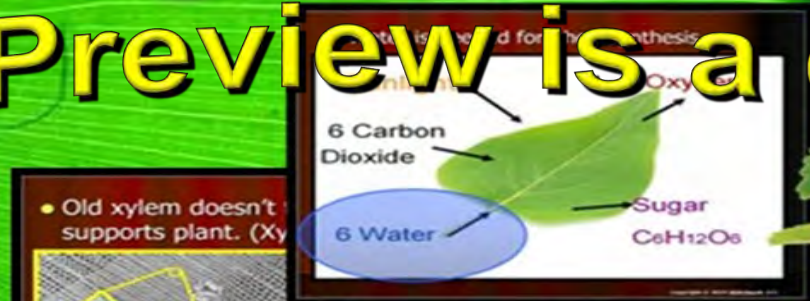


Roots, Hormones, Vascular Tissue, Trophism, Woody Plants, and more

Preview is a compressed file



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



- 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).



Preview is a compressed file



Gibberellin

- 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.

- 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.



Important plant nutrients for healthy growth

7 N 14-0-0-0
16 P
19 K

- A = Vascular
- C = Dermis



Interactive Slideshows

- Usually the underground portion of a plant.



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



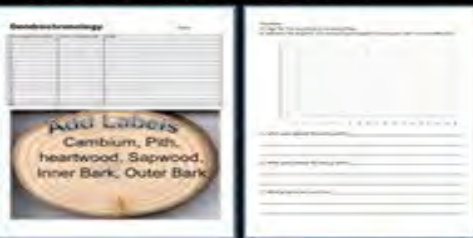
- Activity! Carrot and Celery Dissection. Please carefully dissect both and draw the vascular system. Provide a cross cut view.



- 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.

- Sapwood: Living wood, lighter in color, conducts water with xylem.



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

- Light, water, gravity, temperature / seasons.



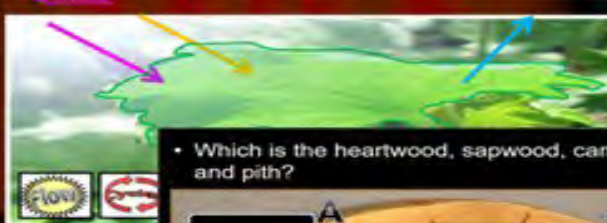
- Which root is a taproot, and which is a fibrous root?



