# Assignment #1

Go to Collea's Corner or Google Classroom to watch the below mentioned Ted-Ed video and then answers the questions that follow.

## *The Simple Story of Photosynthesis and Food*

*- Amanda Ooten*

***What do a man, a mushroom, and an elephant have in common? A very long and simple double helix molecule makes us more similar and much more different than any other living thing. But, how does a simple molecule determine the form and function of so many different living things?***

1. About 60% of the food you eat is **Carbohydrates (glucose)**.

2. Carbohydrates contain the elements **carbon**, **hydrogen** and **oxygen**.

3. What gas is contained in the air we exhale? **carbon dioxide - $CO_2$**.

4. Plants take in $CO_2$ through tiny holes in the leaves called **stomates**.

5. In the space to the right, draw and label a stomate.

6. Plants take in water through their **roots**.

7. **Chloroplasts** are green because of a special light absorbing pigment called **chlorophyll**.

8. The high energy rays of the sun help the chloroplast to split a molecule of **water** into **hydrogen** atoms and **oxygen** atoms.

9. **Photosynthesis** transforms carbon dioxide and water into a simple carbohydrate called **glucose** with the chemical formula **$C_6H_{12}O_6$**.

10. Plants convert some glucose into an energy-storage molecule called **starch**.

11. The **mitochondria** then converts glucose into **ATP**.

12. Even plants have mitochondria that convert **glucose** into **ATP** because photosynthesis is how a plant makes it own food, not energy.

*(Autotrphic Nutrition)*

# Assignment #2

Go to Collea's Corner or Google Classroom to watch the below mentioned Ted-Ed video and then answer the questions that follow.

## *Chromatography*

*(color) (print)*

***It's true that the cooler weather is a good indication that the seasons are changing, but there's no sign like the color of the leaves. In this lesson, you'll learn why leaves change color in the fall, and you'll learn how to do paper chromatography to separate the pigments found in a leaf.***

**1.** What compounds do leaves get their colors from? Which color do they give the leaf?

| Compound | Color |
|---|---|
| chlorophyll | green |
| carotenoids | orange |
| anthocyanins | red |
| xanthrophyll | yellow |

**2.** Why would leaving the experiment to sit longer create better separation between the pigments? _____

_____

**3.** Why does chlorophyll begin to disappear from leaves in the fall?

**a.** The temperature causes the veins in the leaves to constrict

**b.** Plants usually expend their yearly allowance of chlorophyll around October

**c.** More colorful leaves can feed plants more effectively than green leaves

**d.** All of the above

**4.** How could you modify this experiment to separate the pigments found in a marker instead of those found in a leaf?

_____

_____

_____

# Assignment #3

Go to Collea's Corner or Google Classroom to watch the below mentioned Ted-Ed video and then answers the questions that follow.

## *Why Wildfires are Important?*

- Jim Schulz

***Our early ancestors relied on lightning to cause forest fires, from which they could collect coals and burning sticks to help them cook food and clear land. Yet, it wasn't just humans who benefited from these natural phenomena. Even as they destroyed trees, fires also helped the forests themselves.***

1. Several forest species, such as select conifers, need _____fire_____ to survive.

2. Mature lodgepoles will form an umbrella-like structure called a(n) _____ that shades the forest floor.
   **a.** parachute **b.** awning **c.** canopy **d.** gable

3. Douglas fir trees thrive beneath the umbrella of the taller lodgepoles because they are -
   **a.** shade tolerant. **c.** sun destructive.
   **b.** sun reactive. **d.** shade intolerant.

4. When temperatures get high enough, the _____cones_____ pop open, releasing their seeds, which are carried by the hot air to form new _____forests_____.

5. After a fire, _____carbon_____ -rich soil, and open, sun-lit landscape help lodgepole seeds germinate quickly. From the death of the _____old_____ forest comes the _____birth_____ of a new one. ***(Ecological Succession)***

6. S***econdary succession*** is a process started by an event (forest fire, harvesting, hurricane, etc.) that reduces an already established ecosystem (e.g. a forest or a wheat field) to a smaller population of species. After a period of time, what ecosystem would you expect to replace the existing forest? Why? Support your answer.

**After a period of time, I would expect the same type of forest to replace the existing forest after a forest fire.**

# Assignment #4

Go to Collea's Corner or Google Classroom to watch the below mentioned Ted-Ed video and then answers the questions that follow.

## *Invasive Species*

(Video) - Jennifer Klos

***Massive vines that blanket the southern United States, climbing high as they uproot trees and swallow buildings. A ravenous snake that is capable of devouring an alligator. Rabbit populations that eat themselves into starvation. These aren't horror movie concepts – they're real stories that exist in nature?***

**1.** One of the main problems caused by both the Burmese python and European rabbit is:

**a.** They compete with native species for space
**b.** They compete with native species for food
**c.** They bring diseases to the area
**d.** They overpopulate

**2.** Limiting factors can be defined as:

**a.** Factors that limit
**b.** Conditions that are favorable for a species to thrive
**c.** Environmental factors that enable a species to grow
**d.** Environmental conditions that restrict the size or range of a species

**3.** Some examples of limiting factors are:

**a.** Soil nutrients
**b.** Food availability
**c.** Predators
**d.** All of the above

**4.** Species evolve to adapt to limiting factors in their native environment. When they are brought to a new environment, the new limiting factors may not restrict their growth.

**a.** **False**. The new environment will have other factors to limit their growth.
**b.** **False**. There are always limiting factors in every ecosystem.
**c.** **True**. There may not be any limiting factors that help to keep the population size down.
**d.** **True**. Their predators may not have been brought to the new environment with that species.

5. The kudzu vine was able to spread rapidly due to the region's lack of -

a. Cold winters
b. Parasites
c. Soil nutrients
d. Sunlight

6. The introduction of invasive species is one of the major causes of species extinction. Explain how is this possible.

**The invasive species successfully outcompetes top predators, causing a significant reduction in their food sources that can lead to death and extinction.**

(NYS DEC website)

7. Even though governments monitor the transport of plants and animals, what other strategies could be adopted to stop the unwanted introductions of non-native species?

- **Clean boat before transferring to another body of water.**
- **Do not transport firewood across state/county lines.**
- **Do not release unwanted pets (fish/reptiles) into the environment.**
- **If you see an invasive species, report it.**

8. List some invasive (non-native) species that affect **New York State**. (NYS DEC website)

- **Aquatic Plant: Water chestnut**
- **Aquatic Animal: Northern snakehead fish**
- **Terrestrial Plant: Giant hogweed**
- **Terrestrial Animal: Asian longhorned beetle**
- **Emerald ash borer**

# Assignment #5

Go to Collea's Corner or Google Classroom to watch the below mentioned video and then answer the questions that follow.

## *A Way Forward: Facing Climate Change*

***Explore the global impact of climate change and its devastating effects and learn what scientists suggest in response.***

**1.** What human activities contribute to the increase of global warming/climate change?

- burning **of fossil** fuels
- **industrial** emissions
- De**forestation**

**2.** What are some of the results of climate change?

- **rising temperatures**
- **changes in precipitation patterns leading to floods and droughts**
- **disappearing glaciers**
- **sea levels rise / increase storm surges and beach erosion**
- **Loss of Biodiversity**

**3.** What are some solutions to address the issue of climate change?

- **stabilize greenhouse gas emissions**
- **reduce greenhouse gas emissions**
- **improved energy efficiency of appliances and vehicles**
- **better building codes**