

BLOSSOM & ROOT

NATURE STUDY // LEVEL 5

The Art of Observation

LESSON GUIDE



LEVEL 5

A Year of Projects and Prompts Focusing on Water, Weather, and the Celestial Sphere



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Design by Kristina Garner
Editing by Jason Garner
Cover: Royalty-free stock photo ID: 1484627480

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Nature Study
Level 5:

The Art of Observation

A Year of Projects and Prompts Focusing on
Water, Weather, and the Celestial Sphere

Blossom & Root Nature Study Level 5: The Art of Observation

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Important Note: Lessons and corresponding projects can be done in any order. Start by completing the "Preparation" lessons, then begin in your current season, and move through the lessons and projects as quickly or as slowly as you like. Some projects will only take a few minutes to complete, while others will continue for many months. You do not have to complete every project. Remember, this guide is here to work for you--you do not work for it.

Preparation Lessons (complete these first!) Preparing your observation notebook, your notebooking materials, your astronomy gear, and more!

Lessons for Fall

- **Month 1: Autumn Weather**

Watching the Days Grow Shorter | Autumn Flora and Fauna Observations | Studying Wind Direction 1 | Viewfinder Weatherscape

- **Month 2: The Celestial Sphere in Autumn**

Getting Started with Stargazing*** | Autumn Moon Observation | I Spy a Planet | Autumn Constellation Study / Introduction to the Zodiac

- **Month 3: Sensory Exploration of Local Water Sources**

The Color and Sound of Water | Adaptations | The Dance Between Water and Light | Where Water Meets Land

Lessons for Winter

- **Month 1: Winter Weather**

Fogs and Frosts | Temperature and Shadows 1 | Winter Flora and Fauna Observations | Winter Clouds

- **Month 2: The Celestial Sphere in Winter**

Tracking the Path of the Winter Sun | Winter Moon Observation | Spotting Satellites | Winter Constellation Study

- **Month 3: Frozen Wonders**

Playing Jack Frost | Studying Snow and Snowflakes | Hot Cocoa Science | Investigating Ice

Lessons for Spring

- **Month 1: Spring Weather**

Wind Shadows | Studying Wind Direction 2 | Spring Flora and Fauna Observations | Finding Microclimates

- **Month 2: The Celestial Sphere in Spring**

Observing Other Moons** | Spring Moon Observation | Exploring the Surface of Our Moon | Spring Constellation Study

- **Month 3: Puddles, Droplets, and Vapors**

What a Puddle Can Tell You | Ripple Shadows | Playing with Condensation | Playing with Evaporation

Lessons for Summer

- **Month 1: Summer Weather**

Summer Clouds | Temperature and Shadows 2 | Summer Flora and Fauna Observations | Summer Storms

- **Month 2: The Celestial Sphere in Summer**

Tracking the Path of the Summer Sun | Summer Moon Observation | The Perseids* | Summer Constellation Study

- **Month 3: Exploring Wetlands and / or Riparian Areas**

Taking a Closer Look | Gazing Along the Surface | Where It Comes From, Where It Goes | Evening Observations

*This should be done during to the "Lessons for Winter" section for those in the Southern Hemisphere.

** This activity can be moved to any time of the year in order to borrow / purchase a telescope and to optimize viewing of the moons of your planet of choice.

*** No matter which season you begin in, kick off your first "celestial sphere" month with this orientation lesson.

The Observation Notebook

Tracking Water, Weather, and the Celestial Sphere Beyond

This curriculum includes an open-ended observation notebook, but you are free (and encouraged) to use *any* notebook or sketchbook you like instead. The notebook is meant for your child to document observations of the world around them through notes, sketches, photographs, and more. This journaling element is a key cornerstone for this curriculum. Please help your child as needed to set up and design different entries in the observation notebook, according to the prompts in this guide.



STOP! READ THIS BEFORE YOU PRINT OUT THE INCLUDED NOTEBOOK!

