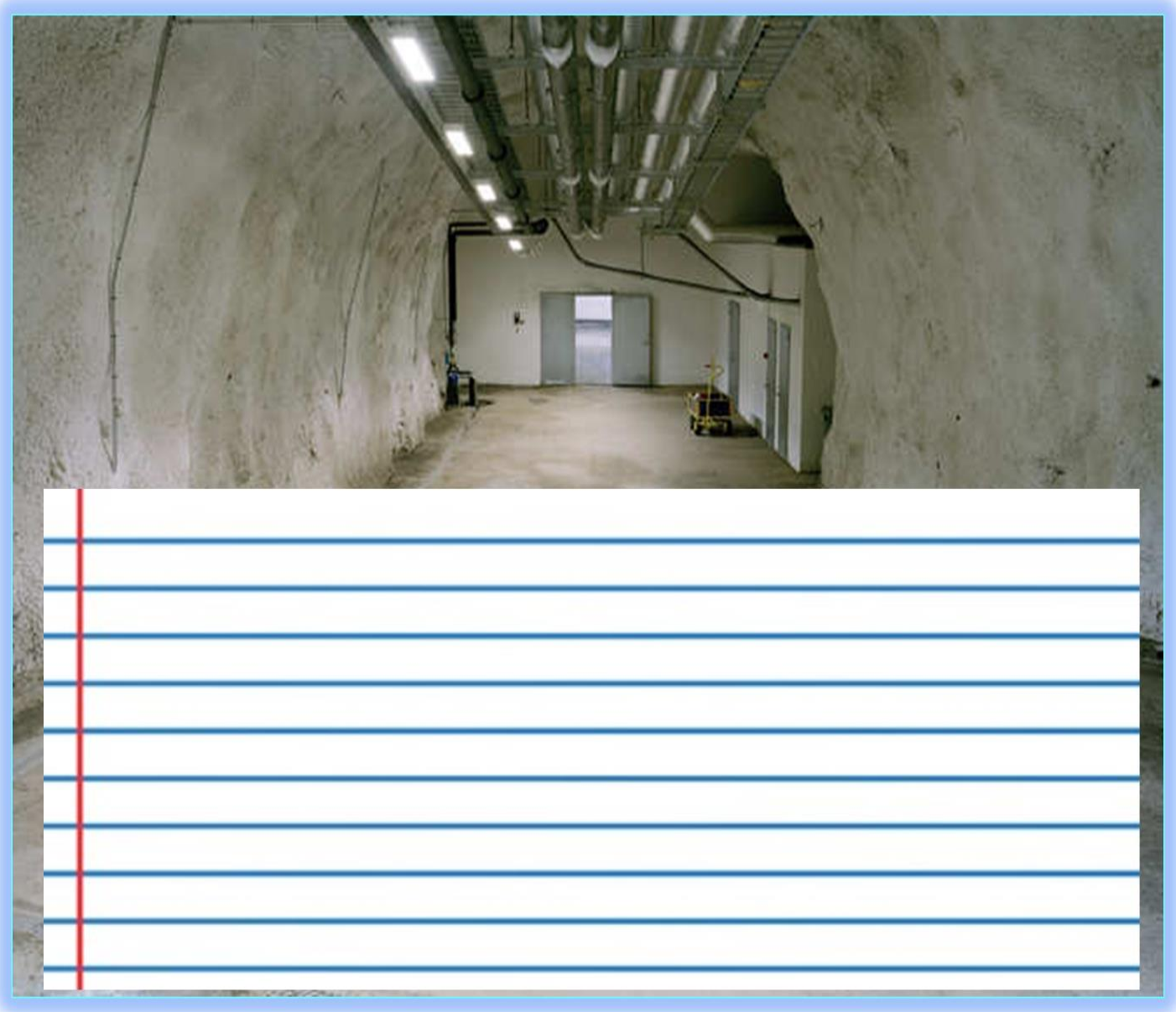
Part 3 Young Plants

Name:

Part 3 Lesson 1 Seeds

Please tell me about this place as described in the slideshow. What? And where is it? And what is its purpose?

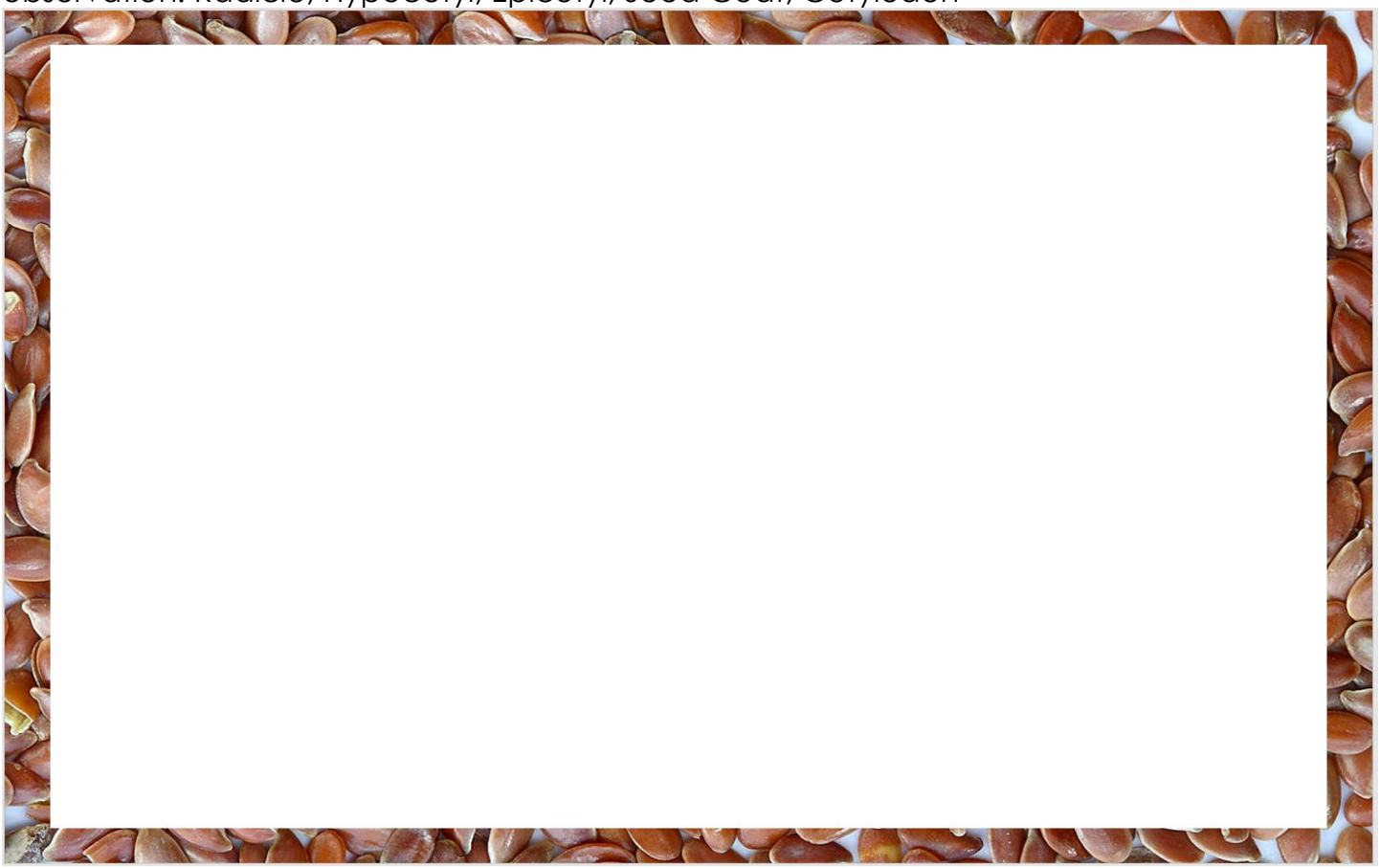


Seed: (Easy) A _____ Plant.

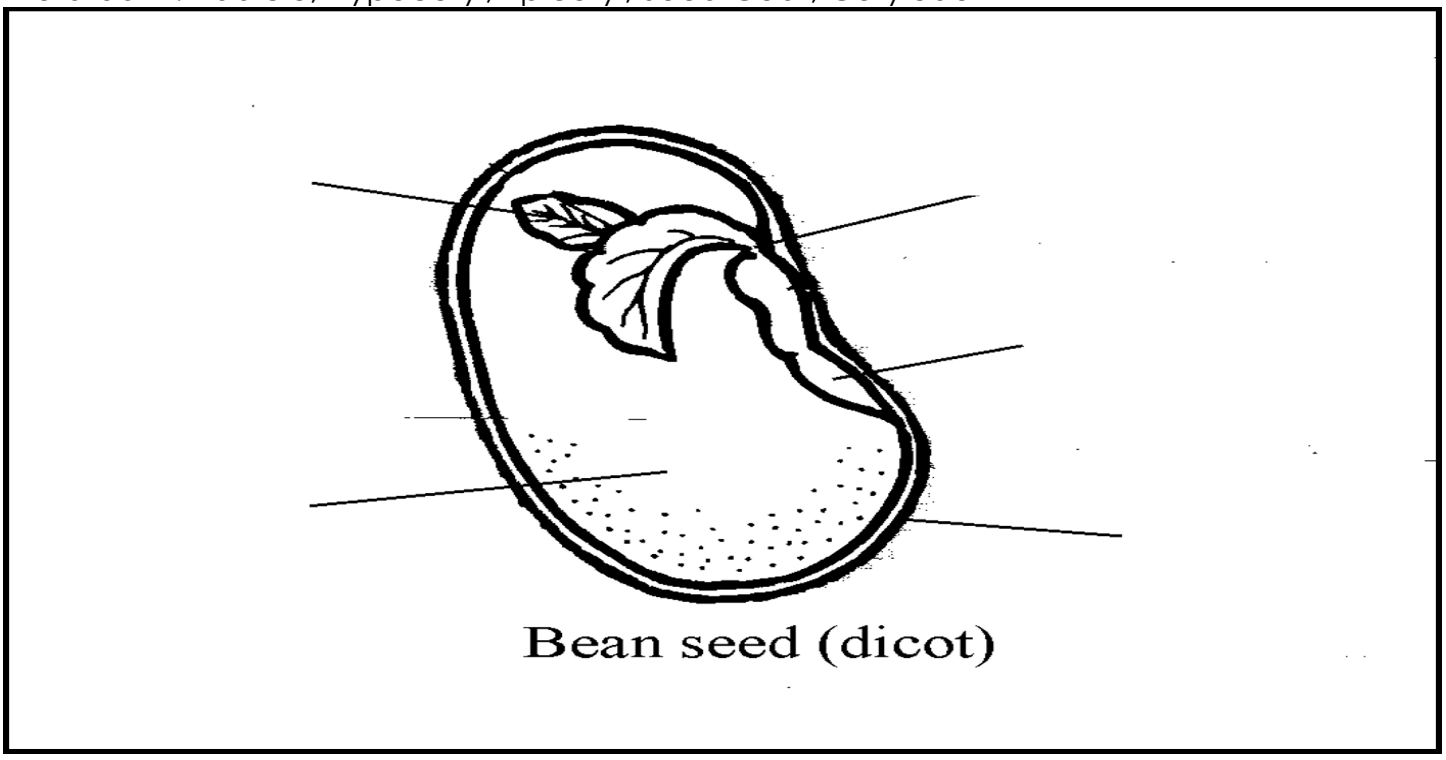
Seed: (Hard) A mature fertilized plant _____consisting of an _____, its _____source, and having a protective _____.

Seed Coat: _____ seed from drying out, aids in seed dispersal, open's when conditions are right.

Please make some observations of the provided seeds. Please include the following in your observation. Radicle, Hypocotyl, Epicotyl, Seed Coat, Cotyledon



Word bank: Radicle, Hypocotyl, Epicotyl, Seed Coat, Cotyledon



Part 3 Lesson 2 Seed Dispersal

Seed Dormancy: A period when the seed _____ grow.

Plants use wind to pollinate.

Pollination: The transferring of pollen (_____) from one plant to another.

Which is male, and which is female.

