



Cocalico School District



SUSTAINABILITY: FROM THE INSIDE OUT

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Cocalico School District
Cocalico Enrichment Program:
Problem Based Learning
Sustainability

PROJECT SUMMARY

Cocalico High School students have been working on Problem Based Learning; Sustainability: From the Inside Out. Through collaboration, research, and data collection we have determined that implementing Problem Based Learning is the method in which to bring change. Students from the class of 2028 will have the opportunity to develop and enhance skill sets in collaboration, creativity, coding, media literacy, critical thinking, global citizenship, and dynamic communication as they follow our guidance through this step by step Project Based Learning initiative. The final outcome of the project will be the creation of a sustainably friendly outdoor courtyard space with instruction in Design Thinking and Engineer Design Process as the guide.



Problem Based Learning provides an opportunity for students to apply classroom content to the real world.

- *Ms. Shirey*

LETTER FROM PROJECT SPONSOR

What stands out to me as the sponsor of this project is the level of professionalism, creativity, collaboration and application to the real-world problem, sustainability, that Cocalico HS students were able to implement during the extremely challenging shift in education to remote and hybrid learning. The local community will benefit from the efforts of these students by gaining an understanding of the impacts of daily behavior on the local environment and the use of an outdoor learning space. Research supports that learning outdoors positively impacts mental health, creativity, retention of knowledge, and offers hands-on learning opportunities. This design concept can be applied to other areas in the school district to support transferability.

BASELINE DATA



90%

90% of students in the class of 2028 could not identify the proper method in which to recycle in Lancaster County



LESS THAN 10%

Less than 10% of the children in the classroom were aware of how much waste is sent to the landfill in Lancaster County



88.7%

88.7 % of the students have an interest in sustainability

RESEARCH ON PROBLEM BASED LEARNING (PBL)

Problem based learning is...

- Process is based on the ***Interest Area*** of the student.
- ***Real World Problems*** are abundant and need our best and brightest to begin developing solutions.
- ***Connections Across Content*** is how scientist and entrepreneurs find success.
- ***Creative Power*** is what keeps students engaged in their self-directed learning.
- ***Critical Thinking, Collaboration Skills and Problem-Solving Skills*** are highly sought-after skills that employers and highly competitive universities seek.
- ***Application of Knowledge*** is how to determine if learning occurred.
- ***Interaction with Community*** helps to bring relevancy to the educational experience.
- ***Presentation Skills and Technology Skills*** are foundational in communicating your unique ideas.
- ***Self-Directed Research*** will guarantee student ***Engagement***.

Students will be prepared to answer the common ***College Essay Question***: What problem have you solved, why and how?

NEED

- Increased student engagement is needed as academic success is at an all-time low as a result of the disruption to content delivery because of Covid-19 and PBL supports student engagement.
- Students have demonstrated interest in sustainability and need the knowledge to guide their decision-making. Interest based learning through PBL is a proven approach.
- Lancaster County is a leader in sustainability efforts and each green space contributes positively to our community and environment.
- 70% of students in the class of 2028 expressed the need for continued hands-on learning in the focus area of sustainability in the post-survey.

APPLICATION: BEAUTIFYING SPACES

6th grade students were educated on eco-friendly design strategies. Choices were offered by category and students were grouped in teams of 5. They developed a design idea for the middle school courtyard. Categories included: Water elements, native plants, compost, sound garden, sustainable furniture/reading/dining area, wildcard-add any design element that is creative and not listed. PBL entries were accepted as CAD, video, essay, or any other 3-D model the team creatively completes. Cross-curricular content was highlighted using science, math, art, STEM, ELA and Social Studies in each entry.



