Course Title: **Constructing Sustainability**
Teachers: **Peter Fee and Brian Counselman**
Hours 5-6 (Learning Lab) - Semester 1 - 2021/22
1.0 Science Credit and 0.5 Math Credit

COURSE INFORMATION:

Click here to hear Brian talk about this class!

Course Description:

In this class, students will be exploring concepts around sustainability and nature. We'll ponder challenges and solutions of how sustainability themes can be identified and addressed in native ecosystems, urban centers, and agricultural spaces. Challenges include physically getting outside, exploring, and thinking about their connection with natural spaces through this class.

Questions tackled: 1) What big and small actionable steps might be out there to make a more sustainable future from what we eat, how we live, and who we elect to political positions? 2)How do you influence societal habits to be more sustainable?

As students study their environment, they will gain spatial awareness by visualizing/imagining space shapes (such as birdhouse designs, ideal location, and installation). In addition, students will gain skills in estimating area (such as one acre) and distance (such as 100 feet); this skill is beneficial for collecting data on animal behavior. Students will develop hand-eye coordination by using critical thinking and creative skills by making accurate measurements followed by lumber cuts with a hand saw. Students will conduct statistical analysis of data from graphs and tables and develop a summary of how human behavior may have a positive, negative, or neutral effect on our earth systems. Students will also learn what natural phenomena have linear or exponential patterns; and interactions that have causation and correlation relationships.

Prerequisites:

None

Method of Instruction:

Activities include spending time outside in all kinds of weather!

- Field trips to sustainable operations such as large scale composting and biodigestating.
- Accurately measuring and cutting lumber.
- Making observations, collecting data, and analyzing data.
- Researching current sustainable methods and hypothesising improvements.
- Design structures for sustainable purposes.
- Discuss the sustainability questions.
- Create a Google Sheet for budgeting cost of materials
- Learn and use the Pythagorean Theorem (3, 4, 5 rule) for accuracy of making square corners

Course Objectives (standards):

Science Standards:
SCI.LS2.C.h - If a biological or physical disturbance to an ecosystem occurs, including one induced by human activity, the ecosystem may return to its more or less original state or become a very different ecosystem, depending on the complex set of interactions within the ecosystem.

HS-LS2-7 - Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

SCI.ESS3.A.h - Resource availability has guided the development of human society and use of natural resources has associated costs, risks, and benefits.

HS-ESS3-1 - Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Math Standards:
CCSS.MATH.CONTENT.HSS.ID.C.9
Distinguish between correlation and causation.

CCSS.MATH.CONTENT.HSS.ID.B.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

CCSS.MATH.CONTENT.HSS.ID.A.4
Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

CCSS.MATH.CONTENT.HSA.REI.D.11
Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

CCSS.MATH.CONTENT.HSF.LE.A.1
Distinguish between situations that can be modeled with linear functions and with exponential functions.

CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Carpenter tools.

CCSS.MATH.PRACTICE.MP6 Attend to precision.
They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context.

Graduate Vision Competencies:

- Creative and Critical Thinker
- Positive Community Member