**Anish Arora**

Mason Middle School-Kirti Arora, Parent

**Threat of Plastic on Ohio’s Wildlife**

This poster is an alert and awareness about non-biodegradable plastic products which are responsible for various diseases and even death of certain wildlife species in Ohio. Experiment/research includes taking a sample of lake water having algae, basically life culture as aquatic life and sowing a seed in soil but in a polythene. In both the cases, growth stops and life vanishes as oxygen supply stops. We reach at the conclusion that plastic in any form is harming Ohio's biodiversity at a very fast pace (data to be added). Plastic, especially single use plastic, should be banned in Ohio in order to save its ecosystem.

**James Bell IV**

Hilltop High School-Kristy Bell, Parent; Cristin Hagens, Physics Teacher

**Examining Produce Yield of *Capsicum Annuum* in Compost Enriched Soil**

The purpose of this project was to measure how much the addition of compost in soil will affect the growth of the *Capsicum Annuum* pepper plant. Compost can help boost plant growth by adding vital nutrients to soil. Composting will also reduce household waste which will reduce the amount of trash sent to landfills. Ten seedlings of *Capsicum Annuum* were planted into two containers filled with identical potting soil; one set of plants had compost added to the soil while the other did not. Weekly, the height of the plants and the number of peppers growing was recorded. When the peppers were ripe, as denoted by a color change from green to red, they were harvested, weighed, and measured. The hypothesis that the *Capsicum Annuum* planted in compost enriched soil would have boosted plant growth defined by plant height and produce yield was supported. Statistics run on the height difference between plants in compost soil compared to regular soil had a p-value of 1.3E-17. Data was proven to be statistically significant with p-values less than 0.05 which supports the hypothesis. Total waste reduction averaged 20 L per month which equates to saving five 13-gallon trash bags a year.

Graphical user interface, application, Word

Description automatically generated**Winnie Bodin**

Benjamin Logan High School-Colleen Bodin, Parent

**The Biological and Chemical Assessment of the Mad River Over Five Years**

This project dealt with an assessment of the Mad River over five years. Sites were tested for diatoms, macroinvertebrates, and chemical characteristics once every three months over the course of a year. Macroinvertebrates were collected using the kick seine technique, they were identified and a pollution tolerance index was recorded based on the taxa collected. Chemical assessment was performed using A.P.I. (Aquariums Pharmaceuticals Inc.) Freshwater Master Testing Kit. Water was tested for pH, ammonia, nitrite, and nitrate levels. Dissolved oxygen and water temperature were also measured each time using Vernier probes. Diatoms were collected at each site and identified. The hypothesis was that the Mad River water quality would be poor consistent with previous years of research showing poor quality because it is lacking a wooded riparian zone, which would offer shade. My hypothesis was partly supported because the PTI was poor, however the chemical parameter and oxygen levels were satisfactory.

**Matthew Devine**

University School-Tanutda Devine, Parent

**UV Photodegradation of Byssal Thread Adhesives on Acrylic, Polystyrene, and Aluminum Substrates**

Zebra mussels (Dreissena polymorpha) are invasive to Lake Erie; attaching to water intake pipes compromising their function. This study observes the effects of ultraviolet radiation, as a means of removal, on a chemically similar adhesive to the one secreted by mussels. Three adhesives were tested with (n= 45) and without UV treatment (n =45) on three substrates (aluminum, acrylic, and styrene). Polyethyleneimine (PEI) solution (0.052M), two polymers of catechol solution (0.058M ; 0.029M, respectively) and PEI solution (0.052 M); in a 1:10 ratio catechol to PEI solution. Each adhesive was used to adhere overlapping 1”x3” slides of the respective substrates. Tensile strength (newtons) of each adhesive was tested using a force table. No adhesives successfully adhered

the aluminum slides. On the styrene and acrylic samples with PEI, UV treatment resulted in decreased tensile strength compared to control (t test p = 0.0017; p = 0.015, respectively) . Both catechol polymers exhibited high tensile strength and strong adhesion with the plastics as well as decreased tensile strength after UV treatment (Styrene t test p = 0.019 ), (Acrylic t test p = 0.0015). Understanding UV’s effects on mussel adhesives can be used to reduce the problem. Summary: Zebra mussels (Dreissena polymorpha) are invasive to Lake Erie; attaching to water intake pipes compromising their function. The goal of this project is to study the effects of ultraviolet light on adhesives chemically similar to mussel adhesives in an attempt to find an effective solution for mussel removal.

