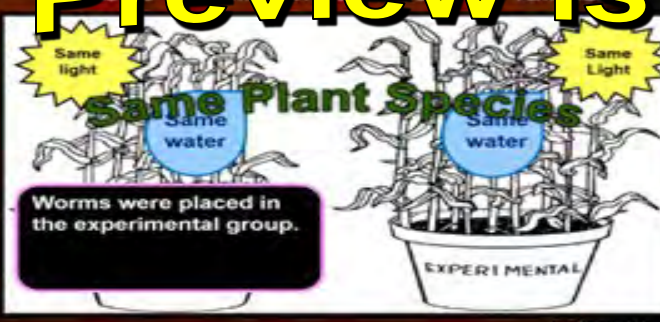


Intro to Botany, Grow Study, Plant Evolution

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)

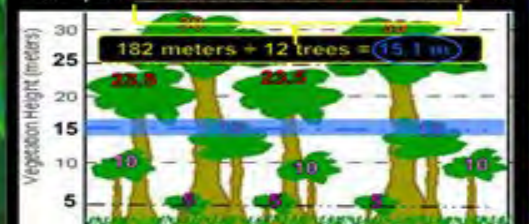


First time Last



Which two are switched?

- 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)

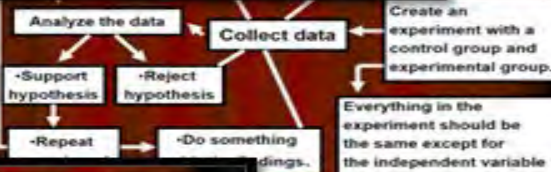
Carbon* = Carbohydrate

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.

Figure 1: Schematic representation of the experimental design. The top part shows a 2x4 grid of colored squares (grey, blue, purple, cyan) representing different conditions. Below the grid is a timeline with arrows indicating the sequence of events: 'Preparation' (grey), 'Training' (blue), 'Transfer' (purple), and 'Test' (cyan). The bottom part is a large empty grid for data recording, with columns labeled 'Preparation', 'Training', 'Transfer', and 'Test'.

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)

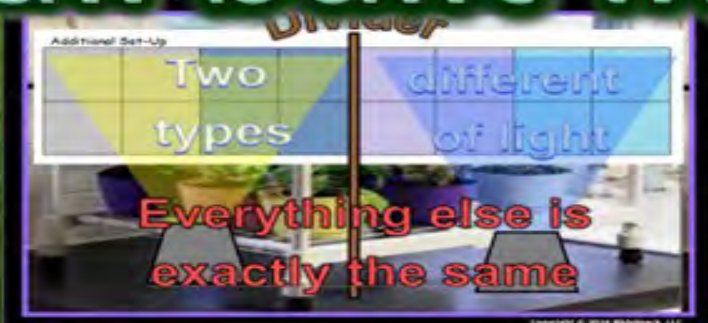
Plant: (noun) Any of various **photosynthetic**, **eukaryotic** multi-cellular organisms of the Kingdom Plantae characteristically producing embryos, containing **cellulose** having a cell wall made of cellulose, and lacking the power of locomotion.



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

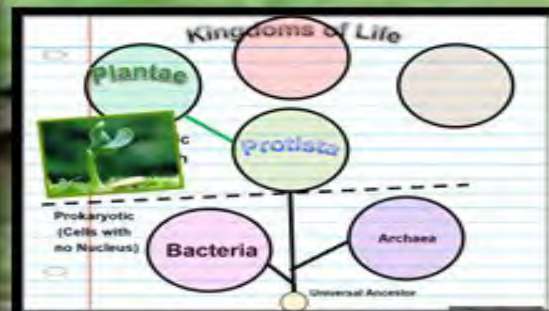
What is the purpose of this study? (What is the independent variable?)

What is the dependent variable?

What is the control variable?

What is the control group?

