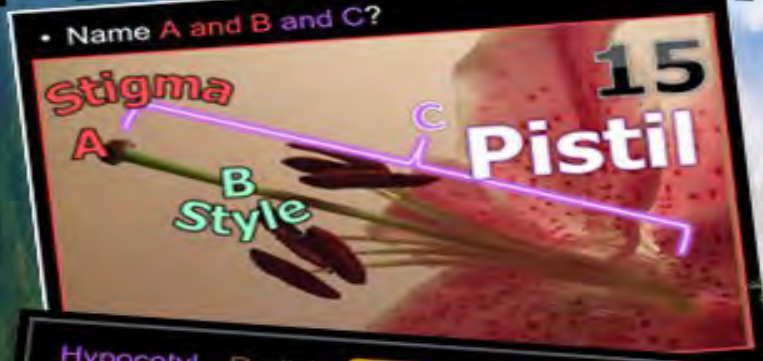


Botany Unit

Preview is a compressed file



5 Parts, 50 Lessons

Interactive Slideshows

Problem	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Does fertilizer help a plant	Amount of fertilizer	Growth of the plant	Same amount of soil, light, water.

- Study could examine different types of light on plant growth.



- Independent Variable:** The variable you have control over, what you can choose and manipulate.



- Gliders** - Nature's perfect design.

- Hydroponics:** The process of growing plants in sand, gravel, or liquid, with added nutrients but without soil.



- The average / mean is the sum of all values divided by the total number of values

$$2.4 + 1.7 + 2.0 = 6.1 \text{ cm} / 3 = 2.03 \text{ cm}$$



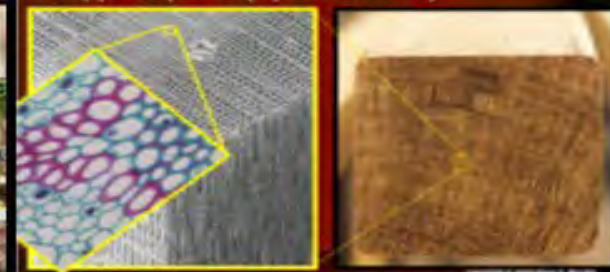
- Do not produce seeds or flowers.

Not a seed → Calyptra covering a sporangium

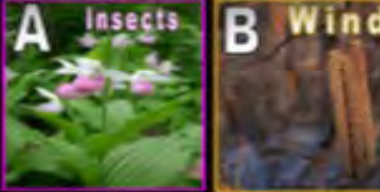
Let's see the capsule inside. Let's see the sporangium inside.



- Old xylem doesn't transport water but supports plant. (Xylem is wood).



- Which flower uses **wind** to pollinate, and which uses **insects**? Why?



a Ginkgo and which is a



- Angiosperms** produce seeds enclosed in a fruit / ovary.



- Dendrochronology Available Sheet**



Follow Along Work Bundles

with Answer Keys

5 Work Bundles = 87 Pages

A collage of various biology worksheets and diagrams. The most prominent sheet is titled "with Answer Keys" in large, bold, yellow letters. It features a central image of a bowl of mixed vegetables (broccoli, carrots, tomatoes, etc.). To the right of the bowl is a circular diagram with a central point and radiating lines. Above the bowl is a grid of six small images showing different fruits: a green apple, a red apple, a pineapple, a strawberry, a kiwi, and a banana. The background of the collage includes other biology-related images, such as a cross-section of a plant stem, a diagram of a cell, and a microscopic view of plant tissue.

5 Work Bundles = 87 Pages

Quizzes, Activities, More

• What's the role of these?

- A.) Create sugar in photosynthesis
- B.) Disperse pollen.
- C.) Disperse waste from the plant.
- D.) Uptake water and nutrients
- E.) Resist plant hormones.

4



• Please name A and B.

– Hint. You can try and unscramble the words.

angiosperm

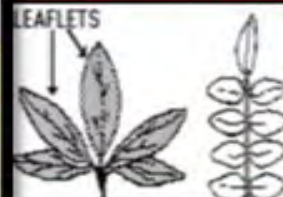
gymnosperm



Which one evolved first?

10

• Compound Leaves: They appear in groups and are made up of leaflets.



• What type of fruit is this plum? **Drupe**

– developed from one ovary and has one seed.

– Please label the endocarp, mesocarp, and exocarp.



• These are the types of plants and shrubs that lose leaves in fall and grow them back in spring.

Deciduous 8

answer is...



• Identify this type of tree



Maples

20

• Equation for Photosynthesis



Carbon • Water • Sunlight • Sugar • Oxygen

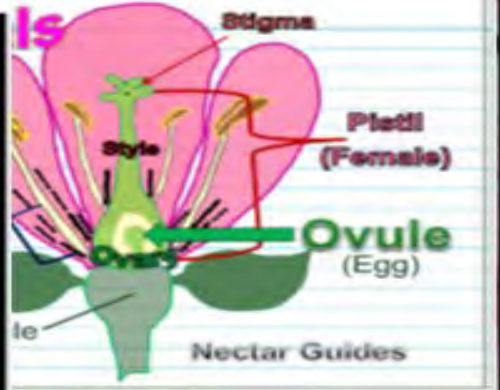
Carbon

Water

Sunlight

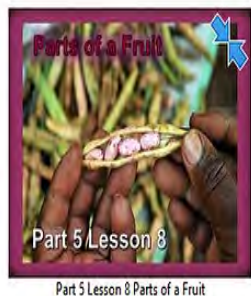
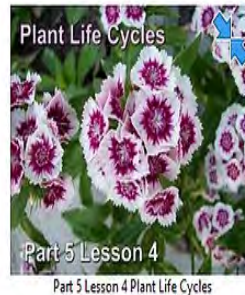
Sugar

Oxygen



Fully Editable

Botany Unit Part 5: 10 Lessons of 50 Minutes and 18 Page Work Bundle, Leaf Identification, Leaf Rubbing Activity, Blades, Venation, Leaf Margins, Leaf Base, Leaf Apex, Petiole, Simple vs. Compound Leaves, Identifying some common leaves, Maples, Oak, Beech, Pines, Poisonous Plants, Case Study on Poison Ivy, Poison Ivy Identification, Ivy Identification Quiz, Other Poisonous Plants, Deciduous Trees, Conifers, Identifying Conifers, Tree Identification Visual Quiz, , Plant Life Cycles, Seed Plant Life Cycles, Gymnosperm, Male vs. Female Cone, Angiosperm, Pollen, Annuals, Biennials, Perennials, Interpretive Dance Plant Life Cycles Group Activity, Flowers, Amazing Flowers Visual Tour, Parts of a Flower, Step by Step drawing on a flower with Parts, Matured Ovaries (Fruits), Stamen, Filament, Anther, Pistil, Stigma, Style, Ovary, Ovule, Sepal, Petals, Nectar Guides, How Flowers Attract Pollinators, Flower Dissection Lab, Visual Quiz Name that Part of a Flower, Exotic Fruits Visual Tour, Poisonous Berries, How Flowers become Fruits, Fruit or Vegetable Visual Standing Quiz, Parts of a Fruit, Epicarp, Mesocarp, Endocarp, Fleshy and Dry Fruits, Simple Fruits, Berries, Drupe, Pome, Aggregate Fruit, Multiple Fruit, Dehiscent Dry Fruit, Legumes, Indehiscent, Animals and Fruits / Seed Dispersal, Uses of Plants Wrap-up, Box Game Review, Crossword Puzzle, Unit Assessment



Botany Unit Part 5

SlideSpark Science



MIDDLE-LEVEL EDUCATIONAL RESOURCES

Interactive slideshows provide the roadmap for an amazing learning experience for students in grades 5-9. A Detailed set of work bundles chronologically follow the digital learning, providing a clear and intuitive roadmap to understanding. As the teacher or student advances through a slideshow, exciting hands-on activities, fantastic visuals, fill-in notes, review opportunities, video links, assessments, and much more are strategically placed throughout. Interactive learning unfolds step by step and supported by the work bundle to reach all types of learners. Everything you need to run to an amazing learning experience is provided in this one-of-a-kind science curriculum.

Each unit in the curriculum is designed to help teachers deliver the best possible learning experience for their students. Our interactive science slideshows are filled with questions and answers, important fill-in notes, hands-on activities, projects, games, built-in quizzes, and end of the unit assessment pieces. Students follow along with a work bundle that documents the entire learning experience for a fantastic review and assessment piece.

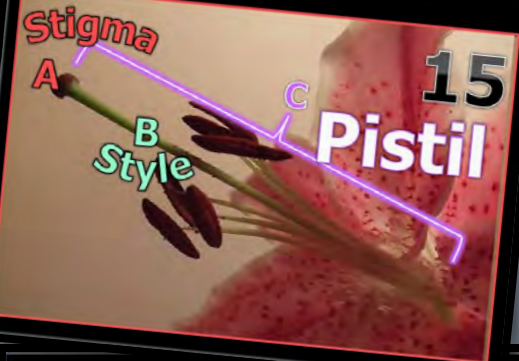
- All plants undergo sexual reproduction (two partners).
- When the sperm (pollen) and egg come together you get a zygote / baby plant.



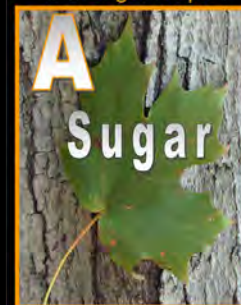
- Which plant is an **angiosperm**, and which is a **gymnosperm**?



- Name **A** and **B** and **C**?



- Which leaf below is a **Red Maple**, and which is a **Sugar** Maple?



- Do not produce seeds or flowers.

Not a seed

Calyptra covering a sporangium

Let's see the capsule inside

Let's see the spores inside



Copyright © 2014 SlideSpark, LLC

PART 2 NON-VASCULAR PLANTS

Name: _____

Non-vascular plants, like mosses, lack _____ (vascular tissues) in the plant to bring _____ and food up _____ and down _____ (ground, stem, or flower, leaves).
 They _____ to the ground because they lack the woody tissue necessary for support (trunk).
 (Caption: Cilia (W), Vascular or Non-Vascular Plant, 1-10)

1)	2)	3)
4)	5)	6)
7)	8)	9)
10)	11)	

Part 2 Section 2 Bryophytes (Mosses)
 Bryophytes: Division of non-vascular plants that have no _____, stems, or _____ and transport nutrients using _____.

Sketch an individual moss plant given to you by your teacher. Then label Capsule, Stem / Seta, Antherid, Sporangium, Gametophyte, Leaf-like Structures.



Peat Moss / Sphagnum: The partially _____ remains of various mosses, which _____ adds to the acidity of the soil (pH).

Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work bundle.

The set-up of the slideshows are designed to make learning fun and interactive for students. With a mix of questions and answers, teachers can use these slides to get their students thinking and actively participating in their education. Plus, the answers are always revealed on the next slide, providing students with immediate feedback and helping teachers assess their understanding.

• Plants get the nutrients they need primarily from the....

- A.) Soil and Water
- B.) Sun, Leaves, and Stems
- C.) Water and Air.
- D.) Soil only.



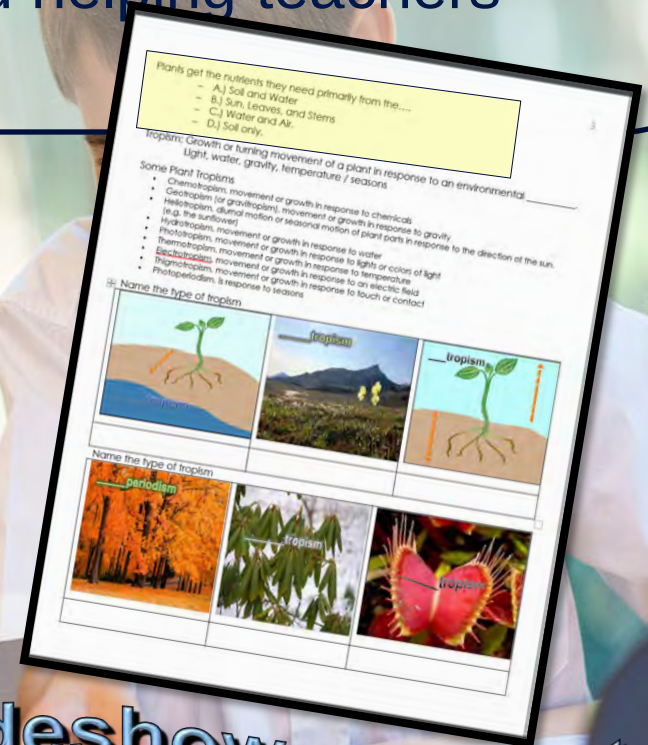
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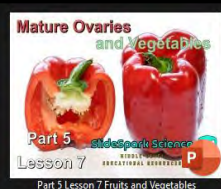
Next Slide

**slideshow supports
Work Bundle**



Lesson Planning

Daily lessons space exciting hands-on activities, red slide notes, video and academic links, projects, simulations, readings, built-in quizzes, and review opportunities throughout the slideshows. A typical day may have many different learning styles being targeted. Daily lesson planning becomes advancing through the slideshow roadmap the night before. Each lesson is roughly 50 minutes, but sometimes things can speed up or slow down. The best strategy is just to go at your classes own pace. The work bundle chronologically follows the interactive slideshow and you can always spend extra time assessing the quality of the writing within. If you don't quite finish a lesson, you can always pick it up the next day where you left off. The only real trick in timing is not starting a larger activity if you don't have the available time to complete. The slideshows have been designed to be a low stress, go at your classes own pace experience. Most activities are designed to be cost effective, using general materials that can be gathered from your local stores.



Lessons chronologically follow a single work bundle

Follow Along Work Bundle

Each science unit includes a single printable work bundle that stays with students from start to finish. Just print and distribute on day one—no daily handouts needed. The bundle follows the unit chronologically and includes everything: fill-in notes, diagrams, quizzes, lab activities, with follow up questions and much more. It's used daily, supports the end-of-unit quiz game, and is handed in for an additional assessment. Answer keys, some writable .pdf versions, and digital versions are also included for flexible classroom use..

Part 3: Lesson 3: Conifers

Deciduous: Plants that lose their leaves in fall and grow them back in spring.

Evergreen: Needles can survive winter. They constantly grow and drop needles.

- Needles can survive cold (sap anthesis).

scale-like shaped awl shaped linear shaped single needles bundled needles clustered needles

Coifers, as their name hints, bear cones.