- Equation for Photosynthesis



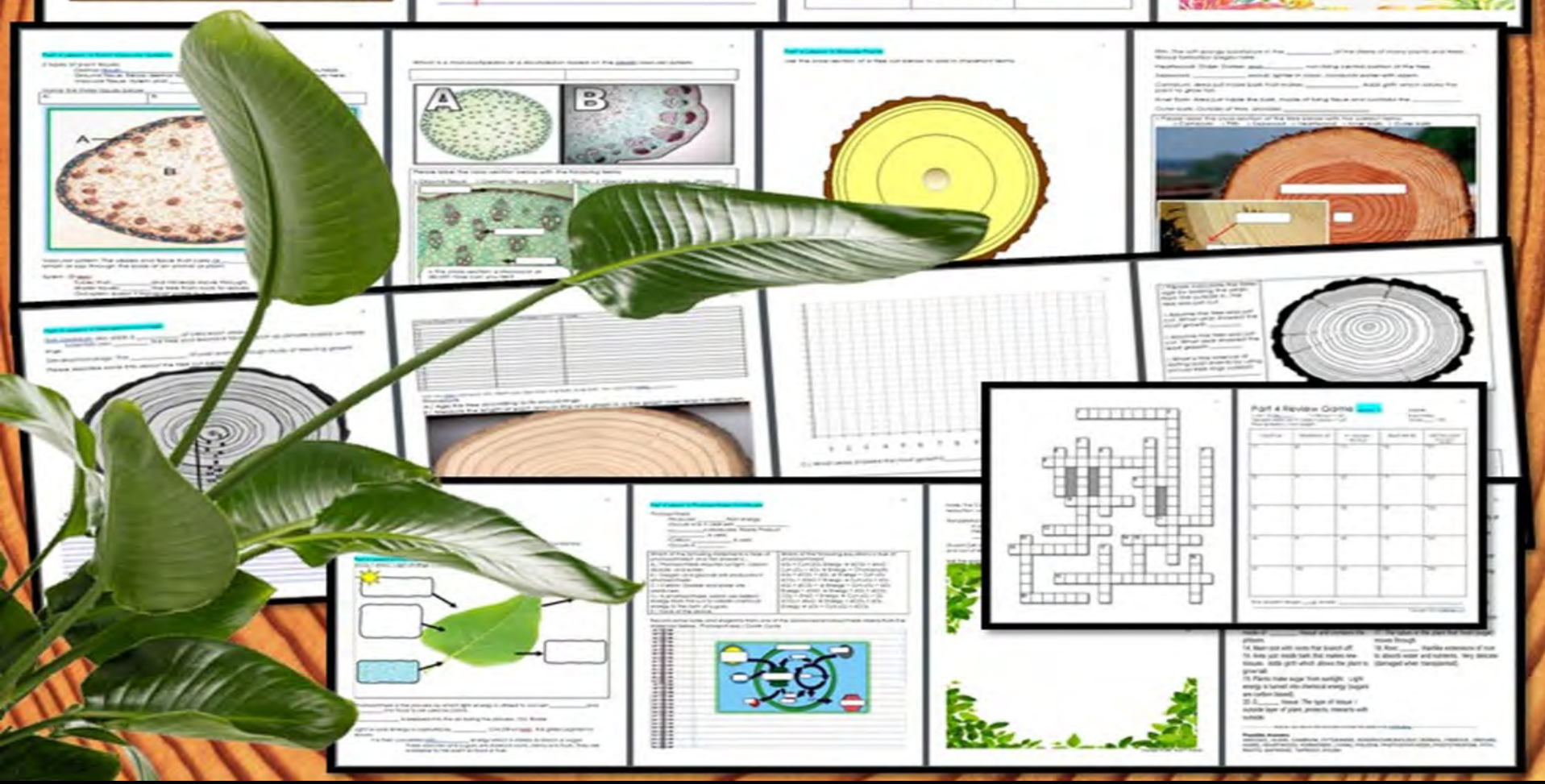
- Carbon
- Water
- Sunlight
- Sugar
- Oxygen



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



Follow Along Bundle



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



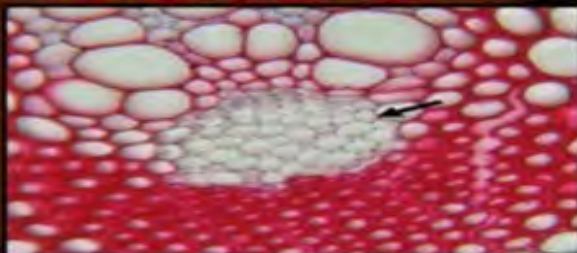
Plants, Eukaryotes, and photosynthesis

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 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



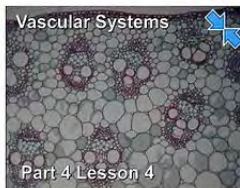
Part 4 Lesson 1 Roots



Part 4 Lesson 2 Tropisms Hydroponics



Part 4 Lesson 3 Plant Hormones



Part 4 Lesson 4 Vascular Systems



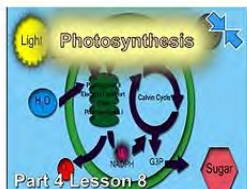
Part 4 Lesson 5 Woody



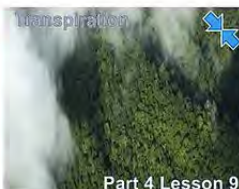
Part 4 Lesson 6 Dendrochronology



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

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.

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

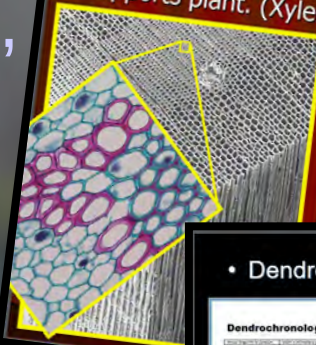
nitrogen
7
N
14.007
15
P
30.97376
Phosphorus
19
Polonium

Important
plant nutrients
for healthy growth

- Equation for **Photosynthesis**
- $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- Carbon • Water • Sunlight • Sugar • Oxygen
- Dioxide



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



- Dendrochronology Available Sheet

Dendrochronology

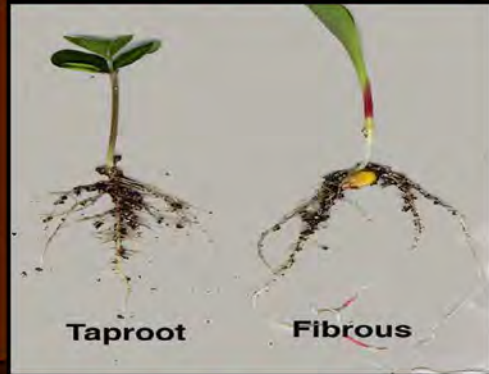
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2000	



- There are two main types of roots.