Day	Height (cm)	Number of leaves	Number of flowers
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			



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 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 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

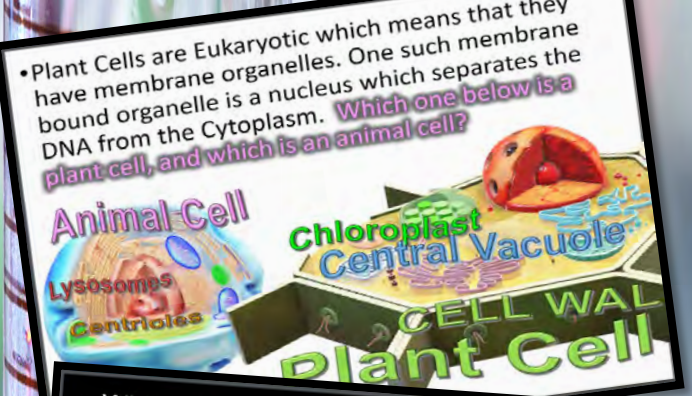
SlideSpark Science



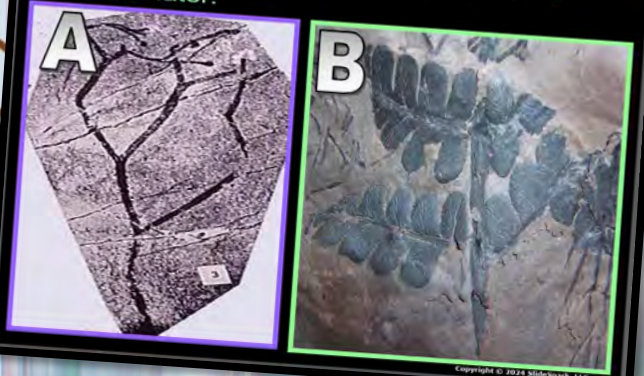
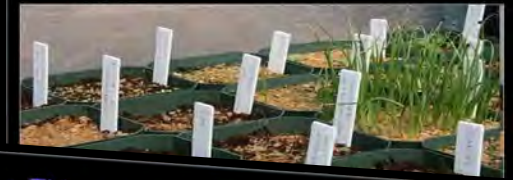
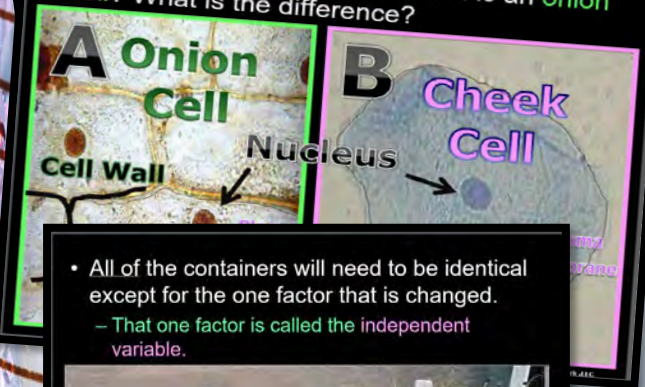
MIDDLE-LEVEL EDUCATIONAL RESOURCES

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.

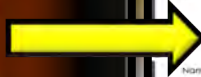


- Which is a cheek cell, and which is an onion cell? What is the difference?



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.



PART 1 GROW STUDY: PLANT EVOLUTION

Name: _____

Your definition of a plant:

Any of various _____, multi-cellular organisms of the Kingdom Plantae characteristically producing _____, containing _____, having cell wall made of _____, and lacking the power of _____.

Photosynthetic – Makes _____ from _____.

Eukaryotic – Cells with a _____ nucleus.

Multi-cellular – Made of _____ cells.

Embryo – Young organism that grows inside _____.

Chloroplast – An organelle that does _____.

Cellulose – A complicated and strong _____.

Locomotion – the _____.

Name of at least 30 products that are made from plants below:



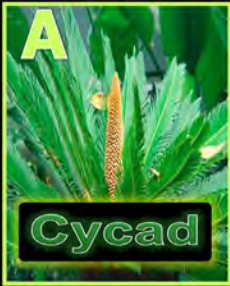
Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work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

