**Sustainable Agriculture Poster/Model Project – Advanced Animal Science or Principles of Ag**

**(If you have a very limited budget, this project can be converted to an Infographic or PowerPoint presentation.)**

MAJOR GRADE: This project counts as a test grade!

OBJECTIVES: Students will collaborate in a team of 2-3 students, research sustainable agriculture methods and technology, and create a 3D poster that emphasizes sustainable practices on a working farm.

LEARNING OUTCOMES: Students will be able to

* + Communicate which sustainable practices they incorporated and why they selected those practices.
  + Write a ¾ to 1 page over view of the rationale they used (typed, double spaced, APA format with citations – may need to adjust for 9th and 10th grade students).
  + Create a 3-dimensional poster that depicts the farm with sustainable practices and/or technology shown.
  + Utilize recycled/found/scrap materials for their poster project, when possible.

KEY TERMS: sustainable agriculture, regenerative, cover crops, companion plantings, rotational grazing, renewable,

TEKS: The following TEKS will be used throughout this project.

* + Principles of Ag: TEKS 4 (A-F) Students will examine the history of modern, traditional agricultural practices and the future of agriculture. (Students can research the history of sustainable practices to reinforce their understanding of the development of modern, traditional agriculture). Students will explain the history of, modern, and sustainable agriculture practices.
  + Principles of Ag: TEKS 7 (A-B) Students apply appropriate research methods to investigate sustainable agriculture practices using USDA data, technological advances in agriculture, and other sources.
  + Principles of Ag: TEKS 9 (A-D) Students use the internet to research peer-reviewed articles about sustainable agriculture practices, and write a ¾-1 page paper (typed, double-spaced, APA format) to explain the practices their team chose to incorporate in the 3-D poster.
  + Advanced Animal Science: TEKS 10 (A-F) Students determine the nutritional requirements of livestock (ruminants and non-ruminants) and select ideal forages for livestock to meet those needs.
  + Adv AnSc: TEKS 11 (F&G) Students will evaluate common diseases and parasites in livestock and determine the ideal multi-species grazing operation which provides the ideal environment for parasite life-cycle disruption and minimizing diseases.
  + Adv AnSc: TEKS 15 (A&B) Students will explore the best method for marketing livestock and examine labeling standards per the USDA, to meet consumer wants. (i.e., grass-fed beef, forage finished, organic, etc…) Students will evaluate market demand for marketing livestock, such as free-range eggs or chicken, pastured-pork, and direct sale to customers of processed meats.

***\*\*\*My classes were traditional block, every other day for 90 minutes – you can adjust this plan to fit with a traditional schedule, or a modified block schedule.***

Day 1: Students will divide into teams, based on interest and strengths. (I typically will “assist students” in finding a group they will be most successful with). Each student will start with a brainstorming session (I typically give them 15 minutes to “break the ice” and explore ideas). I then have students do the following:

1. Define Sustainable Agriculture (3-4 min, use their phone or available technology and Google)
2. List components of sustainable (RENEWABLE) ENERGY SOURCES that can be added to a traditional farm, without disrupting the current crops or livestock situation (3-5 minutes, Google search – or in my case, we have discussed some of these technologies prior to this unit). COST is a big part of deciding to change to renewable power, are there any alternatives or existing features of the farm that contribute to renewable resources? Examples/Ideas: water fall (hydro), sits on a hill where there is a lot of wind (turbines); are there several outbuildings with large roof structures (solar panels); OR the farm a large dairy with a large amount of manure that could be converted to methane, captured, and used to generate heat
3. What type of ag products will the team focus on and WHY! Encourage students to discuss and defend their reasoning. THEY MUST USE RESOUCRCES and not opinion (cows are cute so I only want to raise cows and nothing else, will not work!)

Day 2: Students will agree on a minimum of 5 features to incorporate in their farm plan, that are specifically identified as SUSTAINABLE PRACTICES. Students will sketch out their plan for their poster project and begin developing a plan for creating their poster. Students will collect materials (remember to try and use as much recycled items as possible) and bring to class next time. (I encourage my students to creatively use aluminum foil, popsicle sticks, dental floss, etc. to make solar panels, windows, water and dental floss for fences).

Day 3-4: Students will want to use a standard size foam board for the base of their project. It is more rigid than poster board and holds up much better (Although most of mine were really heavy and could stay on the walls, we did a gallery walk of each project.)

NOTE: I always have a large tote in my classroom for students to scavenge items from to save money, and we just add to it at the end of each project. If students do not choose to take their project home, I recycle items that can be reused. I also collected sale items from craft sections at Walmart, Target, or Hobby Lobby.

**Instructor “suggestions”:** I ask leading questions while walking around the classroom, and try to direct students’ thinking to focus on solar power, wind turbines, electric tractors, methane digesters, water catchment, multi-species rotational grazing, etc.

RESOURCES: Southern SARE Website <https://southern.sare.org/>, USDA NIFA Sustainable Ag website <https://nifa.usda.gov/program/sustainable-agriculture-program>, Texas AgriLife Resources Organic Farming <https://aggie-horticulture.tamu.edu/organic/resources/>, Video SARE Outreach Greg Brann <https://www.youtube.com/watch?v=0TDY-asItL8> Multi-species grazing operation.

RUBRIC:

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| Area: | 3 | 2 | 1 | 0 |
| Research | Students used peer-reviewed science articles to support their plan. Citations were authentic and accurate (APA format). | Students used 1-2 peer-reviewed science articles. Citations were URL’s listed | Minimal evidence of peer-reviewed science articles, 1-2 citations listed | No evidence of research documented |
| Teamwork | Students worked as team and delegated responsibilities. Each student contributed to the project in a meaningful manner. | Students mostly collaborated on the project, some issues with delegating and sharing responsibilities. | Not all students contributed to the success of the project. Many conflict issues arose and instructor had to intervene repeatedly. | No evidence of team work, or communication between students. |
| Neatness | The final product was well-crafted, neat, and to scale (as much as realistically possible). | The final product had some issues with glue/paint/items not attached (appears to have been rushed to finish) | Poster is sloppy, with a lack of concern for neatness. | Poster looks to have been assembled on a roller coaster with everyone’s eyes closed! |
| Accuracy | Students research paper was well-written and thoughtful. Minimal punctuation and grammatical errors and students peer reviewed the final paper for details, mechanics, and citations. | Paper has some focus and minimal citations, but mechanical errors are present and make the information difficult to understand. | Paper is very minimal on supported facts, no citations, and vague transitions. Many mechanical errors. | Paper is missing or does not include credible information. |
| Creativity | Students went above and beyond to demonstrate their concept. | Students demonstrate some creativity with the design and creation of the poster. | There is a poster with some items glued to it…. | Poster is incomplete and fragments. See roller coaster comment. |

Total Points: \_\_\_\_\_\_/15 x 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_