EDUCATE

6th grade students were educated on sustainable designs and native plants



DESIGN

Students were grouped and worked together to put all of these ideas into one design



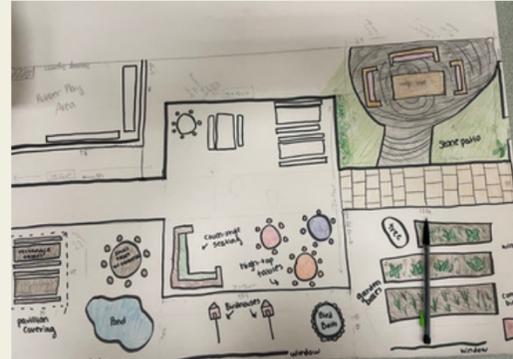
PRODUCE

Best elements from each design were used to create the most functional outdoor space

OUT WITH THE OLD



IN WITH THE NEW



Native Plants (Perennials)

Fall
(August - November)

Witch alder (orange and red)
Virginia sweet spire (red and orange coloration, white flowers)
Royal fern (some orange and red coloration)
Aromatic aster (purple flower, attracts butterflies)

Winter
(December - February)

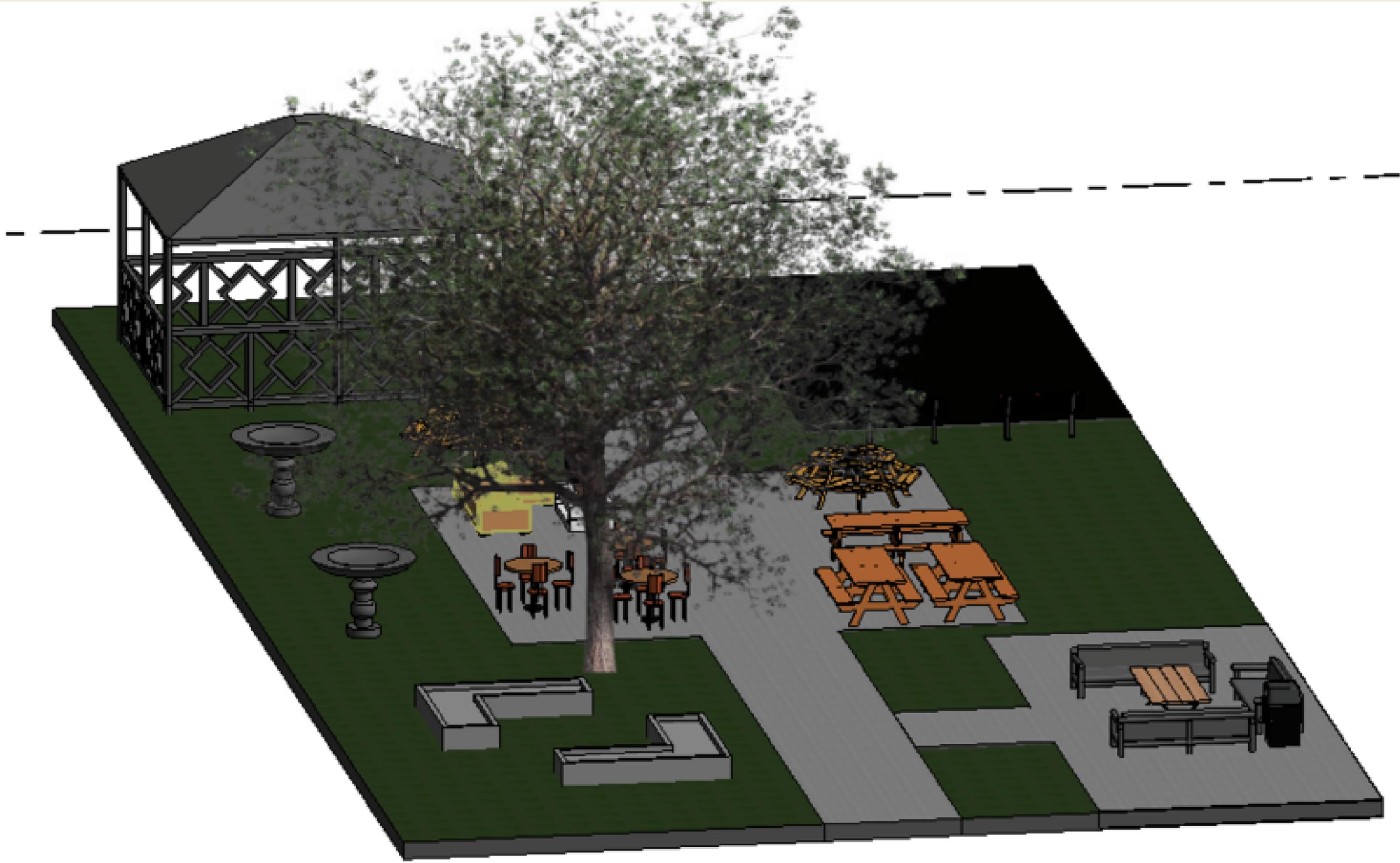
Red twig dogwood (red branches)
Salix discolor (soft fuzzy flowers)