A)	B)	A)	B)

Plants can disperse seeds by…

_____
_____
_____
Tension.
Fire.

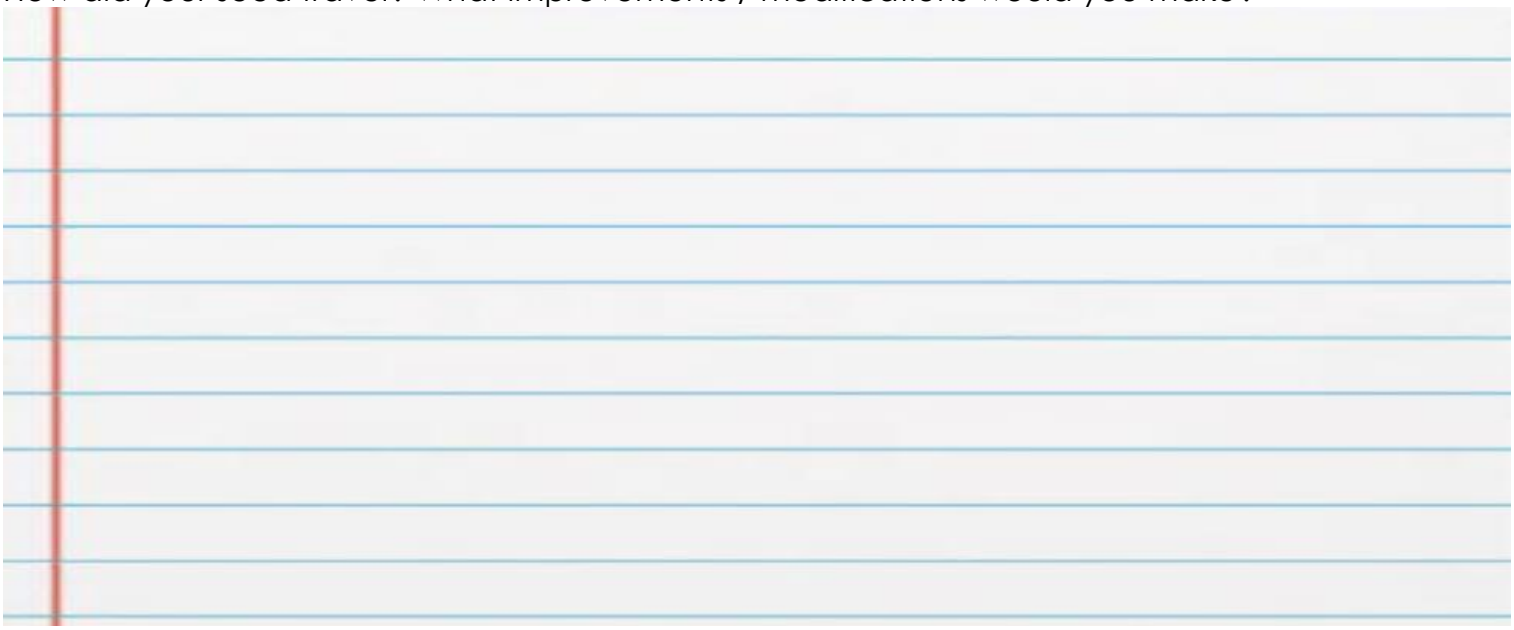
Wind Dispersal: When wind is used to disperse either _____ or _____.

Most common dispersal mechanism.

Animals can pollinate, and then wind can disperse seeds. Wind can pollinate, and then animals can disperse seeds.

Design your seed for wind dispersal in the space below. What materials is it made of? Is it modeled after a type of seed? Remember, natures design is often the best one.

How did your seed travel? What improvements / modifications would you make?



Part 3 Lesson 3 Seed Dispersal Continued Water and Animal.

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

Animal seed dispersal: When animals aid _____ away seeds.

Animal Dispersal
-Review - Animals help disperse _____ to fertilize plants.
-Animals can carry and drop seeds.
-Seeds sometimes _____ to an animal and hitch a ride to fall off later and in a new location.
Animals _____ stashes "cache" of seeds and then forget where.

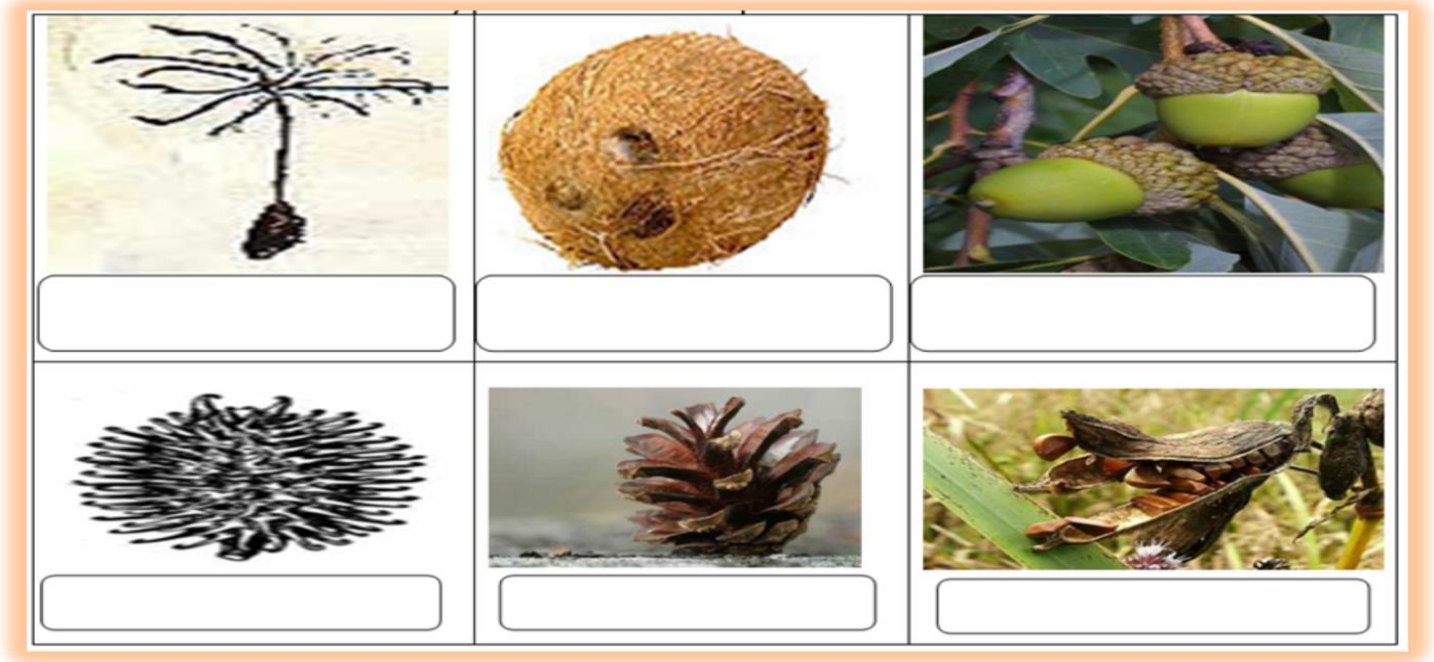
Animals _____ fruits that contain seeds.
They then _____ the seeds many hours later into a nutrient rich, moisture retaining, pile of scat _____from the parent plant.

Tension dispersal. Doesn't involve animals.
Tension builds and seeds are ejected a short distance.

Activity! Quiz 1-10 – Name that seed dispersal mechanism.
- Wind, Water, Animals, Tension,

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

Please name the seed dispersal mechanism below.



Part 3 Lesson 4 Young Plants

Seed Dormancy: A period when the seed _____ grow.

Factors that break seed dormancy.

Mechanical _____

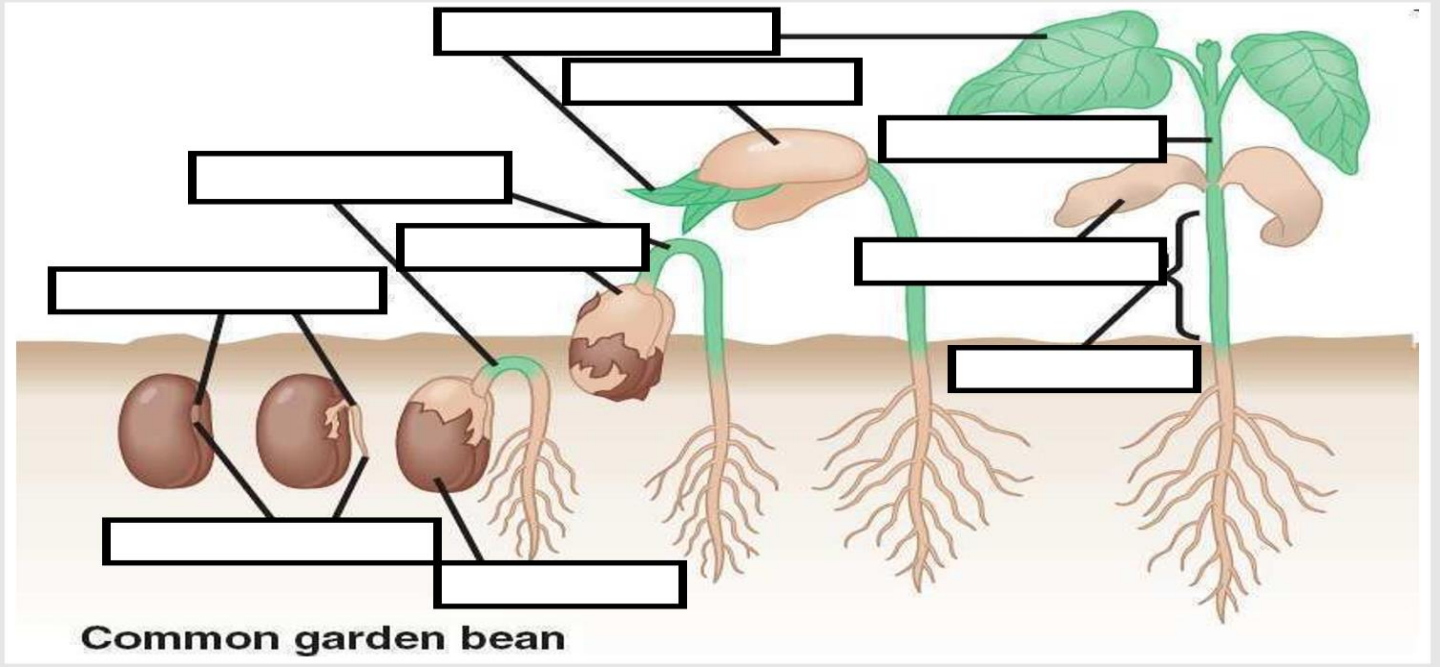
_____ processes of animals.

_____ – Warm and Cold + Fire.

Water

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

Please fill out the diagram below as described in the slideshow.



Cotyledon: _____ leaves (Full of energy).

Radicle: Lower embryo and _____

- Radicle emerges from seed coat and goes _____ into the soil for support, the plant then goes upward.
    - Gravitropism: Response of a plant in relation to _____. Roots go down, shoots go up.