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

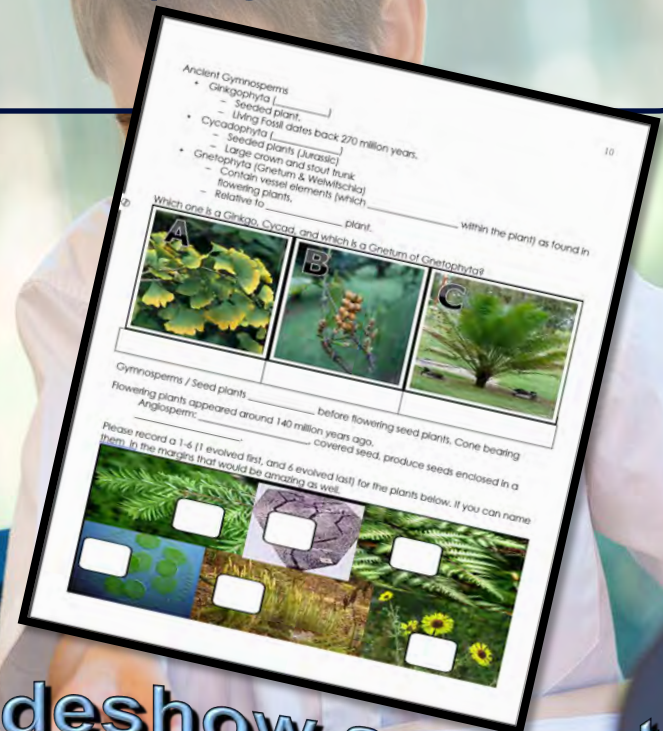


- Which one is a **Ginkgo** and which is a **Cycad**?



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.

Part 1 of 6



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



Part 1 Lesson 7 Review Game Answers



Part 1 Work Bundle Answers



Part 1 Work Bundle Print



Part 1 Work Bundle Writable .gdoc

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]

Apples produce more than _____% of the farm's oxygen.

Apples remove huge amounts of _____ from the air.

- Carbon Dioxide is the global warming, so apples is one of our most important trees in the fight against it.
- Apples may become the next fuel of the future.
- A form of bio-plastic gasoline.

Option-1- Make a left-mount pile of apples and make a scratch in the space below:

Low Power	High Power
	

Plants, _____, and _____

Capturing energy from the _____

Using _____ and _____ to...
create sugar and _____

connected to Animals, and
necessary for our _____

between _____ and _____ million years ago, some algae made the transition to land, becoming land plants. This transition required a series of adaptations to help them survive out of the water.

The first land plants

- had to struggle with maintaining _____ in cells.
- but did need gas exchange.
- How to _____ trusted out of water.
- How to _____ on land.
- How to _____ the ground.

Some solutions

- _____ coverings to prevent water loss.
- Stomata: Cells that _____ and close.
- _____ Stomata.
- Waxy cuticle _____ does.
- Waxy cuticle _____ does.

vascular plants appeared _____ million years ago, with ferns first following 300 million years ago.

PLANT KINGDOM

- Cells and tissues not highly organized
- Cells and tissues organized into functional structures

```

graph TD
    PK[PLANT KINGDOM] --> C1[Cells and tissues not highly organized]
    PK --> C2[Cells and tissues organized into functional structures]
    C1 --> B1[ ]
    C1 --> B2[ ]
    C1 --> B3[ ]
    C1 --> B4[ ]
    C1 --> B5[ ]
    C1 --> B6[ ]
    C1 --> B7[ ]
    C1 --> B8[ ]
    C1 --> B9[ ]
    C1 --> B10[ ]
    C2 --> B11[ ]
    C2 --> B12[ ]
    C2 --> B13[ ]
    C2 --> B14[ ]
    C2 --> B15[ ]
    C2 --> B16[ ]
    C2 --> B17[ ]
    C2 --> B18[ ]
    C2 --> B19[ ]
    C2 --> B20[ ]
  
```

[illegible]

Ancient Gymnosperms _____
 Ginkgo _____
 _____ seedless plant
 _____ living leaf fossils took 270 million years.
 Conifers _____
 _____ seedless plants (Lumens)
 _____ large cones and much pine
 Gnetales (Gnetales & Welwitschia) _____
 _____ contain vascular elements (xylem)
 _____ flowering plants
 _____ resemble to _____ plant.

Above one is a Ginkgo. Cylindar and above is a Gnetales or Gnetales?

Gymnosperm / seed plants _____ before flowering seed plants. Cone bearing
 Flowering plants (seeded) around 140 million years ago.
 Angiosperm _____ covered seed. double seeds enclosed in a _____

Plants require a full 1/2 evolved leaf, and a vascular plant for plants before. If you can name them, the margin leaf would be smaller.

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.

A large, vibrant green fern frond is positioned diagonally across the frame, extending from the upper left towards the lower right. The frond's structure is clearly visible, with numerous small, pointed leaflets (pinnae) branching off a central stem (rachis). The background is a solid, deep black, which makes the green of the fern stand out prominently.

