

**Introduction:** One goal for you in biology is to help each of you gain an appreciation of the beauty and complexity of the biology that surrounds us! To fulfill part of this goal, you need to be outside – you must interact with the beautiful natural world that is our home. This plot study is designed to give you a practical, in-the-field experience to help you partially realize this goal.

**Getting Started:** Each student must select a plot of land, with dimensions of approximately 50 x 50 meters, on which you will concentrate your work. It will be helpful if this plot is near your home (but not your back yard!). The plot should have fairly well defined boundaries so that you can tell where it begins and ends. Plot selection is important to the success of your study because the more varied and interesting it is, the more interesting and rewarding your study will be. An ideal plot will have some woods, some field, and some water on it or bordering it. Your plot cannot be a residential backyard and should have minimal human disturbance.

**Visiting Your Plot:** As a part of the Plot Study Project, you will be asked to create a website where you will post journal entries, reflections, pictures, videos, and other items you may create as a part of the Plot Study Project. Information about creating the Blog will be given in class. These journals and activities will correspond to the topics we are discussing in class. You must work with a partner, but EACH OF YOU NEED TO CREATE YOUR OWN WEBSITE!

**Deadlines:** You are asked to post the activities by the due dates listed. All plot blogs posts **MUST** be made on or before the due date, so all posts must be made by 7:40 a.m. on Monday mornings. When making your weekly updates to your website, be sure to include the date and the time of when you posted. Careful planning and time management is essential for this project. This is an impressive project, so strive to do your very best. A good grade on this project will be helpful!

**The Website:** Your project will be done on the internet by creating a **free** website through Google sites. All posts, reflections, pictures, videos, and other items need to be posted to the website. Your grade will be done on a weekly basis to make sure that you are staying on track. The due dates for each of the assignments are listed and there is also a calendar to help you stay organized. **BE AWARE THAT ANYTHING YOU POST TO THE WEBSITE WILL BE PUBLIC INFORMATION. DO NOT POST ANYTHING THAT YOU DO NOT WANT OTHER PEOPLE TO SEE.**

**To create your website domain name, use the following procedure. (updated 05.SEP.19)**

1. Go to <https://sites.google.com/>
2. Sign into your Google account using your Buchanan High School email address and password.
3. Click the red box that says CREATE (located on the left) in to create a NEW SITE.
4. Start editing! Figure out how to insert text boxes, images, dividers, buttons, etc...
5. Click the blueish/purpleish box in the upper right hand corner that says 'Publish'. This saves all your work and makes your website live on the world wide web!
  - a. Web address: Click this to enter a website title. To do this you will use the first two letters of first name, followed by the first two letters of your last name, followed by your hour, followed by the word **BioPlot2k19**. Write down your website domain here  
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  - b. Click PUBLISH
6. Create a total of 6 pages. Title each Week 1, Week 2, Week 3, ... Week 6. SHOW MR. CRIBLEY BEFORE THE BELL

**One More Thing:** It is recommended that you type and save all blog entries and other assignments in MS Word before copying and entering them into your blog. This will hopefully prevent any accidental deletions and other frustrations that arise when doing online projects. It will also ensure that you have a copy of all of your work on the off chance that your website explodes or the Internet merely disappears off the face of the Earth!

# Week 1 Activities

**Due 16.SEP.19**

## **1) Meet My Plot!**

- Use Google Maps to make 2 maps of your plot.
  - The first map should be a broad view map (zoomed out a bit) relating your plot to streets, highways, natural features (streams, lakes, rivers), public buildings, your home, etc... This map should give a good idea where your plot is located – NOT what your plot looks like. Use MS Paint to highlight the zone of your plot.
  - The second map should be zoomed in more than the first map and give you a good idea of the landscaping of the plot. Google Earth will be helpful here!
- Write a paragraph that answers the following questions and helps describe your plot. What type of plot did you select (woodland, swamp, field, etc...). Describe where it is and what it looks like. Why did you choose your particular plot? What interesting things can you see, hear, smell, feel, taste, etc... while you are at your plot? Do you have any thoughts about the plot study in general or projects that you are going to complete as a part of the plot study?

## **2) Taking Action**

- Take action and help to improve your plot by picking up the trash that is found there. You may do this with your partner. Required with this is proof that you completed the trash pickup (picture of the trash you accumulated). You must also have a picture showing your now trash-free plot.