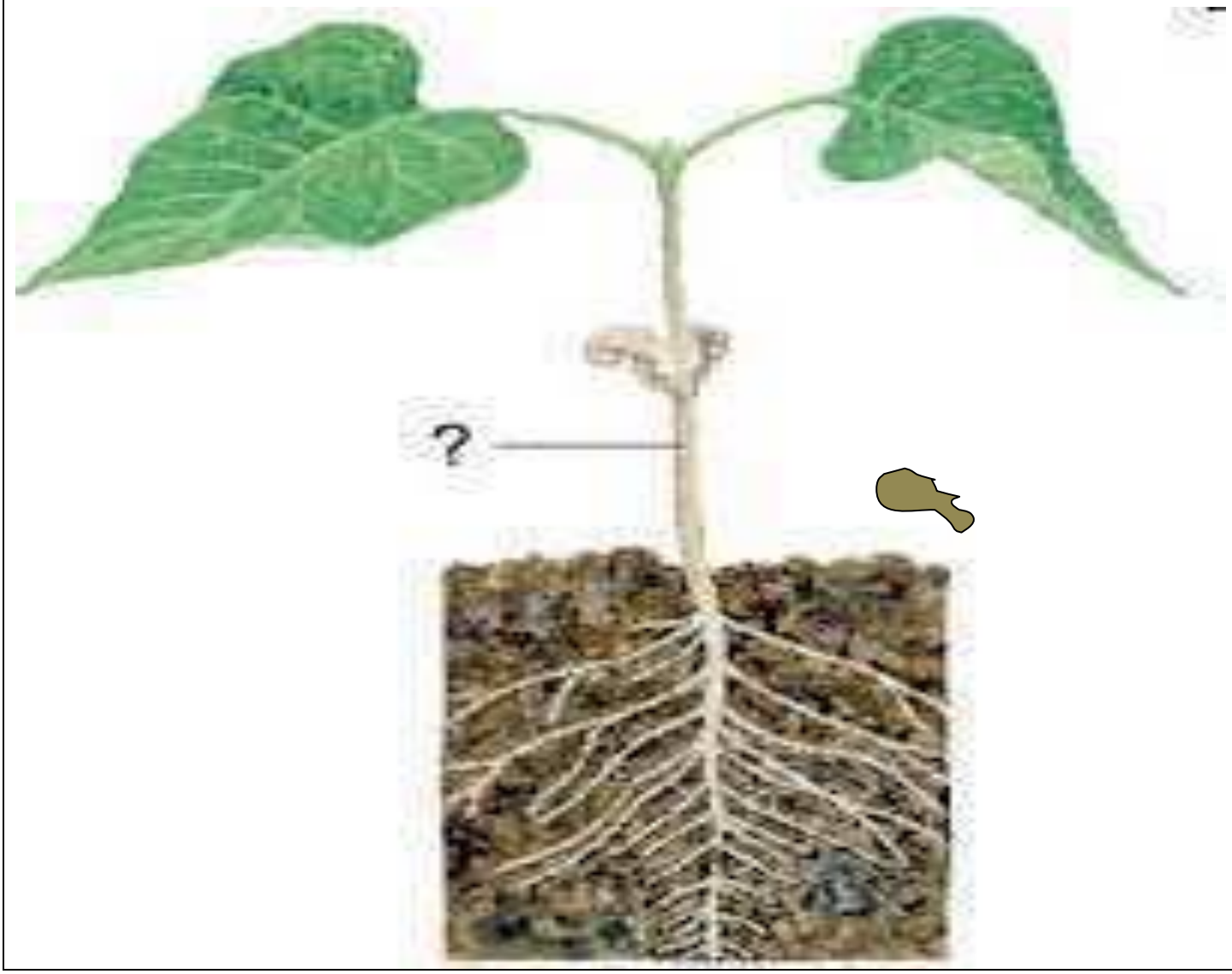
Part 3 Lesson 5 Young Plants Continued

Hypocotyl: Part of the plant between the _____ and _____.

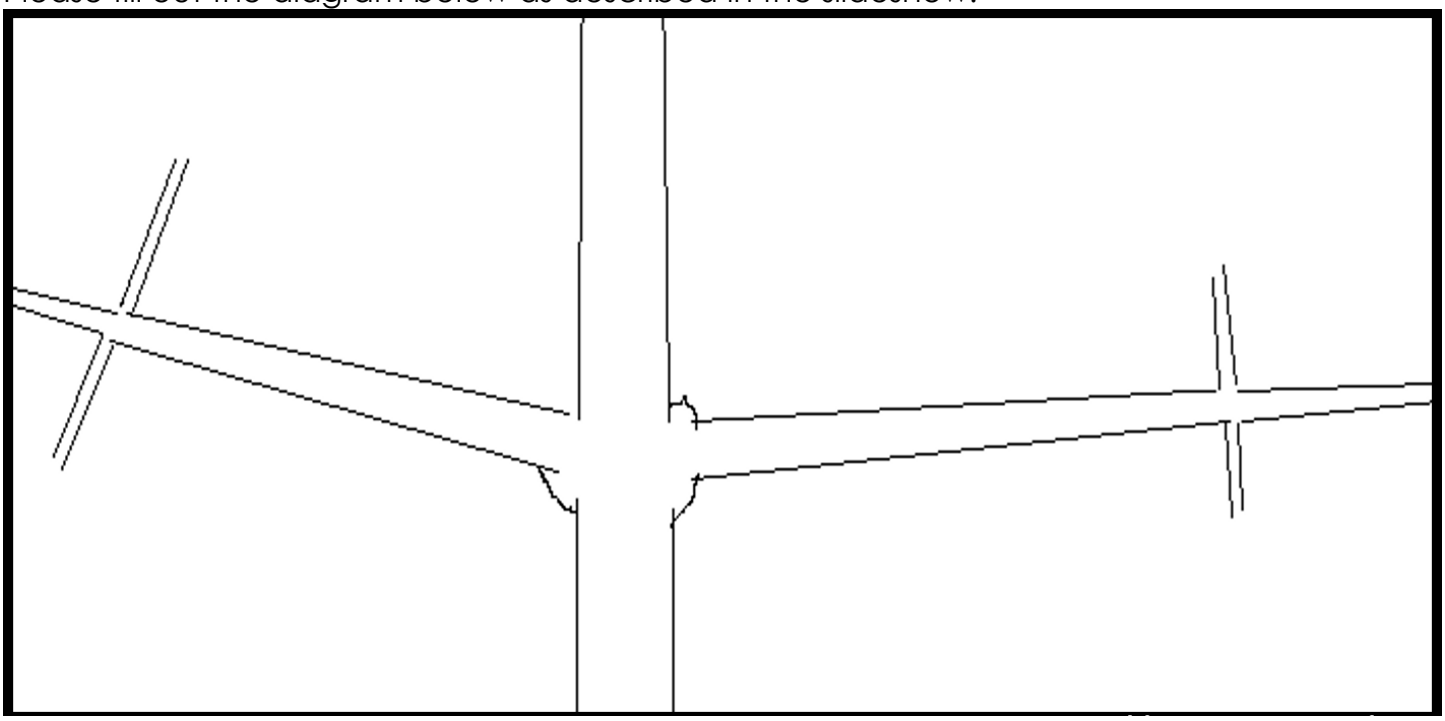
Epicotyl: The stem of a seedling or embryo located between the _____ and the first _____

Please label and provide a brief description of the following terms associated with a young plant. Check off each term after you have described and labeled them. Make sure your arrow accurately points to that plant feature.

◊ True Leaves ◊ Cotyledons ◊ Epicotyl ◊ Hypocotyl ◊ Radicle ◊ Seed Coat

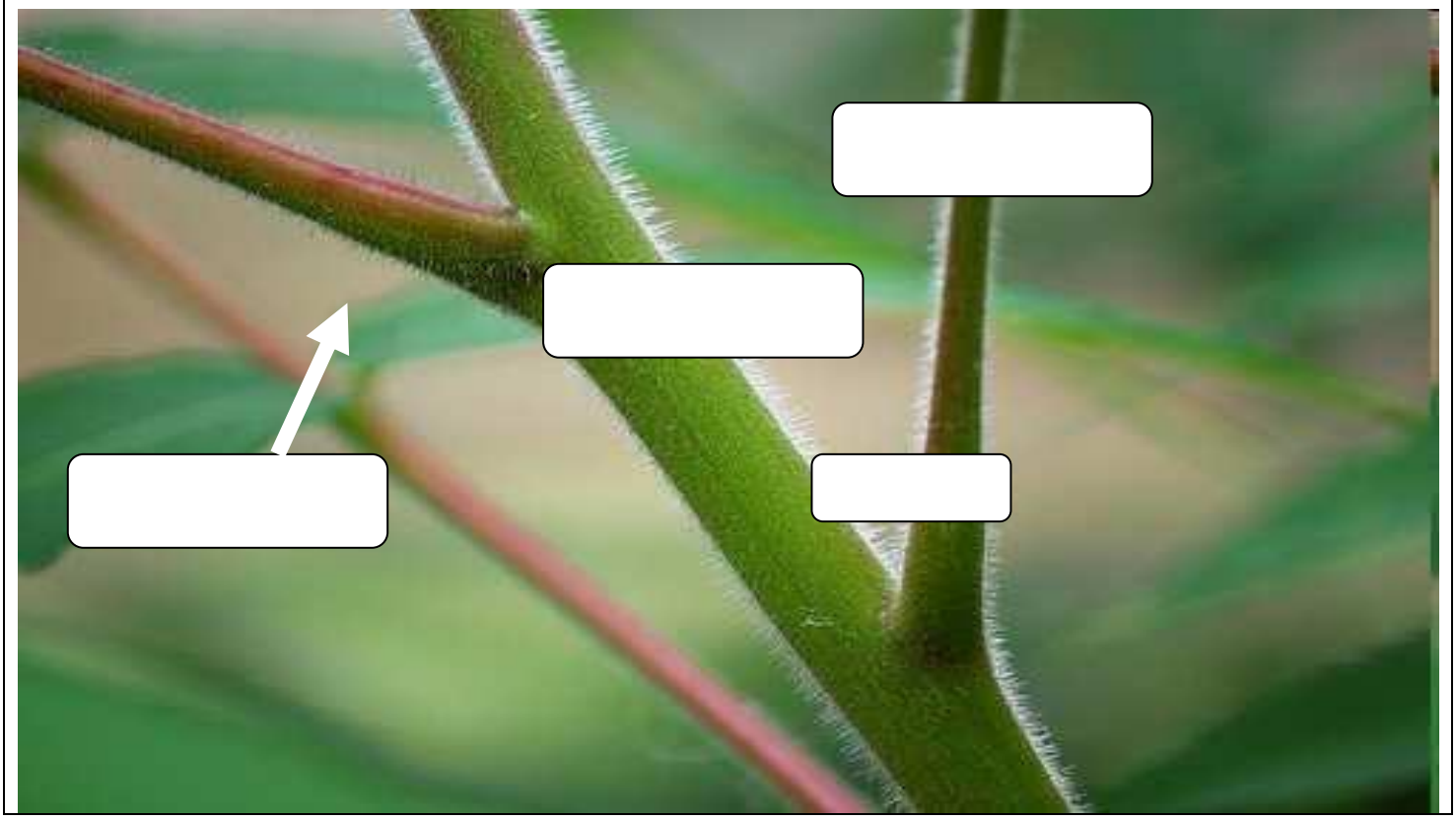


Please fill out the diagram below as described in the slideshow.



Please accurately label the parts of a stem on the picture below. Please check off each box after you have used the term.

◊ Node ◊ Internode ◊ Petiole ◊ Stem



Activity! Quiz Wiz 1-10. Name the part of the seed / plant or other information.

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

Part 3 Lesson 6 Monocotyledons and Dicotyledons

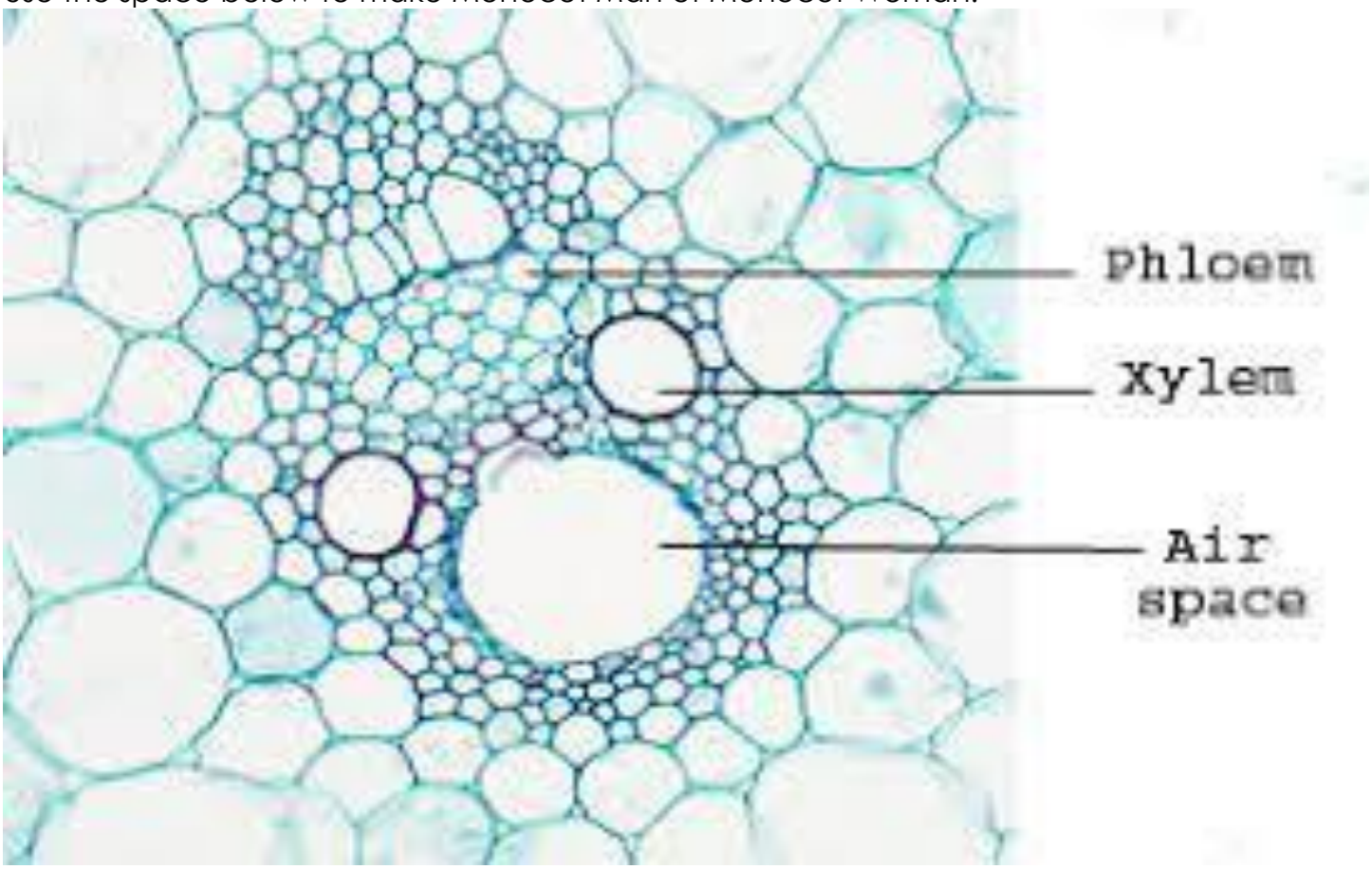
Monocotyledon: A flowering plant with an embryo that bears a _____ cotyledon (seed leaf).