Review Game

Part 1
Lesson 6

SlideSpark Science
MIDDLE-LEVEL
EDUCATIONAL RESOURCES

The logo for SlideSpark Science is a circular emblem. It features a stylized, cartoonish face with large, expressive eyes and a small, curved line for a mouth. The face is rendered in a light blue or cyan color, matching the text of the logo. The entire logo is set against a dark, circular background.

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PART I: INTRO TO BOTANY

201 = 5 g/L Roots in water + glucose solution

*20125 = 5 g/L + 1 g/L

(slightly different to correct answer = 1 g/L)

Final Question = 3 g/L average

NAME:

Date: Today

Score: / 100

IT'S GREEN	TEST ME	LIKE IT OR NOT!	TOU-LE-TOU	HYDROPHIC (first answer, 100 points)
1)	A)	11)	14)	*21)
2)	1)	12)	15)	*22)
3)	B)	13)	16)	*23)
4)	2)	14)	17)	*24)
5)	15)	15)	20)	*25)

Final Question Wager: 10 Analysis: _____

Part 1: Survival & Reproduction

PART 1: INTRO TO BOTANY

1-20 = 5 pts
 *20-25 = Bonus + 1 pt
 Penalty: write and in correct space +1 pt
 Final Question = 3 point wiggle

Date: Today Name: _____
 Score: ____ / 100

IT'S GREEN	TEST ME	LIKE IT CAN NOT	TIME TO GO	TRENDING
1) PE is... Phloem Saprophytic Carnivorous Chlorophyllous Cell wall	6) Energy	11) Autotrophic Heterotrophic Obligate Parasitic Saprophytic	14) Fungi + Animals (cell wall plants)	*21) Autotrophic
2) Fungi + Moss + Plants	7) Control Group Experimental Group Independent Variable	12) Meiosis = 2.0 cells	17) 3-Phases (Growth, Mitosis, Meiosis)	*22) Autotrophic
3) Fungi + Moss + Plants	8) Independent Variable	13) Mitosis = 1 copy of DNA per (daughter)	18) Autotrophic Vascular Plants and Flowering Plants water (cell wall)	*23) Autotrophic
4) Autotrophic	9) Dependent Variable	14) Kingdoms: Eukarya Archaea Protista Fungi Plantae Animalia	19) Autotrophic Autotrophic	*24) Autotrophic
5) Autotrophic Cell Autotrophic Cell	10) Control Group	15) Autotrophic Autotrophic Obligate Parasitic	20) 2 and 3 were notched on the branch	*25) Autotrophic

Final Question: Wiggle — 1/5 Answer: **Autotrophic**

- 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.



Copyright © 2014 iStockphoto, LLC

- These are plants? True or False

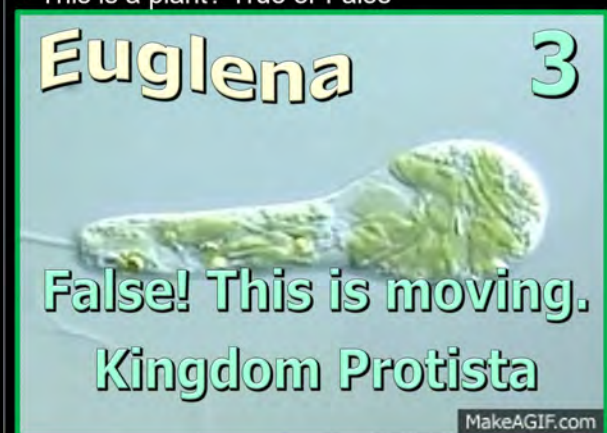
False! These are **single celled Algae**



- This is a plant? True or False

Euglena

False! This is moving.
Kingdom Protista



MakeAGIF.com

- This is a plant? True or False

TRUE!

4

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.

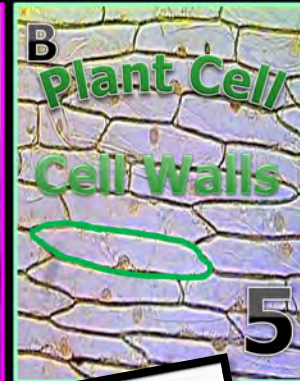


- Which is a plant cell and which is an animal cell?