We have included a pre-designed notebook that your child may use for their observation notebook, but they may prefer to use a large mixed media or watercolor pad or notebook instead. If you decide to use the pre-designed notebook we provide, your child will still sometimes need to use watercolor or mixed media paper for various prompts. These pages can be glued or taped into place in the pre-designed notebook, or dated and kept in a separate folder. We recommend reading the "Preparation Lessons" section before deciding whether or not to print and use the pre-designed notebook.

Supplies You'll Need

Please read carefully through the projects that you plan to do in order to determine supplies needed, and when you'll need them. Many projects can also be adapted to use what you already have on hand. We highly encourage that you use what you already have, whenever possible.

Watching the Days Grow Shorter

About the Project:

Fall: Autumn Weather

Kick off your autumn observations by tracking the decreasing length of the days as you march steadily toward the winter solstice.

This is a long-term project. You can choose one month during the fall to track, or you can begin this project just after the autumnal equinox and track the entire season until the winter solstice. Graphing day length is a wonderful way to visualize the small changes that are happening each day as the solstice approaches.

Step 1:

Decide the length of time you want to track, and set up your graph. (An adult may need to help you if you have not learned how to do this yet.) You will want to label the x-axis with the dates within your determined range of time, and you'll want to label the y-axis with increments of hours and minutes. We recommend increments of five minutes, beginning near the day length at last year's winter solstice (which you can look up online.) Plan your graph carefully, and ask for help if you need it!

Step 2:

Each day, calculate the day's length and mark it on your graph. There are a few ways to do this. You can observe the precise time of sunrise and sunset time each day, but it may prove to be difficult to be consistent with that approach. You can note the precise time of sunrise and sunset in your area, using a weather app on a smart phone or by using some of the recommended websites on the next page.

Project Timing:

This should be done over a period of at least one month during the fall. For best results, track day length for the entire season.

Supplies You Will Need:

- a piece of graph paper
- colored pencils
- pencils
- access to the internet or a smart phone with a weather app that provides local sunrise and sunset times
- tape or glue
- your observation notebook (either the pre-designed notebook provided with this curriculum or your own pad or notebook of mixed media or watercolor paper)

Latitude and Longitude :

Some of the recommended websites will require you to enter the exact latitude and longitude for your town or city. You can look these numbers up online or in an atlas.

Here's a fun art project idea: paint your coordinates (latitude and longitude) in beautiful colors on a paper or canvas with a painted background, or make a collage of your coordinates by cutting numbers out of a magazine and pasting them on a painted background. Hang it up to remember exactly where "home, sweet home" is.

Watching the Days Grow Shorter

Next, you'll need to calculate the length of the day between sunrise and sunset. Some of the recommended websites will provide this as well, but you may prefer figuring this out on your own.

Step 3:

Continue plotting each day's length until you've completed your graph. Are you surprised by the difference in day length over just one month or just one season?

Don't forget to tape or glue your graph into your observation notebook!

Step 4:

You may wish to repeat this activity after the vernal equinox, watching the days grow longer as the summer solstice approaches!