Monocotyledons constitute the _____ of the two great divisions of flowering plants, and typically have elongated stalkless leaves with parallel veins (e.g. grasses, lilies, palms).

Monocotyledons

Seedling has _____ cotyledon
Veins in leaf are _____
Flower petals are in _____
Never _____.
Vascular bundles are _____

Use the space below to make Monocot Man of Monocot Woman.

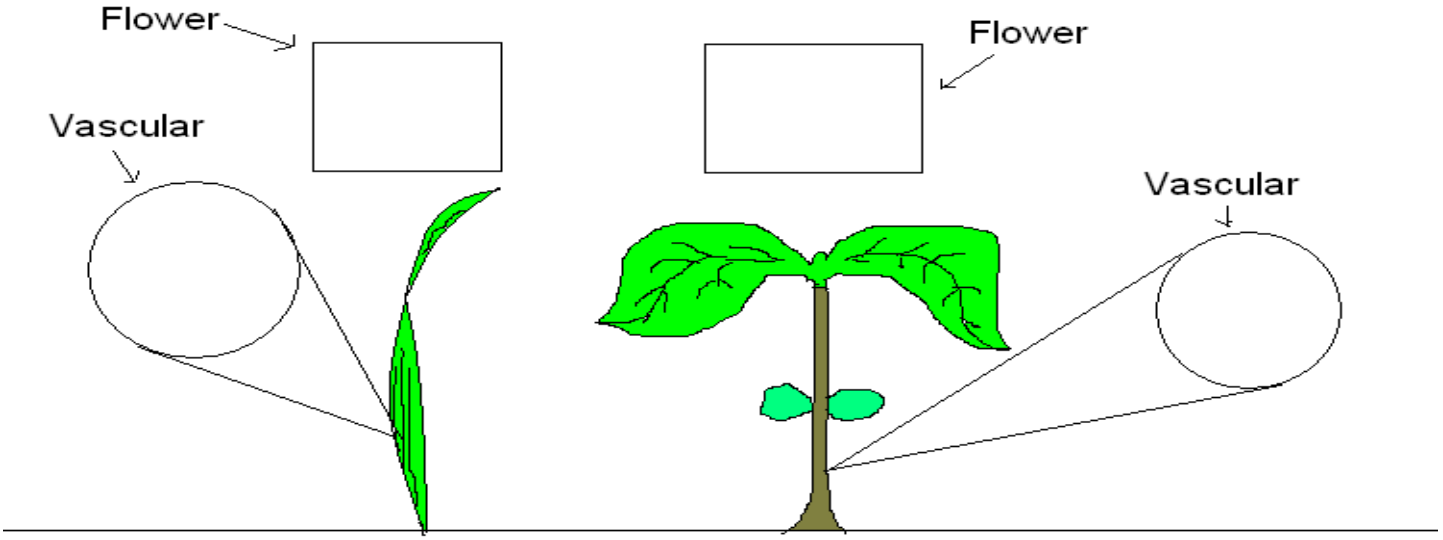


Dicotyledon: A flowering plant with an embryo that bears _____ cotyledons (seed leaves). Dicotyledons constitute the _____ of the two great divisions of flowering plants, and typically have broad, stalked leaves with netlike veins (e.g., daisies, hawthorns, oaks).

Dicotyledons

Veins on leaf are _____
Flower parts are groups of _____
Secondary growth can be _____
Vascular bundles are in a _____

Which plant below is a dicotyledon, and which is a monocotyledon? Explain using the pictures, boxes, and circles to describe the differences between the two.



Please draw a seed, root, stem, leaf, and flower of a monocot, and then dicot that would show that you understand the differences between the two.

	Seed	Root	Stem	Leaf	Flower
Monocot					
Dicot					

Part 3 Lesson 7 George Washington Carver

George Washington Carver was born in Missouri on the Moses Carver plantation. His parents were slaves. His father died right before George was born, then while he was still a baby, slave traders kidnapped him and his mother. Only George was returned to the plantation. George did not know the date of his birthday.

When he was a baby, he had a disease called whooping cough. It left him sickly and he couldn't do hard work like the other slaves. His chores were cooking and sewing. He loved to work in the garden.

He taught himself to read. His family was so poor, he couldn't afford to buy a pencil, so he made a holder and used a pencil that was only 1/4 inch long.

He wanted to get an education. When he was 12 years old, he left home to attend a black school. There was only one teacher with 75 children in a small room. While other children played at recess, he studied. He studied at home before and after he did his chores.

He wrote to a college to enroll and they accepted him, but when they found out he was black, they told him he couldn't attend.

After five more years, when he was 30 years old, he was accepted at a college in Iowa. He did so well, his teacher helped him to get a transfer to Iowa State College where he studied botany. He learned about plants and farming. He became the best botany student on campus.

He did many things to earn money to pay for his expenses. He sold hominy which he had made, and sometimes he ironed clothes for his classmates. He found an old stove at the city dump and brought it home to cook meals for his friends. He used old wrapping paper for notebooks.

"Don't throw anything away," he would say. "Everything can be used again."

After he graduated, they asked him to teach biology to the beginning students.

Later, Carver was asked to teach at the Tuskegee Institute in Alabama. He was paid 125 dollars a month and he never asked for an increase.

Carver started studying diseases which were attacking the farmers' crops. He also did a lot of experimenting to find new ways to use different plants. He made more than 300 products from peanuts. He even made soap and ink from peanuts. From sweet potatoes, he made 118 products, including flour and candy. He made 75 products from pecans and even made a building material for walls from cotton stalks. He had many good ideas!

Later in his life, Thomas Edison offered him $100,000 a year to come and work for him, but he thought he could do more good at Tuskegee.

He made his students work hard, and he insisted they do each experiment right. If they told him they had done something "about right", he would say, "Don't tell me it's 'about right'. If it's '*about* right', then it's wrong."

Money, stylish clothes, and fine cars were not important to him. He thought the truly successful person was the one who had learned to serve others. In 1990 he was inducted into The National Inventors Hall of fame for his many accomplishments.

Questions? Describe George Washington Carver as a young boy about your age.

Describe some of the hardships that George Washington Carver had to overcome.

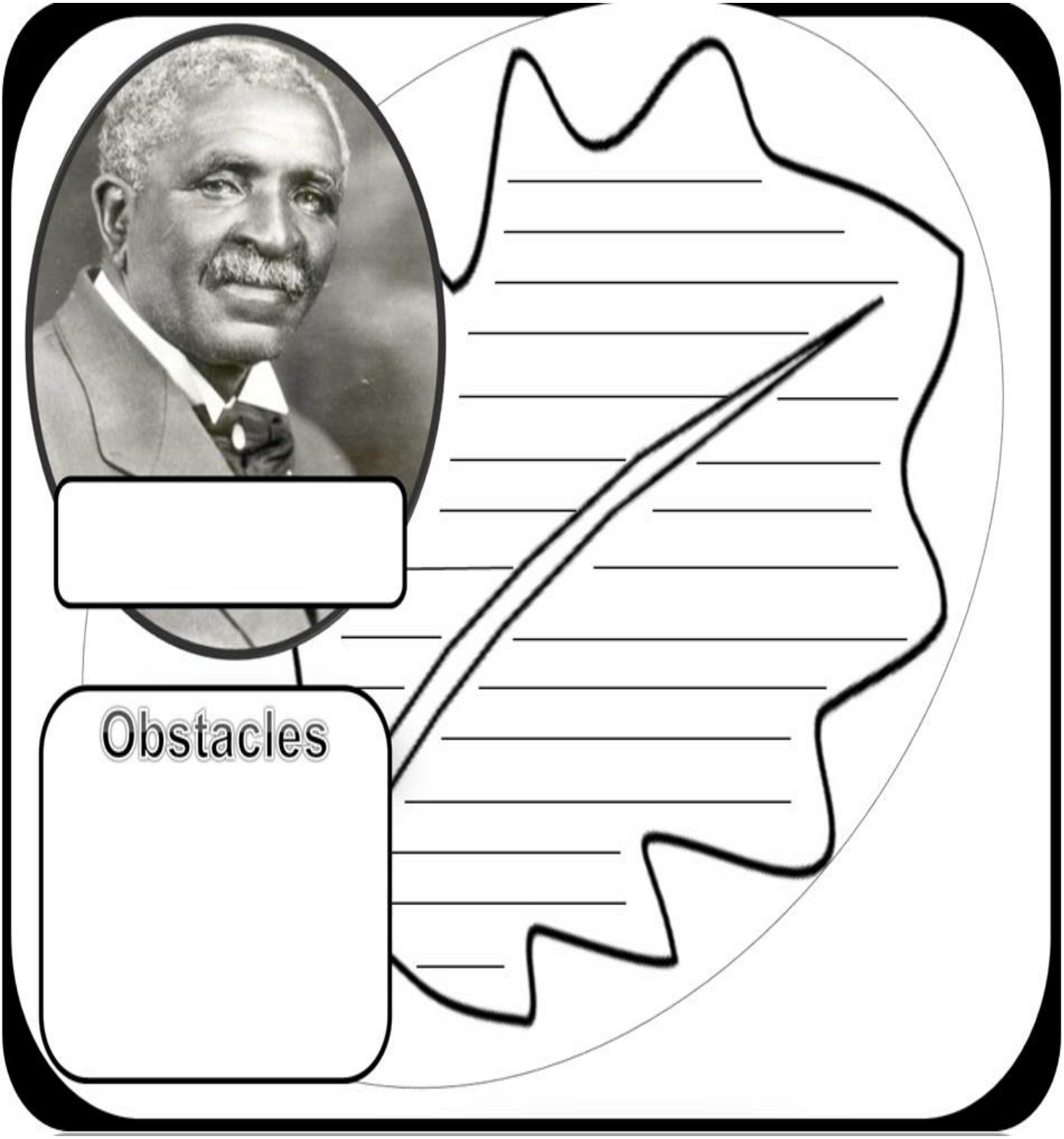
How did George Washington Carver overcome many of the hardships that he faced?

Name a few of George Washington Carvers many accomplishments?

What kind of person was George Washington Carver? How is he different than many other scientists?

George Washington Carver overcame extreme obstacles to achieve his hopes and dreams. How are you doing on your journey?

Who is this person? Explain using some information provided in the readings, videos, and from the classroom lesson. What obstacles did he overcome?