Herky to the touch Spiky to the touch 2 lines visible

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scale-like shaped awl shaped linear shaped single needles bundled needles clustered needles

Coifers, as their name hints, bear cones.

Quiz: 1-11, Name that tree based on the leaf / needles.

1)	2)	3)
4)	5)	6)
7)	8)	9)
10)	11)	

Part 3: Lesson 3: Plant Life Cycles

Seed Plant Life Cycles

All plants undergo reproduction (two partners). When the sperm and egg come together you get a baby plant.

Gymnosperm: non-flowering, seeds usually arranged on a cone.

Which is the male cone (pollen producer) and which is female (egg)?

A) B)

Angiosperm: flowering, covered seed, produce seeds enclosed in a fruit (ovary).

Which plant is an angiosperm, and which is a gymnosperm?

A) B)

Annual: Seed germinates, grows, and produces seeds, before dying.

Biennial: Plant grows through the winter and produces seeds before dying.

Perennial: Plants that live for many years, producing seeds each year.

Please label the life cycles below. Which picture is an annual, biennial, and perennial?

Plant Life Cycles Dramatic Set

- Each life cycle group has three groups (Annual, Biennial, Perennial).
- Each group will have 15 minutes to act out an interactive skit that explains their life cycle.
- Groups should not discuss the cycle with other groups but interact with drama and drama.
- Groups can make a poster or any other creative product (not recommended).

Notes for Dramatic Plant Life Cycle Set

How does the plant get the water and the nutrients it needs?

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Water and nutrients are taken up by the roots and transported through the xylem to the leaves. The leaves use these to perform photosynthesis and transpiration.

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PART 2 NON-VASCULAR PLANTS

Nonvascular plants: mosses, liverworts, hornworts. They lack true roots, stems, and leaves. They are small, green, and grow in moist, shaded areas. They reproduce asexually by producing spores.

Word Bank: Moss, Liverwort, Hornwort, Spore, Gametophyte, Sporophyte, Rhizoid, Capsule, Stalk, Leaf-like structures, Stem / Rhizoid.

MOSS OF MOSS

Mosses are small, green, nonvascular plants that grow in moist, shaded areas. They have a gametophyte that is anchored to the ground by rhizoids. The sporophyte grows from the gametophyte and consists of a capsule and a stalk. The capsule contains spores that develop into new gametophytes.

BRANCHED TYPE

Brachyotum is a genus of bryophytes consisting of the division Anthocerotophyta. The common name refers to the branched habit of the gametophyte, which is a small, green, leafy plant. The sporophyte is a small, green, leafy plant that grows from the gametophyte.

LEAFY TYPE

Leafy plants are a group of bryophytes consisting of the division Anthocerotophyta. The common name refers to the leafy habit of the gametophyte, which is a small, green, leafy plant. The sporophyte is a small, green, leafy plant that grows from the gametophyte.

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with Answer Key

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PART 2

Fern Life Cycle

The fern life cycle is a complex process involving the alternation of generations. It begins with a spore that grows into a gametophyte. The gametophyte produces gametes that fuse to form a zygote, which grows into a sporophyte. The sporophyte produces spores that grow into new gametophytes.

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1. George Washington was the first President of the United States.

2. John Adams was the second President of the United States.

3. Thomas Jefferson was the third President of the United States.

4. James Madison was the fourth President of the United States.

5. James Monroe was the fifth President of the United States.

6. John Quincy Adams was the sixth President of the United States.

7. Andrew Jackson was the seventh President of the United States.

8. Martin Van Buren was the eighth President of the United States.

9. William Henry Harrison was the ninth President of the United States.

10. John Tyler was the tenth President of the United States.

11. James K. Polk was the eleventh President of the United States.

12. Franklin Pierce was the twelfth President of the United States.

13. John P. Taylor was the thirteenth President of the United States.

14. James Buchanan was the fourteenth President of the United States.

15. Abraham Lincoln was the sixteenth President of the United States.

16. Andrew Johnson was the seventeenth President of the United States.

17. Ulysses S. Grant was the eighteenth President of the United States.

18. Rutherford B. Hayes was the nineteenth President of the United States.

19. James A. Garfield was the twentieth President of the United States.

20. Chester A. Arthur was the twenty-first President of the United States.

21. William McKinley was the twenty-second President of the United States.

22. Theodore Roosevelt was the twenty-sixth President of the United States.

23. Taft was the twenty-seventh President of the United States.

24. Woodrow Wilson was the twenty-eighth President of the United States.

25. Warren G. Harding was the twenty-ninth President of the United States.

26. Calvin Coolidge was the thirty-first President of the United States.

27. Herbert Hoover was the thirty-third President of the United States.

28. Franklin D. Roosevelt was the thirty-second President of the United States.

29. Eisenhower was the thirty-fourth President of the United States.

30. John F. Kennedy was the thirty-fifth President of the United States.

31. Lyndon B. Johnson was the thirty-sixth President of the United States.

32. Nixon was the thirty-seventh President of the United States.

33. Richard M. Nixon was the thirty-seventh President of the United States.

34. Johnston was the thirty-eighth President of the United States.

35. Gerald R. Ford was the thirty-eighth President of the United States.

36. Ronald Reagan was the forty-first President of the United States.

37. Jimmy Carter was the thirty-ninth President of the United States.

38. Richard M. Nixon was the thirty-seventh President of the United States.

39. Jimmy Carter was the thirty-ninth President of the United States.

40. Jimmy Carter was the thirty-ninth President of the United States.

with Answer Key

Part 3 Young Plants

1. Label the parts of the seed.

2. Draw a cross-section of the seed.

3. Label the parts of the seed.

With Answer Key

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Part 3

4th **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31**

Details on the map of the Amazon rain forest are contained in the following table. The table is divided into two sections. The first section contains information on the Amazon rain forest, and the second section contains information on the Amazon rain forest's impact on the world.

Amazon Rain Forest

Location

The Amazon rain forest is located in the northwestern part of South America, covering an area of approximately 6.9 million square kilometers. It is the largest tropical rain forest in the world.

Climate

The climate of the Amazon rain forest is tropical, with high temperatures and high humidity. The average temperature is around 27°C (81°F), and the average humidity is around 80%.

Biodiversity

The Amazon rain forest is home to a vast number of species, including plants, animals, and insects. It is estimated that there are over 300 million species in the Amazon rain forest, many of which are found nowhere else in the world.

Impact on the World

The Amazon rain forest has a significant impact on the world's climate. It produces a large amount of oxygen, and it helps to regulate the Earth's temperature. It also plays a role in the water cycle, and it is a source of many valuable resources.

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Part 4 Seeds, Roots, Leaves

Fill in the blank: The seed is the embryo of the plant. It is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

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Part 4 Review Game

1. The seed is the embryo of the plant. It is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

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Part 4 Review Game

1. The seed is the embryo of the plant. It is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

2. The seed is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

with Answer Key

Part 4 Seeds, Roots, Leaves

Fill in the blank: The seed is the embryo of the plant. It is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

The seed is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

Part 4 Review Game

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Part 4 Review Game

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2. The seed is made up of the embryo and the food supply. The embryo is the young plant that will grow into the adult plant. The food supply is the stored food that the embryo uses to grow.

Part 4

Photosynthesis: Sunlight + Carbon Dioxide + Water → Oxygen + Sugar

Cellular Respiration: Sugar + Oxygen → Carbon Dioxide + Water

Review Games / Assessments

This unit concludes with a review quiz. Answers are provided in slideshow form so students can self assess. A blank template sheet is provided in the work bundle. Students can benefit from working together in small table groups with quiet communication. You can decide if you want to allow the use of work bundles or not. These are a nice review opportunity and get the students looking through their work bundles for the answers.



Part 5 Review Game Lesson 9

1-10 = 10 pts. * = Bonus + 1 pt.
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Name: _____
Due: Today
Score: ____ / 100

IDENTITY CRISIS	THE WONDER YEARS	BOYS AND GIRLS	TOOTY FRUITY	BIG BERRY
1) _____	6) _____	11) _____	16) _____	*21) _____
2) _____	7) _____	12) _____	17) _____	*22) _____
3) _____	8) _____	13) _____	18) _____	*23) _____
4) _____	9) _____	14) _____	19) _____	*24) _____
5) _____	10) _____	15) _____	20) _____	*25) _____

Final Question Wager: ____ pt. Answer: _____

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Part 5 Review Game Lesson 10

1-10 = 10 pts. * = Bonus + 1 pt.
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Name: _____
Due: Today
Score: ____ / 100

IDENTITY CRISIS	THE WONDER YEARS	BOYS AND GIRLS	TOOTY FRUITY	BIG BERRY
1) Write Owl (Quercus alba)	6) Penicillin (antibiotic)	11) Pollen	16) Letter C	*21) CRUNCH BERRIES
2) Maples	7) Blotches	12) Letter A (Has male and female)	17) Sepals	*22) FRUIT STRIPES
3) Non-vascular plants (Mosses, Liverworts, Hornworts)	8) Deciduous	13) A=Antler B=Antennae C=Antennae	18) Fruit	*23) BLUEBERRIES FOR SALE
4) Ferns (Group of seedless plants)	9) Sexual Egg Zygote	14) Ovary	19) A=Vegetable B= fruit	*24) PAUL BUNYAN AND SAGE
5) Pine Tree (seed plant)	10) Angiosperm Gymnosperm	15) A=Stigma B=Style C=Petal	20) Drupe Exocarp Mesocarp Endocarp	*25) FRUIT OF THE LOOM

Final Question Wager: ____ pt. Answer: _____

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- Name the words under the boxes. (1pt each)

– Plant: (noun) Any of various **photosynthetic**, **eukaryotic**, multi-cellular organisms of the Kingdom Plantae characteristically producing embryos, containing **chloroplasts** having a **cell wall** made of cellulose, and lacking the power of locomotion.



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- These are plants? True or False

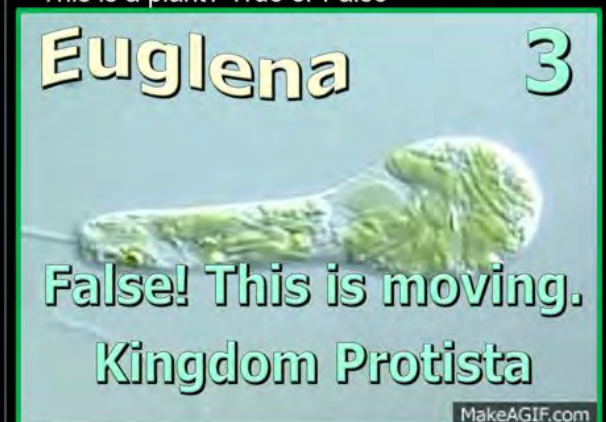
False! These are single celled Algae



- This is a plant? True or False

Euglena

False! This is moving. Kingdom Protista



MakeAGIF.com

- This is a plant? True or False

TRUE!

Plant: (noun) Any of various **photosynthetic**, **eukaryotic**, multi-cellular organisms of the Kingdom Plantae characteristically producing embryos, containing **chloroplasts**, having a **cell wall** made of cellulose, and lacking the power of locomotion.



- Which is a plant cell and which is an animal cell?



5

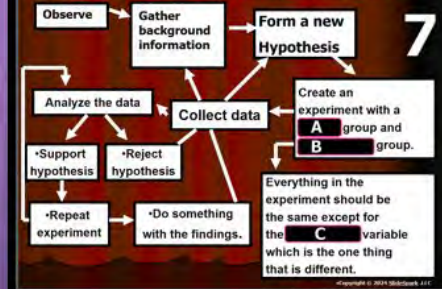
- The **energy** flow of life occurs because of plants.
- Plants harness the **energy** from the sun, and pass it on to all other life forms.

ENERGY



6

What are the 3 Blanks?



- This is the variable that you have control over, what you can choose and manipulate.

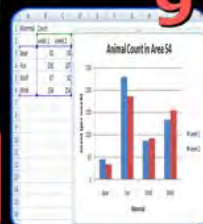
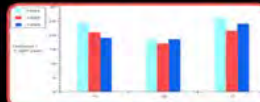
- A.) Dependent Variable
- B.) Conclusive Variable
- C.) The Hypothesis
- D.) Independent Variable
- E.) Control



- This is what you measure in the experiment and what is affected during the experiment.

The Numbers

- A.) Dependent Variable
- B.) Conclusive Variable
- C.) The Hypothesis
- D.) Independent Variable
- E.) Control



PART 1: INTRO TO BIOLOGY

Student Name: _____ Date: _____

Lab #	Lab Title	Date	Initials	Score
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Part 1/6

- This needs to be (Same). Quantities that a scientist wants to remain constant so it's a fair test.

10

- A.) Dependent Variable
- B.) Conclusive Variable
- C.) The Hypothesis
- D.) Independent Variable
- E.) Control



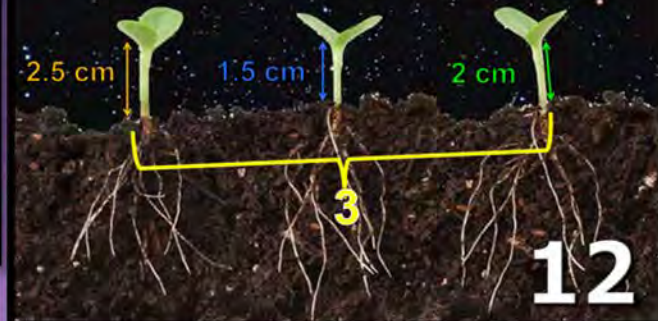
Which is the, **independent variable**, **problem**, control, and dependent variable?

Problem	Independent Variable (Change)	C	D
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)	Growth of the plant, Height, number of leaves, flowers, etc	Same amount of soil, light, water, space, all the same.



- What is the average height of the three plants below.

$$2.5 + 1.5 + 2.0 = 6.0 \text{ cm} / 3 = 2.0 \text{ cm}$$

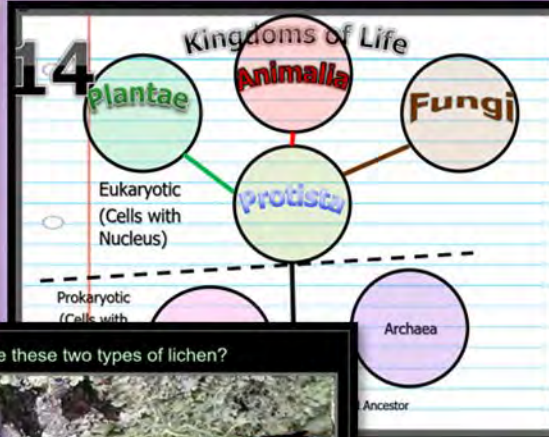


12

- What is the average / mean amount of pizza slices eaten by the students?