## **3) 3/5 Leaf Study**

- Collect leaves from three different species of trees for five consecutive weeks. (Be sure you have the same three types of leaves for each week!). Choose leaves from the same three trees each time. The leaves should be identified, pressed, dried, and displayed on white paper. The collected leaves should show the beauty of the Michigan deciduous forest through the first five weeks of the season.

## **4) Seasonal Change**

- You are asked to visit you plot on a weekly basis. Each time you visit your plot, you need to take at least 1 picture. The picture from each visit should be taken from the same location. Try to visit your plot around the same time so that the daylight is consistent in each photo. For each picture, state the date it was taken and add at least 3 sentences describing any changes from your previous visit. Doing this for at least 6 weeks will allow you to capture the changes that take place during the changing season.

# Week 2 Activities

**Due 23.SEP.19**

## 1) My Plot is an Ecosystem

- There are 5 of different levels of organization (species, population, community, ecosystem, biome) that we will go over in class. List each level. Take a photo of at least 1 example of a species, a population, a community, an ecosystem, and a biome on your plot. The picture should be clear. In addition, provide 1 sentence for each picture describing how it is an example of that level of organization.

## 2) Plot Community

- Develop a list of various community interactions that are seen on your plot. You need to have 1 photo for each and a 2 sentence description of how your photo represents each community interaction.
  - Mutualism
  - Predation
  - Herbivory
  - Parasites and pathogens

## 3) Biodiversity (PICK THREE)

- **Flowers, Insects, Weeds, Fungi, Trees/leaves, Other organisms:**
  - Create a photo collection of the diversity of life found on your plot. You should have at least five species for EACH category, and you need to identify them correctly (both scientific AND common name). The photos need to be clear, and the organisms need to be large enough to see. If you can't find the real organism, you are allowed to use EVIDENCE of the species

## 4) Seasonal Change & 3/5 Leaf study

- See week 1 if you forgot what to do.

# Week 3 Activities

**Due 30.SEP.19**

## **1) Biotic or Not?**

- Develop a list of biotic and abiotic factors from your plot. You need to include photos taken with a camera or your iPad. You will need to have at least 20 different factors on your list and at least 5 of these must be abiotic factors.

## **2) Biomagnification**

- The phenomenon through which certain pollutants get accumulated in tissues in increasing concentrations along the food chain is called biomagnification. Such pollutants are non-biodegradable – so once they are taken in by a living organism, they cannot be metabolized and broken down or excreted out.
  - Create a 4 panel cartoon to show the process of biomagnification
  - Research 2 of the following substances that biomagnify (DDT, Hexachlorobenzene, PCB's, Mercury, PCB's). For each substance, please have the following on your website:
    - Image of the banned substance
    - 1 paragraph that answers what the chemical is, why it was used in society, where does it come from, what the negative effects are, and what has been done to fix the problems caused.

## **3) Producers and Consumers**

- Create a list (you need to include photos with the list (use your iPad or phone to create a photo collage)) of producers and consumers that you can find (or find evidence of) on your plot. Now, categorize the consumers as herbivores, carnivores, omnivores, or detritivores. You should have at least 20 different organisms.

## **4) Seasonal Change & 3/5 Leaf study**

- See week 1 if you forgot what to do.

# Week 4 Activities

**Due 07.OCT.19**

## 1) My Plot is an Ecosystem

- There are 5 of different levels of organization (species, population, community, ecosystem, biome) that we will go over in class. List each level. Take a photo of at least 1 example of a species, a population, a community, an ecosystem, and a biome on your plot. The picture should be clear. In addition, provide 1 sentence for each picture describing how it is an example of that level of organization.

## 2) Expression (PICK TWO)

- **Art:** Create a piece of artwork that incorporates the colors, forms, and textures found in your plot. It can be a painting, drawing, collage, or other medium that you prefer. You can also incorporate computer technology (photo mosaics, framed photos, etc...).
- **Poetry:** Write a good poem that was inspired by your plot. Indicate what type of poem you have chosen. You also need to creatively illustrate the paper on which the poem is written or show a photo of what it was that inspired your poetry. Each poem must be a minimum of 10 lines long. (4 haiku's)
- **Any other ideas:** It is probably a good one! Tell your idea to Mr. Cribley before doing it.