○ -

○ -



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Part 4 Seeds, Roots, Leaves

Name: _____

Roots: The usually _____ portion of a plant that _____ buds, leaves, or nodes and serves as _____ from the surrounding soil, and sometimes stores _____.

There are two types main types of roots.
Taproot: (Draw) _____ root with roots that branch off.
Fibrous roots: (Draw) Many _____
Other roots can be tubercular, (tubers).

(i) Draws minerals and water from the surrounding soil. Name three important plant nutrients.

Please sketch and then label some types of roots found when "weeding" around the school



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.



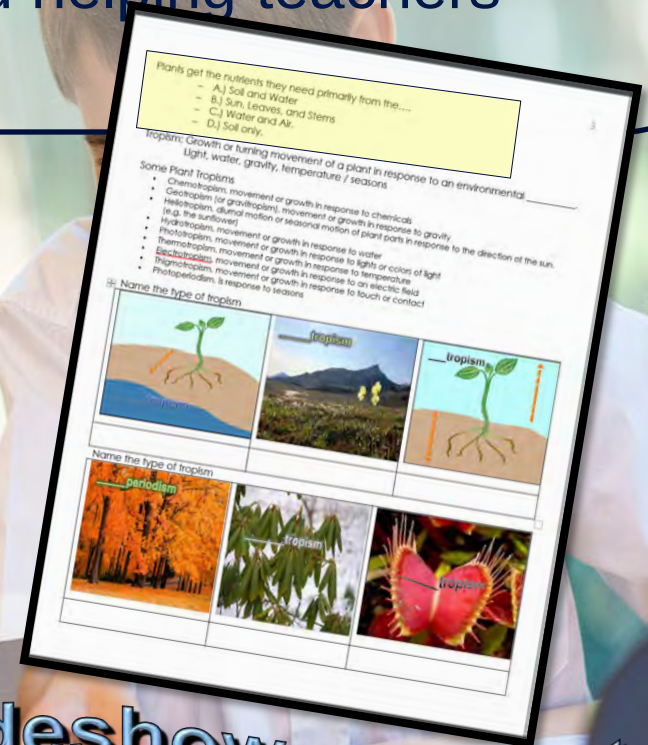
• Plants get the nutrients they need primarily from the....

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



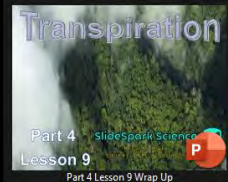
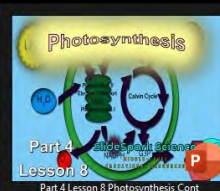
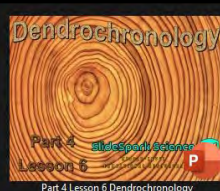
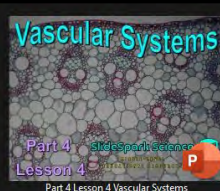
Next Slide

**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

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..

[illegible]

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 4 Review Game Lesson 11

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

Named: _____
Date: Today _____
Score: _____ / 100

ROUTE 44	GROWING UP	IF I COULD I WOULD	LEAVE ME BE	SEE THE LIGHT
1) _____	4) _____	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: _____ / 25 Answer: _____

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Part 4 Review Game Lesson 11

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

Named: _____
Date: Today _____
Score: _____ / 100

ROUTE 44	GROWING UP	IF I COULD I WOULD	LEAVE ME BE	SEE THE LIGHT
1) Letter A	4) Letter A	11) LETTER C	16) A=Cambium B=Endopwood C=Vascular D=Pin	*21) Rainbow Bellie
2) taproot fibrous root	7) MYCOPHYTES	12) A=Cambium B=Endopwood C=Vascular D=Pin	17) Dendro chronology	*22) Gansai
3) Tubercula Root	8) Plant Hormones	13) PHLOEM	18) Photosynthetic Chlorophyll Pin Light	*23) Bot
4) Letter D	9) Cellulose	14) XYLEM	19) Letter E	*24) Princess and the Frog
5) Letter C	10) Axon Phototropism	15) Letter A Cambium	20) Transpiration	*25) Endo Game

Final Question Wager: _____ / 25 Answer: _____

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Woody Plants, Plant Tissues, Plant Hormones QUIZ

- 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.