13



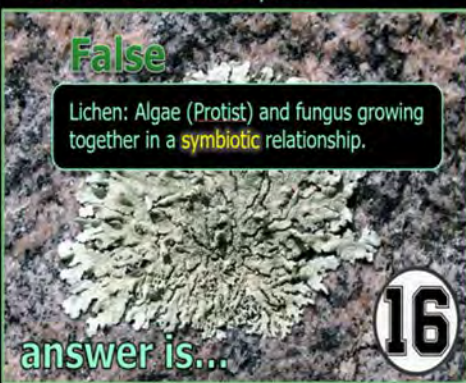
14

- Cyanobacteria are bacteria that photosynthesize (Unicellular)
- Algae are photosynthetic protists (Unicellular with no roots, leaves, stems)
- Plants are photosynthetic (Multi-cellular and have leaves, roots, stems)



15

- True or False? This is a plant?

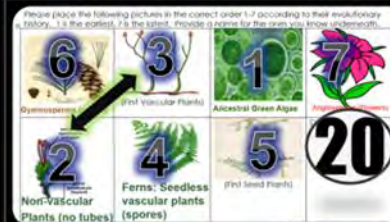


False

Lichen: Algae (Protist) and fungus growing together in a **symbiotic** relationship.

16

- Name these two types of lichen?



Which two are switched / In the wrong order?



Which two are switched?

18

- Which is a gymnosperm, and which is an angiosperm? Which one evolved first?



19

Quiz Game Non-vascular plants

4 True or False? This is a non-vascular plant?
False! Vascular Plant 2

Flowers

1 Vascular Tissues

5 Bryophytes

3 True or False? This is a non-vascular plant?
True! Hornwort

What are the names of these tissues that bring water and nutrients up and down a plant?

20 Questions

8 Ferns reproduce using bisexual spores.

6 Moss

7 True or False? This is true moss hanging from these trees in the Southern United States.
False! Called Spanish Moss but its not a moss.

4 True or False? These are seeds on this bryophyte.
False! These are moss capsules that contain spores.

9 Which is the gametophyte generation and which is the sporophyte generation?

8 Name the parts of this moss

Part 2

10 Sphagnum moss is moisture loving moss that carpets the ground in wet areas.
They play a vital role in the creation of peat moss / bogs: by storing water in their spongy forms, they prevent the decay of dead plant material.

Peat Moss Sphagnum Moss

12 The bryophyte lifecycle consists of alternating generations between the gametophyte and the sporophyte.
The two gametes (sperm and egg) fuse, a zygote is formed.
The zygote of bryophytes grows inside the archegonium and will eventually become a sporophyte.

Name the terms

Green Box =

Pink Box =

13 Which terms are switched?

gametophyte

sperm eggs

archegonium

sporophyte

14 This is a picture of a fern...

A.) Gametophyte
B.) Setae
C.) Rhizome
D.) Sporangia
E.) Frond

11 Name the plants?

A Liverwort B Hornwort

15 The moss life cycle relies heavily on this for fertilization...

Mosses produce both male and female sex organs (antheridia and archegonia, respectively) on their leafy gametophytes. These organs require a film of water for the male sperm to swim to the egg and complete fertilization. After fertilization, a sporophyte develops, which then produces spores that are dispersed, and the cycle restarts when these spores land on a surface and germinate.

A.) Soil
B.) Air
C.) Nutrients
D.) Moisture
E.) Roots
F.) Insects

with Answer Version

16 Which one is not a seedless vascular plant?

A.) Lycophytes (Seedless Vascular)
B.) Sphenophytes (Seedless Vascular)
C.) Polyploids (Seedless Vascular)
D.) Gymnosperm (Cone / Seed Bearing Vascular Plant)
E.) Pteridophytes (Seedless Vascular)

17 What is in the missing boxes...
A.) Egg, Spore, Gamete, Water
B.) Sporophyte, Meiosis, Gametophyte, Fertilization
C.) Water, Spores, Seeds, Flower
D.) Sporangia, Water, Mitosis, Eggs

Alternation of Generations Life Cycle

18 Which is male? and which is female?

Male (Sperm 1p)
Female (Egg 1p)

19 Name this plant?
Horsetails

20 Ferns reproduce using bisexual spores.

What is this?
Bisexual Gametophyte

Note: The Archegonium is here...

answer is...

Seeds and Young Plants Quiz Game

• What is this and what's stored here?

1 The Svalbard Global Seed Vault



Aka "Doomsday Vault"

• Name all 5. One point each

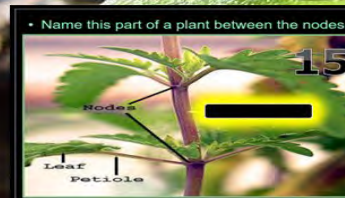
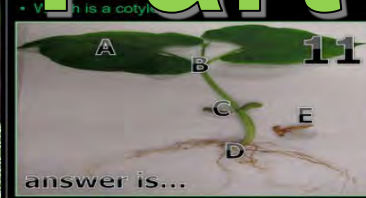
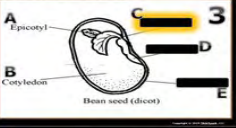
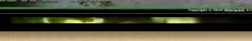
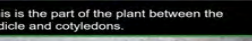
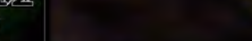
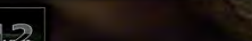
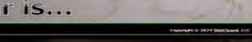
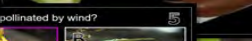


• Seed: A mature unfertilized plant ovule consisting of an embryo and its food source and having a protective coat.



• All of the following are factors that break seed dormancy except...

- A.) Gravitropism
- B.) Mechanical Abrasion
- C.) Digestion processes of animals
- D.) Temperatures - Warm and Cold + Fire
- E.) Water



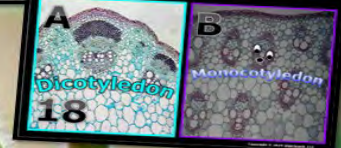
• Which cone is the male cone, and which cone is the female cone?



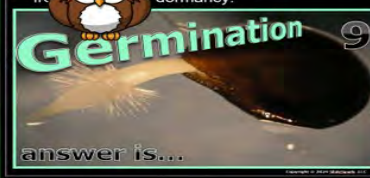
• What mechanism disperses these seeds?



• Which is a monocotyledon and which is a dicotyledon?



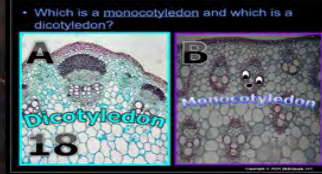
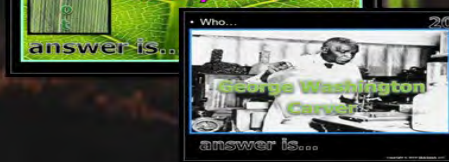
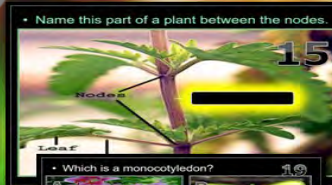
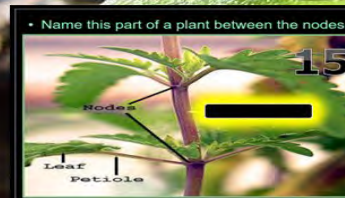
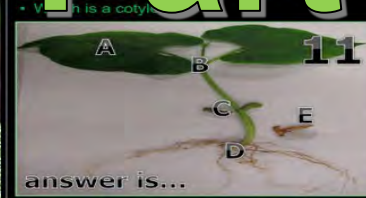
• This process whereby growth emerges from dormancy.



• What mechanism disperses these seeds?



w/ Answer Version



Woody Plants, Plant Tissues, Plant Hormones

QUIZ GAME

- 1
- Which is incorrect of roots?
 - A.) Usually underground portion of a plant.
 - B.) Contains buds and nodes.
 - C.) Serves as support.
 - D.) Draws minerals and water from the surrounding soil.
 - E.) Sometimes stores food.

answer is...

- 2
- What's the role of these?
 - A.) Create sugar in photosynthesis.
 - B.) Disperse pollen.
 - C.) Disperse waste from the plant.
 - D.) Uptake water and nutrients.
 - E.) Resist plant hormone.

answer is...

20 Questions

- 3
- Which is a taproot and which is root?



name for this type of root?



and the answer is...

- 4
- Plants get the nutrients they need primarily from the...
 - A.) Air and Water.
 - B.) Sun, Leaves, and Stems.
 - C.) Soil and Air.
 - D.) Soil only.
 - E.) Plants can only get nutrients from man made fertilizers.

answer is...

- 5
- This is the name for the chemicals that affect flowering; aging; root growth; distortion; killing of leaves, stems, and other parts; prevention or promotion of stem elongation; color enhancement of fruit; prevention of leafing and/or leaf fall; and many other conditions.

Plant Hormones

- 6
- Auxin: Promotes stem elongation and bud dormancy.
 - Phototropism: When plants grow toward a light source.



and the answer is...

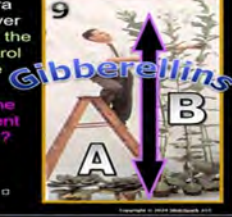
- 7
- This is the name for the cultivation of plants in a nutrient solution rather than in soil.



and the answer is...

- 8
- Plant B shows extra stem elongation over plant A. Plant A is the normal plant / control while plant B is the variable.
 - What plant hormone was the independent variable given to B?

answer is...



- 9
- Ethylene does all of the following except...
 - A.) Stimulates the release of seed dormancy.
 - B.) Stimulates shoot and root growth.
 - C.) Promotes cell division. They are produced in growing areas like the tips.
 - D.) Stimulates leaf and fruit abscission.
 - E.) Creates femaleness in flowers.
 - F.) Stimulates flower opening.
 - G.) Stimulates flower and leaf dying.

answer is...

- 10
- Tubes in the plant that food (sugar) moves through.



and the answer is...

- 11
- Which letter represents the living layer of cells in this hardwood?

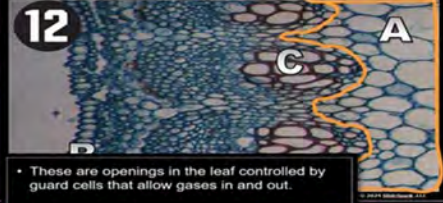


answer is...

- 12
- Which of the following equations is the correct equation for photosynthesis?
 - A.) $6O_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
 - B.) $6CO_2 + 6H_2O + \text{sugar} = C_6H_{12}O_6 + 6O_2$
 - C.) $6CO_2 + 6CO_2 + \text{light energy} = C_6H_{12}O_6 + 6H_2O$
 - D.) $6CO_2 + 6H_2 + \text{light energy} = C_6H_{12}O_6 + 6H_2O$
 - E.) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
 - F.) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
 - G.) $6CO_2 + 6H_2O + \text{sugar} = C_6H_{12}O_6 + 6O_2$
 - H.) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6CO_2$
 - I.) $6CO_2 + H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
 - J.) $C_6H_{12}O_6 = 6CO_2 + 6H_2O + \text{light energy} + 6O_2$
 - K.) None of the above.

answer is...

- 13
- A = Ground Tissue, B = Dermal Tissue
 - C = Vascular Tissue



answer is...

- 14
- Name the very important tissue below...
 - Part of a plants vascular system.
 - Tubes that water and minerals move through.
 - Water travels up the tree from roots to leaves.
 - Old types of these cells help to support the plant



and the answer is...

- 15
- A leaf is a plant organ, that is...
 - contains...
 - and is usually...
 - can penetrate.



and the answer is...

- 16
- Which is the heartwood, sapwood, cambium, and pith?



and the answer is...

- 17
- This term for the dating of past events through study of tree ring growth.
 - How old is this tree (+1 point)



answer is...

- 18
- This is the name for the evaporation of water from plants.
 - It occurs during photosynthesis.
 - Helps pull water up the xylem from roots.
 - Cools the leaf.



answer is...

Plant Life Cycles Quiz Game

• Which one below is the perfect flower?

A Male
B Female

Female
answer is... 12

• Name A and B and C?

stigma
A
B Style
C
Pistil 15

• These are the names for the green leaves that cover the outside of a flower bud to protect it before opening.

Sepals
answer is... 17

• Which one is a Berry, Aggregate, Pome and Dehiscent Fruit?

A Aggregate
B Dehiscent
C Pome
D Berry

• Name A, B, and C?

Anther A
B Filament
C =
Stamen
Pollen 13
A and B

Part 5

• These are the names for the green leaves that cover the outside of a flower bud to protect it before opening.

Sepals
answer is... 17

• Which is a fruit and which is a vegetable?

A
B
19

• Identify this type of tree

Maples
answer is... 20

• What type of fruit is this plum? Drupe
— It developed from one ovary and has one seed.
— Please label the endocarp, mesocarp, and exocarp.

A
B
C
Drupe
20

• Identify this tree.

White Pine
PINE
5
answer is...

with
Answer Version

This is the name for plants that live for many years producing seeds.

Perennial
answer is... 6

• Carrots are examples of biennials. They live through their first winter and produce seeds before dying.

7 Biennials

• Name this type of tree?

Cedar
North Atlantic White Cedar
answer is... 3

20 Questions

• Please name A and B.
— Hint: You can try and unscramble the words.

angiosperm
gymnosperm

Which one evolved first?
10

• These are the types of plants and shrubs that lose leaves in fall and grow them back in spring.

Deciduous
8
answer is...

• All plants undergo sexual reproduction (two partners). When the sperm and egg come together you get a baby plant.

9

• Identify this type of tree.

hemlock
Asteraceae family
4

• This is the name for a matured ovary in the pistil that contains the seeds.

Fruit
18

• This is at the bottom of the flower. It has the seeds inside and turns into the fruit when fertilized. (contains ovules)

ovary
14
answer is...

• What is this....

POLLEN
11

• Flowers attract pollinators through all of the following except...

A.) Fragrance (smell)
B.) Nectar (food)
C.) Storms (wind)
D.) Colors (sight)

16
answer...