Spring
(March - June)

Witch alder (white flowers)
Mountain laurel (white and pink flowers)
Wild blue phlox (ground cover, spreads, purple/blue flowers)
Virginia bluebells (blue)
Woodland stonecrop (small white flowers, ground cover)

Upon approval HS students will begin the refresh process by cleaning the current area and adding more seating and native plants.

BLUEPRINT: CAD STUDENT



Pre-Planning and Inspiration

101 N Queen

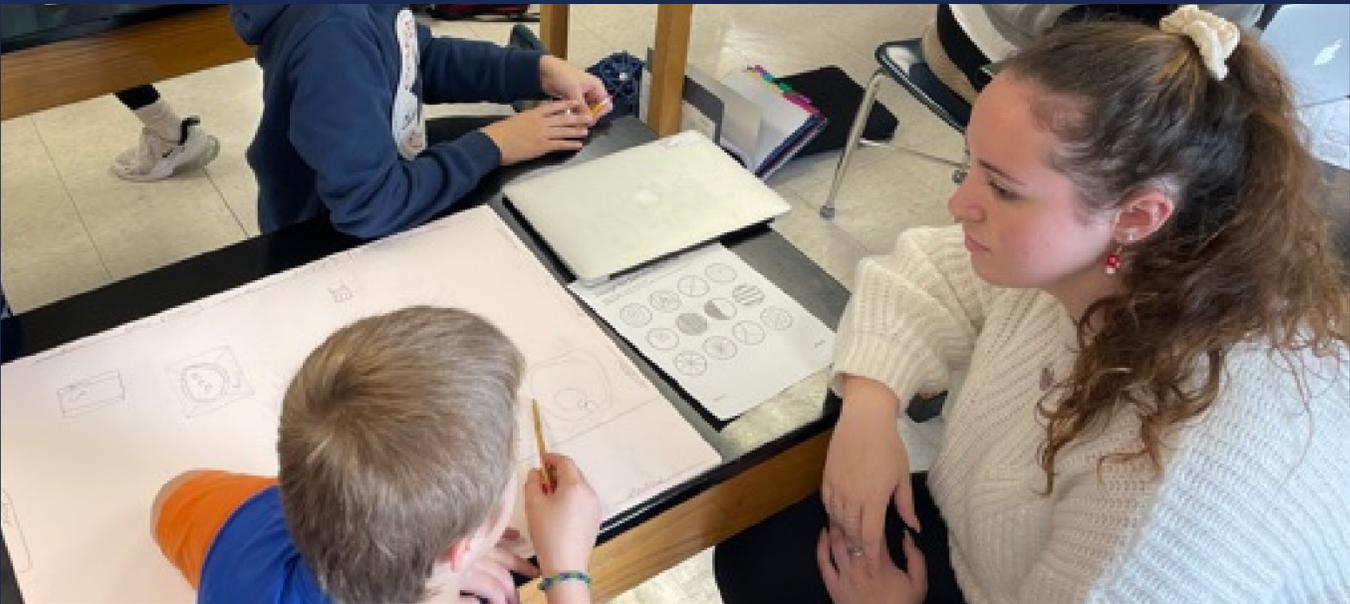
Penn Stone

Lancaster County Parks



Design Thinking and Engineer Design Process

Cocalico Middle School, Class of 2028





ACKNOWLEDGEMENTS

Cocalico School District:

Ryan Blocksom

Gavin Herr

Amelia Madrigal

AJ Rally

Teagan Sahm

Mikeala Watson

Class of 2028

Cocalico School District School Board

Karl Bierly, Technology Education

Collaborative Partners:

EFS

Earth Turf And Wood

Lancaster County Dept. of Parks &
Recreation, Environmental Ed. Team

LCSWMA

Penn Stone

101 North Queen, Cargas