1



- Which is a taproot and which is root?

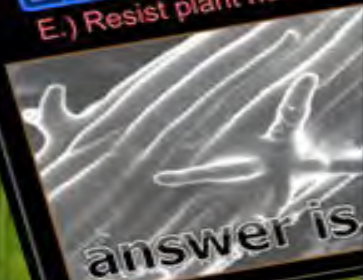
GAME

2



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- 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



- Water uptake plants for all except...
- A.) Water is
 - B.) Helps to
 - C.) Water carries
 - D.) Water carries dissolved nutrients and minerals throughout plant.

5

answer is...

Part 4 Review Game

Q	A	Q	A	Q	A	Q	A
1	Which is incorrect of roots?	2	Which is a taproot and which is root?	3	What's the role of these?	4	Water uptake plants for all except...
5	Which is incorrect of roots?	6	Which is a taproot and which is root?	7	What's the role of these?	8	Water uptake plants for all except...
9	Which is incorrect of roots?	10	Which is a taproot and which is root?	11	What's the role of these?	12	Water uptake plants for all except...
13	Which is incorrect of roots?	14	Which is a taproot and which is root?	15	What's the role of these?	16	Water uptake plants for all except...
17	Which is incorrect of roots?	18	Which is a taproot and which is root?	19	What's the role of these?	20	Water uptake plants for all except...

name for this type of root?



20 Questions

- 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.

6



- 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.

8 Plant Hormones

and the answer is...

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



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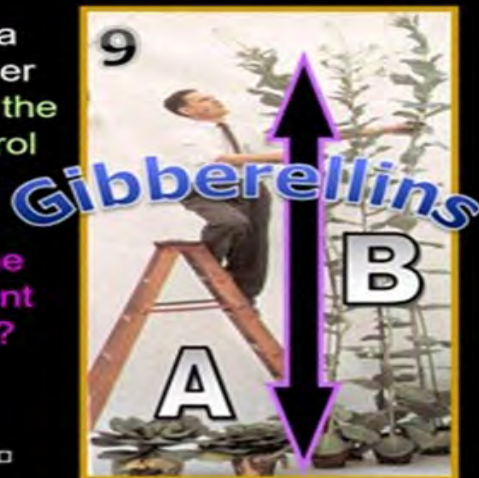
- This is the name for the cultivation of plants in a nutrient solution rather than in soil.



- 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...



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- Ethylene does all of the following except...

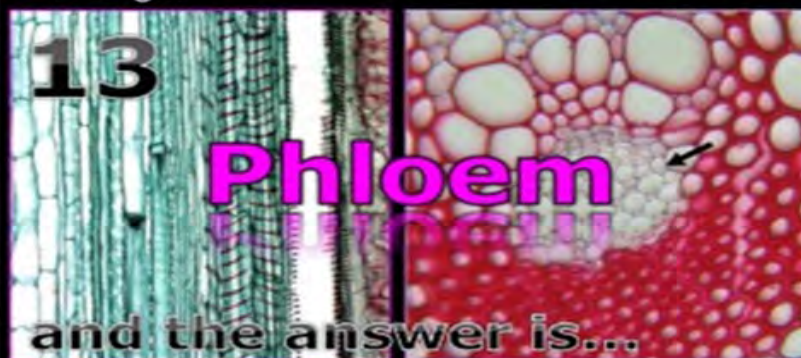
- A.) Stimulates the release of seed dormancy.
- B.) Stimulates shoot and root growth.
- C.) Promotes cell division. They are produced in growing areas like the tips.
- D.) Stimulates leaf and fruit abscission.
- E.) Creates femaleness in flowers.
- F.) Stimulates flower opening.
- G.) Stimulates flower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

