# Table of Contents

Goals ..............................................................................................................................................4  
Model Lesson Plan ..................................................................................................................5  

**Unit I: The Root & Stem**  
Lesson 1: Plant Systems & Organs ..........................................................................................8  
Lesson 2: The Root System .......................................................................................................10  
Lesson 3: External Structure of Stem .......................................................................................12  
Lesson 4: Internal Structure of Stem .......................................................................................14  
Lesson 5: Unit I Review ............................................................................................................16  

**Unit II: Leaves**  
Lesson 6: External Structure of Leaves I .................................................................................20  
Lesson 7: External Structure of Leaves II ...............................................................................22  
Lesson 8: Internal Structure of Leaves ...................................................................................24  
Lesson 9: Unit II Review ...........................................................................................................26  

**Unit III: Flowers & Fruits**  
Lesson 10: Flowers: Structure & Perfect Flowers ...................................................................30  
Lesson 11: Flowers: Pollination & Fertilization .....................................................................32  
Lesson 12: Fruits: Simple Fleshy Fruits .................................................................................34  
Lesson 13: Fruits: Simple Dry Fruits; Aggregate & Multiple; Seed Dispersal ..................36  
Lesson 14: Unit III Review ........................................................................................................38  

**Unit IV: Observing Trees**  
Lesson 15: Observing Trees ......................................................................................................44  
Tree Observations 1-15 ..............................................................................................................46  
Lesson 16: Final Exam Review ..................................................................................................91  

**ADVANCED WORK**  
**Unit V: Photosynthesis & Respiration**  
Lesson 17: Photosynthesis I ......................................................................................................98  
Lesson 18: Photosynthesis II ....................................................................................................100  
Lesson 19: Respiration I ..........................................................................................................102  
Lesson 20: Respiration II .........................................................................................................104  
Lesson 21: Unit V Review ........................................................................................................106
Lesson 2: The Root System

Reading and Questions

1. How do plants attain the water they need to live and grow? ________________________________________ 
   ____________________________________________________________________________________

2. What are the two basic designs for plant roots? ________________________________________________

3. What is the difference between these two designs? ____________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

4. Trees begin their life with what root design? __________________________________________________________________

5. What are the two types of taproots? _________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

6. List examples of food-storing taproots (both from the text and from your own knowledge and experience). 
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

7. What are the benefits of a fibrous root system? ______________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

8. List the parts of a plant root from outside to inside. ____________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

9. __________________________ are minerals and salts that are dissolved in the water the plant absorbs which help the plant grow.

10. The __________________________ transports water and food in the root. The __________________________ specifically takes the water to the stem, and the __________________________ receives the food made in the leaves.

11. What are cells? __________________________________________________________________________
   ____________________________________________________________________________________

12. What are the two functions of the cortex? ______________________________________________________
   ____________________________________________________________________________________
Diagrams and Labeling

• Label the plants according to their root design.

![Diagram of plants with roots]

• Label the parts of a plant root.

![Diagram of a root cross-section]

Activities

1. (With permission!) Gently uproot a plant near your house or building and examine its root system. (The larger the roots, the easier the activity.) What type of root system does it have? Can you see the root hairs?

2. Make a cross section (if you are holding the plant vertically, make a cut horizontally) of the root specimen you collected, and using a magnifying glass, see how many parts of the internal structure you can identify.