



The Bio/Diversity Project

Data Science Outreach Curriculum Fall 2025 Lesson 5: Where Plants Belong

Based on: [Growing Indoor Plants with Success | CAES Field Report](#), [Determining Light Levels](#)

Grade Level: 8th

Time: 50 minutes

AZ Science Standards:

- **8.L2:** Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.
- **8.E1:** The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.

Student Facing Learning Objectives:

- I can explain why plants evolved to have different light requirements.
- I can measure light intensity (lux) at several distances from the window.
- I can recommend one plant for one classroom spot using data and reasoning.

Guiding Questions:

- Why do different plants need different amounts of light?
- How does the sun's angle change where sunlight reaches in a room?
- How does distance from the window affect brightness?
- Why do scientists take multiple measurements and average them?
- How might indoor light at our chosen spot change at another time of day?

Vocabulary:

- Lux
- Adaptation
- Sun angle

Materials:

- Arduino science kit r3
- Smartphone or tablet with arduino science kit app
- Timer
- Measuring tape
- [L5 Plant cards](#) (print one per student pair)
- [L5 Worksheet](#) (print one per student pair)
- [L5 Landscape Images](#)
- [L5 Slides Energy](#)



Lesson 5: Where Plants Belong

Instructor Background

Because indoor light is weaker and changes with distance from a window, students can see why only some plant species (especially shade or medium-light plants) can survive indoors. The plant cards give simple habitat notes that help students think about why each plant needs a certain light range, and the worksheet guides them to match those needs with the average lux values in different distances from the window. Measurements are taken for 15 seconds because sensor readings fluctuate, so the average displayed in the app over a recorded 15 second period is more stable. Time of day changes matter because a single measurement only captures one moment, so part of the reasoning challenge is recognizing that the same spot would look different at varying times of the day.

Mini-Lesson (10-15 minutes)

1. Why plants have different light preferences (~5 min)

Explain that plants evolved in different habitats. Understory/shade plants for low light, edge plants for medium light, and open-desert plants for high light. Indoor light is weaker, so some desert plants cannot live indoors unless they tolerate lower ranges.

- Shade plants grow under taller plants in low light
- Middle plants grow in between shady and sunny patches in medium light
- Desert sun plants grow in wide open spaces in very bright light

2. Plant cards & landscape cards (~10 min)

Hand out the [L5_Plant cards](#), [L5_Landscape Images](#), and [L5_Worksheet](#), one copy of each per pair. Tell students they will read the plant cards and their descriptions. Then, complete the “warm-up” portion of the worksheet, where they will match each plant to the best habitat for it.

Set a timer for 5 minutes, then review answers.

1. Snake plant: Landscape 6
2. Desert Marigold: Landscape 3
3. Brittlebush: Landscape 1
4. Beargrass: Landscape 2
5. Parlor Palm: Landscape 5
6. Fairy Duster: Landscape 4



Work Time (25-30 minutes)

1. Worksheet Part 1:

Call students to volunteer to assist with this task.

Measure three distances from the window: 1 ft, 3 ft, 6, ft.

For each spot:

- Hold the sensor still for 15 seconds and record.
 - Hold the science kit so the sensor is facing the brightest part of the window to keep the readings consistent.
- Have a student report the average to the class
- Students record the averages onto their worksheets

Classroom lights may raise values slightly. The overall pattern still comes from the window.

Mention time of day. We're capturing a single moment. This room would look different at 8am or 4pm because of the sun angle.

2. Worksheet Part 2

As a class, introduce part 2. Use the example plant card for the palo verde.

Students work on their own on part 2. Set a timer for 5 minutes for this task. After the timer is up, ask volunteers to share answers.

3. Worksheet Part 3

As a class, introduce part 3. Use the example plant card for the palo verde. This plant would not grow indoors, but the closest to the window would be the best fit.

Students work on their own on part 3. Set a timer for 10 minutes for this task. After the timer is up, ask volunteers to share answers.



The Bio/Diversity Project

Wrap-Up (10 minutes)

Think-Pair-Share:

How could the light here change at different times in the day? (For example, think morning vs evening.)

Which plant on the cards do you think would have the hardest time indoors? Why?