A Animal Cell



B Plant Cell/
Cell Walls



5

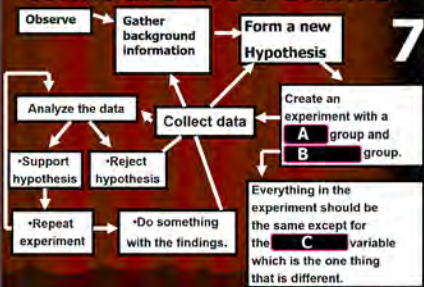
- The **energy** flow of life occurs because of plants. Same word
- Plants harness the **energy** from the **sun**, and pass it on to all other life forms.

ENERGY



6

What are the 3 Blanks?



7

- 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

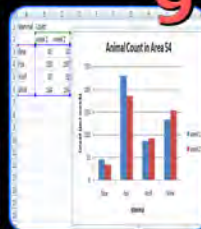
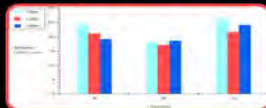


8

- 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



9

PART 1: INTRO TO BOTANY

NAME: _____ DATE: _____

PERIOD: _____

1. What is a plant?

2. What is a plant cell?

3. What is a plant tissue?

4. What is a plant organ?

5. What is a plant system?

6. What is a plant community?

7. What is a plant ecosystem?

8. What is a plant biome?

9. What is a plant kingdom?

10. What is a plant phylum?

11. What is a plant class?

12. What is a plant order?

13. What is a plant family?

14. What is a plant genus?

15. What is a plant species?

16. What is a plant variety?

17. What is a plant cultivar?

18. What is a plant hybrid?

19. What is a plant mutant?

20. What is a plant clone?

- 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



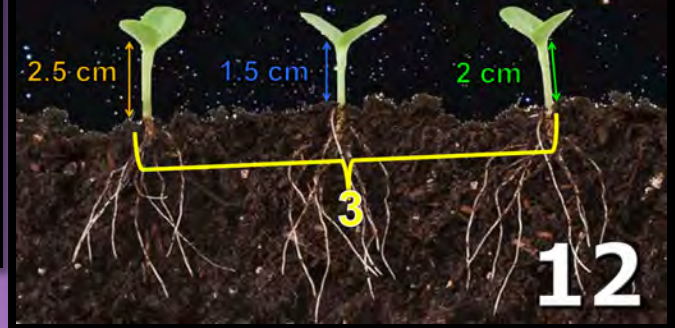
Which is the, independent variable, problem, control, and dependent variable?

Problem	Independent Variable (Change)	C	D
A	B	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.



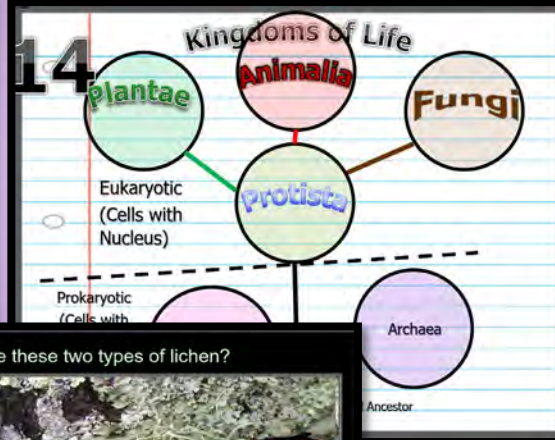
- What is the average height of the three plants below.

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



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

13



- 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)



- True or False? This is a plant?

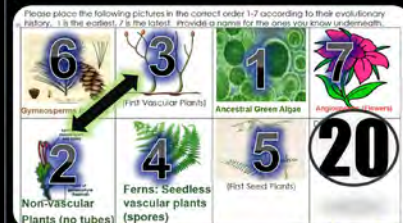
False

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

answer is...

16

- Name these two types of lichen?



Which two are switched / In the wrong order?



Which two are switched?

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

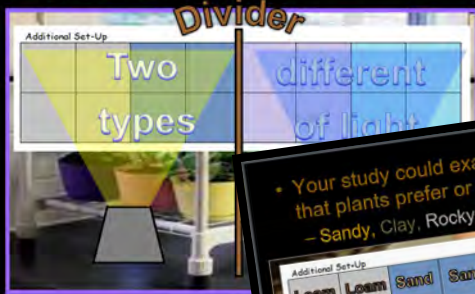


Activities / Labs

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.