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

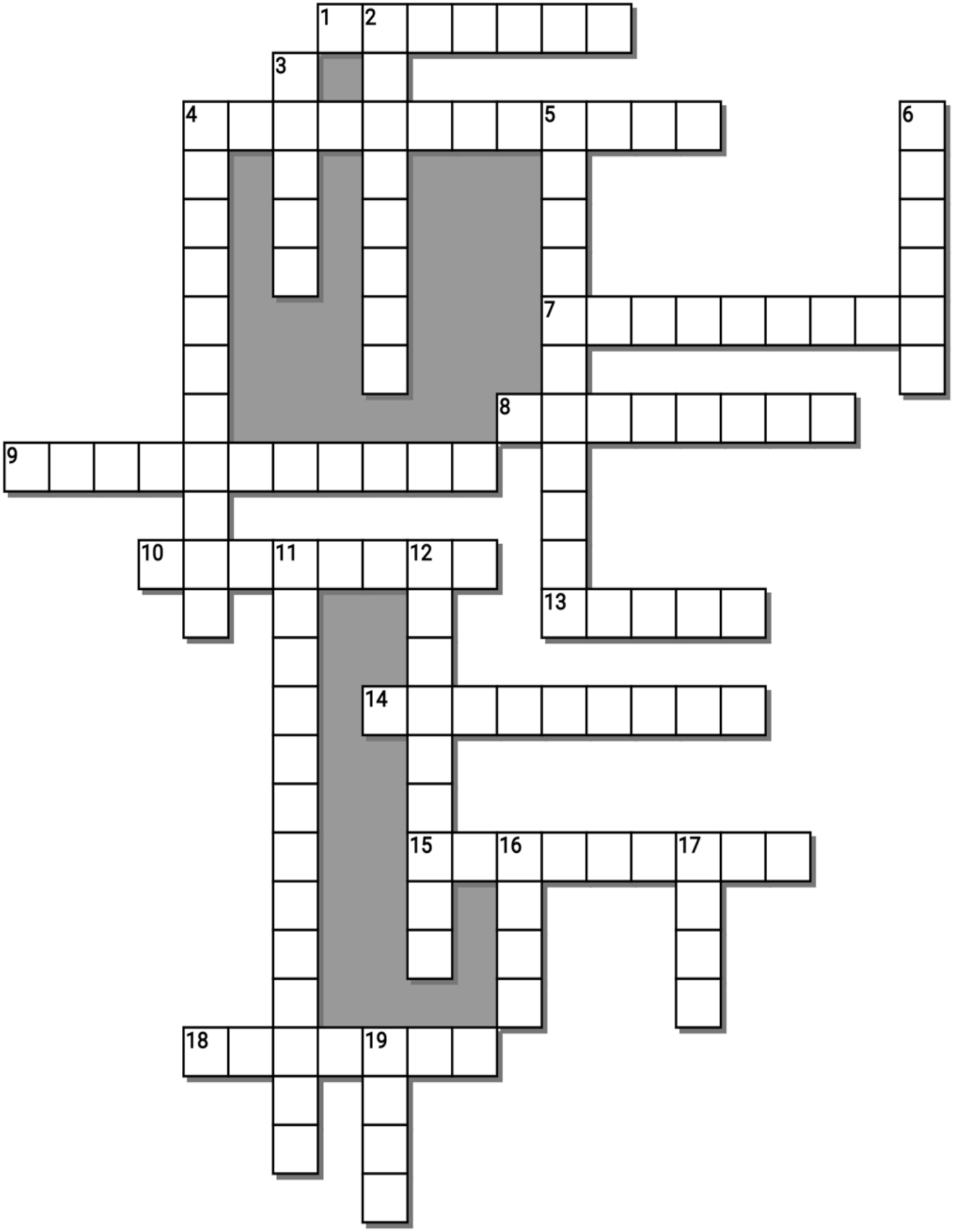
Down

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.

----------teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

CARVER, COAT, COTYLEDON, DICOTYLEDON, DORMANCY, EPICOTYL, GERMINATION, GRAVITROPISM, HYPOCOTYL, MONOCOTYLEDON, NODES, PETIOLE, POLLINATION, RADICLE, SEED, STEM, WATER, DISPERSAL , INTERNODE, PARALLEL


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Part 3 Review Game Lesson 8

Name:

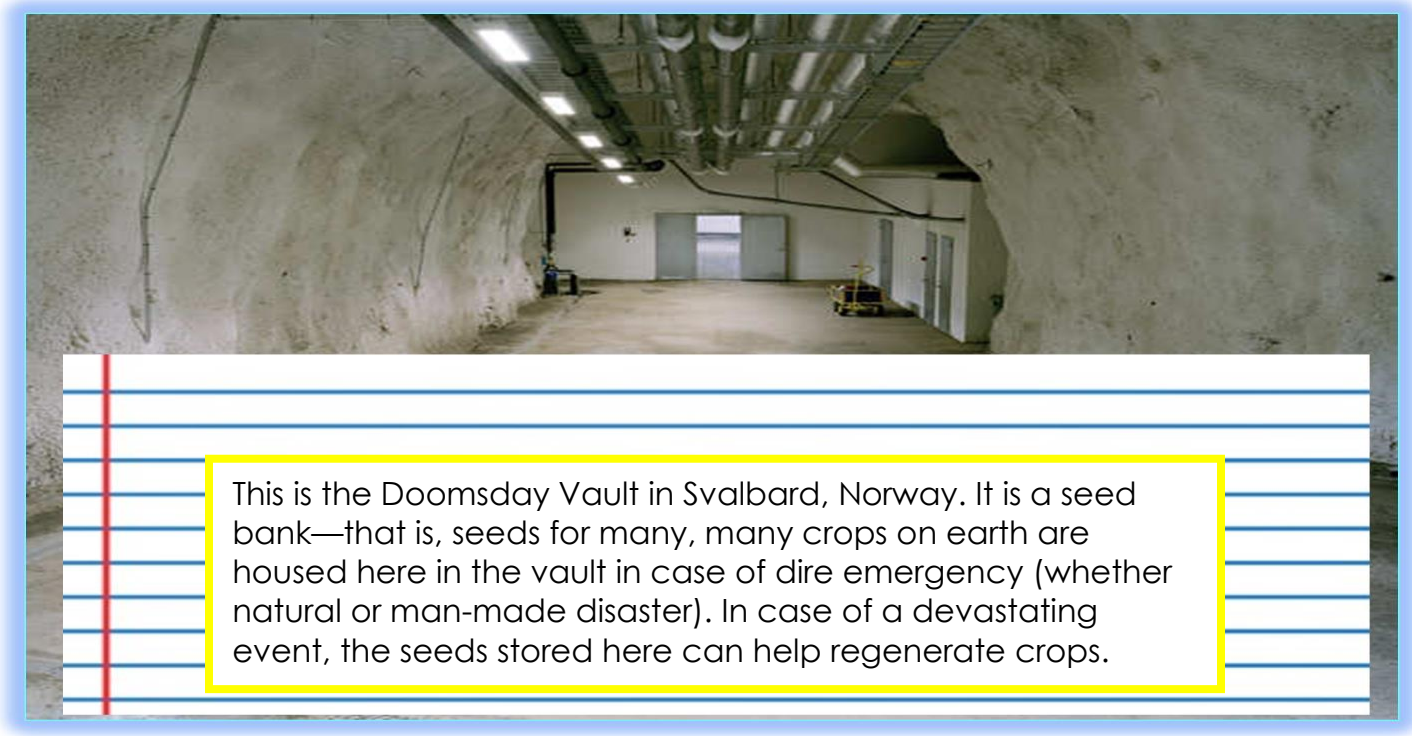
1-10 = 10 pts * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Due: Today
Score ____ / 100

NEED FOR SEED	UP UP AND AWAY	YOUNG ONE	ONE FOR ME, TWO FOR YOU	GREEN MACHINE Bonus round 1 pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager ___ /5 Answer: _____

Part 3 Young Plants Name:
Part 3 Lesson 1 Seeds
Please tell me about this place as described in the slideshow. What? And where is it? And what is its purpose?

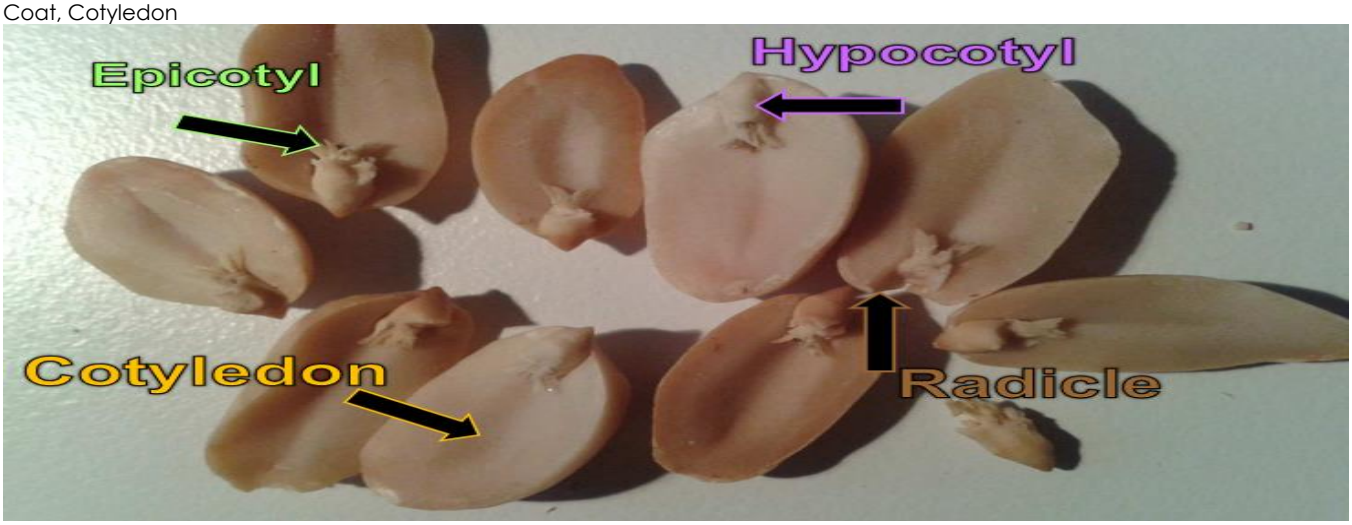


Seed: (Easy) A baby Plant.

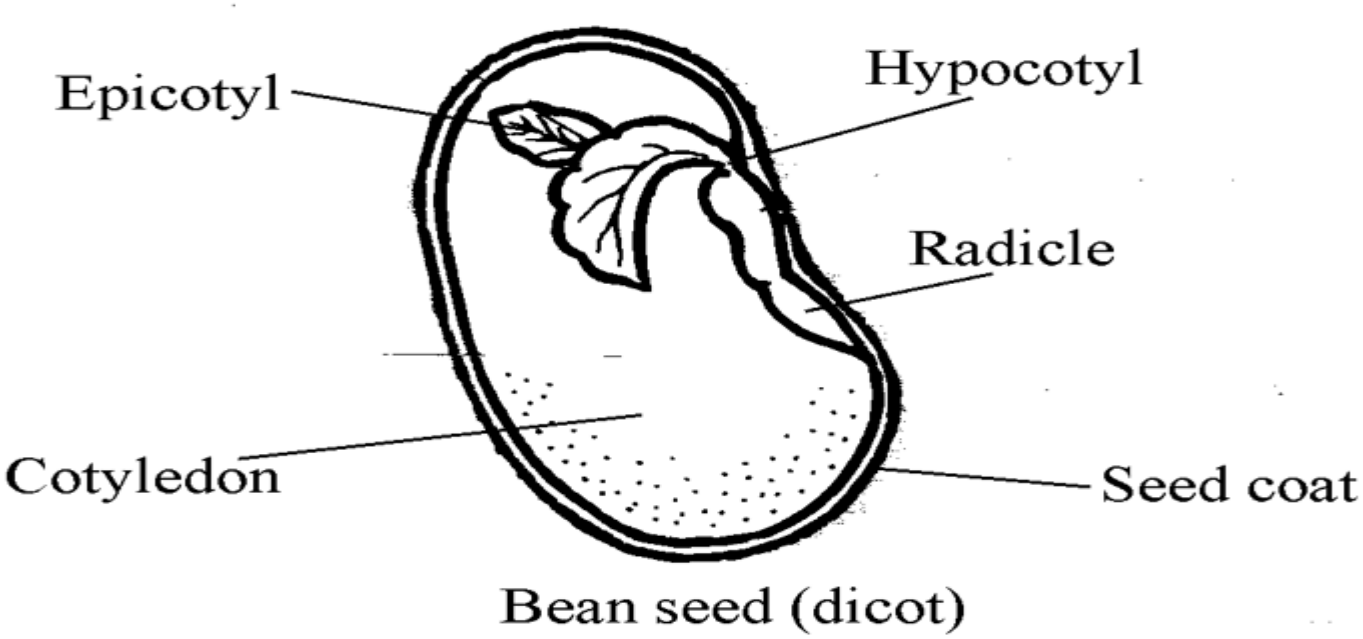
Seed: (Hard) A mature fertilized plant ovule consisting of an embryo, its food source, and having a protective coat.