Activities / Labs

Our science activities are designed to help students explore and understand complex scientific concepts in an engaging and interactive way. Each science unit includes several hands-on activities that encourage students to collect data and think critically about the world around them. Our easy-to-follow slideshow provides detailed visuals, simple materials, and clear directions, making it easy for both students and teachers to navigate the activities.

• Activity! Flower Dissection.

- Remove the parts of the flower (Be delicate)
- Line them up in your journal and label them.
- Once labeled, place clear tape on top.



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Part 3 Lesson 4: Flower Dissection

Activity! Flower Dissection.

- Remove the parts of the flower (Be delicate)
- Line them up in your journal and label them.
- Once labeled, place clear tape on top.

Quiz Wk 1-10, Name that part of the flower. Some answers can be used more than once.

	1)	2)	3)
4)	5)	6)	
7)	8)	9)	
10)	11)		

Plant Life Cycles Dramatic Dance.

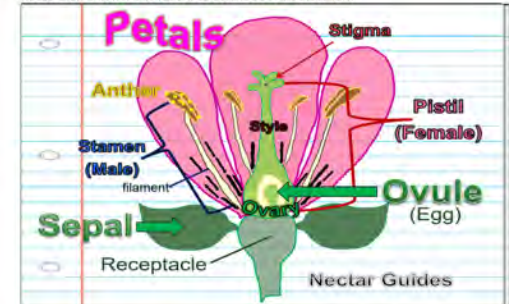
- Class will be divided into three groups (Annuals, Biennials, Perennials)
- Each group will have 15 minutes to plan an interpretive dance that explains their life cycle.
- Group should not discuss the cycle with words but instead with dance and drama.
- Group can have a narrator only if really needed. (Not recommended)

Notes for Dramatic Plant Life Cycle Skit

Part 3 Lesson 5: Parts of a Flower

Flower: The reproductive organ of a plant that makes the **seed**.

Please draw a flower and label it as described in the slideshow.



Stamen – **Male** part of flower (sperm).

Filament: **Supports** the anther.

Anther: Part of the stamen that holds the **pollen**.

Pistil: Female part of flower (egg).

Stigma: Sticky tube in the center of the flower. Receives the **pollen** grains.

Style: Long **tube** that the stigma sits on top of.

Ovary: On bottom of the flower, has the **seeds** inside and **turns** into the fruit.

Contains the ovules.

Ovule: The part of the **ovary** that becomes the seeds.

Petal: The colorful, often bright part of the flower. They attract **pollinators**.

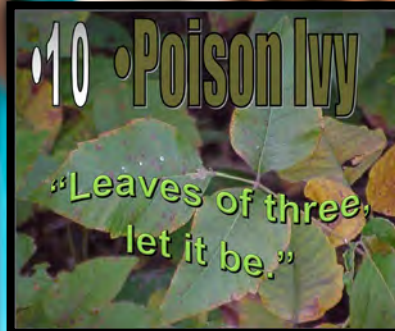
Sepal: Green leaves that cover the outside of a flower bud to **protect** the flower before it opens.

Built-in Assessment

Each unit contains several built-in assessment questions that students answer in their work bundle. With the question revealed before the answer, the teacher can easily call on individual students or table groups to respond. These provide an effective and efficient way for teachers to assess student learning.

- Quiz Wiz –Poison Ivy Identification. 1-10, Write Poison Ivy for the slides that are, and Not Ivy for the others.

QUIZ WIZ



Name this plant!



Poison Ivy: A North American _____ plant of the cashew family that occurs on many farms and roads, which can cause _____.

Please describe Poison Ivy in the Spring, Summer, Fall, and Winter. Sketches work as well.

Spring	Summer	Fall	Winter

Quiz Wiz –Poison Ivy Identification. 1-10. Write Poison Ivy for the slides that are, and Not Ivy for the others.

1)	2)	3)
4)	5)	6)
7)	8)	9)
10)		

Work Bundle

Built-in Video Links

Our science education program is designed with the modern, multimedia learner in mind, and our video and academic links are a perfect complement to our educational materials. These short clips are embedded into the slideshow at just the right places for a fantastic review. Whether you're studying biology, chemistry or physics, the links are an excellent way to reinforce your learning.

- Visit the link below and try and identify this tree species.

– <http://www.oplin.org/tree/leaf/byleaf.html>



Poison Ivy, the stuff you don't know yet.

<https://www.youtube.com/watch?v=zKEjXRKa0A>



- Video Link! Flowers opening and closing time lapse.

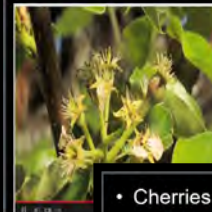
– <http://www.youtube.com/watch?v=E1xv0T2auJU>



- Video Link! Flower to fruit time lapse and animation.

– <http://www.youtube.com/watch?v=zVNsCW6eiiw>

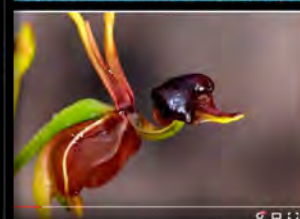
– <http://www.youtube.com/watch?v=sEwmUbzN-g>



- Video! 10 Neat looking flowers.

ne names are a little inappropriate.

www.youtube.com/watch?v=3gNik3FAB5c



- Video Link! Plant Life Cycles – Optional and Advanced.

– Covers the topic more advanced.

– <http://www.youtube.com/watch?v=AyKzPernLs7Q>



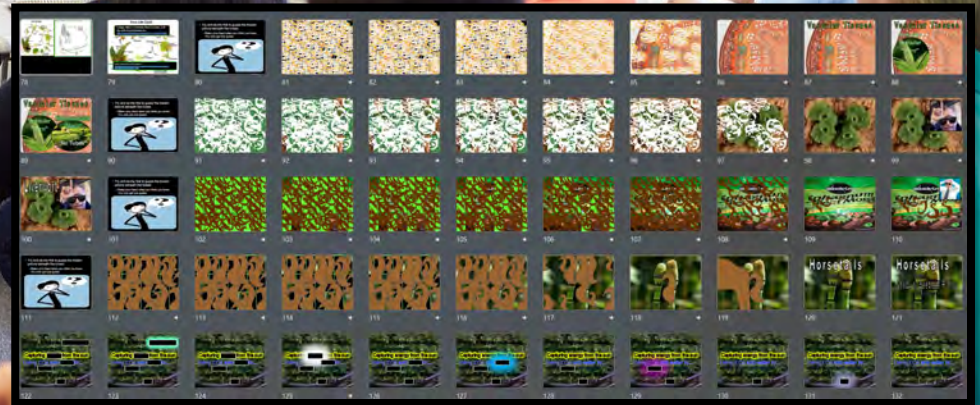
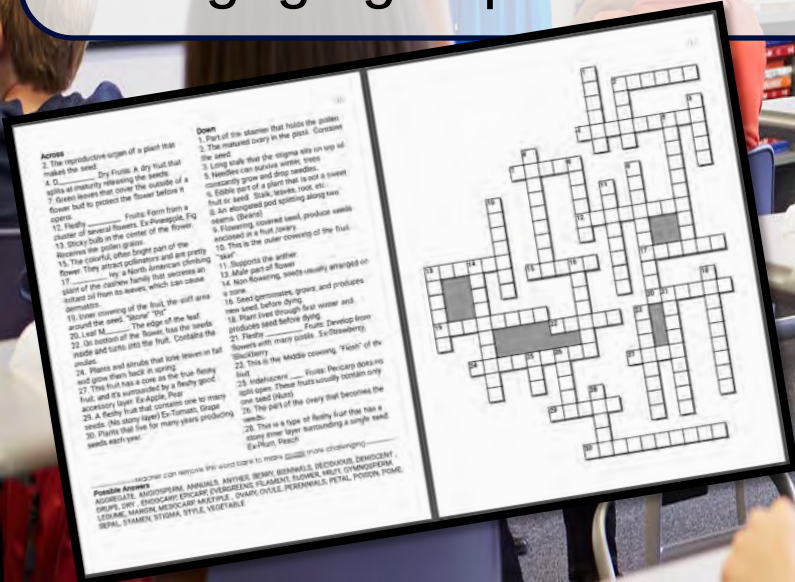
- Cherries from flower to fruit.

– <https://www.youtube.com/watch?v=Q80pcN0lp8s>



Games and Review

Games are a fantastic way for students to learn scientific concepts while having fun. We incorporate a variety of games into our curriculum, including interactive quizzes and puzzles that challenge students to think critically about the material. Our Hidden Box Games are a particularly popular feature, which conclude each unit by revealing a picture related to the topic. Students try to guess what the picture might be, making learning an engaging experience.



• Eastern White Cedar:



Copyright © 2014 Wildlife LLC

• Eastern White Cedar:



Copyright © 2014 Wildlife LLC



The Owl - Each Part of the slideshow has a small clipart Owl hiding somewhere in a slide. The owl is incredibly small and blended into just the right slide. If a student spots the "Owl" they can raise their hand high into the air. When you call upon the student they can say "Owl" and be the student who spotted the Owl. Each PowerPoint Review game also has an owl hiding in it worth one point. Remind the students that they secretly write the word "owl" rather than yell it out during the review games. The Owl search is not included in every lesson. A slide at the beginning of the lesson will alert the students that today is an "Owl" day. Everything arrives editable so delete if you wish. You will find that some students will become the expert owl hunters in the group.

Google Classroom Compatible

Our digital learning programs are designed for students to learn science in a flexible and engaging environment. Our Google Classroom-compatible units provide a seamless learning experience whether your students are in the classroom or learning from home. Our step-by-step slideshows and student work bundles ensure that students can complete their work independently. The PowerPoint Slideshows and step-by-step work bundles can easily be loaded to your Google Drive and posted in your Google Classroom. These are great for daily lessons, students who need additional time, and for a student who was absent and looking to catch up in their work bundle.

 Fire Ecology Part 6 Lesson 3	Part 6 Lesson 3 Fire Ecology Google Slides	 Ecological Succession Part 6	Part 6 Lesson 2 Primary Succession Google Slides
 Ecological Succession Part 6	Part 6 Lesson 1 Ecological Succession Google Slides	 Field Study Part 6	Part 6 Lesson 5 Optimal Species Google Slides
 Nutrient Pollution Part 6	Part 6 Lesson 6 Aquatic Succession Google Slides	 Ecological Succession Review Game Part 6	Part 6 Lesson 7 Review Game Google Slides
 Ecological Succession Part 6	Part 6 Lesson 4 Wrap up and Review Google Slides		

Ecological Succession Unit also included



[Part 1 Lesson 2 Method Gro...](#)

Google Slides



[Part 1 Lesson 1 Botany Intro](#)

Google Slides



[Part 1 Lesson 3 Plant Evoluti...](#)

Google Slides



[Part 1 Lesson 4 Plant Evo Co...](#)

Google Slides



[Part 1 Lesson 7 Review Game](#)

Google Slides



[Part 2 Lesson 1 Intro](#)

Google Slides



[Part 2 Lesson 3 Moss Water ...](#)

Google Slides



[Part 2 Lesson 5 Ferns Horse...](#)

Google Slides



[Part 2 Lesson 2 Mosses](#)

Google Slides



[Part 2 Lesson 6 Review Game](#)

Google Slides



[Part 2 Lesson 4 Liverwort H...](#)

Google Slides



[Part 3 Lesson 8 Review Game](#)

Google Slides



[Part 3 Lesson 4 Young Plants](#)

Google Slides



[Part 3 Lesson 5 Young Plant...](#)

Google Slides



[Part 3 Lesson 1 Seeds](#)

Google Slides



[Part 3 Lesson 3 Seed Disper...](#)

Google Slides



[Part 3 Lesson 2 Seed Disper...](#)

Google Slides



[Part 3 Lesson 6 Monocots D...](#)

Google Slides



[Part 3 Lesson 7 George Was...](#)

Google Slides



[Part 4 Lesson 5 Woody](#)

Google Slides



[Part 4 Lesson 1 Roots](#)

Google Slides



[Part 4 Lesson 6 Dendrochro...](#)

Google Slides



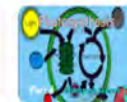
[Part 4 Lesson 2 Tropisms Hy...](#)

Google Slides



[Part 4 Lesson 3 Plant Horm...](#)

Google Slides



[Part 4 Lesson 8 Photosynth...](#)

Google Slides



[Part 4 Lesson 11 Review Ga...](#)

Google Slides



[Part 4 Lesson 4 Vascular Sy...](#)

Google Slides



[Part 4 Lesson 7 Leaf Proces...](#)

Google Slides



[Part 4 Lesson 10 Review Ga...](#)

Google Slides



[Part 4 Lesson 9 Wrap Up](#)

Google Slides



[Part 5 Lesson 4 Plant Life C...](#)

Google Slides



[Part 5 Lesson 3 Tree Identifi...](#)

Google Slides



[Part 5 Lesson 5 Flowers](#)

Google Slides



[Part 5 Lesson 6 Dissection...](#)

Google Slides



[Part 5 Lesson 10 Review Ga...](#)

Google Slides



[Part 5 Lesson 1 Leaf Identifi...](#)

Google Slides



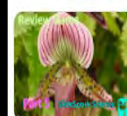
[Part 5 Lesson 7 Fruits and V...](#)

Google Slides



[Part 5 Lesson 8 Parts of a Fr...](#)

Google Slides



[Part 5 Lesson 9 Review Game](#)

Google Slides



[Part 5 Lesson 2 Poison Ivy](#)

Google Slides

Built-in Questions and Assessments

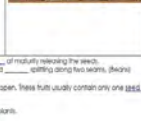
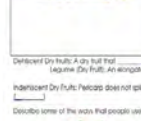
Many slides will have relevant terms covered with a box. When advancing through the slideshow an outline around the box will glow with a bright color. The next slide will make the box disappear. These slides allow the teacher to call upon students or table groups / check for understanding before advancing. The team at SlideSpark has found that using this technique helps to keep the students focused. Constantly recalling and reviewing information learned is necessary when moving through a large unit. The slideshows don't just give everything away for free. Students should be able to demonstrate knowledge before moving on. Some slides have full questions instead of just covered terms. In these slides, the teacher should encourage small group work. The teacher can then call upon one or two groups to share before advancing the slide. The next slide will always reveal the correct answer.

• Which one is a vegetable?