Create your own grow study lab

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



- Your study could examine the use of fertilizer at varying levels.

Additional Set-Up		2.5 ml of fertilizer to liter mix of water	5.0 ml of fertilizer to liter mix of water	10 ml of fertilizer to liter mix of water
None	None			
Control				

- Your study could examine the type of soils that plants prefer or grow better in.
– Sandy, Clay, Rocky, Loam?

Additional Set-Up		Sand	Sand	Clay	Clay	Gravel	Gravel
Loam	Loam						
Loam	Loam						

All given same amount of water and light

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

Plant Study Set-Up Name: _____ Site: _____

Visual complete the four items below as they relate to the project you have selected.

Independent variable: _____

Dependent variable: _____

Control: _____

Please describe your set-up with words:

Additional Set-Up:

--	--	--	--	--	--

Control Group:

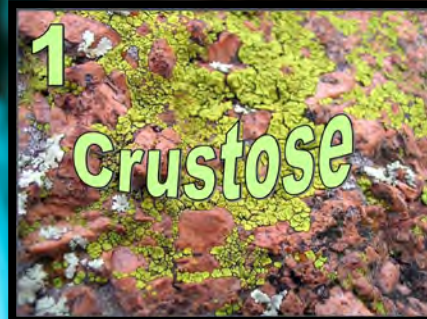
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Built-in Assessment

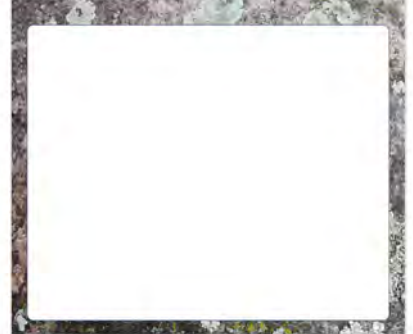
Each unit contains several built-in assessment questions that students answer in their work bundle. With the question revealed before the answer, the teacher can easily call on individual students or table groups to respond. These provide an effective and efficient way for teachers to assess student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

- Quiz Wiz, Name the type of Lichen. 1-10.
- - Crustose, - Foliose, - Fruticose.
- Crusty Leafy Branchy

**QUIZ
WIZ**



Activity! Going on a short walk to observe, sketch, and identify lichens.



Quiz Wiz 1-10 Name that type of Lichen: Word Bank: - Crustose, - Foliose, - Fruticose, Crusty Leafy Branchy

1.)	6.)
2.)	7.)
3.)	8.)
4.)	9.)
5.)	10.)
*11.)	Score:

Questions in 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! Algae as a bio-fuel.
 - Will algae power your car in the near future?
 - http://www.youtube.com/watch?v=n9_ZquuhBw