**Anna Helmling**

Delaware Area Career Center-Dona Rhea, Instructor

**How Are Song Bird Behaviors Associated with Their Species?**

People often set up bird feeders in their backyard in order to observe and feed these beautiful birds. This study will be done on the behavior of songbirds whilst visiting bird feeders. It will help to further expand knowledge about how birds interact and behave at feeders, based on certain characteristics. There are many different kinds of interactions at bird feeders, both good and bad. My research concluded that sunflower seeds are favored by birds because they are high energy and have an easy to crack shell. There is a hidden social order amongst birds, birds such as crows, jays and woodpeckers are at the top, while birds such as chickadees and finches are at the bottom. Some common bird behaviors we see include aggression, chasing/ flying after other birds, fluffing feathers, darting eyes/head, sorting through bird seed and more. Mentioned by the Cornell Lab of Ornithology, learning how birds behave can help differentiate and identify bird species. My hypothesis is that the behavior of birds directly correlates with their species because birds of the same species commonly share the same traits. In this study, I have set up thirteen bird feeders, of different types and labeled them A-K and 1-2. I used different kinds of BirdPros’ seed mixes, along with suet and mealworms. I sat outside and jotted down my observations in a notebook. Study results concluded that I have found my hypothesis to be accurate, as birds of the same species typically behave in a similar manner. They have similar characteristics from the seed choice to aggression. For example, I found that the Carolina Chickadee tended to be the most vocal. Another example would be that the downy woodpecker would eat suet most of the time. One big thing I observed while conducting this study was the food choices that birds made. It was interesting to see what birds choose certain seeds. The most commonly chosen foods were sunflower seeds and peanuts, with suet and finger millet being popular as well. This information can be used to attract birds to your bird feeders.

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Description automatically generated**Britain Kandel**

New Philadelphia High School-Kip Brady, Teacher

**The Influence of Land Use on Stream Water Quality and Invertebrate Diversity**

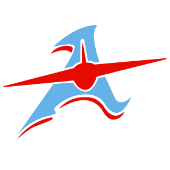
Humans alter the landscape in myriad ways, and these land use practices can have different effects on downstream water quality. I evaluated the water chemistry and invertebrate communities of 10 headwater streams across a gradient of human land use intensity in order to examine the effects of land use on stream water quality. This research is ongoing, and I will share my results in a poster presentation at this year's symposium.

**Addy Kendle and Elizabeth Dorsey**

New Philadelphia High School-Kip Brady, Teacher

**Effects of Metal Precipitates on Leaf Breakdown in Acid Mine Drainage Contaminated Streams**

Acid mine drainage (AMD) resulting from historic coal mining affects more than 1,300 miles of headwater streams in Ohio. AMD waters tend to have high concentrations of dissolved metals, which can accumulate on substrates, such as senescent tree leaves, and potentially limit basal energy resources available to the food webs of these ecosystems. We examined the role that metal precipitates have on leaf breakdown rate of senescent red maple leaves, using common garden laboratory and field experiments. These experiments are ongoing. In this poster we will share our results and their importance.

**Eva Miller**

Alliance High School-Amy H. Miller, AP Biology Teacher

**Winter Feeding Behavior of Dark-eyed Juncos in Relation to Environmental Temperature**

The Earth’s temperature is predicted to continue to increase in the upcoming decades. This will have an effect on how birds migrate and the ranges in which they live. The purpose of this study was to observe the effect temperature has on the feeding behavior of Dark-eyed juncos, which migrate to Ohio during the winter. To achieve this, I observed a small plot of land in my backyard which was systematically covered in black-oil sunflower seeds and cracked corn in the morning. I recorded the dates, times, and temperatures at the time of observation. The results, while not conclusive, show a slight trend that Dark-eyed juncos were mostly likely to be feeding during the temperatures of 20-40 degrees Fahrenheit, average Ohio temperatures. Further research and observation are necessary to gain an understanding of how climate change will affect the amount of Dark-eyed juncos migrating to and feeding in Ohio.

**Andrew Riccio, Thomas Meyers, Clay Fallon, Easton Sumlin, James Fu, Sebastian Henry, Johan Guy, Cam Zizjak, Ben Elliott, Brian Billups**

University School-Dr. Michael Smith, Science Teacher

**An Assessment of McFarland Creek in Bainbridge Township, Ohio**

Excess sediment from development-driven stream erosion is a leading cause of impairment of Ohio waterways. Responding to homeowner’s concerns about bank erosion and flooding along McFarland Creek in Bainbridge Township, and how ongoing construction upstream might worsen these, our PBL-geology class collected baseline data on stream dimensions, pattern, and profile and made recommendations for mitigating bank erosion. Data included a longitudinal profile, five cross-sections, Wollman pebble counts, stream reach inventory, streambank photography, bedrock and sediment sampling, gradient, sinuosity, and historical satellite imagery. The longpro documented locations, water depths, and bankfull channel depths of riffles, glides, and pools. Cross-sections revealed an average bankfull cross-sectional area of 142 ft2, consistent with published regional curves for Ohio streams of comparable drainage area. Pebble counts revealed that gravel predominates, and given the valley’s form, sinuosity (1.22), and gradient (0.006), we classified McFarland Creek as a C4 stream. Future classes will re-measure the longpro and cross-sections to reveal how the stream channel responds to development and add biological assessments to our study. We presented results to residents via Zoom, and they published our written report on their website. Recommendations included improving riparian vegetation and how toe-wood can be used to stabilize a large eroding bank.