11



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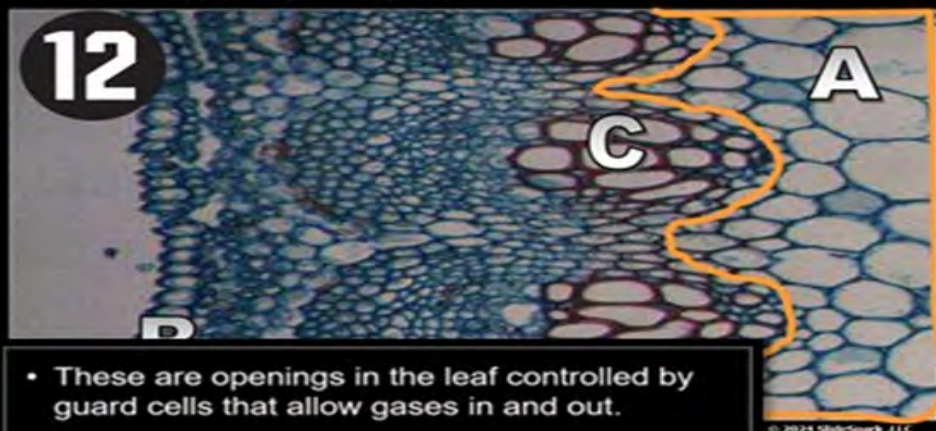
- Tubes in the plant that food (sugar) moves through.



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

12



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- These are openings in the leaf controlled by guard cells that allow gases in and out.



Stoma

answer is...

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- Name the very important tissue below...

14

- 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



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



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



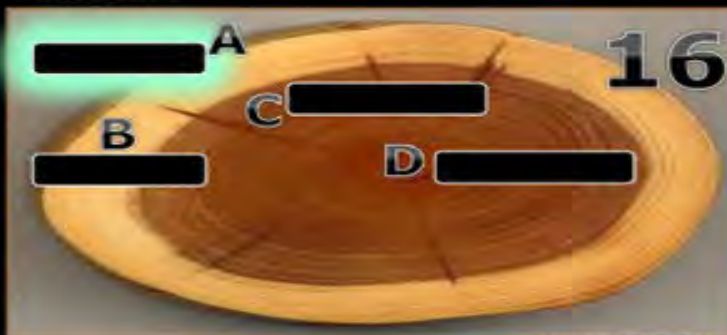
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- A leaf is a plant organ, that is contains and is usually so can penetrate.



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



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- Which of the following equations is the correct equation for photosynthesis?

19

- 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.) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6H_2O$
- 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

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

Dendrochronology 17
12-13 years old

answer is...

THIS is the name for the evaporation of water from plants.

20

- It occurs during photosynthesis.
- Helps pull water up the xylem from roots.
- Cools the leaf.

Transpiration

answer is...

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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.

Tree Ring Dating Activity

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.

• Which of the following statements is false of photosynthesis? and the answer is...

- A.) Photosynthesis requires sunlight, carbon dioxide, and water.
- B.) Oxygen and glucose are produced in photosynthesis.
- C.) Carbon Dioxide and water are produced.
- D.) In photosynthesis, plants use radiant energy from the sun to create chemical energy in the form of sugars.
- E.) None of the above.

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- D.) In photosynthesis, plants use radiant energy from the sun to create chemical energy in the form of sugars.
- E.) None of the above.

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Unit 4 Lesson 2 Photosynthesis Continued

Photosynthesis

- Produces _____ from energy.
- Occurs only in cells with _____.
- _____ is produced, Waste Product
- Carbon _____ is used.
- Occurs in _____.

Which of the following statements is false of photosynthesis? and the answer is...

A.) Photosynthesis requires sunlight, carbon dioxide, and water.

B.) Oxygen and glucose are produced in photosynthesis.

C.) Carbon Dioxide and water are produced.

D.) In photosynthesis, plants use radiant energy from the sun to create chemical energy in the form of sugars.

E.) None of the above.

Which of the following equations is true of photosynthesis?