Copyright © 2024 SlideShare LLC

- Plants. Advanced. First half.
 - https://www.youtube.com/watch?v=X4L3r_XJW0I

Alternation of Generations

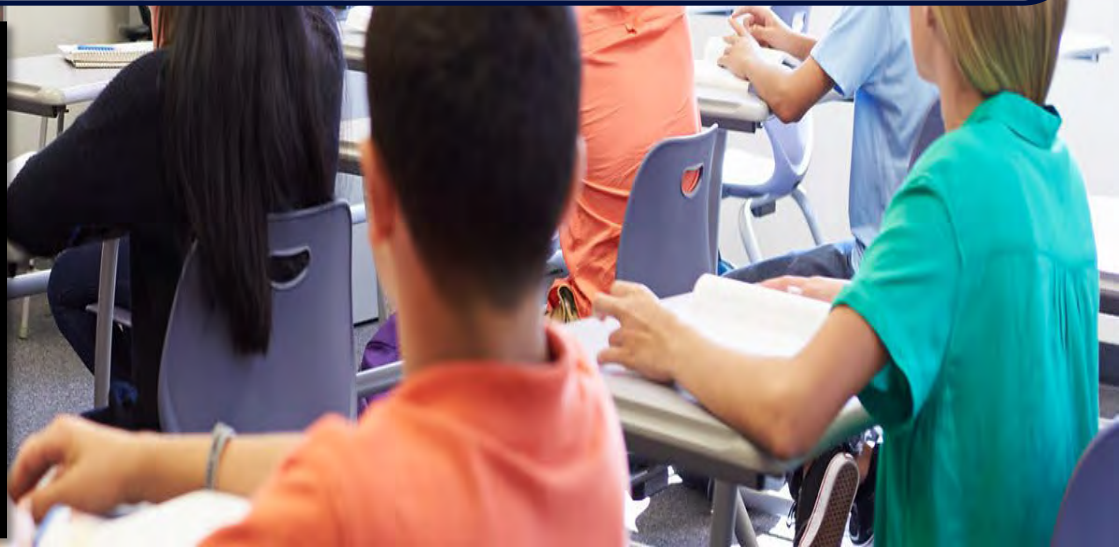
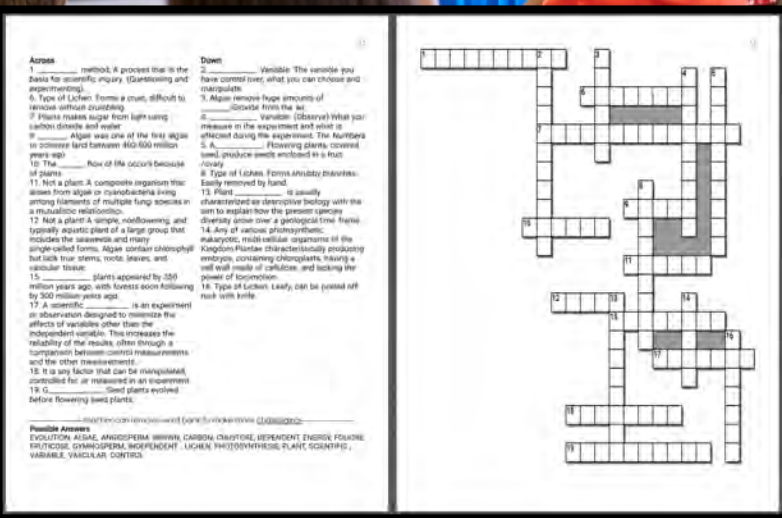


Sporophyte - diploid

Gametophyte - haploid

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.



- Plants are extremely important to our lives.

– Can you name 20 products that use materials from plants or the remains of plants.



- Plants are extremely important to our lives.

– Can you name 20 products that use materials from plants or the remains of plants.



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 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](#)

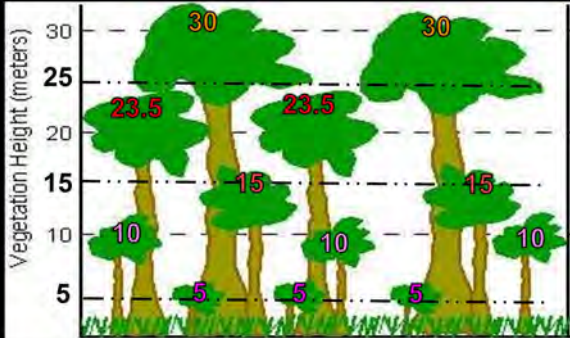
Google Slides



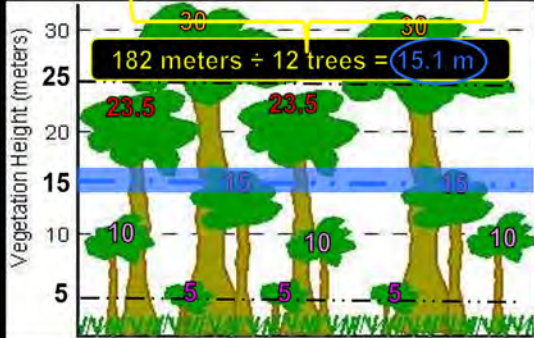
Built-in Questions and Assessments

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.

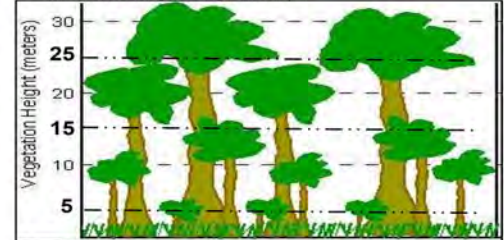
- Please find the average tree height in this sample. $5+5+5+10+10+10+15+15+23.5+23.5+30+30 = 182$



- Please find the average tree height in this sample. $5+5+5+10+10+10+15+15+23.5+23.5+30+30 = 182$



The average / mean is the sum of all values divided by the total number of values.
• Please find the average tree height in this sample.



