 - Were there early designs in binoculars that were not as effective?
 - Is there a difference in quality of binoculars based on the lenses and prisms?

After engaging students

Facilitator will:

- Assist youth in adjusting the width of the eye pieces to fit their eyes. Then, the facilitator explains how to focus the binoculars (one eye at a time). Make sure that all students are looking at something fairly large and common to start with such as a stop sign or a school building informational sign. Once everyone sees a large object then find a medium sized object to focus on and finally a smaller object. Then, it's on to 'flat birds' (see lesson plan #4).