$6\text{CO}_2 + \text{C}_6\text{H}_{12}\text{O}_6 + \text{Energy} \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$

$6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

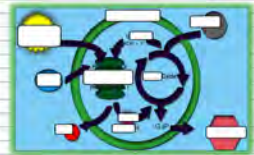
$6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

$6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

$6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

$6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

Record some notes and diagrams from one of the advanced photosynthesis videos from the library below. Photosynthesis / Calvin Cycle

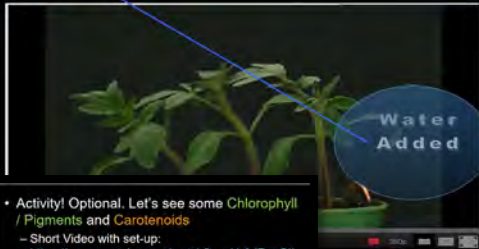


Work Bundle

Built-in Video Links

Our science education program is designed with the modern, multimedia learner in mind, and our video 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, our video links are an excellent way to reinforce your learning.

- Video of young plant and periodic watering.
- <http://www.youtube.com/watch?v=LICDb8nM5rs>



- Activity! Optional. Let's see some Chlorophyll / Pigments and Carotenoids
- Short Video with set-up:
<https://www.youtube.com/watch?v=qH-AJDqSJI>
- Pigment: A pigment is a material that changes the color of reflected or transmitted light as the result of wavelength-selective absorption.



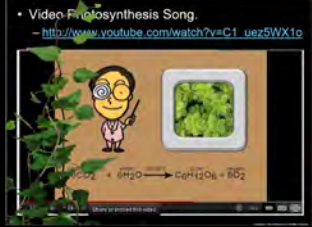
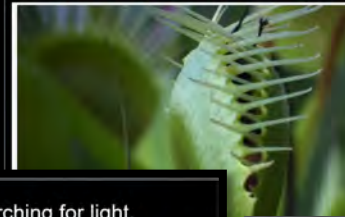
- Video Link! Hydroponics on a city roof.
- http://www.youtube.com/watch_popup?v=W5tnHfikb64



- Maple Syrup How it's made.
- Pay attention markers of tomorrow.
- Maybe I'll get a sample ready during the video....
- <http://www.youtube.com/watch?v=6bgUdH1Mjo>



- Venus Fly Trap
- <https://www.youtube.com/watch?v=O7e>



- Video Link! Plants searching for light.
- <http://www.youtube.com/watch?v=H9MV5CgPqIQ>



- Plant Tropisms and Hormones (Video Break)
- <https://www.youtube.com/watch?v=pCFstSMvAMl>



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.

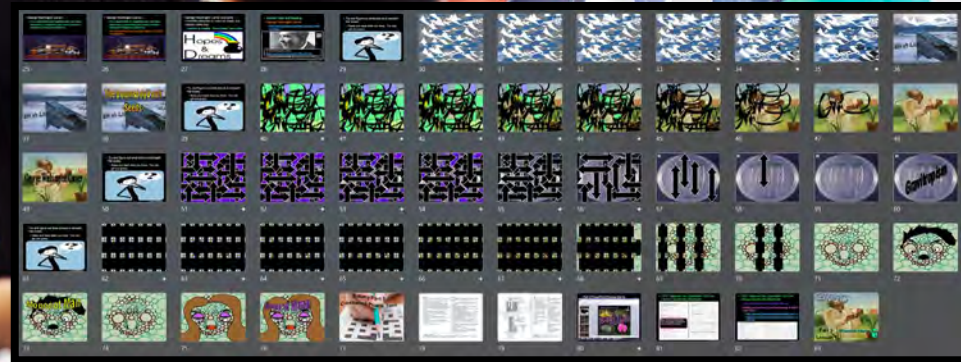
Across

1. The small stalk attaching the leaf blade to the stem.
4. Response of a plant in relation to gravity. Roots go down, shoots go up.
7. Portion of a plant stem between nodes.
8. Monocotyledons constitute the smaller of the two great divisions of flowering plants, and typically have elongated stalkless leaves, with _____ veins (e.g. grasses, lilies, palms).
9. A flowering plant with an embryo that bears two cotyledons (seed leaves).
10. Seed _____ A period when the seed doesn't grow.
13. Place on stem where buds form.
14. Part of the plant between the radicle and cotyledons.
15. Seed _____ is the movement, spread or transport of seeds away from the parent plant.
18. Lower embryo and root.