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Description automatically generated**Sophia Riker, Ariana Blair, Isabelle Moreland, Charlotte Menapace,**

**Sutton Bercaw**

New Philadephia High School-Kip Brady, Teacher

**Reclamation of “Ohio’s Hidden Mine” and its Impact on Aquatic Ecosystems**

The Dessecker Mine Complex, known as "Ohio's Hidden Mine", is a small watershed in Tuscarawas County, Ohio that was mined for coal from 1947-1995. Extensive, unregulated mining activity resulted in severely degraded water quality downstream of the complex. We examined changes to the ecology of a headwater stream that drains from the mine complex following completion of a reclamation project in August 2018. Between 2018 and 2021, macroinvertebrate similarity to a nearby unmined reference stream improved by a factor of 4, the abundance of Northern Dusky Salamanders increased by a factor of 6, and the ratio of the decay rate of White Oak leaf litter between the unmined reference and reclaimed streams decreased from 10 to 5. Here we report updated results examining the trajectory of this stream's recovery through March 2023 and propose estimates for the amount of time required for this stream to return to reference-like conditions.

**Aaron Slisher**

Reynoldsburg High School-Summit Campus-Richard Ladowitz, Biology Teacher

**Wildlife Study of the Summit Wetlands for Biodiversity and Human Impact**

The major goals of the survey are two main tasks. The first is figuring out the land vertebrate biodiversity in the area. This needs to be done to figure out the health of the ecosystem for the creatures involved. The animals included in the biodiversity count include field mice, deer, and coyotes. The second goal is in terms of human impact measurements. Part way through the study a new dock and better walking paths were established and so as part of the survey we looked into animals before and after to see if numbers changed due to added human traffic. My research methods used are the use of trail cameras in various locations to gain photos as well as personal observations. The results of the survey are yet to be determined however a large variety of wildlife has been seen and relating to the second point the numbers of some have decreased. No conclusions can be made as yet but tentative calculations will be made for the poster at the current length.

**Skyler Thompson**

Delaware Area Career Center-Dona Rhea, Instructor

**Albinism in Wildlife: How Rare is Albinism in Wild Skunk Populations?**

Albinism in wildlife is not something a lot of people know about or have done research on because of how rare it is (Dennison, 2022), especially in specific types of animals. This study seeks to find out how rare albinism is in wild skunk populations in Central Ohio. This research consisted of setting up trail cams in five different locations in Central Ohio to try to catch striped skunks on the camera. The main thing sought out in the skunks is any difference in coloration from that of normal skunks. Occasionally, bait will be set out to see if they will be more attracted to that spot with food. The type of bait used was tuna, wet chicken cubes, seafood flavored dog food, and seafood flavored wet cat food. The research hypothesis is that zero albino wild skunk images will be captured on trail cameras. Experimental Design: This is a research study to determine how rare albinism is in wild skunk populations. The independent variable is location of trail cams and bait. The dependent variable is the amount of skunks caught on camera. The hypothesis of this research was proven correct. According to my research, a large skunk population was captured on trail cameras, however no albino skunks were found, so the research shows that albinism in wild skunk populations is very rare.

**Kohen Wampler**

Delaware Area Career Center-Dona Rhea, Instructor

**What is the Most Socially Preferred Method to Control CWD in the Deer Population?**

Chronic Wasting Disease (CWD) was first diagnosed in a captive deer population in Holmes County, Ohio in 2014. This highly contagious disease causes brain and neurological fatal damages. There is not currently a control method being used in Ohio to control CWD. Knowledge from this study may assist wildlife biologists and law makers when implementing a control method. This study seeks to see the public's social perceptions on two different CWD control methods (population control and selective breeding). Selective breeding in this project means releasing genetically resistant bred deer with a K22 genotype. This genotype is more resistant but not immune to CWD. Population control in this project means allowing hunters to harvest diseased deer without using a tag. A similar practice is currently being used in Illinois. My research hypothesis is population control will be more favored than selective breeding. Out of the 151 respondents in the social analysis, 95 people selected population control and 56 respondents said selective breeding is the best way to control CWD. The researcher proved the hypothesis to be correct because almost twice as many people suggested hunting diseased deer with using the annual deer season tags is the preferred method to manage this disease in Ohio.