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

Please make some observations of the provided seeds. Please include the following in your observation. Radicle, Hypocotyl, Epicotyl, Seed Coat, Cotyledon



Word bank: Radicle, Hypocotyl, Epicotyl, Seed Coat, Cotyledon

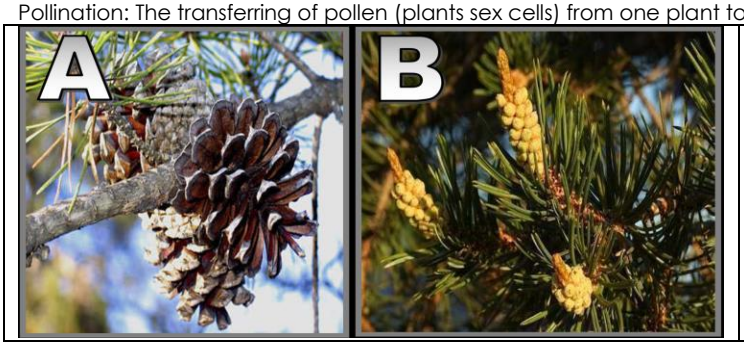


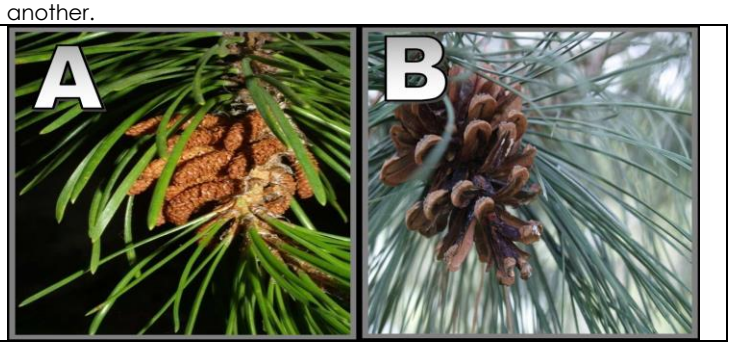
Bean seed (dicot)

Part 3 Lesson 2 Seed Dispersal

Seed Dormancy: A period when the seed doesn't grow.

Plants use wind to pollinate.
Pollination: The transferring of pollen (plants sex cells) from one plant to another.





Which is male, and which is female.

A) Female	B) Male	A) Male	B) Female

Plants can disperse seeds by…
Wind.
Water.
Animals.
Tension.
Fire.

Wind Dispersal: When wind is used to disperse either pollen or seeds.
Most common dispersal mechanism.

Animals can pollinate, and then wind can disperse seeds. Wind can pollinate, and then animals can disperse seeds.

Design your seed for wind dispersal in the space below. What materials is it made of? Is it modeled after a type of seed? Remember, natures design is often the best one.

How did your seed travel? What improvements / modifications would you make?

Part 3 Lesson 3 Seed Dispersal Continued Water and Animal.

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

Animal seed dispersal: When animals aid carrying away seeds.

Animal Dispersal
-Review - Animals help disperse pollen to fertilize plants.
-Animals can carry and drop seeds.
-Seeds sometimes stick to an animal and hitch a ride to fall off later and in a new location.
Animals hide stashes "cache" of seeds and then forget where.

Animals eat fruits that contain seeds.
They then pass out the seeds many hours later into a nutrient rich, moisture retaining, pile of scat far from the parent plant.

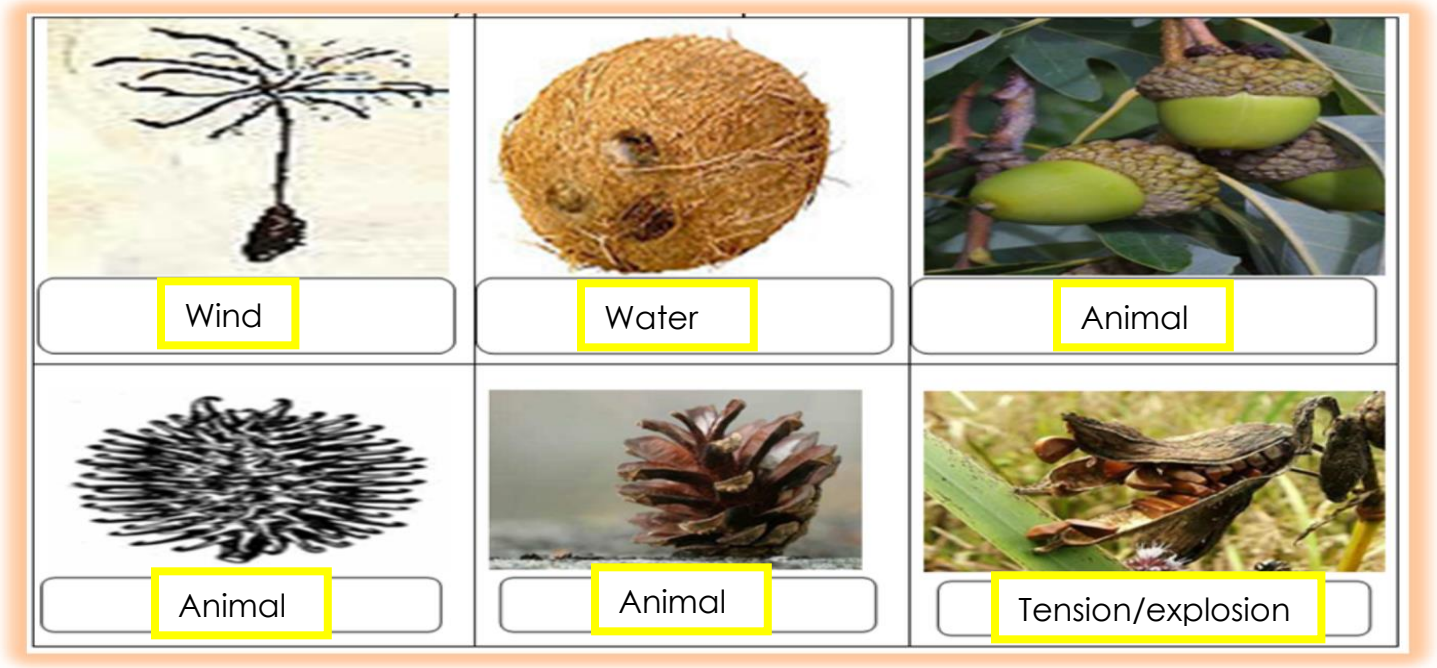
Tension dispersal. Doesn't involve animals.
Tension builds and seeds are ejected a short distance.

Activity! Quiz 1-10 – Name that seed dispersal mechanism.

– Wind, Water, Animals, Tension,

1) Animal	2) Animal	3) Wind
4) Tension/explosion	5) Water	6) Animal
7) Wind	8) Animal	9) Water
10) Wind	*11) Planters	

Please name the seed dispersal mechanism below.



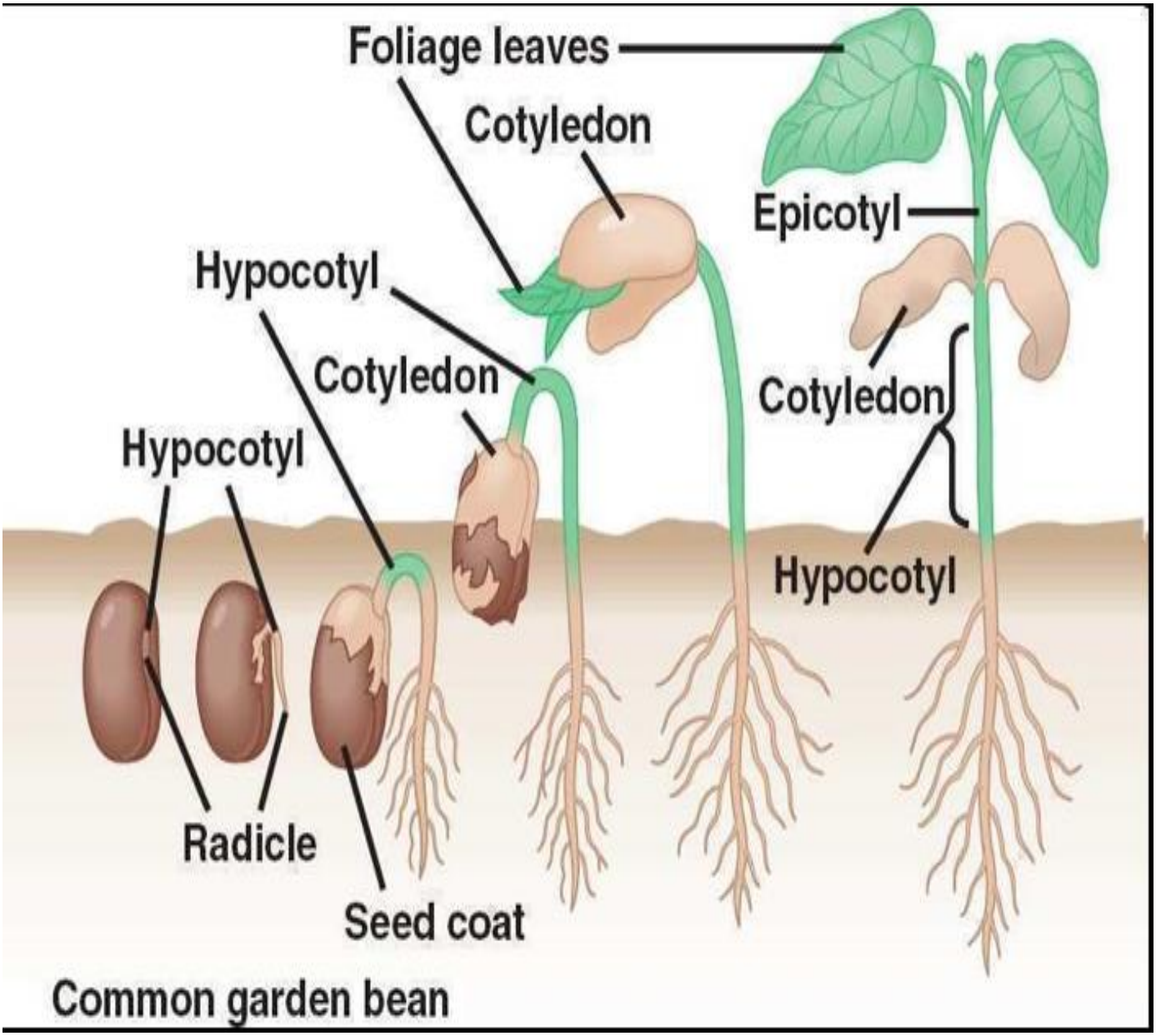
Part 3 Lesson 4 Young Plants

Seed Dormancy: A period when the seed doesn't grow.

Factors that break seed dormancy.
Mechanical abrasion.
Digestion processes of animals.
Temperatures – Warm and Cold + Fire.
Water

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

Please fill out the diagram below as described in the slideshow.



Cotyledon: First leaves (Full of energy).

Radicle: Lower embryo and root.

- Radicle emerges from seed coat and goes downward into the soil for support, the plant then goes upward.
    - Gravitropism: Response of a plant in relation to gravity. Roots go down, shoots go up.