Down

2. The stem of a seedling or embryo located between the cotyledons and the first true leaves.
3. _____ Dispersal: The seeds or fruits are dropped from the plant into rivers, lakes or seas.
4. The process whereby growth emerges from a period of dormancy.
5. The transferring of pollen (plants sex cells) from one plant to another.
6. George Washington _____ was an American agricultural scientist and inventor who promoted alternative crops to cotton and methods to prevent soil depletion. He was the most prominent black scientist of the early 20th century.
11. A flowering plant with an embryo that bears a single cotyledon (seed leaf).
12. The First Leaves (Full of energy). Not true leaves.
16. A mature fertilized plant ovule consisting of an embryo, its food source, and having a protective coat.
17. Main trunk of a plant.
19. Seed _____ Protects seed from drying out, aids in seed dispersal, opens when conditions are right.

Possible Answers
CARPUS, COAT, COTYLEDON, DORMANCY, EPICOTYL, GERMINATION, QUANTIFICATION, HYPOCOTYL, MONOCOTYLEDON, NODES, PETIOLE, POLLINATION, RADICLE, SEED, STEM, WATER DISPERSAL, HYDRONOME, PALLELS



• Can you find the tuber in the picture below?



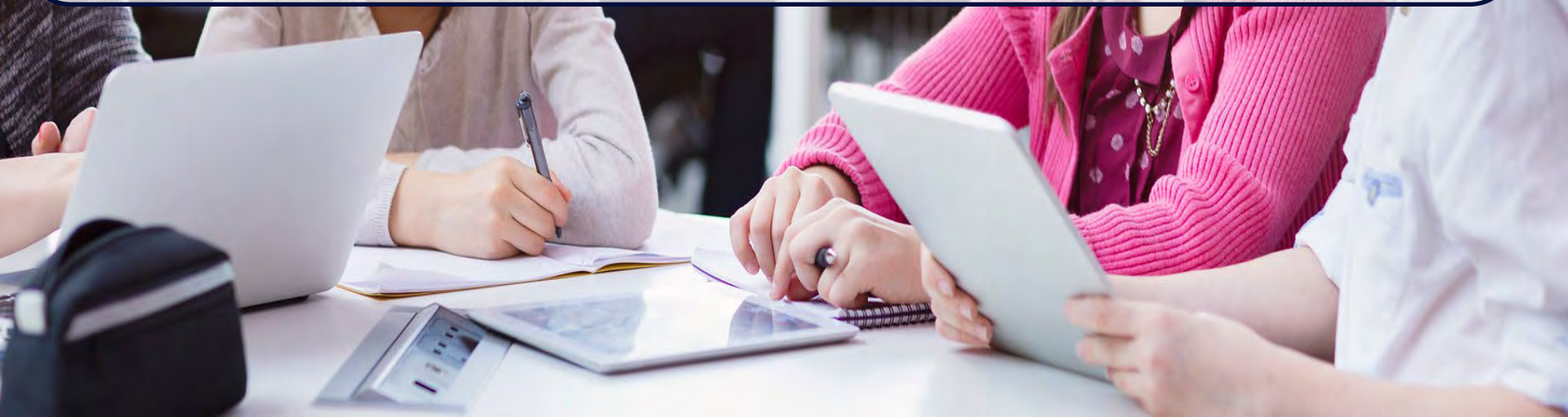
• Can you find the tuber in the picture below?



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.





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



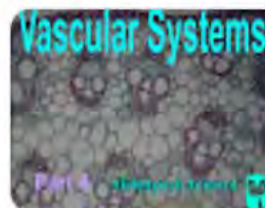
Part 4 Lesson 8 Photosynth...

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

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 the plant hormone ethylene?

- 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 the release of seed dormancy
- Stimulates shoot and root growth
- Stimulates leaf and fruit abscission
- Creates femaleness in flowers
- Stimulates flower opening
- Stimulates flower and leaf dying



• Which one is the plant hormone ethylene?

- Gibberellins 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



- Ethylene also...
 - Stimulates the release of seed dormancy
 - Stimulates shoot and root growth
 - Stimulates leaf and fruit abscission
 - Creates femaleness in flowers
 - Stimulates flower opening
 - Stimulates flower and leaf dying



Gibberellins

Ethylene

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

- A) Soil and water
- B) Sun, water, and stems
- C) Water and air
- D) Soil only

Plants exhibit an internal movement of a plant in response to an environmental...

Some Plant Hormones

- Auxin: Promotes... elongation and bud dormancy.
- Gibberellins: Stimulate growth toward a... source.
- Cytokinin: Promotes... they are produced in growing areas like the tips.
- Abscissa Acid: Causes and controls... the rise in seed dormancy.
- Ethylene: A gas that promotes fruit...

