ABSTRACT OF PROJECTS

Effect of soil type on seed germination and seedling growth

Instructor: Ken Baumgartner
Joslyn Chapo, Adrian Edwards, Veronica Espinoza, Carletta Gray, Lisa Jaramillo. Tyler Lee, Charmaine Manhiemer, Joshua Mayoral, Alexander Ordonez, Nekayla Store, Kurrie Welch, Violet Wielgus

We conducted an examination of characteristics of vegetable plant growth in the NAU Research Greenhouse and in an outdoor environment in Flagstaff, Arizona. Understanding of growing vegetables continues to be popular in contemporary society. Recently, the study of Permaculture has gained recognition in Flagstaff, as many people desire locally-grown, organic vegetables. We selected 10 species of crop plants to use to determine how a greenhouse environment would affect their development in relation to being started outside. We chose three variables to measure: germination rate, germination percent, and rate of development of true leaves. We found that all plants grown in the greenhouse germinated and produced true leaves faster than those started outside. We also found that plants started in the greenhouse had higher percentages of germination. Our findings suggest that for many of the species studied, starting the plants outdoors in Flagstaff results in a much less efficient development than could otherwise be obtained by altering their growing conditions. Given the cost and limited availability of seeds, it is advantageous to maximize the number of seeds that germinate in each growing season. Given the short growing season in Flagstaff, it is advantageous to accelerate the development of a plant crop.

Material Properties and Scientific Measurements of the World Around Us

Instructor: Osita Onyejekwe
Amanda Brouws, Shelby Brown, Michael Buffalo, Tamera Dale, Alicia Helmer, Cody Jeff, Dawntaye Johnson, Leandra Marris, Sophia Osif, Megan Yazzie, Diane Yazzie

Biodiesel is a strong means people are using to employ nowadays to help power the automobiles during travel. Biodiesel can be used in its pure form, B-100 or it can be mixed with petroleum. The problem with biodiesel is that it tends to crystallize during cold conditions causing problems in the diesel engine. This project aims to employ the use of additives such as ethanol, methanol and kerosene to reverse this wax crystallization process when temperatures drop.

Water Quality of Six Different Water Sources from Northern Arizona

Instructor: Jessica Vespi
Ryan Brooks, Annette Brown, Marvin Calavaza, Anthony Jim, Tyler Lee, Dyllon Mills, Nicole Montoya, Hannah Nez, Brianne Smith, Cyriah Yazzie

All societies share the same need for a clean water source, as do any ecosystem. This is particularly true in areas that lack water, such as the arid southwest. Water quality is influenced by both the geology of the area and the land use of the area (agricultural runoff, cattle rangelands, recreation areas, ect). Seven qualities of water (pH,

phosphate, nitrate, silica, total hardness, dissolved oxygen, and biological oxygen demand) were tested at six different sites around northern Arizona using LaMott's field titration limnology test kits. These sites were compared to treated water from the tap, considered the control for this project. Three replicates were sampled from each of the six sites and standard error was calculated to determine differences between sites for each test. Coyote Springs had the most unexpected results out of all of the sites. It was hypothesized that it Coyote Springs and Pumphouse Wash would have the same water quality as tap water, since they both are newly emerged ground water. Although this was true in several aspects of Pumphouse Wash (such as pH, BOD, and dissolved oxygen), the results did not support this hypothesis for Coyote Springs. On the contrary, Coyote Springs was continually significantly different than tap water in several tests including: pH, nitrate, phosphate, BOD, and silica. This is potentially due contamination from run off, or water outcrops further upstream, but further study needs to be done on these aspects of Coyote Springs to determine what causes such deviation from drinking water standards.

Public Service Announcement

Instructor: Jamie Santillo

Shayla Chatto, Donya Dalton, Adrian Edwards, Veronica Espinoza, Adrian Horton, Kayla Hume, Joshua Mayoral, Renae Pailzote, Florisa Peshlakai, Jimmie Tsosie Jr, Alannah Yazzie

The students will all take turns discussing (presenting on PowerPoint) their dual involvement in Future Health Leader (FHL) and 4 Corners. Through FHL, these students have gained many valuable experiences and knowledge that helps prepare them for college and adult life. Their topics are college exploration, CPR and First Aid certification, career exploration and heart dissections and ropes course. After working with the Zaki Gordon Institute, the students produced three 30 second public service announcements (PSA). All the topics, plot charts and productions were the original work and ideas of the students. The titles to their Public Service Announcements are Teen Pregnancy, STD's and Exercise.

The Fun of Chemistry

Instructor: Diane Mares

Leandra Becenti, Royce Brady, Renae Byakeddy, Velincia Clyde, Germayne James, Elmetina Manygoats, Chanygne Masawytewa, Alexander Ordonez, Antonio Sonny, Kurrie Welch, Andrell Williams, Kaydee Williams

This year's Chemistry students have enthusiastically prepared a PowerPoint presentation showcasing their favorite aspects of their chemistry class. Everything from synthesizing ice cream and elephant toothpaste, to their favorite element Uranium is included in this presentation along with a brief discussion why these things are important to chemistry. After the presentation, the students will demonstrate their favorite chemical reaction which is known as the "genie in a bottle." With a big burst of smoke, it will become apparent how fun and exciting chemistry can be.