## 3) Soil Profile

- Research the different types of soil that are found in the area (Southwest Michigan). Then, dig a 1 meter deep hole and attempt to identify the type of soil that is found on your plot. Take a photo (with you in it) of your newly dug hole which shows the layers of the soil. Identify at least each region. For each region you identify, describe the composition of the soil layer and indicate what minerals/particles make up that layer.
- Fill in your hole after you've taken a picture

## 4) Seasonal Change & 3/5 Leaf study

- See week 1 if you forgot what to do.

# Week 5 Activities

**Due 14.OCT.19**

## 1) Cycles, Cycles, Cycles

- Many of your plots have some type of body of water. And all of your plots receive rainfall on a regular basis. Create an illustration illustrating various components of the water cycle that can be found on your plot.

## 2) Debatable Topics

- As the election times approach, there are many platforms that politicians take when running for an office position. In fact, a few of them relate to science! Your goal is to go to the website [https://www.sciencedaily.com/news/science\\_society/environmental\\_policy/](https://www.sciencedaily.com/news/science_society/environmental_policy/) and pick a topic to read up on.
- Once your topic has been chosen, you are asked to create a persuasive essay (5 paragraphs are fine) outlining the topic. In addition to providing both sides of the story, your essay should also include your thoughts/comments – because this is a persuasive essay after all!
  - Do your research and include relevant and current background information as well.
  - Use your best writing skills!
  - 3 sources minimum (this article, your textbook, plus one other!)

## 3) Survival Skills

- Survival skills are techniques a person may use in a dangerous situation to help save themselves or others. These techniques are meant to survive with basic necessities – such as food, water, shelter, clear thinking, signals for safety, and navigation. When hiking, camping, exploring, or enjoying nature, one must be prepared to handle any situation which arises.
- Your goal is to research a minimum of 5 different survival skills. For each skill, describe it in a minimum of 3 sentences. Describe what the skill is, how it is a survival technique, and how this skill is accomplished.
- Each survival skill needs to include a 30 second video of you demonstrating and explaining the survival skill.

## 4) Seasonal Change & 3/5 Leaf study

- See week 1 if you forgot what to do.

# Week 6 Activities

**Due 21.OCT.19**

## 1) Variety and Adaptation

- Search the area to find the largest plant and the smallest plant. Make a list of how they are the same and how they are different. Then, select make list the ways in which it is adapted for survival in its habitat. Each organism needs 3 pictures highlighting the adaptation and 3 sentences describe how that adaptation allows it to survive in the harshness of our world.

## 2) Population Growth

- What stops a population from continuing to increase after reaching carrying capacity? Several factors contribute to this – these are called ‘limiting factors’. On your website, define density-dependent factors and density-independent factors. Then, find 3 examples for each (6 total) that are found on your plot. For each example, take a photo (with you in it) and explain in 2 sentences how this example is a limiting factor.

## 3) Carbon Footprint

- Current consumption of fossil fuel releases more than 25 billion tons of CO<sub>2</sub> into the atmosphere every year. If current trends continue, there will be a tripling of atmospheric CO<sub>2</sub> by the end of the century—levels not seen for more than 40 million years. By measuring our carbon footprint, we can learn how we are contributing to this rise in atmospheric CO<sub>2</sub> and how we might use energy more efficiently.
  - Your task is to calculate your family’s carbon footprint at <https://www.carbonfootprint.com/calculator.aspx>
    - Take a screen shot of your family’s carbon footprint and post it to your website.
  - Create a list of 10 things you and your family could realistically do that would help reduce the size of your carbon footprint.
  - Create a list of 5 things we can do here at Buchanan High School

## 4) 3/5 Leaf Study

- Think back to week 1 when you started your 3/5 Leaf study. At this point, there should be some progression in the color of the leaves. Fall time in Michigan, gotta love it! At any rate, your goal is to figure out why. Your answer is limited one hand-drawn explanation as to why leaves turn colors. To go with this, you are limited to 200-250 words to explain your drawing.
- On your website, also post a picture your completed 3/5 leaf study!

## 5) Seasonal Change & 3/5 Leaf study

- See week 1 if you forgot what to do.