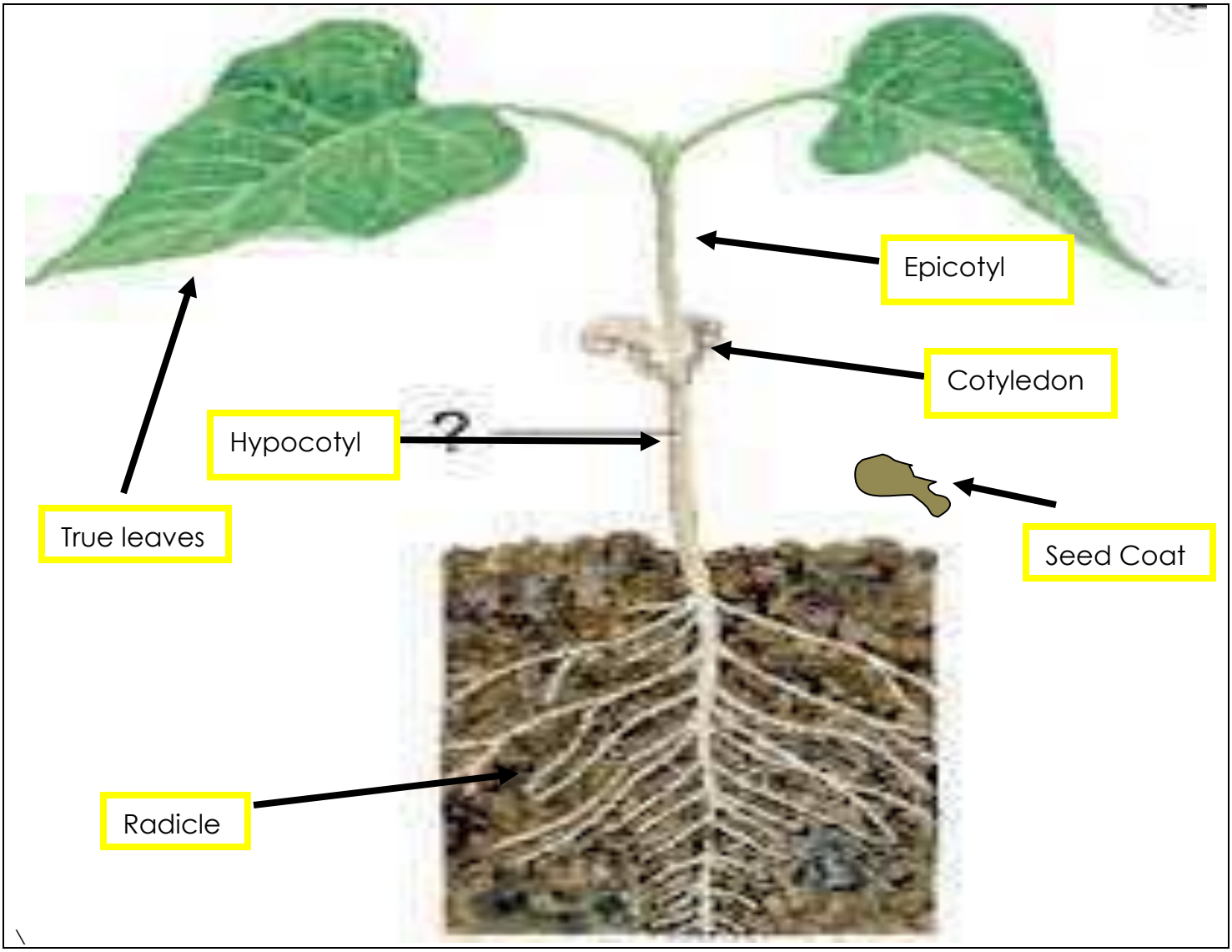
Part 3 Lesson 5 Young Plants Continued

Hypocotyl: Part of the plant between the radicle and cotyledons.

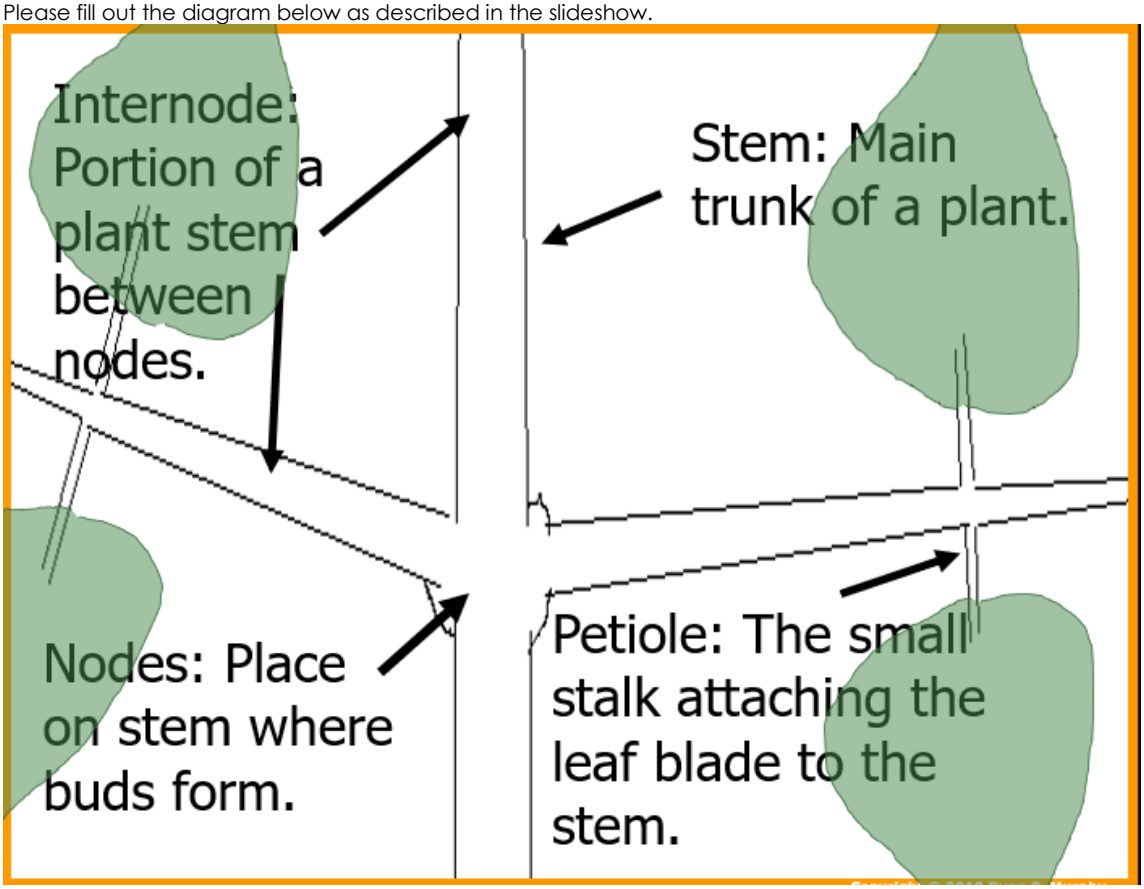
Epicotyl: The stem of a seedling or embryo located between the cotyledons and the first true leaves.

Please label and provide a brief description of the following terms associated with a young plant. Check off each term after you have described and labeled them. Make sure your arrow accurately points to that plant feature.

◊ True Leaves ◊ Cotyledons ◊ Epicotyl ◊ Hypocotyl ◊ Radicle ◊ Seed Coat

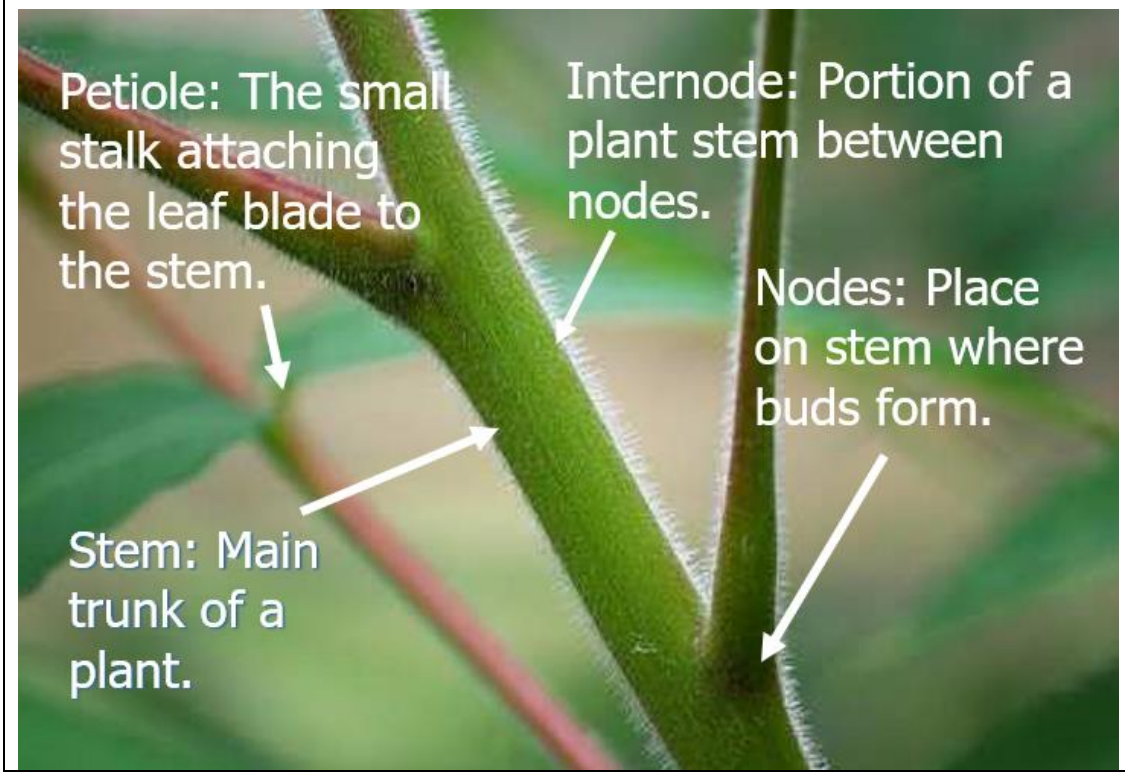

Epicotyl
Cotyledon
Hypocotyl
True leaves
Seed Coat
Radicle

Please fill out the diagram below as described in the slideshow.



Please accurately label the parts of a stem on the picture below. Please check off each box after you have used the term.

◊ Node ◊ Internode ◊ Petiole ◊ Stem



Activity! Quiz Wiz 1-10. Name the part of the seed / plant or other information.

1) Petiole	2) Hypocotyl	3) Node
4) Radicle	5) Epicotyl	6) True Leaves
7) Stem	8) Cotyledon	9) Seed Coat
10) Epicotyl	*11) Pandora	

Part 3 Lesson 6 Monocotyledons and Dicotyledons

Monocotyledon: A flowering plant with an embryo that bears a single cotyledon (seed leaf).
Monocotyledons constitute the smaller of the two great divisions of flowering plants, and typically have elongated stalkless leaves with parallel veins (e.g. grasses, lilies, palms).

Monocotyledons

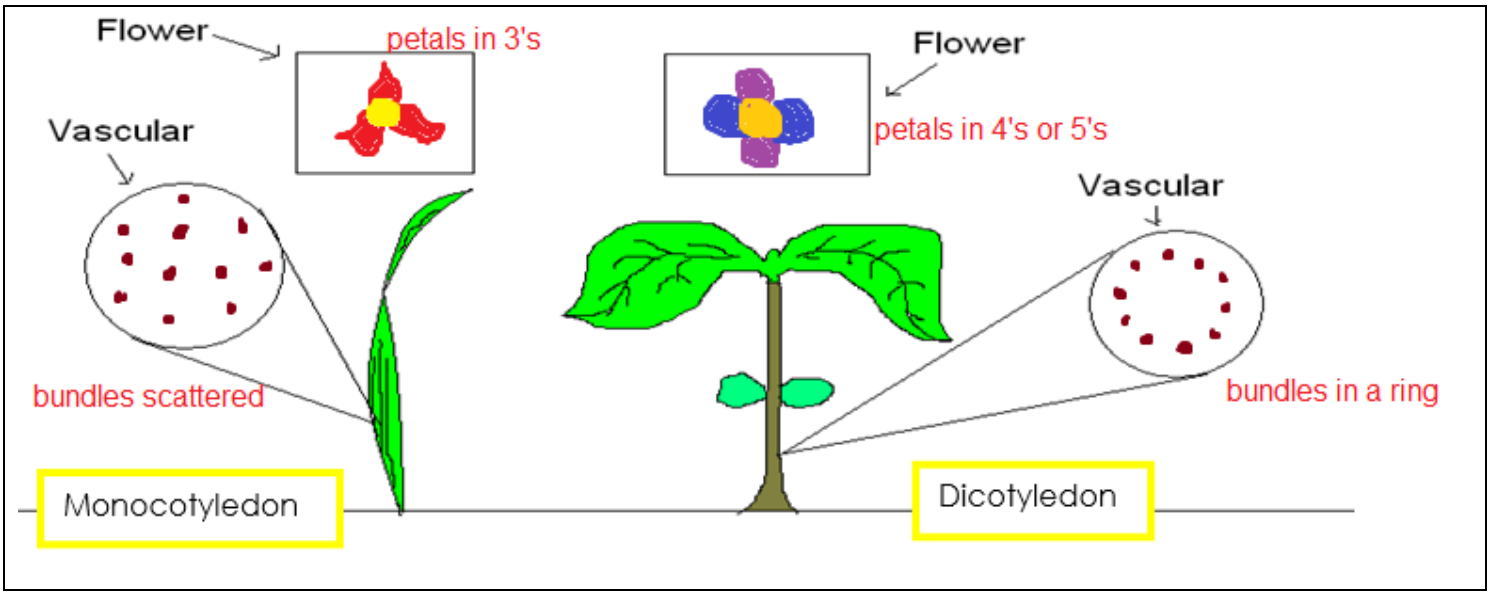
- Seedling has one cotyledon.
- Veins in leaf are parallel.
- Flower petals are in 3's.
- Never woody.
- Vascular bundles are scattered.