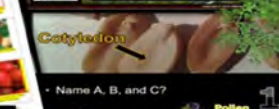
Please show your work in the space below



The Average height of the trees is = _____
The data collection section of your grow study can be found on the last few pages of this pocket.

Botany Unit

Botany Unit



5 Parts, 50 Lessons

Interactive Slideshows

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

• 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

Let's see how different types of plants are the same and different.

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

• Orders

• Angiosperms: The process of growing plants in sand, gravel, or liquid, with added nutrients but without soil.

• Angiosperms produce seeds enclosed in a fruit / ovary.

• Dendrochronology Available Sheet

Follow Along Work Bundles



5 Work Bundles = 87 Pages

Quizzes, Activities, More

• What's the role of these?

A.) Create sugar in photosynthesis
B.) Disperses pollen
C.) Disperses waste from the plant
D.) Quilts water and nutrients
E.) Reseed plant hormones

• Please name A and B.

— Hint: You can try and unscramble the words.

angiosperm gymnosperm

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

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

deciduous

• Equation for Photosynthesis

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

• Identify this type of tree

Maples

• Dendrochronology Available Sheet

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



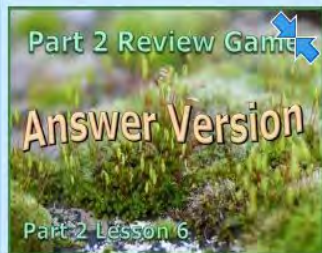
Part 2 Lesson 4 Liverwort Hornwort



Part 2 Lesson 5 Ferns Horsetails



Part 2 Lesson 6 Review Game



Part 2 Lesson 7 Review Game Answers

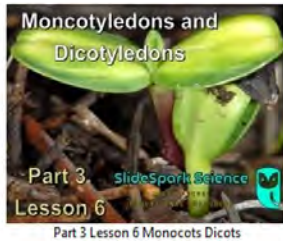
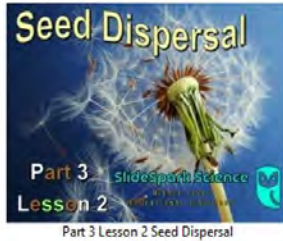


Part 2 Work Bundle Answers



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



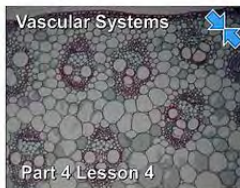
Part 4 Lesson 1 Roots



Part 4 Lesson 2 Tropisms Hydroponics



Part 4 Lesson 3 Plant Hormones



Part 4 Lesson 4 Vascular Systems



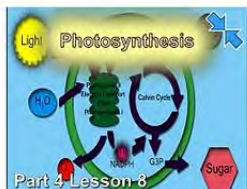
Part 4 Lesson 5 Woody



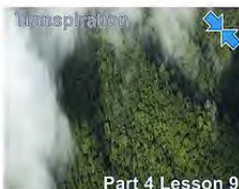
Part 4 Lesson 6 Dendrochronology



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

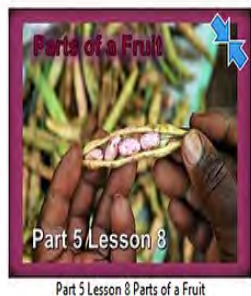
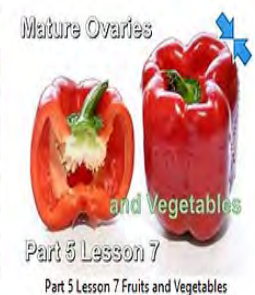
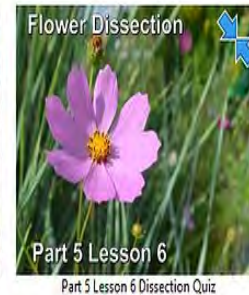
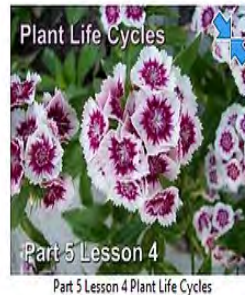


Part 4 Work Bundle Answers



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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