• Which one is a vegetable?

D, Stem, Has no seeds



Delectable Dry fruits: A dry fruit that _____ of maturity releasing the seeds.
Legume: Dry fruits, are elongated _____ splitting open to release seeds.
Induricent Dry fruits: Peaches do not split open, these fruits usually contain only one seed.
Describes some of the ways that people use plants.



Botany Unit

Botany Unit

Plant Topics / Botany Unit

5 Parts, 50 Lessons, (5th-7th Grade -Medium Difficulty) Part 1 Introduces Plant Project and Plant Evolution, 7 Lesson 18 Page Work Bundle, Part 2 is about Non-vascular Plants and is 6 Lessons and 12 Page Work Bundle, Part 3 is Seeds and Young Plants, and has 8 Lessons and 19 Page Work Bundle. Part 4 has 11 Lessons and 20 Page Bundle, Part 5 is Leaves and Plant Life Cycles and has 10 Lessons and 18 Page Work Bundle.

-Areas of Focus in The Plant Unit: Cool Facts about Plants, Plant Evolution, Importance of Algae, Lichens, The Three Types of Lichens, Non-Vascular Plants, Bryophytes, Seedless Vascular Plants (Ferns), Seeds, Seed Dormancy, Factors that Break Seed Dormancy, Germination, Parts of a Young Plant, Monocots and Dicots, Roots and Water, Types of Roots, Water Uptake and Photosynthesis, Plant Hormones, Types of Plant Tissues, Xylem and Phloem, Woody Plants, Leaves, Light and Plants, Transpiration, Guard Cells, Leaf Identification, Plant Life Cycles, Seed Plant Life Cycles, Parts of a Flower, Matured Ovaries (Fruits), Types of Fruit.



Part 1 has 7 Lessons of 50 Minutes and 18 Page Work Bundle, Definition of a Plant and Breaking that Definition Down, Plant and Animal Cells, Ways Humans Use Plants, Energy Flow of Life, Visual Tour of Some Amazing Plants, Types of Scientist, Scientific Method, Step by Step Drawing of Scientific Method, Understanding Variables, Control, Setting Up Grow Study for Entire Unit, Averages, Finding Averages, Plant Evolution, Kingdoms of Life Diagram, Side Bar on Protists / Algae, Importance of Algae, Looking at Algae under microscope, How to make a Wet Mount Slide, Brown Algae, First Land Plants, Challenges of Early Plants to Terrestrial Environment, First Vascular Plants, Carboniferous Period and Fossil Fuels, Flow Chart of Plant Evolution, Cycads and Gingko, Gnetum & Welwitschia, Gymnosperms, Angiosperms, Timeline Review, Optional lesson on Lichens (Kingdom Fungi), Lichen, Algae Fungi Symbiosis, Types of Lichen, Lichen Field Trip Outside, Quiz on Types of Lichen, Types Introduction to Plants, Set-up of Grow Study, The Scientific Method, Plant Evolution, Plants, Set-up of Grow, Study, The Scientific Method, Plant Evolution

Part 2: 6 Lessons of 50 Minutes and 12 Page Work Bundle, Non-Vascular Plants, Visual Quiz of Vascular vs. Non-vascular, Bryophytes, Moss, Parts of a Bryophyte, Sphagnum Moss, Moss Water Retention Study where students create their own to study to record how much water a clump of moss can retain, Liverworts, Hornworts, Visual Quiz, Bryophyte Life Cycle Diagram, Sporophyte, Gametophyte, Alternations of Generations, Seedless Vascular Plants, Ferns, Fern Life Cycle, Horsetails, Box Games, Crossword Puzzle, End Unit Assessment

Part 3: 8 Lessons of 50 Minutes and 19 Page Work Bundle, Svalbard Seed Depository Case Study, Breakdown of the Definition of a Seed, Parts of a Seed, Seed Dissection Activity, Seed Coat, Seed Dormancy, Factors that Break Seed Dormancy, Parts of a Seed, Factors that break Seed Dormancy, Seed Dispersal, Wind, Male and Female Cones of Gymnosperm, Seed Dispersal Project where student design a seed to be dispersed by wind, Water Dispersal, Animal Dispersal, Tension Dispersal, Visual Quiz of Seed Dispersal Mechanism, Germination, Germination Observation Activity, Peanut Allergies, Parts of Young Plants, Cotyledon, Radicle, Gravitropism, Hypocotyl, Epicotyl, Foliage Leaves, Stems, Nodes, Internodes, Petioles, Visual Quiz Name that part of a Young Plant, Monocotyledons, Dicotyledons, Differences between the two, Visual Quiz of Mono or Dicot, Case Study on George Washington Carver, Box Game Review, Crossword Puzzle, End of Unit Assessment

Part 4: 11 Lessons of 50 minutes and 20 Page Work Bundle, Important Role of Roots, Types of Roots Water and Mineral Uptake, Root Hairs, Water Uptake and Photosynthesis, Hydroponics, Tropisms, + and – Tropism, Name that Tropism Challenge, Plant Hormones, Auxin, Gibberellins, Cytokinin, Absciscic Acid, Ethelene, Types of Plant Tissues, Xylem and Phloem, Woody Plants, Pith, Heartwood, Sapwood, Case Study on Maple Syrup, Cambium Layer, Porcupines and Beavers, Emerald Ash Borer, Inner Bark, Outer Bark, Tree Rings, Dendrochronology, Dendrochronology Lab, Chainsaw Safety, Breakdown of definition of a leaf, 3 Big Aspects of Plants and Light, Optional What's Inside a Leaf Chromatography, Chloroplasts, Photosynthesis, Photosynthetic Equation, Learning the Equation with M&M's, Review of Photosynthesis, Leaves, Light and Plants, Transpiration, Guard Cells, Box Games, Crossword Puzzle, Unit Assessment

Part 5: 10 Lessons of 50 Minutes and 18 Page Work Bundle, Leaf Identification, Leaf Rubbing Activity, Blades, Venation, Leaf Margins, Leaf Base, Leaf Apex, Petiole, Simple vs. Compound Leaves, Identifying some common leaves, Maples, Oak, Beech, Pines, Poisonous Plants, Case Study on Poison Ivy, Poison Ivy Identification, Ivy Identification Quiz, Other Poisonous Plants, Deciduous Trees, Conifers, Identifying Conifers, Tree Identification Visual Quiz, , Plant Life Cycles, Seed Plant Life Cycles, Gymnosperm, Male vs. Female Cone, Angiosperm, Pollen, Annuals, Biennials, Perennials, Interpretive Dance Plant Life Cycles Group Activity, Flowers, Amazing Flowers Visual Tour, Parts of a Flower, Step by Step drawing on a flower with Parts, Matured Ovaries (Fruits), Stamen, Filament, Anther, Pistil, Stigma, Style, Ovary, Ovule, Sepal, Petals, Nectar Guides, How Flowers Attract Pollinators, Flower Dissection Lab, Visual Quiz Name that Part of a Flower, Exotic Fruits Visual Tour, Poisonous Berries, How Flowers become Fruits, Fruit or Vegetable Visual Standing Quiz, Parts of a Fruit, Epicarp, Mesocarp, Endocarp, Fleshy and Dry Fruits, Simple Fruits, Berries, Drupe, Pome, Aggregate Fruit, Multiple Fruit, Dehiscent Dry Fruit, Legumes, Indehiscent, Animals and Fruits / Seed Dispersal, Uses of Plants Wrap-up, Box Game Review, Crossword Puzzle, Unit Assessment

Botany Unit Part 1 : Part 1 has 7 Lessons of 50 Minutes and 18 Page Work Bundle, Definition of a Plant and Breaking that Definition Down, Plant and Animal Cells, Ways Humans Use Plants, Energy Flow of Life, Visual Tour of Some Amazing Plants, Types of Scientist, Scientific Method, Step by Step Drawing of Scientific Method, Understanding Variables, Control, Setting Up Grow Study for Entire Unit, Averages, Finding Averages, Plant Evolution, Kingdoms of Life Diagram, Side Bar on Protists / Algae, Importance of Algae, Looking at Algae under microscope, How to make a Wet Mount Slide, Brown Algae, First Land Plants, Challenges of Early Plants to Terrestrial Environment, First Vascular Plants, Carboniferous Period and Fossil Fuels, Flow Chart of Plant Evolution, Cycads and Ginkgo, Gnetum & Welwitschia, Gymnosperms, Angiosperms, Timeline Review, Optional lesson on Lichens (Kingdom Fungi), Lichen, Algae Fungi Symbiosis, Types of Lichen, Lichen Field Trip Outside, Quiz on Types of Lichen, Types Introduction to Plants, Set-up of Grow Study, The Scientific Method, Plant Evolution, Plants, Set-up of Grow Study, The Scientific Method, Plant Evolution



Part 1 Lesson 1 Botany Intro



Part 1 Lesson 2 Method Grow Study



Part 1 Lesson 3 Plant Evolution



Part 1 Lesson 4 Plant Evo Cont



Part 1 Lesson 5 Opt Lichens



Part 1 Lesson 6 Review Game 10Q



Part 1 Lesson 7 Review Game Answers



Part 1 Work Bundle Answers



Part 1 Work Bundle Print

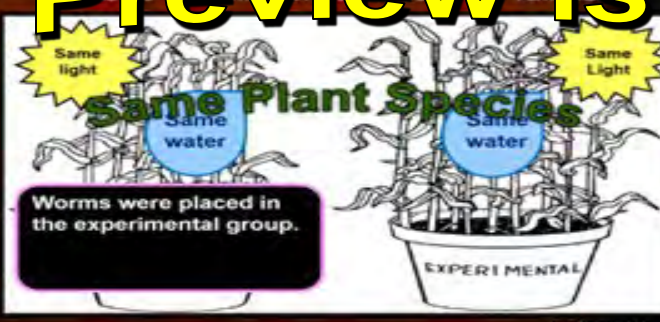


Part 1 Work Bundle Writable .pdf

Intro to Botany, Grow Study, Plant Evolution

Preview is a compressed file

- Control: (Same) Quantities that a scientist



- The average / mean is the sum of all values divided by the total number of values

$$2.4 + 1.7 + 2.0 = 6.1 \text{ cm} / 3 = 2.03 \text{ cm}$$



- All of the containers will need to be identical except for the one factor that is changed. That one factor is called the independent variable.



- Cyanobacteria are bacteria that photosynthesize (Unicellular)
- Algae are photosynthetic protists (Unicellular with no roots, leaves, stems)
- Plants are photosynthetic (Multi-cellular and have leaves, roots, stems)



First time Last



Which two are switched?

9

- Please find the average tree height in this sample. $5+6+6+10+10+10+15+15+23.6+23.6+30+30 = 182$



- Which one is a Ginkgo and which is a Cycad?



6 Lessons

Interactive Slideshow

- Some solutions
- Waxy coverings to prevent water loss.



- Gymnosperms / seed plants evolved before flowering seed plants.



- This is a picture of a plant cell. It has...
 - Protective cell walls.
 - Chloroplast for photosynthesis.
 - Large storage

Activity! Definition of a plant

- (Circle the words you don't know)
- Any of various photosynthetic, eukaryotic, multi-cellular organisms of the Kingdom Plantae characteristically producing embryos, containing chloroplasts, having cell wall made of cellulose, and lacking the power of locomotion.
- Photosynthetic – Makes sugar from light.
- Eukaryotic – Cells with a nucleus.
- Multi-cellular – Made of many cells.
- Embryo – Young organism that grows inside.
- Chloroplast – An organelle that does photosynthesis.
- Cellulose – A complicated and strong sugar.
- Locomotion – To move.

- The plants use the sun, and pass it on to all other life forms.
- Except for extreme bacteria on the ocean floor and their predators that use chemosynthesis.

SOLAR ENERGY & PHOTOSYNTHESIS

Carbon dioxide (CO_2) + Water (H_2O)

Carbon* ($\text{C}_6\text{H}_{12}\text{O}_6$) + Oxygen (O_2)

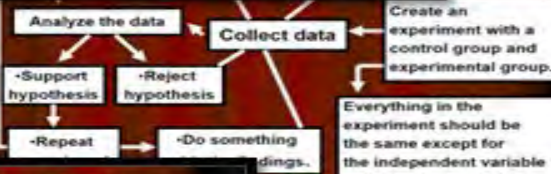
Carbon* = Carbohydrate

HYDROTHERMAL ENERGY & CHEMOSYNTHESIS

Carbon dioxide (CO_2) + Water (H_2O) + Hydrogen Sulfide (H_2S) + Oxygen (O_2)

Carbon* (CH_2O) + Sulphur

Carbon* = Carbohydrate



- Vascular plants appeared by 350 million years ago, with forests soon following by 300 million years ago.



- Video! Algae as a bio-fuel.
- Will algae power your car in the near future?
- http://www.youtube.com/watch?v=n9_-ZguuhBw



- Which one is a Ginkgo, Cycad, and which is a Gnetum of Gnetophyta?



Ginkgo



Gnetum



Cycad



- Scientific method. A process that is the basis for scientific inquiry
- (Questioning and experimenting).



Please place the following pictures in the correct order 1-7 according to their evolutionary history. 1 is the earliest, 7 is the latest. Provide a name for the ones you know underneath.

6 Gymnosperms (cones)	3 (First Vascular Plants)	1 Ancestral Green Algae	7 Angiosperms (Flowers)
2 Non-vascular Plants (no tubes)	4 Ferns: Seedless vascular plants (spores)	5 (First Seed Plants)	Draw a hornwort in the space below.

Follow Along Bundle

Part 1: Grow Study, Plant Evolution

Your partner or a group

Any of the following plants are suitable for the experiment. Please choose one of the following and fill in the table. (You can also choose a plant of your own choice.)

- Plantain (Banana)
- Spinach
- Broccoli
- Carrot
- Tomato
- Pepper
- Bean
- Onion
- Garlic
- Chive
- Herb (e.g. Basil, Mint, etc.)
- Any other plant of your choice

Form a group of 3-4 students. Each student will have a role to play in the experiment.

The purpose of this experiment is to study the growth of plants under different conditions. The aim is to see if the plants grow better in one condition than another.

Before the experiment, you should have a hypothesis about the results. Write down your hypothesis in the space provided.

During the experiment, you should record the growth of the plants in the table provided.

After the experiment, you should analyze the results and draw a conclusion.

Write down your conclusion in the space provided.