Use the space below to make Monocot Man or Monocot Woman.

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

Dicotyledons
Veins on leaf are branched.
Flower parts are groups of 4 to 5.
Secondary growth can be woody.
Vascular bundles are in a ring.

\Which plant below is a dicotyledon, and which is a monocotyledon? Explain using the pictures, boxes, and circles to describe the differences between the two.



Please draw a seed, root, stem, leaf, and flower of a monocot, and then dicot that would show that you understand the differences between the two.

Monocots or Dicots

	Seed	Root	Stem	Leaf	Flower
Monocots					
Dicots					

Part 3 Lesson 7 George Washington Carver
George Washington Carver was born in Missouri on the Moses Carver plantation. His parents were slaves. His father died right before George was born, then while he was still a baby, slave traders kidnapped him and his mother. Only George was returned to the plantation. George did not know the date of his birthday.

When he was a baby, he had a disease called whooping cough. It left him sickly and he couldn't do hard work like the other slaves. His chores were cooking and sewing. He loved to work in the garden.

He taught himself to read. His family was so poor, he couldn't afford to buy a pencil, so he made a holder and used a pencil that was only 1/4 inch long.

He wanted to get an education. When he was 12 years old, he left home to attend a black school. There was only one teacher with 75 children in a small room. While other children played at recess, he studied. He studied at home before and after he did his chores.
He wrote to a college to enroll and they accepted him, but when they found out he was black, they told him he couldn't attend.

After five more years, when he was 30 years old, he was accepted at a college in Iowa. He did so well, his teacher helped him to get a transfer to Iowa State College where he studied botany. He learned about plants and farming. He became the best botany student on campus.
He did many things to earn money to pay for his expenses. He sold hominy which he had made, and sometimes he ironed clothes for his classmates. He found an old stove at the city dump and brought it home to cook meals for his friends. He used old wrapping paper for notebooks.

"Don't throw anything away," he would say. "Everything can be used again."

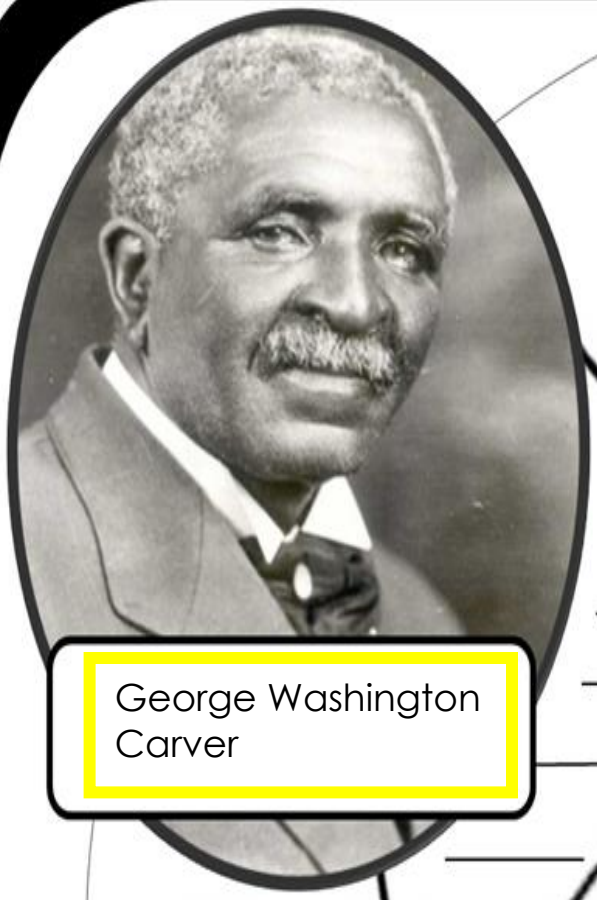
After he graduated, they asked him to teach biology to the beginning students.

Later, Carver was asked to teach at the Tuskegee Institute in Alabama. He was paid 125 dollars a month and he never asked for an increase.
Carver started studying diseases which were attacking the farmers' crops. He also did a lot of experimenting to find new ways to use different plants. He made more than 300 products from peanuts. He even made soap and ink from peanuts. From sweet potatoes, he made 118 products, including flour and candy. He made 75 products from pecans and even made a building material for walls from cotton stalks. He had many good ideas!
Later in his life, Thomas Edison offered him $100,000 a year to come and work for him, but he thought he could do more good at Tuskegee.

He made his students work hard, and he insisted they do each experiment right. If they told him they had done something "about right", he would say, "Don't tell me it's 'about right'. If it's '*about* right', then it's wrong."

Money, stylish clothes, and fine cars were not important to him. He thought the truly successful person was the one who had learned to serve others. In 1990 he was inducted into The National Inventors Hall of fame for his many accomplishments.
Questions? Describe George Washington Carver as a young boy about your age.
He left home at age 12 to attend school and was in a class of 75 students. Rather than playing at recess, he studied. He studied before and after chores too.

Describe some of the hardships that George Washington Carver had to overcome.
He was born into slavery and was orphaned as a baby. He also survived a life-threatening childhood illness. Additionally, he survived extreme poverty and put himself through school. Later, he was not allowed to go to college at first because of the color of his skin.
How did George Washington Carver overcome many of the hardships that he faced?
Through incredible hard work and determination. He was also resourceful.
Name a few of George Washington Carvers many accomplishments?
He invented many products from plants, became a professor at the Tuskegee Institute in Alabama, and was inducted into the National Inventors Hall of Fame.
What kind of person was George Washington Carver? How is he different than many other scientists?
George Washington Carver was very hard working. He is different than many other scientists because he didn't care about money or fame—he thought success was measured by a person's ability to serve others.
George Washington Carver overcame extreme obstacles to achieve his hopes and dreams. How are you doing on your journey?
Answers will vary.
Who is this person? Explain using some information provided in the readings, videos, and from the classroom lesson. What obstacles did he overcome?



George Washington Carver

George Washington Carver was born into slavery. When he was 12, he left home to go to school where he studied very hard. He was very interested in botany, which is what he studied in college. He became the greatest agricultural chemist the world has ever seen and invented many, many products from plants. He was inducted into the Inventor Hall of Fame.

Obstacles

-Born into slavery
-Doesn't know his birthday
-Orphaned as an infant
-Survived life-threatening illness as a child
-Survived guerilla warfare
-Survived extreme poverty

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

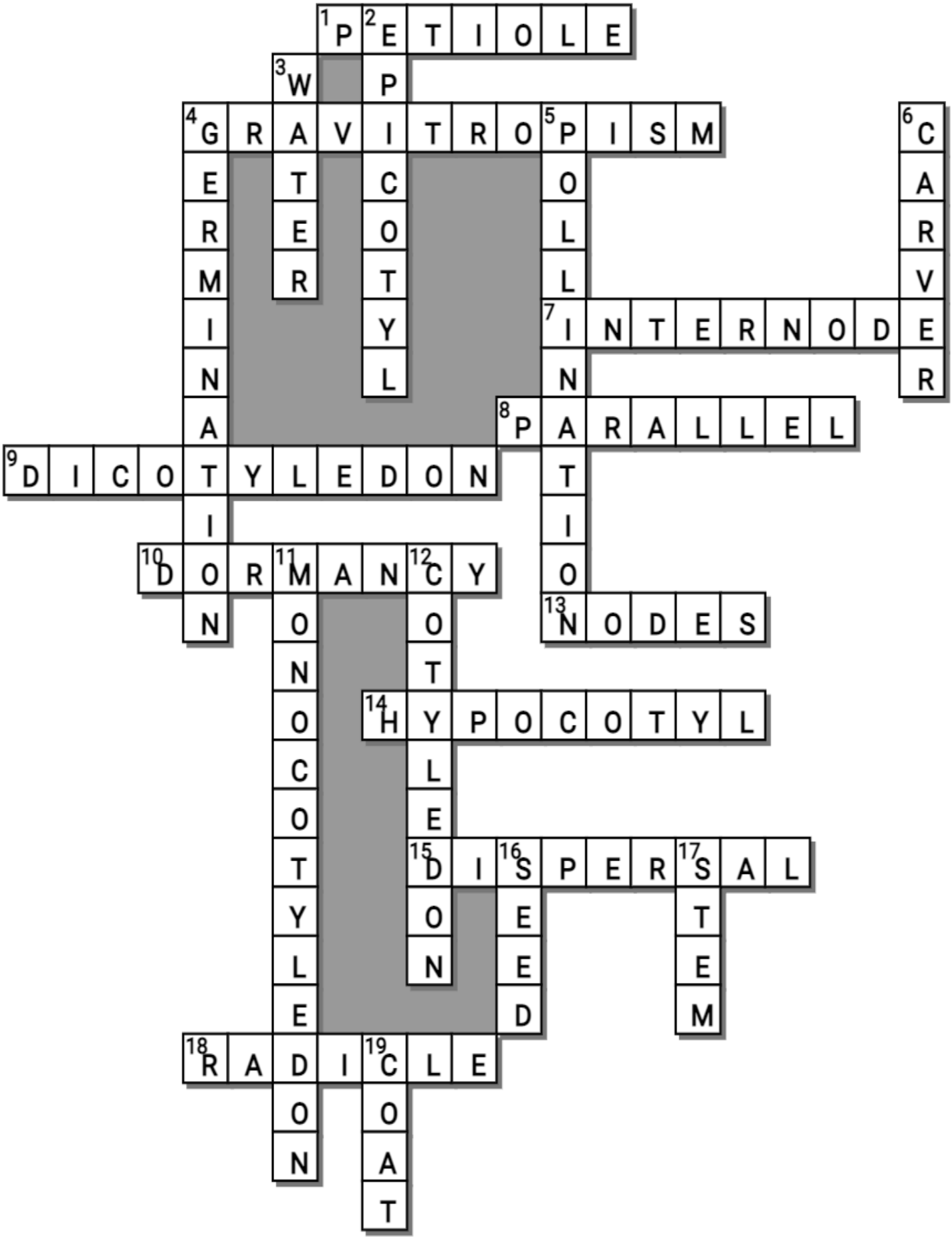
Down

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.

----------teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

CARVER, COAT, COTYLEDON, DICOTYLEDON, DORMANCY, EPICOTYL, GERMINATION, GRAVITROPISM, HYPOCOTYL, MONOCOTYLEDON, NODES, PETIOLE, POLLINATION, RADICLE, SEED, STEM, WATER, DISPERSAL , INTERNODE, PARALLEL


1 P 2 E T I O L E
3 W P
4 G R A V I T R O 5 P I S M 6 C
E T C O A
R E O L R
M R T L V
I Y 7 I N T E R N O D E
N L N R
A 8 P A R A L L E L
9 D I C O T Y L E D O N T
I I
10 D O R M A N 12 C Y O
N O O 13 N O D E S
N T
O 14 H Y P O C O T Y L
C L
O E
T 15 D I 16 S P E R 17 S A L
Y O E T
L N E E
E D M
18 R A D I 19 C L E
O O
N A
T

Part 3 Review Game Lesson 8 Name:
1-10 = 10 pts * = Bonus + 1 pt, Due: Today
(Secretly write owl in correct space +1 pt) Score ____ / 100
Final Question = 5 pt wager

NEED FOR SEED	UP UP AND AWAY	YOUNG ONE	ONE FOR ME, TWO FOR YOU	GREEN MACHINE Bonus round 1 pt each
1) The Svalbard Global Seed Vault AKA "Doomsday Vault"	6) A= Female B= Male	11) C: cotyledons	16) A= Monocotyledon B= Dicotyledon	*21) Keebler Elves
2) Unfertilized	7) Water	12) Gravitropism	17) Veins are branched (dicotyledon)	*22) Lucky
3) A= Epicotyl B= Cotyledon C= Hypocotyl D= Radicle E= Bean seed	8) Animals	13) Hypocotyl	18) A= Dicotyledon B= Monocotyledon	*23) The Wizard of Oz
4) A: Gravitropism	9) Germination	14) Epicotyl	19) A (petals in 3's)	*24) Neverland
5) B	10) Fire	15) Internode	20) George Washington Carver	*25) Temple Run

Final Question Wager ____/5 Answer: A= Epicotyl, B= Hypocotyl, C= Cotyledon, D= Radicle