Add some extra illustrations about plant hormones in the space below

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

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



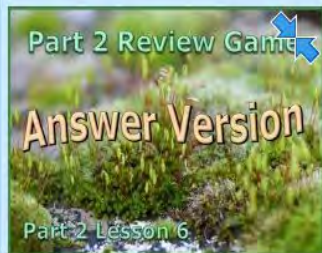
Part 2 Lesson 4 Liverwort Hornwort



Part 2 Lesson 5 Ferns Horsetails



Part 2 Lesson 6 Review Game



Part 2 Lesson 7 Review Game Answers

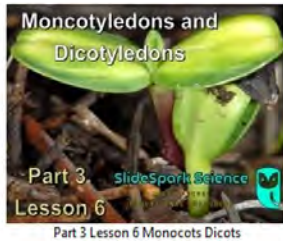
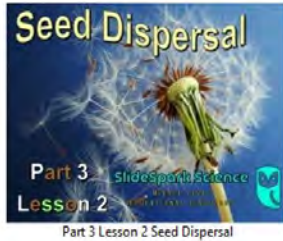


Part 2 Work Bundle Answers



Part 2 Work Bundle Print

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

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



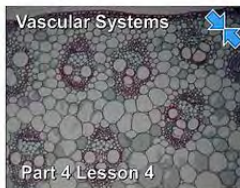
Part 4 Lesson 1 Roots



Part 4 Lesson 2 Tropisms Hydroponics



Part 4 Lesson 3 Plant Hormones



Part 4 Lesson 4 Vascular Systems



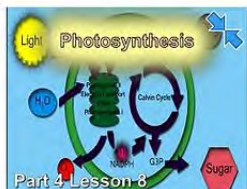
Part 4 Lesson 5 Woody



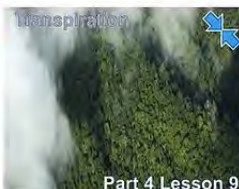
Part 4 Lesson 6 Dendrochronology



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

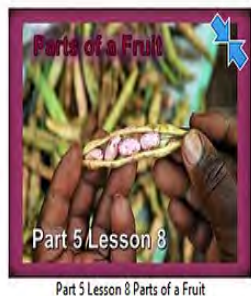
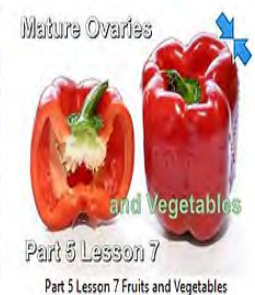
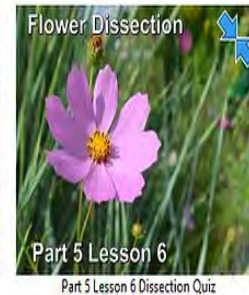
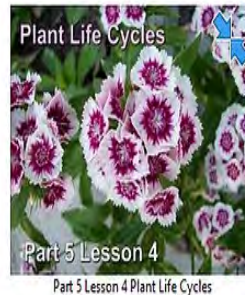


Part 4 Work Bundle Answers



Part 4 Work Bundle Print

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

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](#)



Dear Valued Educator,

Our fully editable .pptx and .doc resources are perfect for educators looking to bring enthusiasm and creativity to their lessons. We encourage you to make changes to fit your needs and style. As science educators, we're committed to providing students with the tools they need to succeed in the classroom and beyond. Each unit in the curriculum includes a range of resources that have been developed through extensive research and use in a busy classroom. Our teaching approach is designed to make science education engaging and exciting for learners of all ages. We offer a one-of-a-kind science curriculum that will challenge, inspire, and educate students to become tomorrow's scientists and leaders. Join us today and learn more about how our program can help you achieve your classroom goals.

With appreciation,

Support@SlideSpark.net



Thank you for your time and interest in our Science curriculum. We strive to provide students with engaging and informative lessons that will spark their curiosity and encourage scientific exploration. Should you have any questions or concerns, please do not hesitate to contact us. Thank you again for considering our curriculum, and we wish you all the best in your educational journey.

Sincerely,

Support@slidespark.net



SlideSpark Science

MIDDLE-LEVEL
EDUCATIONAL RESOURCES



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