Finally, you should write a report about the experiment. This should include an introduction, a hypothesis, a description of the experiment, a table of results, a conclusion, and a bibliography.

Write your report in the space provided.

Remember to write clearly and use correct grammar.

Good luck with your experiment!

Teacher's name: _____

Date: _____

Class: _____

Page: _____

Version: _____

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Perimeter: _____

Mass: _____

Weight: _____

Force: _____

Energy: _____

Power: _____

Time: _____

Distance: _____

Speed: _____

Acceleration: _____

Velocity: _____

Momentum: _____

Impulse: _____

Work: _____

Energy: _____

Power: _____

Time: _____

Distance: _____

Speed: _____

Acceleration: _____

Velocity: _____

The purpose of this experiment is to study the growth of plants under different conditions. The aim is to see if the plants grow better in one condition than another.

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Force: _____

Energy: _____

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Acceleration: _____

Velocity: _____

Momentum: _____

Impulse: _____

Work: _____

Energy: _____

Power: _____

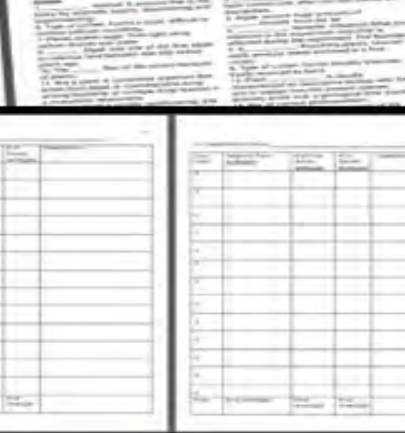
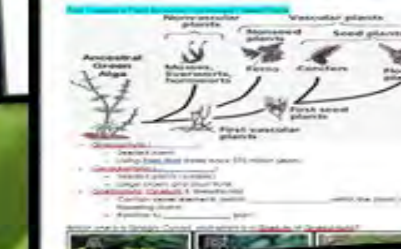
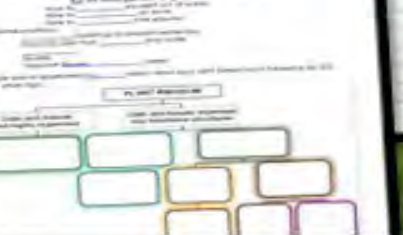
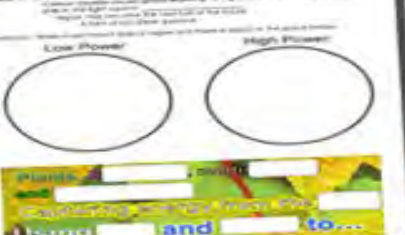
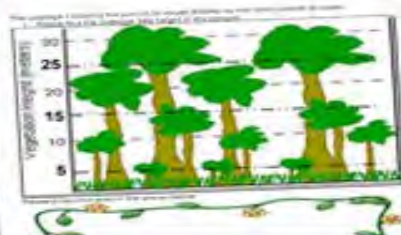
Time: _____

Distance: _____

Speed: _____

Acceleration: _____

Velocity: _____



Lab Set-up, Activities, Assessments, all built-in

your study could examine the type of soils

Loam	Loam	Sand	Sand	Clay	Clay	Gravel	Gravel
Loam	Loam	Sand	Sand	Clay	Clay	Gravel	Gravel

All given same amount of water and light

- Name the words under the boxes. (1pt each)

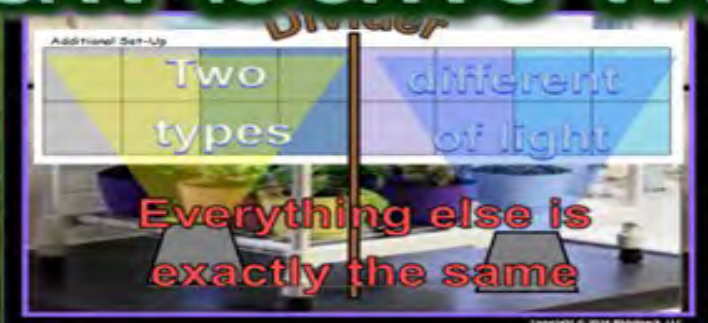
Plant: (noun) Any of various **photosynthetic**, **eukaryotic** multi-cellular organisms of the Kingdom Plantae characteristically producing embryos, containing **cellulose** having a cell wall made of cellulose, and lacking the power of locomotion.



Problem	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)	Growth of the plant, Height, number of leaves, flowers, etc	Same amount of soil, light, water, space, all the same.



- Algae: A simple, nonflowering, and typically aquatic plant of a large group that includes the seaweeds and many single-celled forms. Algae contain chlorophyll but lack true stems, roots, leaves, and vascular tissue.



- Plant Study Set-up and Data Collection Available Sheet.

Plant Study Set-Up

What is the purpose of the study? (What is the independent variable?)

What is the dependent variable?

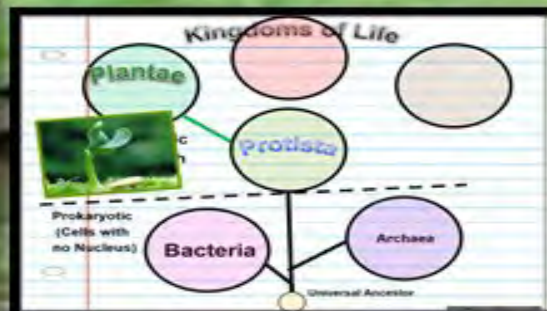
What is the control variable?

What is the control group?

What is the experimental group?

What is the control group?

What is the experimental group?



Botany Unit Part 2: 6 Lessons of 50 Minutes and 12 Page Work Bundle, Non-Vascular Plants, Visual Quiz of Vascular vs. Non-vascular, Bryophytes, Moss, Parts of a Bryophyte, Sphagnum Moss, Moss Water Retention Study where students create their own to study to record how much water a clump of moss can retain, Liverworts, Hornworts, Visual Quiz, Bryophyte Life Cycle Diagram, Sporophyte, Gametophyte, Alternations of Generations, Seedless Vascular Plants, Ferns, Fern Life Cycle, Horsetails, Box Games, Crossword Puzzle, End Unit Assessment

Botany Unit Part 2



Part 2 Lesson 1 Intro



Part 2 Lesson 2 Mosses



Part 2 Lesson 3 Moss Water Study



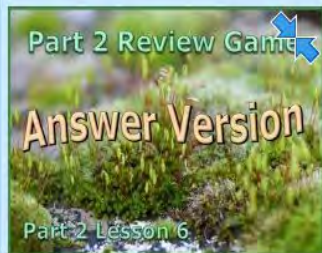
Part 2 Lesson 4 Liverwort Hornwort



Part 2 Lesson 5 Ferns Horsetails



Part 2 Lesson 6 Review Game



Part 2 Lesson 7 Review Game Answers



Part 2 Work Bundle Answers



Part 2 Work Bundle Print

Non-vascular Plants

Preview is a compressed file

Fern Life Cycle



- Which is the gametophyte generation and which is the sporophyte generation?



- Do not produce seeds or flowers.



- Do not produce seeds or flowers.

Not a seed → Calyptra covering a sporangium

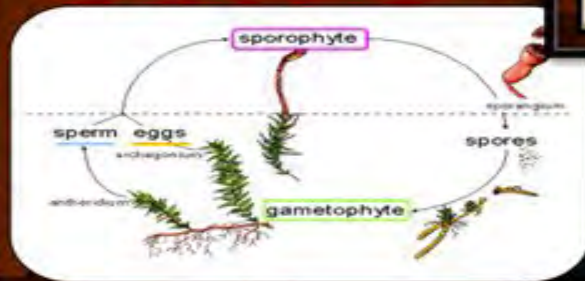
Let's see the capsule inside
Let's see the spores inside



- Design an experiment to solve...
 - Describe your experimental design (appropriate variables, data collection, dependent variable), as well as your set-up.
 - Show your design to the teacher and your experiments.



- Life Cycle (Alternation of Generations)



- This is a division of non-vascular plants that have no roots, stems, or leaves and transport nutrients using diffusion.



6 Lessons

Interactive Slideshows

- Peat Moss / Sphagnum: The partially decomposed remains of various mosses.
 - Retains water, adds to the acidity of the soil pH.



- The growth, death, and decay of mosses produces more humus, and soon there is enough to support the growth of grasses.



- Activity! Quiz Wiz, Vascular or Non-Vascular Plant. 1-10



– <https://www.youtube.com/watch?v=ogOhGlcJSuQ>



- Quiz Wiz 1-10 Stand and Identify the Non-vascular Bryophyte with a symbol
 - Moss, Liverwort, Hornwort.



Follow Along Bundle

Part 2 Non-Vascular Plants

Non-vascular plants:

- They have no vascular tissue in the stem to carry water and food up and down.
- The leaf structure tends to be thin.
- They live in the moist environment that lack the waxy, waxy cuticle that is found in vascular plants.

Activity: Rank the types of non-vascular plants 1-10

Rank	Plant Type	Rank	Plant Type
1		6	
2		7	
3		8	
4		9	
5		10	

Diagram: Division of non-vascular plants that have a stem, roots, and leaves (mosses and liverworts).

Hard Basal Stem, Leaf-like structures, Capsule, Stem, Rhizoid

Masses of Moss

Please design your own test to determine how much water can be absorbed by moss. The amount of water absorbed is measured by the amount of water that is absorbed by the moss.

Procedure: (How much water can be absorbed by moss?)

Materials:

Independent variable:

Dependent variable:

Control:

Please record your data with a ruler.

Variables: (Moss, Water, Time, Temperature, Humidity, etc.)

Conclusion:

Graph your findings:

Conclusion based on your data:

Diagram: A moss plant showing its structure: Hard Basal Stem, Leaf-like structures, Capsule, Stem, Rhizoid.

Diagram: A moss plant showing its structure: Hard Basal Stem, Leaf-like structures, Capsule, Stem, Rhizoid.

Diagram: A moss plant showing its structure: Hard Basal Stem, Leaf-like structures, Capsule, Stem, Rhizoid.

Diagram: A moss plant showing its structure: Hard Basal Stem, Leaf-like structures, Capsule, Stem, Rhizoid.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Diagram: The life cycle of a moss plant.

Activities, Built-in Assessments, and more

- New Area of Focus: Seedless Vascular Plants.



- Which is liverwort is **branched**, and which is **leafy**?



- Liverworts: A small flowerless green plant with leaflike stems or lobed leaves, occurring in moist habitats. Liverworts lack true roots and reproduce by means of spores released from capsules.



- Ferns reproduce using bisexual **spores**.



- They reproduce with spores located at the top of the horsetail.



- Please graph your data and then draw conclusion based on your graph.



- Sphagnum moss can hold up to twenty its dry weight in water.

— It's often used to help retain moisture in gardens and potted plants.

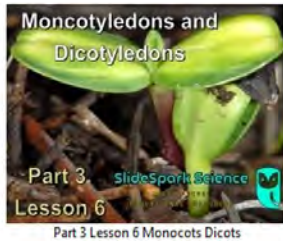
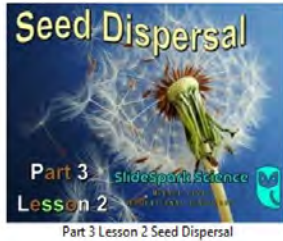


- Hornworts



Learn more about hornworts at:
<http://www.ucmp.berkeley.edu/vertebrates/anthocerotophyta.html>

Botany Unit Part 3 : 8 Lessons of 50 Minutes and 19 Page Work Bundle, Svalbard Seed Depository Case Study, Breakdown of the Definition of a Seed, Parts of a Seed, Seed Dissection Activity, Seed Coat, Seed Dormancy, Factors that Break Seed Dormancy, Parts of a Seed, Factors that break Seed Dormancy, Seed Dispersal, Wind, Male and Female Cones of Gymnosperm, Seed Dispersal Project where student design a seed to be dispersed by wind, Water Dispersal, Animal Dispersal, Tension Dispersal, Visual Quiz of Seed Dispersal Mechanism, Germination, Germination Observation Activity, Peanut Allergies, Parts of Young Plants, Cotyledon, Radicle, Gravitropism, Hypocotyl, Epicotyl, Foliage Leaves, Stems, Nodes, Internodes, Petioles, Visual Quiz Name that part of a Young Plant, Monocotyledons, Dicotyledons, Differences between the two, Visual Quiz of Mono or Dicot, Case Study on George Washington Carver, Box Game Review, Crossword Puzzle, End of Unit Assessment



Botany Unit Part 3

Seeds, Seed Dispersal, Young Plants and More

- **Dicotyledon:** A flowering plant with an embryo that bears two cotyledons (seed leaves).
- Dicotyledons constitute the larger of the two great divisions of flowering plants, and typically have broad, stalked leaves with netlike veins (e.g., daisies, hawthorns, oaks).



- This is the stem of a seedling or embryo located between the cotyledons and the first true leaves.



- Which is pollinated by wind?



- Which uses **insects**? Why?



- Activity! Video and Reading
- **George Washington Carver.**
– http://www.youtube.com/watch_popup?v=sdzEXTNltdc



- Which is a **dicotyledon**?



- All of the following are factors that break seed dormancy except...

- A.) **Gravitropism**
- B.) Mechanical Abrasion
- C.) Digestion processes of animals
- D.) Temperatures – Warm and Cold
- E.) Water



8 Lessons

Interactive Slideshows

Seed Coat: Protects seed from drying out, aids in seed dispersal, opens when conditions are right.

seed coat

embryo



- Wind Dispersal: When wind can disperse either pollen or seeds.
- Most common dispersal mechanism.



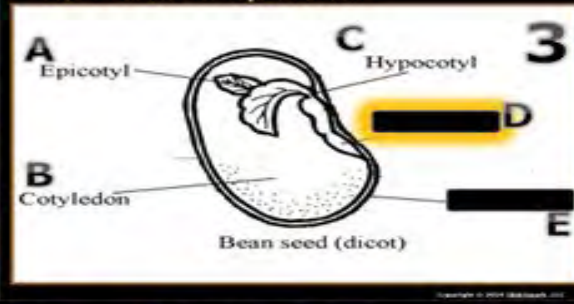
- Veins in leaf are parallel.



- Which cone is the male cone, and the female cone?



- Name all 5. One point each



Animal

9

Seed Coat



- Seed: (Hard) A mature fertilized plant ovule consisting of an embryo, its food source, and having a protective coat.



Gravitropism: Response of a plant in relation to gravity. Roots go down, shoots go up.

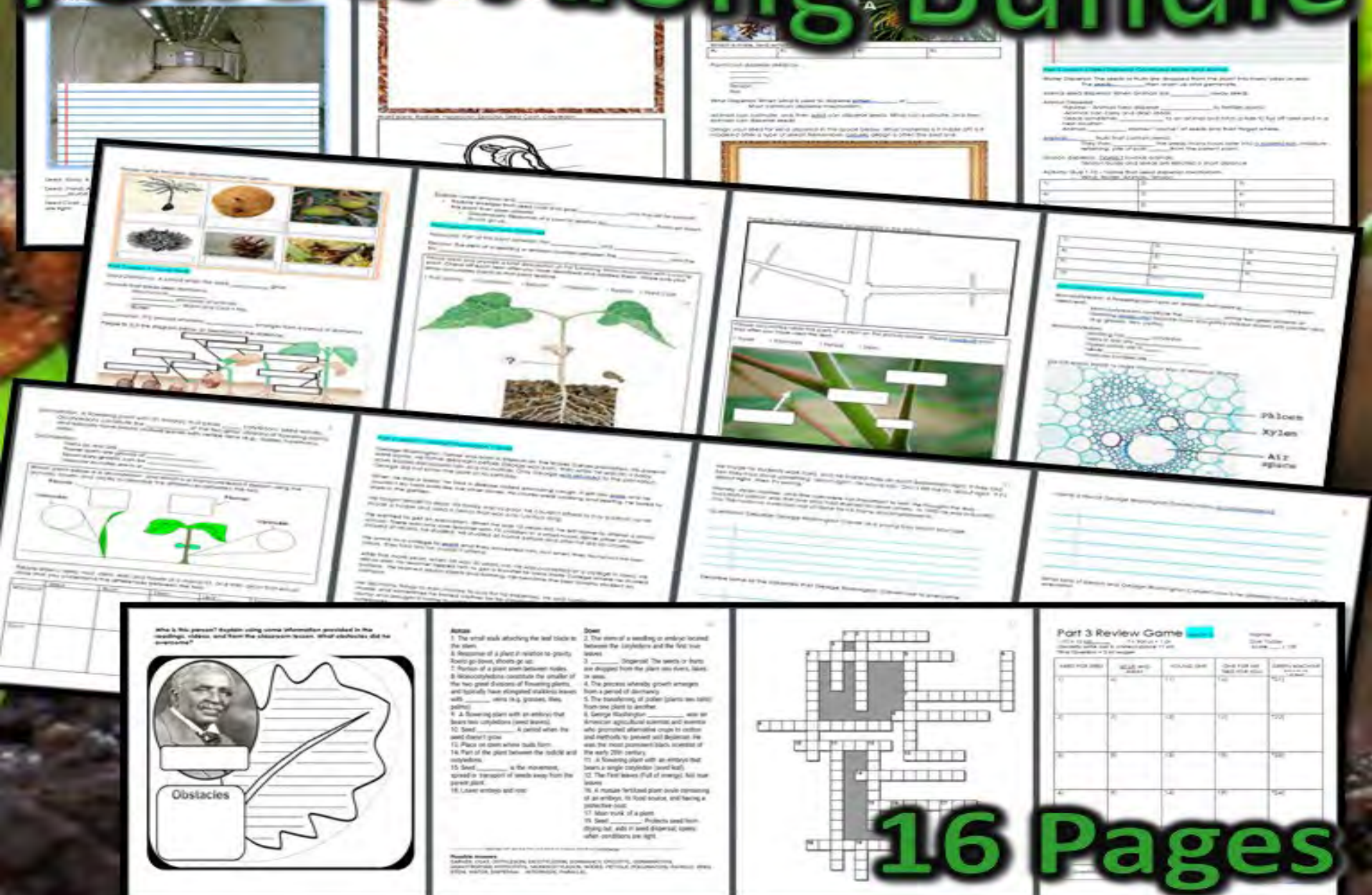


Positive Gravitropism



Negative Gravitropism

Follow Along Bundle



16 Pages

Activities, Quizzes, Games and more all built-in

- Germination: The process whereby growth emerges from a period of dormancy.



- Which is a cotyledon?



- Plants use wind to pollinate
- Pollination: The transferring sex cells) from one plant to



- Wind can pollinate, and then animals can disperse seeds.



- Water Dispersal: The seeds or fruits are dropped from the plant into rivers, lakes or seas.
- The seeds float then wash up and germinate.



- Name this part of a plant between the nodes.



Dormant seeds can survive

- Freezing temperatures.
- Droughts.

Desert Dry Years



- Seeds sometimes stick to an animal and hitch a ride to fall off later and in a new location.



Botany Unit Part 4: 11 Lessons of 50 minutes and 20 Page Work Bundle,
Important Role of Roots, Types of Roots Water and Mineral Uptake, Root Hairs,
Water Uptake and Photosynthesis, Hydroponics, Tropisms, + and – Tropism,
Name that Tropism Challenge, Plant Hormones, Auxin, Gibberellins,
Cytokinin, Absciscic Acid, Ethelene, Types of Plant Tissues, Xylem and Phloem,
Woody Plants, Pith, Heartwood, Sapwood, Case Study on Maple Syrup,
Cambium Layer, Porcupines and Beavers, Emerald Ash Borer, Inner Bark,
Outer Bark, Tree Rings, Dendrochronology, Dendrochronology Lab, Chainsaw
Safety, Breakdown of definition of a leaf, 3 Big Aspects of Plants and Light,
Optional What's Inside a Leaf Chromatography, Chloroplasts, Photosynthesis,
Photosynthetic Equation, Learning the Equation with M&M's, Review of
Photosynthesis, Leaves, Light and Plants, Transpiration, Guard Cells, Box
Games, Crossword Puzzle, Unit Assessment

Botany Unit Part 4



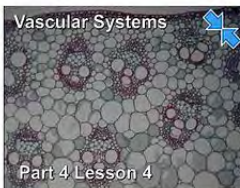
Part 4 Lesson 1 Roots



Part 4 Lesson 2 Tropisms Hydroponics



Part 4 Lesson 3 Plant Hormones



Part 4 Lesson 4 Vascular Systems



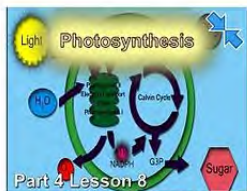
Part 4 Lesson 5 Woody



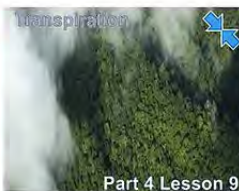
Part 4 Lesson 6 Dendrochronology



Part 4 Lesson 7 Leaf Processes



Part 4 Lesson 8 Photosynthesis Cont



Part 4 Lesson 9 Wrap Up



Part 4 Lesson 10 Review Game



Part 4 Lesson 11 Review Game Answers



Part 4 Work Bundle Answers



Part 4 Work Bundle Print

Roots, Hormones, Vascular Tissue, Trophism, Woody Plants, and more

Preview is a compressed file

- Old xylem doesn't supports plant. (Xylem)

6 Carbon Dioxide

6 Water

Sugar
 $C_6H_{12}O_6$

- The big three aspects of light and plants.

- Quality (how good)
- Quantity (how much)
- -



- Root Hairs: Hairlike extensions of root to absorb water and nutrients.

- Very delicate (damaged when transplanted).



- Activity (Optional) Root Growth.
- Cut leaf close to the stem.
- African Violet works well, many other species that propagate from cuttings can be explored.
- Add fertilizer to some water in.
- Root growth will appear in a few weeks.

- Draws **minerals** and water from the surrounding soil.

7	N	14.007
15	P	30.974
19	K	39.098

Important plant nutrients for healthy growth

- A = Vascular
- C = Dermis



- The cambium also adds a layer of cells each year.

- Scientists can age the tree and examine factors such as climate based on these rings.



This is the name for the cultivation of plants in solution rather than in soil.

Hydroponics

the answer is...

Interactive Slideshows

- Usually the underground portion of a plant.



- Hydroponics: The sand, gravel, or but without soil.



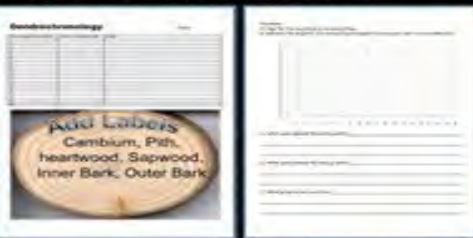
- Activity! Carrot and Celery Dissection. Please carefully dissect both and draw the vascular system. Provide a cross cut view.



- There are two main types of roots.



- Dendrochronology Available Sheet



- What's the role of these?
 - A.) Create sugar in photosynthesis
 - B.) Disperse pollen.
 - C.) Disperse waste from the plant.
 - D.) Uptake water and nutrients.
 - E.) Resist plant hormones.



Absciscic Acid...

- Inhibits shoot growth.
- Induces seeds to synthesize storage proteins.
- Helps to recognize and fix wounding on an injured plant.



Which is Auxin and v

berrellins also...

Stimulates flowering in response to long days.
Breaks seed dormancy
Induces maleness in some flowers (sex expression).
Can cause fruit development.
Can delay dropping of leaves and citrus fruits.

- Stimulates cell division.
- Stimulates differentiation of phloem and xylem
- Response of bending in response to gravity and light.
- Delays growth of lateral buds.
- Can induce fruit setting and growth in some plants.
- Delays fruit ripening.
- Stimulates growth of flower parts.

- Tropism: Growth or turning movement of a plant in response to an environmental stimulus.

- Light, water, gravity, temperature / seasons.



- Which root is a taproot, and which is a fibrous root?



- Equation for Photosynthesis



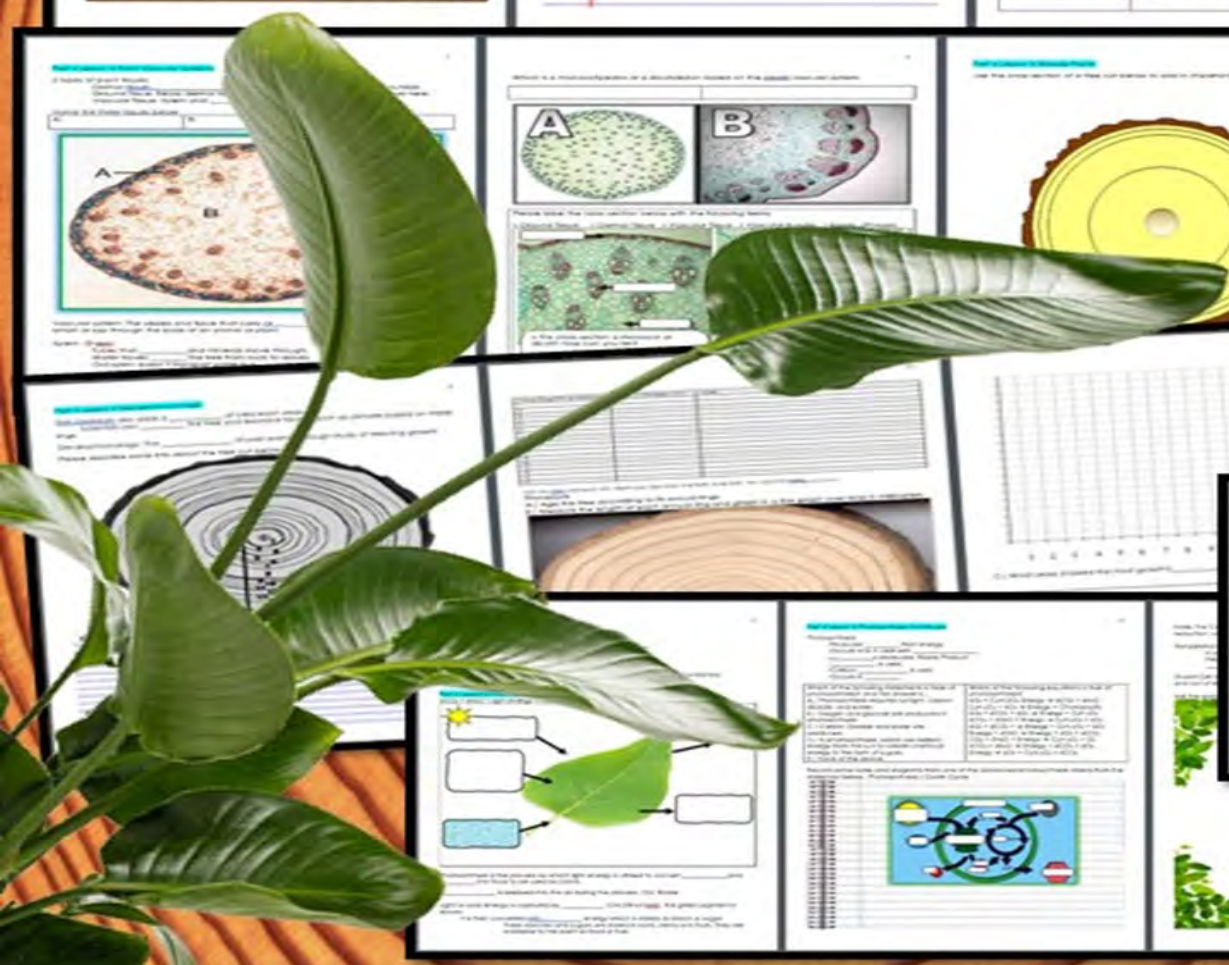
Carbon + Water + Sunlight → Sugar + Oxygen



- Which is the heartwood, sapwood, cambium, and pith?



Follow Along Bundle



Part 4

There are two types of roots: tap roots and fibrous roots.

Tap roots grow deep into the soil. Fibrous roots grow shallow and spread out.

Draw the roots of a plant. Label the tap root and fibrous roots.

Draw a cross-section of a root. Label the epidermis, cortex, and pith.

Part 5

Roots absorb water and minerals from the soil. Water moves up the stem to the leaves. Minerals move up the stem to the leaves.

Draw a diagram of a plant showing the movement of water and minerals. Label the roots, stem, and leaves.

Water moves up the stem through the xylem. Minerals move up the stem through the phloem.

Draw a diagram of a plant showing the movement of water and minerals. Label the xylem and phloem.

Part 6

Stems support the plant and transport water and minerals. Stems also store food.

Draw a diagram of a stem. Label the pith, cortex, and epidermis.

Stems grow in length at the apical meristem. Stems grow in thickness at the vascular cambium.

Draw a diagram of a stem showing growth in length and thickness.

Part 7

Leaves are the site of photosynthesis. Leaves absorb carbon dioxide from the air and release oxygen.

Draw a diagram of a leaf. Label the epidermis, mesophyll, and stomata.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 8

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Part 9

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 10

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 11

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 12

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 13

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 14

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 15

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 16

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 17

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 18

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Part 19

Leaves have stomata to allow gas exchange. Stomata are made of two guard cells.

Draw a diagram of a leaf showing the stomata and guard cells.

Leaves have a waxy cuticle to prevent water loss. Leaves have veins to transport water and minerals.

Draw a diagram of a leaf showing the waxy cuticle and veins.

Activities, Assessments, Notes, Games, and More...

- A = Ground Tissue, B = Dermal Tissue
- C = Vascular Tissue



- Plants get the nutrients they need primarily from the....
- A.) Soil and Water
- B.) Sun, Leaves, and Air
- C.) Water and Air
- D.) Soil and Air



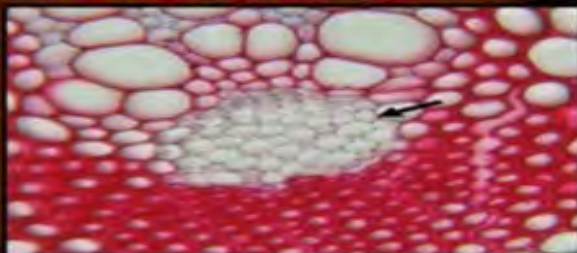
Plants, Eukaryotes, and photosynthesis

Plants use light energy to produce glucose and oxygen.

What is the independent variable? (Gibberellins)

What is the dependent variable? Stem Height

- Phloem: (Flow-em): Tubes in the plant that food (sugar) moves through.



- Ground Tissue: Below the epidermis, photosynthesis occurs.



- Inner Bark: Area just inside the bark, made of living tissue and contains the phloem.



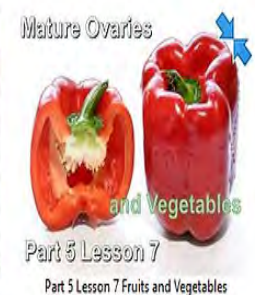
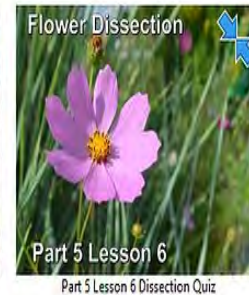
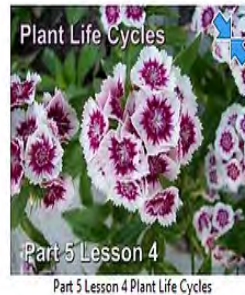
- Auxin: Promotes stem elongation and bud dormancy.
- Phototropism: When plants grow toward a light source.



- Video Link! Hydroponics on a city roof.
- http://www.youtube.com/watch_popup?v=W5tnHfkb64



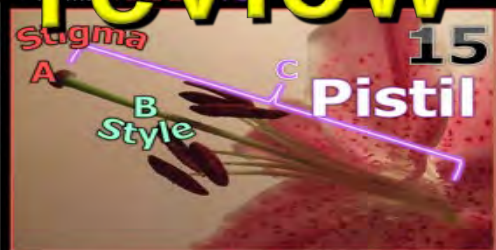
Botany Unit Part 5: 10 Lessons of 50 Minutes and 18 Page Work Bundle, Leaf Identification, Leaf Rubbing Activity, Blades, Venation, Leaf Margins, Leaf Base, Leaf Apex, Petiole, Simple vs. Compound Leaves, Identifying some common leaves, Maples, Oak, Beech, Pines, Poisonous Plants, Case Study on Poison Ivy, Poison Ivy Identification, Ivy Identification Quiz, Other Poisonous Plants, Deciduous Trees, Conifers, Identifying Conifers, Tree Identification Visual Quiz, , Plant Life Cycles, Seed Plant Life Cycles, Gymnosperm, Male vs. Female Cone, Angiosperm, Pollen, Annuals, Biennials, Perennials, Interpretive Dance Plant Life Cycles Group Activity, Flowers, Amazing Flowers Visual Tour, Parts of a Flower, Step by Step drawing on a flower with Parts, Matured Ovaries (Fruits), Stamen, Filament, Anther, Pistil, Stigma, Style, Ovary, Ovule, Sepal, Petals, Nectar Guides, How Flowers Attract Pollinators, Flower Dissection Lab, Visual Quiz Name that Part of a Flower, Exotic Fruits Visual Tour, Poisonous Berries, How Flowers become Fruits, Fruit or Vegetable Visual Standing Quiz, Parts of a Fruit, Epicarp, Mesocarp, Endocarp, Fleshy and Dry Fruits, Simple Fruits, Berries, Drupe, Pome, Aggregate Fruit, Multiple Fruit, Dehiscent Dry Fruit, Legumes, Indehiscent, Animals and Fruits / Seed Dispersal, Uses of Plants Wrap-up, Box Game Review, Crossword Puzzle, Unit Assessment



[Botany Unit Part 5](#)

Leaf Identification, Life Cycles, Flowers, and Fruits

Preview is a compressed file



• Anther: Holds the pollen.



• Try again, Which is **male**, and which is **female**.



I plan

produce

together

16

What?

Ivy

• Blade: The entire leaf unit. Sometimes this is made up of several smaller leaflets.



• Which is the filament, and which is the anther? Where is the pollen?



14 Red Pine
Pinus resinosa

RED

9 Lessons

INTERACTIVE SLIDESHOWS

- These are the names for the green leaves that cover the outside of a flower bud to protect it before opening.

Sepals

17

answer is...

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- Strawberries develop from flowers with many pistils.



Not a Berry

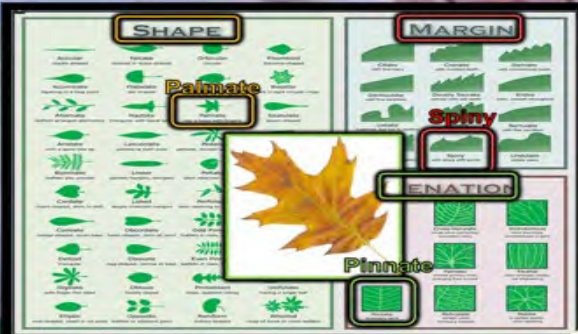


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- Eastern Hemlock: The needles are narrow, flat and soft, less than 1 inch long. Dark green above, with two white lines below.



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- Pome: This fruit has a core as the true fleshy fruit, and it's surrounded by a fleshy good accessory layer.

Apple

Pear



- Sugar Maple



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- Which leaf below is a red maple, and which is a sugar maple?

A

Red Maple

B

Sugar



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- Which is a Beech and Which is a Birch?

Birch

B

Beech



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Define a leaf in or around the rubbing(s). Once we learn about leaf identification can you describe some identifiable leaf structures / name the tree this leaf came from?

Bloss: the entire _____ unit. Sometimes this is made up of several subleaves (lobes).

Vine: Cordain _____ leaves.

Leaf Margin: the _____ of the leaf

Leaf Base: Name for the blade close to stem.

Leaf Apex: the _____ of the leaf.

The Petiole: Stem that connects the leaf blade to the stem.

Please identify some of the structures on these leaves:



Witch-hazel plant

Witch-hazel is a North American _____ plant of the cashew family that secretes an irritant _____ from its leaves, which cause _____.

Please describe Witch-hazel in the table. Summer, Fall and Winter are the best times to work on it.

Spring	Summer	Fall	Winter

Deciduous plants shed leaves that _____ leaves fall and grow them back in spring.
 Evergreen needles can survive _____ mean constantly growing and not shed.
 • needles can survive cold (and sometimes)

scale-like awl shaped linear shaped single needles bundled needles clust needles

Coughlin, 2010. *Plant Systematics*, 10th edition, Wiley

11	11	11
12	12	12
13	13	13
14	14	14
15	15	15

Seed Dispersal in Populus

Seed Plant Life Cycle:

All plants undergo _____ reproduction, two parents. When the sperm and egg fuse to form a zygote, it is called _____ fertilization.

Populus comes together for sex. The _____ of the plant is the male part, and the _____ is the female part.

_____ is the process by which the seed is dispersed from the parent plant.

Which is the seed? (circle, bracket and label, and which is female part?)

A **B**

_____ (circle) seed, produce seed, enclosed in a fruit.

Explain: Point _____ groups the water and sediment veins before doing
 Paperwork. Paper must be for _____ photos (showing plastic much year
 these have the the same _____, which include all sediment material, and permeable

Water the the same (same) system

- the same as the the same (same) system (same) system (same) system
- the same as the the same (same) system (same) system (same) system
- the same as the the same (same) system (same) system (same) system

Notes for the same (same) system (same) system (same) system

Write a sentence to describe the image.

Answer the questions below in English. If a point that makes sense.

Please write in English and copy it to the clipboard in the clipboard.

A large, detailed illustration of a green leaf with prominent veins, positioned diagonally across the page. A small, three-petaled green flower is attached to the upper part of the leaf. The background is a sheet of white paper with horizontal blue lines and a vertical red margin line on the left. There are some faint, illegible markings on the paper, possibly from a previous page or a watermark.

Reproduct _____ the pollinizer _____
 Autotroph: path of the incoming light inside the _____
 From flower bud of flower stage:
 Epigyn: Waxy stuff in the center of the flower. Retains the _____ growth.
 Sheath: _____
 Ovary: On bottom of the flower. Has the _____ inside and turns into the fruit.
 Connects the ovary _____
 Corolla: The part of the _____
 Petal: The colorful outer layer part of the flower. Very attractive
 Sepal: Green leaves that cover the outside of a flower bud. It is _____
 Very sensitive to _____
 The peak name A. At the bottom bottom.

A)	B)	C)
D)	E)	F)

D C B F A E

Fun & Learning in English and Spanish!

Put the vegetables _____ in the bowl. Combine the seeds.

Some are **fruits** to be eaten and which is an important try and provide what type of fruit is **seeds**.

A)	B)	C)	D)	E)
F)	G)	H)	I)	J)

Spanish to English

Parts of a fruit

Seeds / **Grains** _____ covering of the fruit. "skin"

Seeds / **Grains** _____ covering.

Seeds / **Grains** _____ covering, the **seed** deep around the seed. "Shore" "th"

"Seeds of fruit"

Freshy fruits

Seeds / Freshy fruits

Shore is in fruit

	
Observation: The seeds, 1. the seed pod _____ germinates, requiring the water. Reflection: (Did you?) the seed pod _____, waiting for the water. (Does it?) Conclusion: _____ (the water) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow. Discussion: _____ (the seeds) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow.	Observation: _____ (the seeds) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow. Reflection: _____ (the seeds) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow. Conclusion: _____ (the seeds) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow. Discussion: _____ (the seeds) the seeds can grow. (The seeds) the seeds can grow. (The seeds) the seeds can grow.



[illegible]

Part 5 Review Game New!

Directions: Write your answers in the spaces provided.

QUESTIONS	THE MIDDLE	QUESTIONS	THE MIDDLE	QUESTIONS	THE MIDDLE
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

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Activities, Quizzes, Links, Assessments, and more...

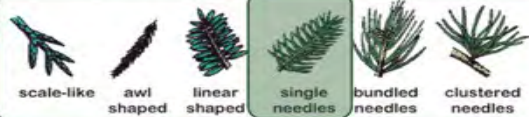
- Annuals: Seed germinates, grows, and produces new seed, before dying.



- Name this type of tree?



- These are the types of plants and shrubs that lose leaves in fall and grow them back in spring.



Needle Arrangement?



- The ovary in the flower contains the seeds. The ovary then becomes the fruits with the seeds inside.



- Which is a red oak, and which is a white oak?



- Please name A and B.
– Hint. You can try and unscramble the words.
angiosperm **gymnosperm**

Which one evolved first?



- What type of fruit is this plume? **Drupe**
– It developed from one ovary and has one seed.
– Please label the endocarp, mesocarp, and exocarp.



- Evergreens: Needles can survive winter, trees constantly grow and drop needles.
• Needles can survive cold (sap antifreeze).



Curriculum Guide

Number of Lessons in each unit (50 min, daily lessons) and difficult rating scale / intended grade level.

 =Easier,

 = More difficult,

 =Most difficult

Earth Science Units	Daily Lessons	Intended Grade	
Geology Topics Unit	60 Lessons	6-8 medium difficulty	
Weather and Climate Unit	40 Lessons	6-8 medium difficulty	
Astronomy Unit	60 Lessons	6-8 medium difficulty	
Weathering, Soil Sciences	28 Lessons	5-7 easier	
Rivers and Water Quality	25 Lessons	5-7 easier	
Water Molecule Unit	20 Lessons	5-7 easier	

Life Science Units

Life Science Units	Daily Lessons	Intended Grade	
Ecology Feeding Levels Unit	13 Lessons	5-6 easier	
Ecology Interactions Unit	30 Lessons	5-6 easier	
Ecology Abiotic Factors Unit	24 Lessons	5-6 easier	
Botany Unit	50 Lessons	5-7 easier	
Evolution and Natural Selection	40 Lessons	5-7 easier	
Taxonomy and Classification	50 Lessons	6-8 medium difficulty	
Infectious Diseases Unit	30 Lessons	7-9 more difficult	
DNA and Genetics Unit	42 Lessons	8-10 most difficult	
Human Body Systems Unit	85 Lessons	6-8 medium difficulty	
Cell Biology Unit	30 Lessons	8-10 most difficult	

Physical Science

	Daily Lessons	Intended Grade	
Laws of Motion and Machines Unit	33 Lessons	8-10 most difficult	
Matter Energy and the Environment	58 Lessons	7-10 medium difficulty	
Atoms and Periodic Table Unit	44 Lessons	8-10 most difficult	
Science Skills Unit	30 Lessons	5-7 medium difficulty	

[Physical Science Curriculum](#)

[Entire SlideSpark Science Curriculum](#)



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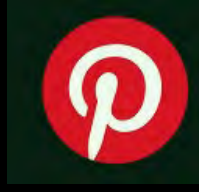
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