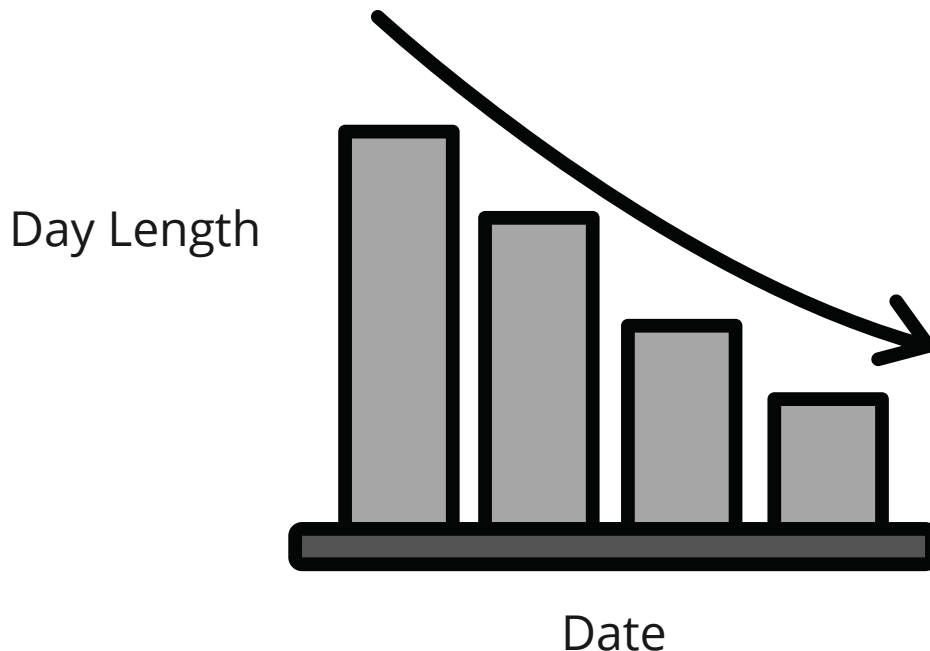
Fall: Autumn Weather

Helpful Websites (clickable links can be found in the back of this guide):

- <https://www.timeanddate.com/astronomy/usa>
- https://www.calculatorsoup.com/calculators/time/sunrise_sunset.php
- <http://www.solartopo.com/daylength.htm>

Looking Closer:

After finishing your graph, look back on how it lines up with other entries in your observation notebook. Did you notice any changes in the flora and fauna in your area as the days became shorter? What about the temperature and weather?



1 Spy a Planet

About the Project:

Anytime you have a "celestial sphere" prompt that requires an observation of the night sky, you're likely to spot a planet or two fairly quickly. Several planets appear bright in the night sky--brighter than most of the stars. This is because they are so much closer to us than those stars. Unlike stars (which shine with their own light), planets in our solar system reflect the light of our sun. In this prompt, you'll learn to spot planets in the night sky. This skill will come in handy all year long as you begin each nighttime observation.

Step 1:

Consult a star map, like the free ones available at Skymaps.com, or do an internet search to find out which planets are visible in the night sky in your area right now. The Farmer's Almanac has a "visible planets" guide on their website. Here is the link for 2021:

<https://www.farmersalmanac.com/visible-planets-guide>. To find the guide for future years, simply use the search function. Planets are usually easiest to spot just before dawn and just after dusk. Unlike stars, planets do not appear to us to "twinkle"--at least not as much.

Step 2:

Head outside with your astronomy gear, using the work you did in step 1 to help you spot the planet(s), either with the naked eye, with binoculars, or with a telescope.

Step 3:

Make an entry in your observation notebook about the planet(s) you saw. Include a quick sketch and a few notes, plus any questions you may have.

Fall: The Celestial Sphere in Autumn

Project Timing:

This can be done at any time in the autumn, but a clear night would be best.

Supplies You Will Need:

- your astronomy gear (see "preparation lessons")
- your observation notebook (either the pre-designed notebook provided with this curriculum or your own pad or notebook of mixed media or watercolor paper)
- colored pencils or art pens
- pencil and eraser

Follow the Ecliptic:

Want to know a secret tip to finding the planets in the night sky? They will always be located fairly close to the ecliptic.

The ecliptic is the apparent path that the Sun traces out in the sky during the year.* Trace along the sun's current daytime path through the night sky with your finger--this is where you'll want to look for planets. (This will require you to pay a bit of attention to the sun's path during the day.)

If you're using a star map (or the recommended maps from Skymaps.com), you'll usually see a dotted line curved across the map. This is the ecliptic. You can learn more about the ecliptic with the next activity's recommended videos.

Bonus Video:

From SciShow, Why Do Stars Twinkle?:
<https://youtu.be/N3lgVidGjQk>

*<https://kids.kiddle.co/>

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The Art of Observation

STUDENT NOTEBOOK



This book belongs to:

LEVEL 5

A Year of Projects and Prompts Focusing on Water,
Weather, and the Celestial Sphere

Season:

Prompt:

Date:

Time:

Location:

Temperature:

Weather:

