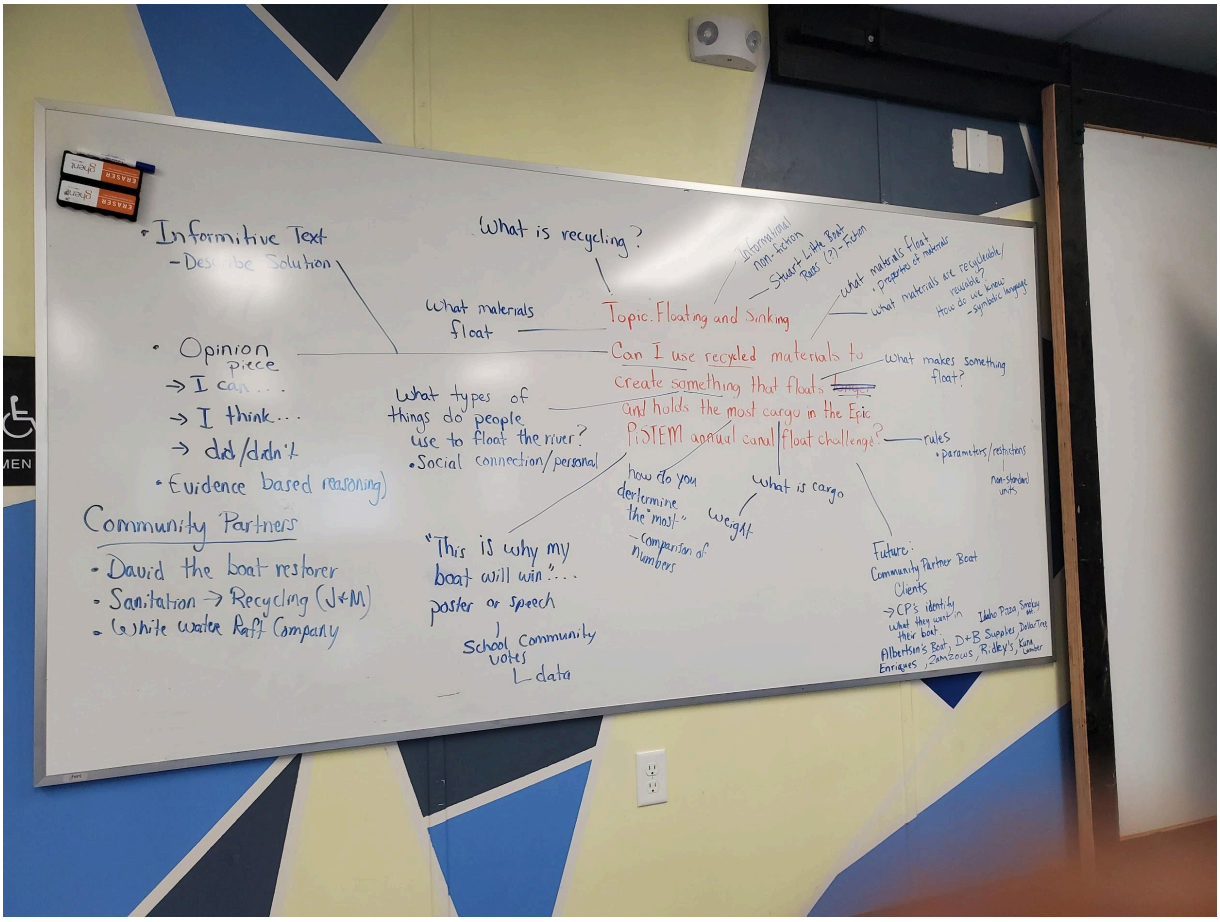
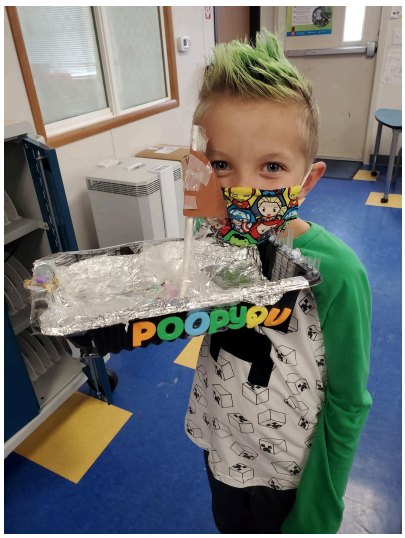
G1 Q1: Boat Float Challenge - Materials and Motion

Driving Question: What recycled materials can be used to create a boat that floats and holds the most cargo in the Epic PiSTEM Float Challenge?



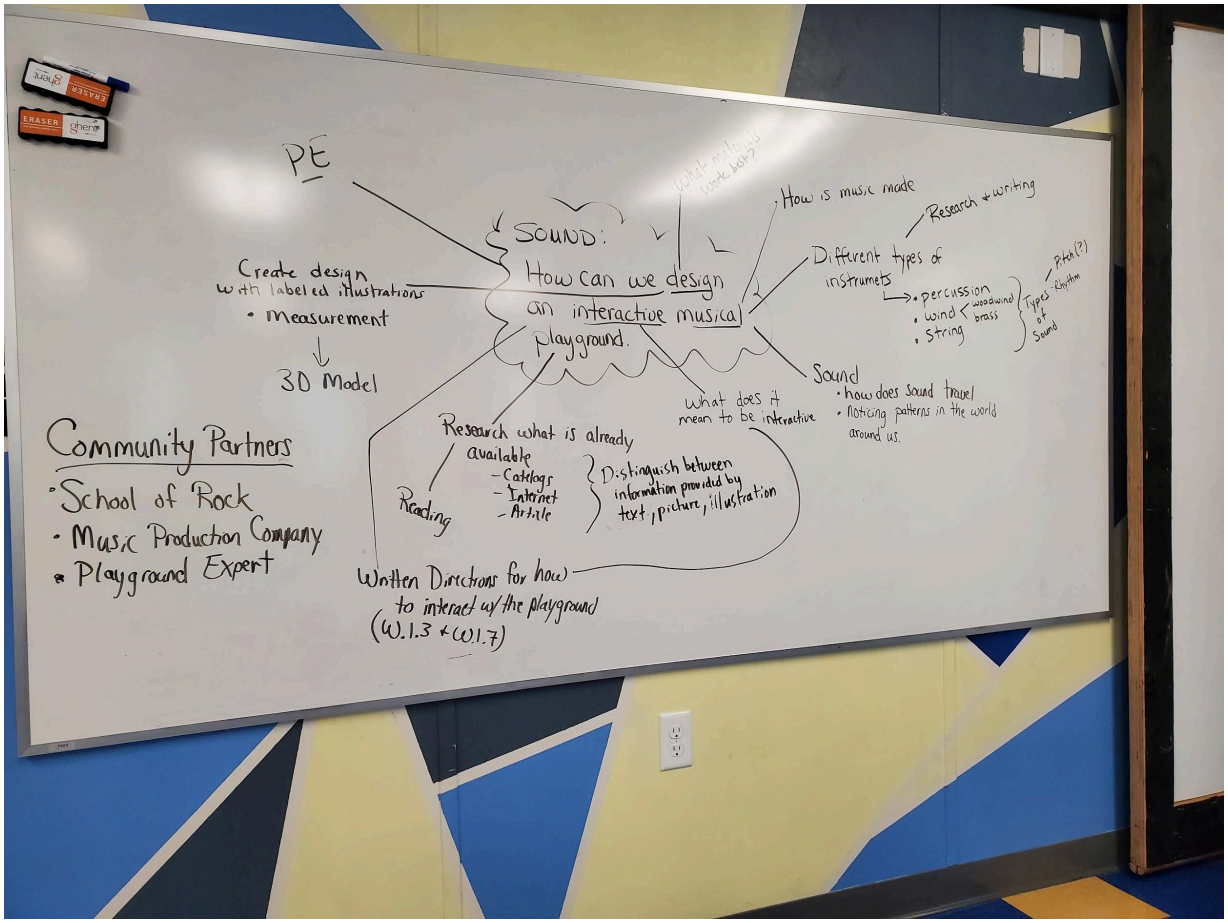
	
Grade: 1st	Semester: Q1
Community Partners:	Curriculum Connections:
Arie to bring boats to Launch the Boat Challenge Recycling- J & M Recycling Station Allan Marsh Travel Center West Roaring Springs -Have to go before they shut off the water (plan for august or first week of september) - this would be for tinfoil boat float as a practice Final Float - Watershed (Have to plan before October)	• Science: FOSS Materials & Motion • ELA: Name boat and describe the process of creation. Beginning, middle and end of the story. (Recycling, • Math: Tracking and graphing data, skip counting by 5s, 10s, 20s, and 100s using grams placed in boats as cargo. Counting to 120 • Art: Design the boats to be visually appealing and boat-like. • PE: Play the game “Captain’s Coming” that uses ship terminology. • Social Studies: • Ag/Tech: fishing and marine agriculture
What Worked	What Didn’t

● Total participation. ● Students were able to be engaged while they were at home. ● Good introductory project--high interest. 2021-2022: ● Very engaging and used curriculum paired very well to experiment with materials and floating/sinking interactions. ● Floating the boats in large tubs in class. ● Students skip counting with gram weights until the boat starts sinking. ● Using makerspace materials to build the boats. ● Testing boats in tubs of water. ● Doing a lesson on shapes that float using tin-foil (penny boats) so students had an idea of good boat shapes. 2022-23: ● Having cargo counted in math worked VERY well. It allowed the math teacher to collect data for future projects. Use the black, science bins for floating. ● Great, new launch with bringing boats to school to have students be the cargo in the boats. ● Science emphasized learning the parts of the boats and it lead to students making more boat-like structures in final project. ● Teaching propelling devices (balloon and straw) made a good challenge for students who are more advanced.	● Did not get math involved to the level it should be. ● No social studies tie-in. ● Too many parent-built boats in 2020 ● Had to rush to complete before irrigation was shut off ● Students were not at a writing level to complete meaningful writing. 2021-2022: ● Irrigation shut-off, so we couldn't float down the canal. ● Boats could have been more artistic looking (more boat-like). ● Having a large tub of water indoors (flooding hazard if breaks). ● Skip counting was challenging for gram counters when going above 20.
Changes	Resources

● Structured graphic organizer to record boat data while students float boats. (prediction of if it will float and how much cargo it can carry, did it float, # of cargo it held) ● Math: Larger units of cargo could include graphing and measurement (use grams) ● Social Studies - Map the path the boat took (1.SS.2.1.1, 2.1.2, 2.1.3) - Identify individuals who are helpful to people in their everyday lives (1.SS.4.3.1) ● Post number lines to help with skip counting and limit the types of gram counters that can be used. Limit cargo counting to 1,000 grams for sake of time. ● Have students start with larger grams and move to smaller grams. Have an order for gram counting. ● 2022: Math: Limit grams used for cargo and organize the counting of them when placing into the boat. Limit dimensions to measurable units of centimeters. ● Washers used for cargo for longevity ● Longevity tested at Roaring Springs and weight tested in class ● 2022-23: ELA - Students wrote explanatory pieces about why they chose certain materials for their boats. Add Stuart Little Boat story for read aloud. ● 2022-23: Math - tallied the cargo for each boat, made a tally chart, made ending bar graph **FINAL PRODUCT: Build a boat that floats and see how much cargo it can carry.**	● Science: FOSS Kit - Materials & Motion ● Literature: Lightship by Brian Floca ● Literature: Boats by Byron Barton (maybe do repeated reading until kids can read it without assistance) ● Literature: Busy Boats by Tony Mitton and Ant Parker ● Recycling Read Alouds ● Video of Impact of the blockage of the Panama Canal

G1 Q2: Light & Sound

DQ: How can we design an interactive musical playground using both light and sound?



Grade: 1st

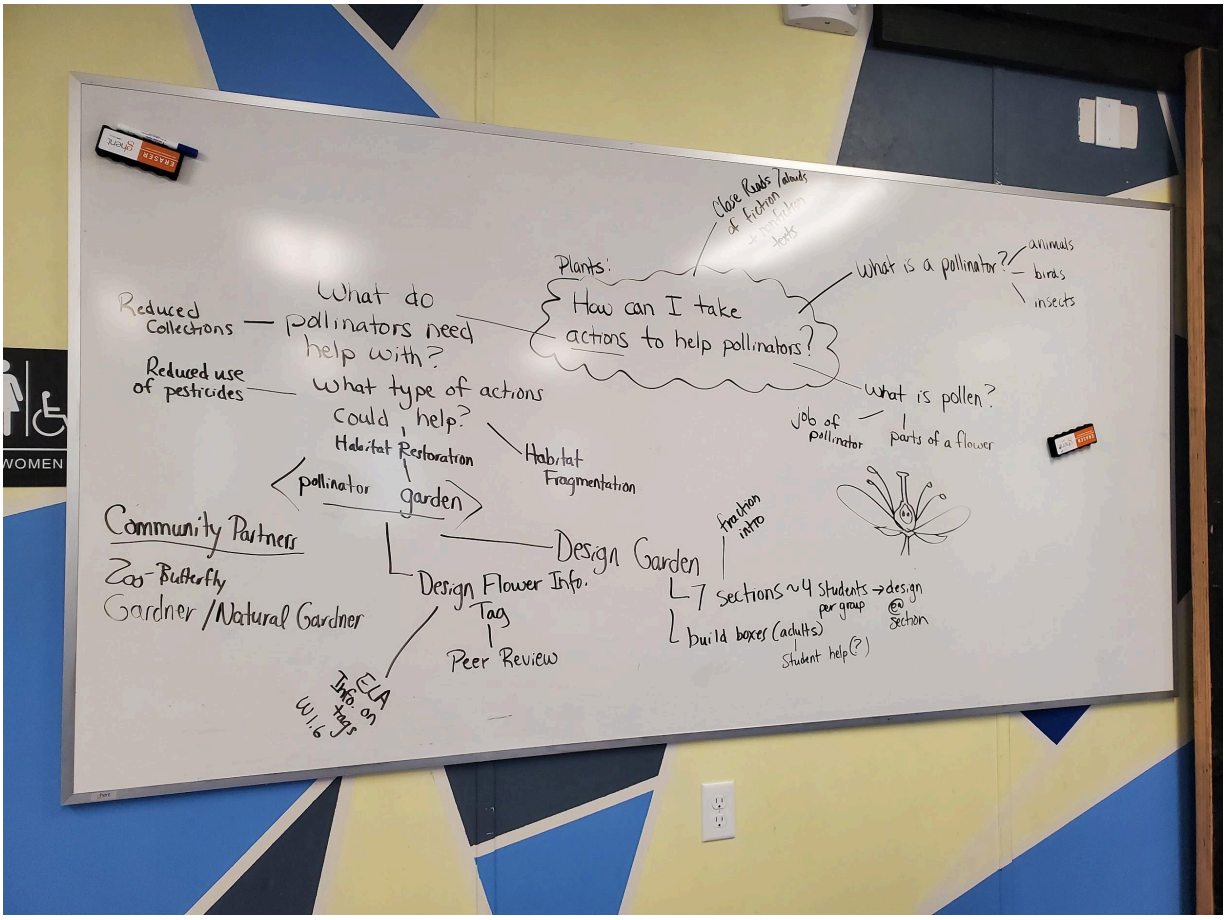
Semester: Q2

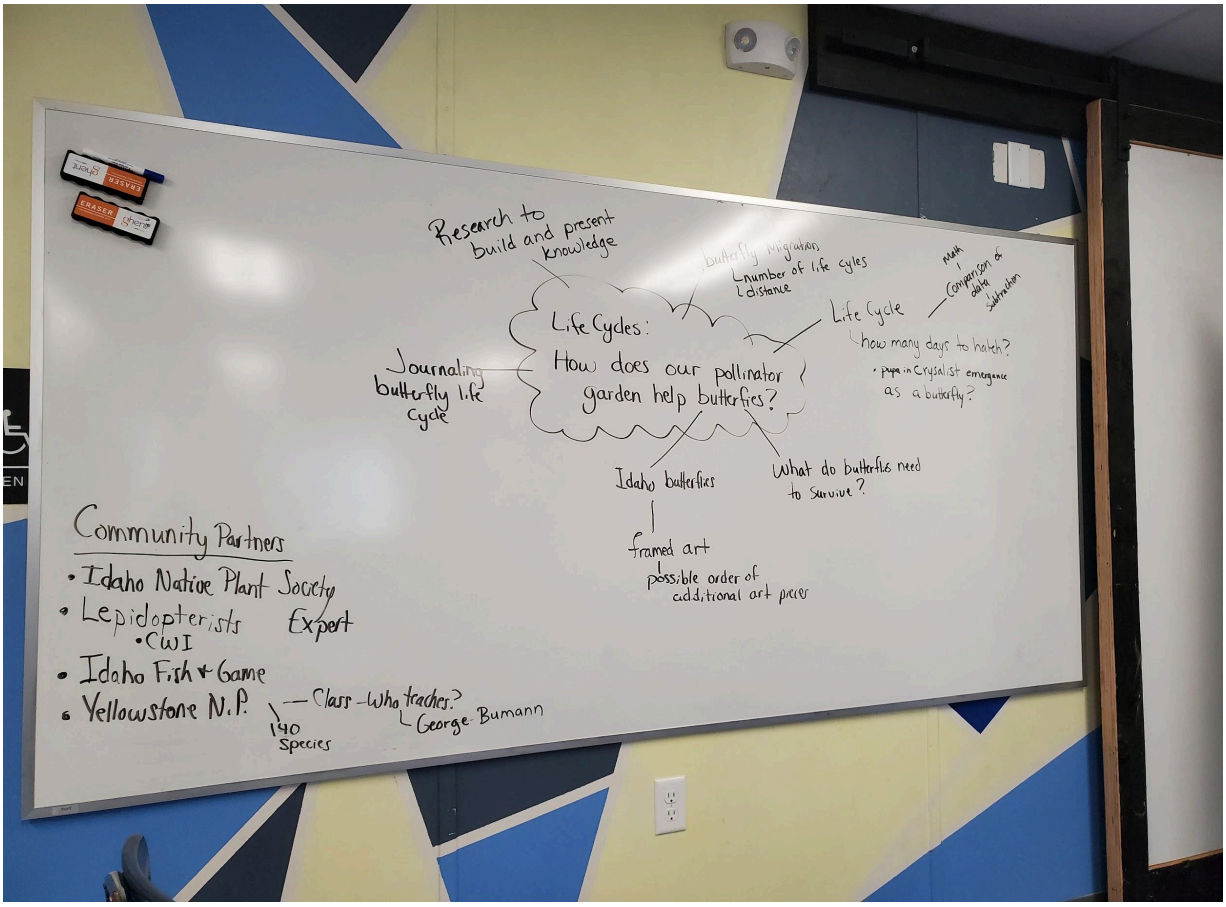
Community Partners:	Curriculum Connections:
Boise School of Rock Present Music Production Company (Contact Person is Ms. Brown) Settler's Park Field Trip (Talk to Jill, notify brown bus, fill out form for bus company, parent volunteers (cannot ride bus but can meet us there, must have background checks) *Ethan, Calan, Makana mom* PTA as Clients wanting to add Playground Secondary Students 3D Printers Pool Noodles for Desk Music Parts of a Playground/ Individually for Whole Unifix Cubes for Measuring Vocabulary-Interactive "What Does That Mean?"	• Science: FOSS Sound & Light • ELA: Epic (Website) • Math: • Art: • PE: • Social Studies: • Ag/Tech:
What Worked	What Didn't
• 2021: • Great for distance learning • Students loved suncatchers and shadows • 2022: • Very hands-on • Every student had a message • Groups of 2 • Many types of messages: sun shadows, flashlight shadows, sound morse code, light morse code, made-up code with mirrors, reflection messages - half messages, backwards messages, flashlight mazes, black light messages	• 2021: • Didn't incorporate enough math.. • Getting them to write a message was a struggle • Most students used one form of communication for their message (morse code) • Unknown parent vs student product • A lot of teacher time to edit videos • 2022: • Not enough flashlights • Escape room concept hard to understand
Changes	Resources

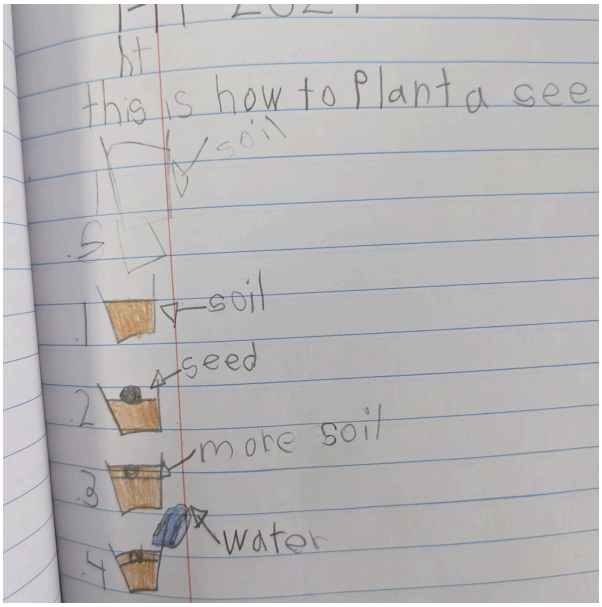
● More time allowed for message creation ● Erase playground question? ● More exploration time for sending/creating messages ● Less message options ● Number sentences with light and sound (1.OA.1, 1.OA.2) ● Social studies: tie in rules and how we can be kind to classmates with disabilities who must adjust (i.e. blindness, deafness, autism, other sensory issues). ○ Describe ways people adjust to their environment (1.SS.2.2.1). ○ Identify the ways people modify their environment (1.SS.2.2.2). ● Social studies: study individuals who embody personal traits (1.SS.4.1.4) ○ Marian Anderson ○ Thomas Edison ● Time: sun dials outside with 1st grade (different times of day, sparkman and science, measure shadows) ● Measuring how far mirrors are (cm rulers) do practice in math with mirrors and rulers to determine best distance. ● ELA: riddles and written hints to hint at light/sound unlock message FInal Project: Escape room with light and sound clues	● FOSS ○ Light and sound ● Literature: When Marian Sang by Pam Munoz Ryan (1.SS.4.1.4, personal traits such as courage, honesty, responsibility) ● Informational Writing-How to W1.3 W1.7 ● Epic! ○ Many books - Sending Messages with Light and Sound by Jennifer Boothroyd - Vibrations Make Sound by Jennifer Boothroyd - Sound Waves and Communication by Jenna Winterberg ● Mystery Science ○ 5 lesson unit on light and sound

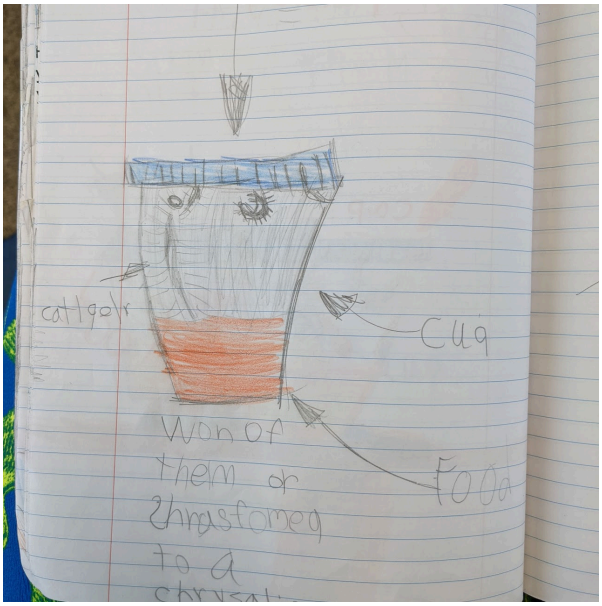
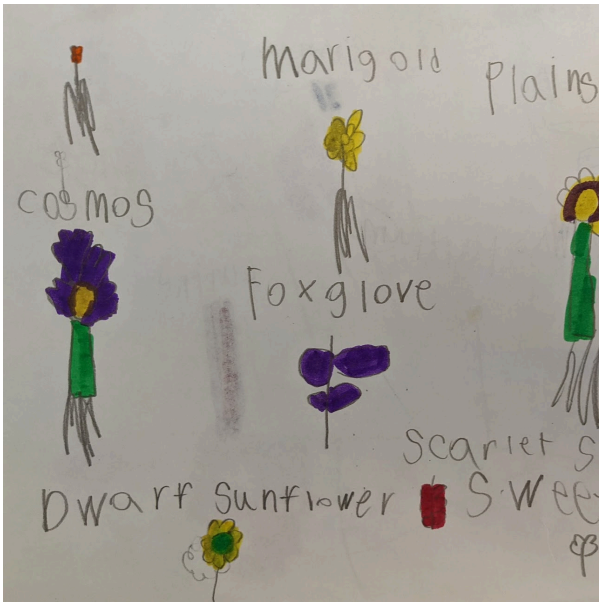
G1 Q4 Insects/Pollinators

DQ: How can we take actions to help pollinators?




Research to build and present knowledge
Life Cycles:
How does our pollinator garden help butterflies?
Journaling butterfly life cycle
Butterfly Migrations
number of life cycles
distance
Life Cycle
how many days to health?
pupa in Crysalist emergence as a butterfly?
Math
Comparison & data subtraction
Idaho butterflies
framed art
possible order of additional art pieces
What do butterflies need to survive?
Community Partners
Idaho Native Plant Society
Lepidopterists
CWI
Expert
Idaho Fish & Game
Yellowstone N.P.
Class
Who teaches?
George Bumann
140 species


this is how to Plant a see
soil
soil
seed
more soil
water

	
Grade:1	Semester:Q3
Community Partners:	Curriculum Connections:
Idaho Native Plant Society What is a pollinator? What do pollinators do? Botanical Gardens Field Trip Fast seeds/ Grow lights/ Pollinate All design One Garden D & B/ Grant and Donation of materials and seeds Landscaper to design a drip system Draggin'Wing High Desert Nursery Mk Nature Center/Sale of Native Plant Seeds Product-Plan for Garden/Drip System/Signs with Art Teacher Boone Science Hall (Orma J. Smith Museum) - College of Idaho- Caldwell	• Science: FOSS Insects & Plants; EiE Designing Hand Pollinators (hand pollinators project and garden) • ELA: Read Informational Text/Writing • Math: Measurement, Graphing, Area Intro • Art: Pollinator's and plants that attract difference species and the circuitry pollinator project. • PE: • Social Studies:Mapping, agricultural area • Ag/Tech: Grow boxes for garden
What Worked	What Didn't

• Fast plants - they worked • Pollination was very exciting for kids	• Wrong season for growing and observing plants
Changes	Resources
• Mark popsicle sticks as measuring sticks so students can track growth. Use data in graphing. • Social studies: create a timeline to show their life and the plant's life (1.SS.1.1.3). **FINAL PROJECT:** 1. **A sellable product for pollinators (Making seed packets with student art on the packaging)** 2. **Pollinator Garden** Consider making plant and butterfly PBLs into one unit and then add a different PBL unit for the third quarter.	• Literature: The Tiny Seed by Eric Carle • Literature: A Seed is Sleepy by Dianna Aston • Literature: Sophie's Squash • FOSS - Plants and Pollinators • Engineering is Elementary (EIE) Designing Hand Pollinators • Ag & Art Teacher Pollinator lessons MPEP • Order Butterflies/

G1 Q3: Plants

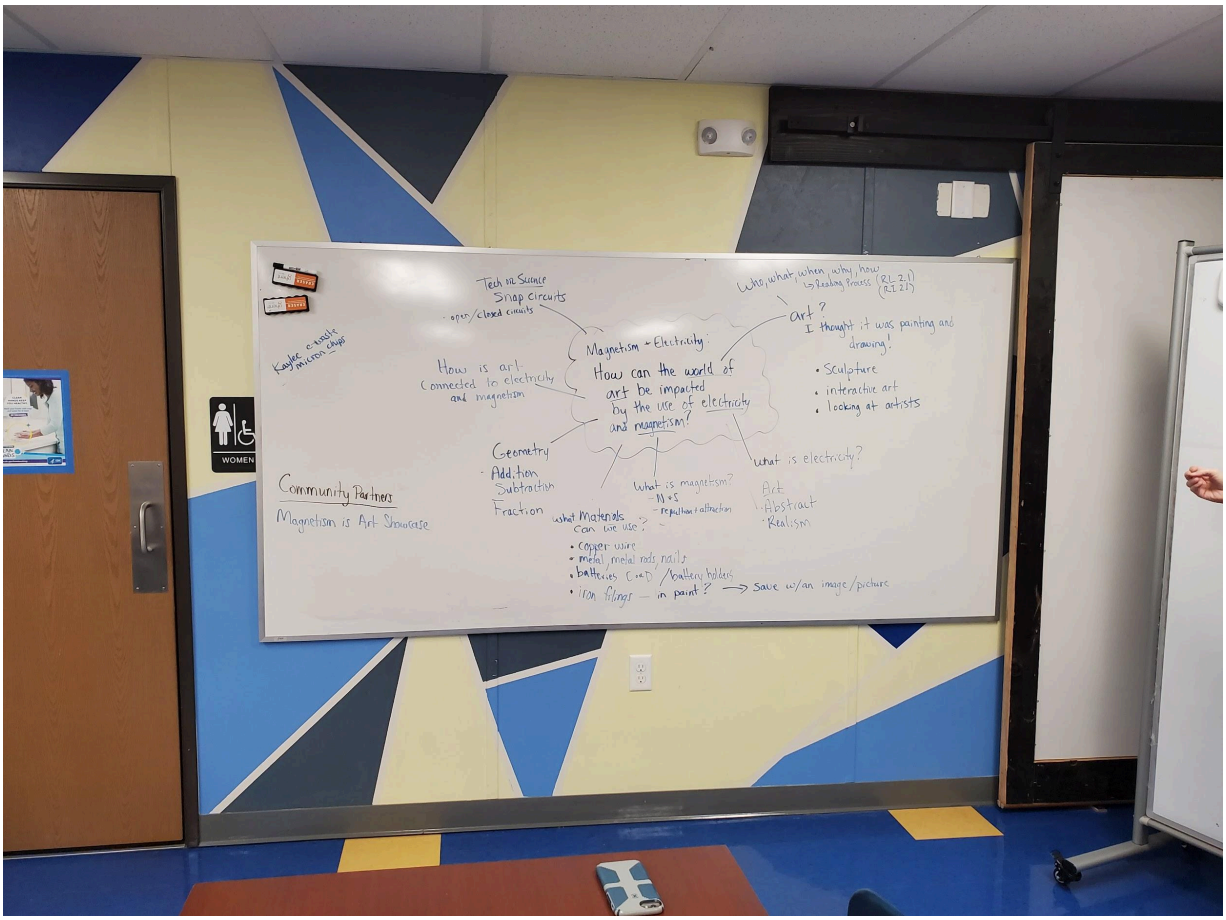
DQ: How can we find the best place and the right conditions for a plant to grow?

Grade: 1st	Semester: Q4
What Worked	What Didn't
• FOSS Insects & Plants;	•
Changes	Resources
•	• Idaho Native Plant Society • Lepidoteristis CWI • Idaho Fish & Game • Yellowstone National Park-George Bumann- Butterflies • Zoo Boise Field Trip • Shop.monarchwatch.org •

G2 Q2: Magnetism and Electricity

Grade: 2nd	Semester:Q2

DQ: How can the world of art be impacted by electricity and magnetism?



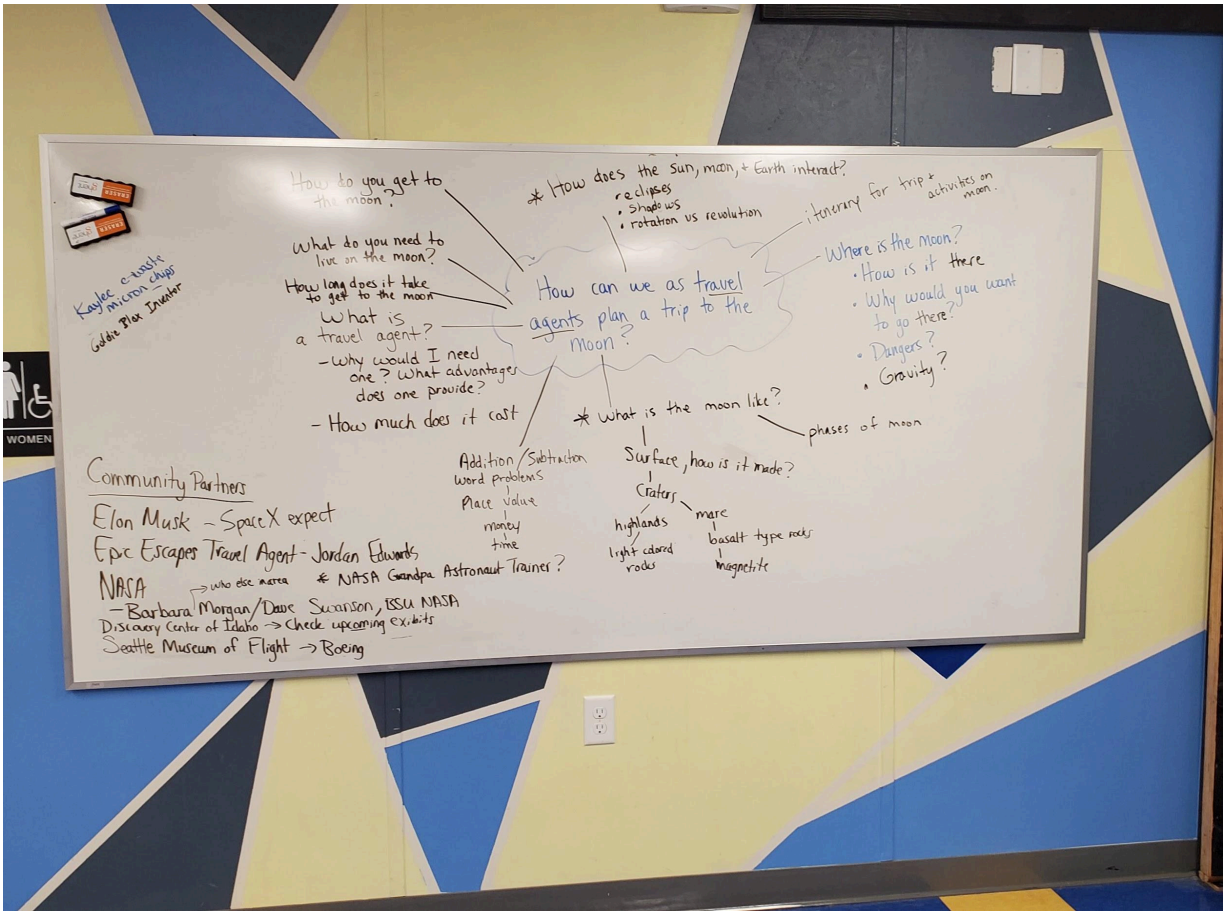
Community Partners:	Curriculum Connections:
Micron Medical Field Personnel Jewelry Maker Agriculture/Food Processing/Syngenta Seed Company: Alforex Seeds	• Science: FOSS Forces in Action • ELA: Vocab.: Design, impact, magnets, inventions, process of design • Math: • Art: • PE:

	● Social Studies: Compass/ how they work with maps- Magnets affect compass ● Ag/Tech:Amanda
What Worked	What Didn't
● Students loved the magnet missions ● Good Length of time ● Interesting art ideas	● Art project did not work out ● Writing was difficult ● ?? Electricity ○ Students could only connect with lightning
Changes	Resources
● Collaborate more with art beforehand ● More activities for electricity ● Consider how to work more math into this PBL. ● Maybe tie into compasses and how they work (2.SS.2.1.2). **FINAL PRODUCT: Students will design a product that uses magnets in everyday life.**	● Magnet missions ● FOSS ○ Forces in Action (unit 3) ○ Motion and Matter ● Literature:

G2 Q3: Space, Moon, & Earth

Grade: 2nd	Semester: Q3

DQ: How can we as travel agents plan a trip to the moon?



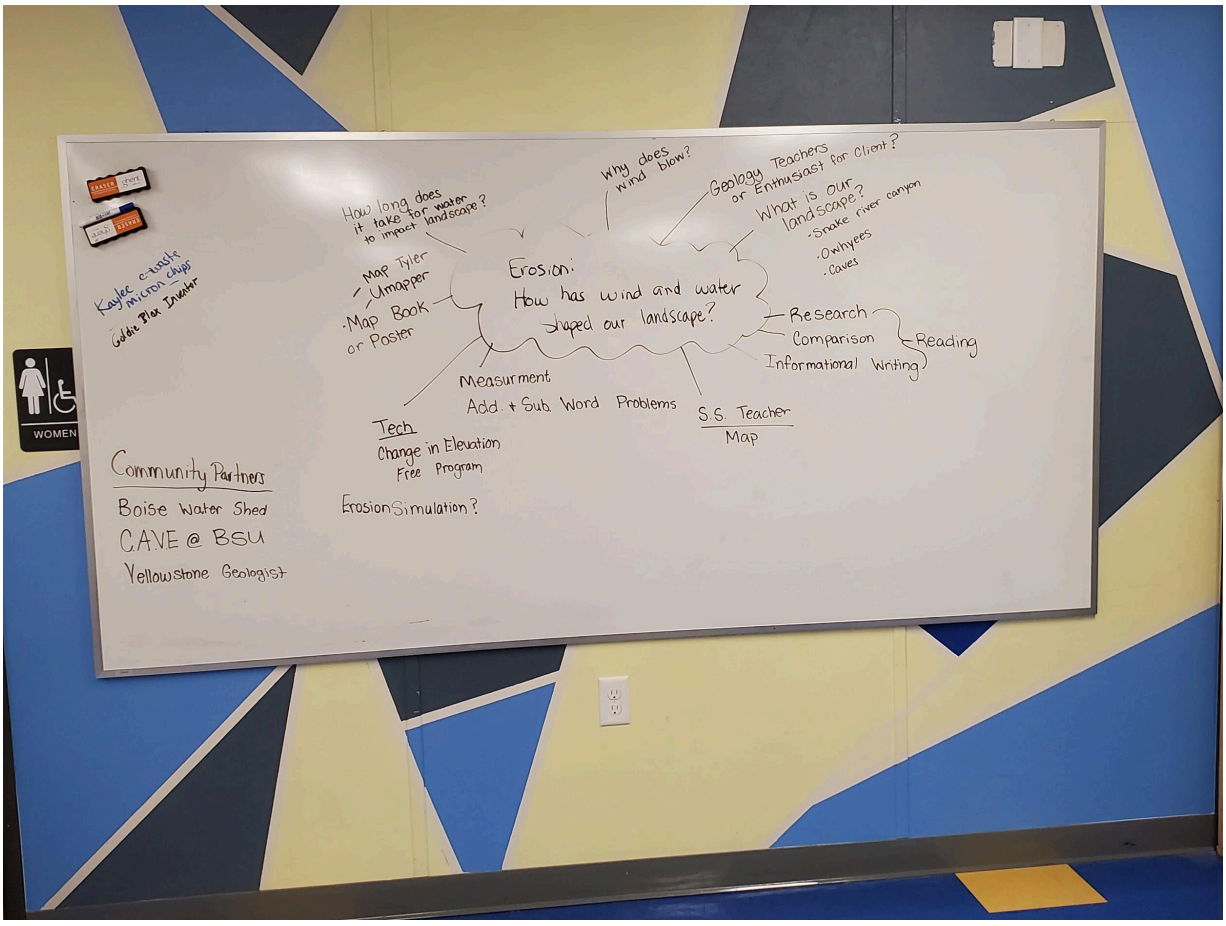
Community Partners:	Curriculum Connections:
Elon Musk-Space X Richard Branson Epic Escapes Travel Agent-Jordan Edwards NASA-Barbara Morgan/Dave Swanson, Courtney Peterson (micah's mom) can connect to Bryson's grandfather (astronaut)	• Science: DSM Finding the Moon, Phases of the moon, Eclipse, Craters, Scientific Facts for Brochure • ELA: Brochure (travel brochure, time leaving, how long it takes, TIME, itinerary with time, departure, etc.)

	• Math: Cost of trip, how long it would take to get to the moon • Art: Trifold painting-moon, earth,stars. Brochure facts on interior. • PE: • Social Studies: Maps/ history of NASA/Moon Landing • Ag/Tech:
What Worked	What Didn't
• 2021: • Students loved learning about space • Canva Travel Posters • Storytime from Space • Mystery Science (Spinning Sky Unit) • 2022: • Ms. Pfeil is going to get the information to Mrs. Brenneman one month prior to the due date. • Astronaut food • Egg-drop rocket ships and dropping from playground • Blood moon, eclipses, diagrams • Moon landscapes with shaving cream • Travel Brochures in ELA - facts about moons and space, with picture • Videos from ISS • Height limit for rocket	• Very text heavy • Varying quality of posters ○ A lot of teacher editing • Hard to tie in math • 2022: • Teams of 3-4, some people were left out • Never got to see moon during the day
Changes	Resources
• More structured support for posters • More hands-on activities (the science kit will definitely help with this • Math: Telling time - itineraries • Product-Travel Brochure, Commercial, Poster • 2022- Itinerary developed in math class. • Make moon journals for moon phases (science) • Give rockets a weight limit (science) • Weight limits to what they can take: Use addition and subtraction to plan a packing list.	• DSM Finding the Moon • Mystery Science • Generation Genius • Nearpod - history of space travel • Canva • Wallace and Grommet • Storytime from space • The Darkest Dark by Chris Hadfield • Brycen's grandfather NASA engineer • More ELA resources: https://www.weareteachers.com/best-space-books-for-kids/

G2 Q1: Weathering and Erosion

Grade: 2nd	Semester: Q1

DQ: How has wind and water shaped our landscape?



Community Partners:	Curriculum Connections:
Idaho Museum of Mining and Geology Boise Watershed CAVE at BSU Yellowstone National Park Geologist Field Trip: Go to Farmstead to do gemstone mining	• Science: FOSS Pebbles, Sand, & Silt • Clay diorama • ELA: Sts. Pick favorite landform and do an informational piece and compare and contrast landforms • Math: Graphing, data collecting, erosion tank measurement.

	• Art: • PE: • Social Studies: Snake river, caves, ice caves (maps/images) • Ag/Tech: Powerpoint will be the final project
What Worked	What Didn't

• Idaho geology is super cool!
• Kids like rocks
  ○ Rock museum
• Local geology allowed students to make a connection
• Informational Writing about their favorite landform.
• 2022-23 Science: Using outdoor, nature items, students collected samples of items to decorate their landforms with earth layers. This made the landscapes much more realistic looking. Doubling the salt-dough also made the landforms better! Students created the salt-dough in class using the giant, black science bins.
	• Mile wide inch deep
	• FOSS videos
	  ○ BORING!!!!!!!!! (but funny)

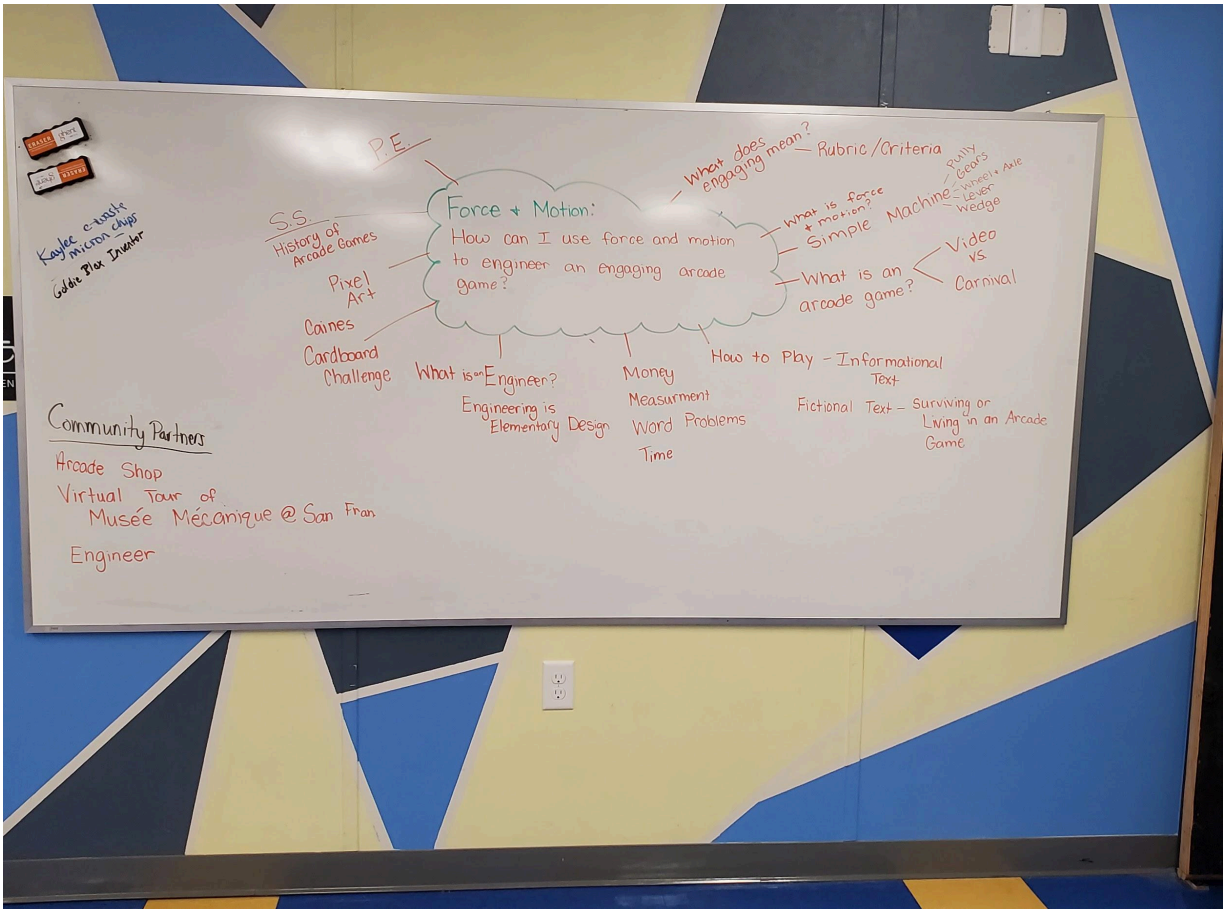
Changes	Resources
• More local geology features (not just learning about 4) • Condense FOSS curriculum • Math: weigh rocks, measure rocks • Graph data from weight and length • Social studies: "Explain how natural resources affect economic activities in the local community" (2.SS.3.2.1). • 2022-23 ELA: Students wrote an explanatory piece about the landform they created. The landform I created is _____. I made it out of _____. Explain weathering/erosion process. Explain the changes that occurred. Students went through the entire writing process to finished, typed product. • 2022-23 Math: Took measurements of height, width, and length of landforms	• https://www.blm.gov/documents/idaho/public-room/guidebook/geology-southwest-idaho • FOSS Pebbles, Sand, & Silt, NGSS

before weathering/erosion process (cm.) Students retook the measurements after the weathering process ended to quantify the erosion. ● 2022-23 Change for next year science: ○ Use makerspace items underneath the salt dough to hold up the landform's shape. (ex: paper cup under the salt dough to make landscape higher)	

G2 Q4: Caine's Arcade - Force and Motion

Grade:2	Semester:Q4

DQ: How can I use force and motion to engineer an engaging Caine's Arcade game?



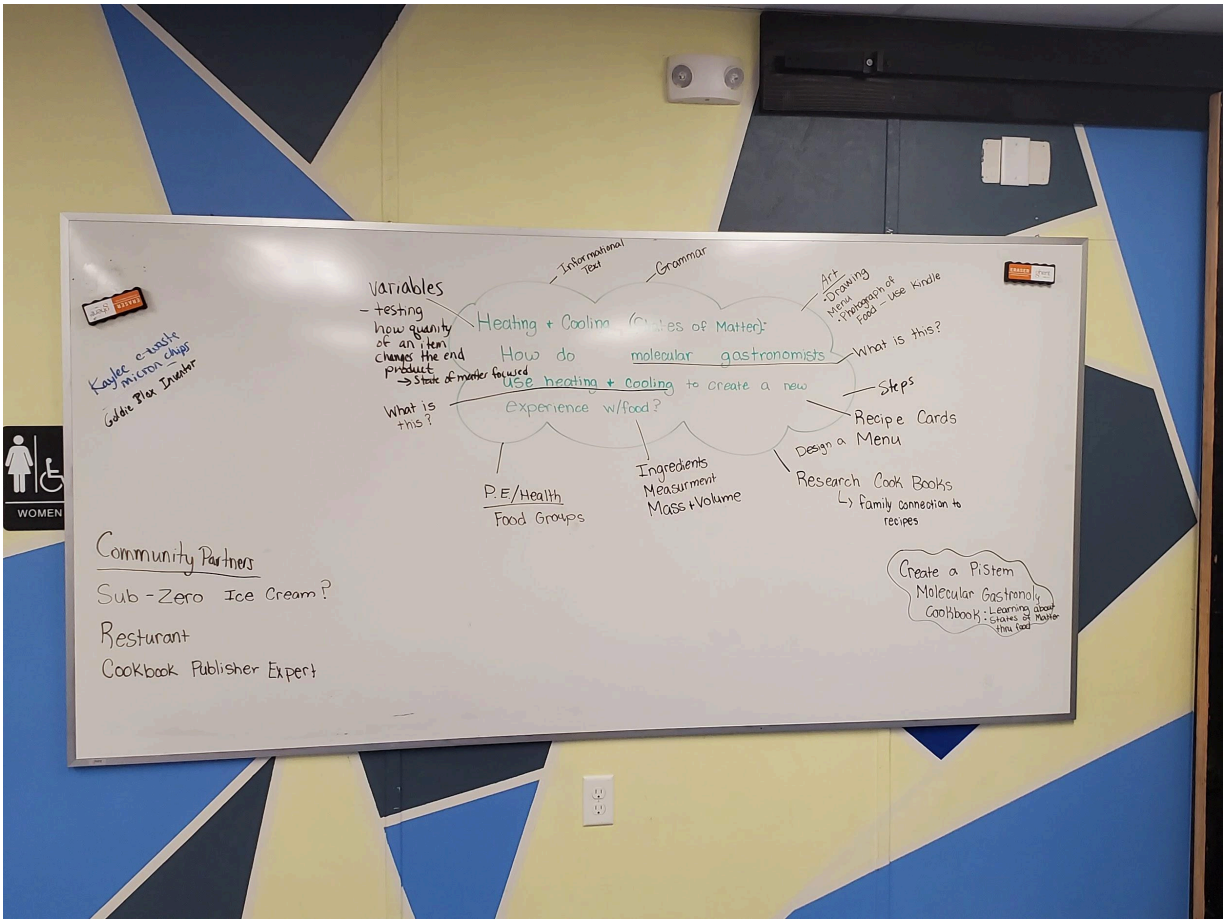
Community Partners:	Curriculum Connections:
Wahooz, Pojos, Big Al's (If using Cardboard - Box Making Plant - Dixon Container Co, Pak West Packaging, PCA)	• Science: FOSS Motion & Matter • (3x2x2 max dimensions, outdoor arcade, cardboard cutters from Jill) • ELA: • Math: • Art: • PE: • Social Studies: • Ag/Tech:

What Worked	What Didn't
● Caine's arcade math problems. ● Drawing their box creation ● Explanatory Writing of how their arcade worked	
Changes	Resources
● Social studies: Goal 3.1: Explain basic economic concepts (2.SS.3.1.1-4). ● Social studies: Could also tie in standards about rules? (2.SS.4.1.1-3) **FINAL PROJECT: Students will design an arcade.**	● Let's Play - An Interdisciplinary Unit based on Caine's Arcade! ● FOSS Kit - Force and Motion

G3 Q1: States of Matter - Molecular Gastronomy

Grade: 3rd	Semester: Q1

DQ: How do molecular gastronomists use states of matter to create a new experience with food?



Community Partners:	Curriculum Connections:
Cold Stone Liquid Nitrogen Ice Cream: Killer Creamery Chefs (field trip to see liquid nitrogen ice cream) Nutritionist	• Science: FOSS Solids & Liquids • ELA: • Math: jello/ pudding/no bake cookies • Art: Make a “My Plate” Poster/Dancing Ooblick/Paper making for recipe book cover • PE:

	● Social Studies: Nutrition ● Ag/Tech: Digital Cookbook/Experiences with local ag food? ● 2022-23 ELA: Students went through the writing process to draft and finalize recipes until they were typed up. ● 2022-23 Math: Students multiplied and divided their recipe ingredient amounts in math to determine serving sizes.
What Worked	What Didn't
● Students loved unusual food pairings ● A lot of home involvement and connections ● 2022: ● Grasped states of matter well ● Lots of math measurement involved and lots of ELA with the writing process for the recipe ● Students had lots of opportunities for creativity and to do trial/error for science experiments ● Properties of liquids and solids ● Lots of cooking experiences ● Multiplied and divided in recipes ● 2022-23 Science: moving this to Q1 was much better! Starting the year with states of matter makes the most sense.	● Math cooking project because of covid!! ● Google Doc Cookbook ○ Not all in one doc ○ So many deleted recipes (by accident) ● Writing ability ● Lower level of thinking (early 2nd grade) ● 2022: ● Too light in content, doesn't match 3rd grade science standards, already knew states of matter from unit 1 ● Art would need to be involved in this prior to January as the high school graphics art students are working on the yearbook starting mid January.
Changes	Resources

● Separate documents for recipes ● More cooking experiences ● More writing structure ● Begin measurement of mass and volume earlier. Include multiplication in that content. ● Multiply recipe measurements ● Student Treasures publishing company (school project) ● Go through whole writing process ● Have students type recipes for final draft in ag/tech ● 2022-23 Note for future years: This unit takes longer than others, because it is a big final project. If the final project is going long, move on with science content for the next unit and then work on the final project periodically until finished. ● 2022-23 Science and Art - collaborated with art for students to draw realism drawings from the picture we took of their final recipe creation in Science. **FINAL PRODUCT: Students will develop a cookbook with recipes and illustrations that is a sellable product. Lorri will do paper making for the front cover.**	● FOSS kit - Solids and liquids ● Good Mythical Morning (food pairings) ○ Preview the videos first ● https://readingmiddlegrade.com/middle-grade-books-about-food/ ● blender

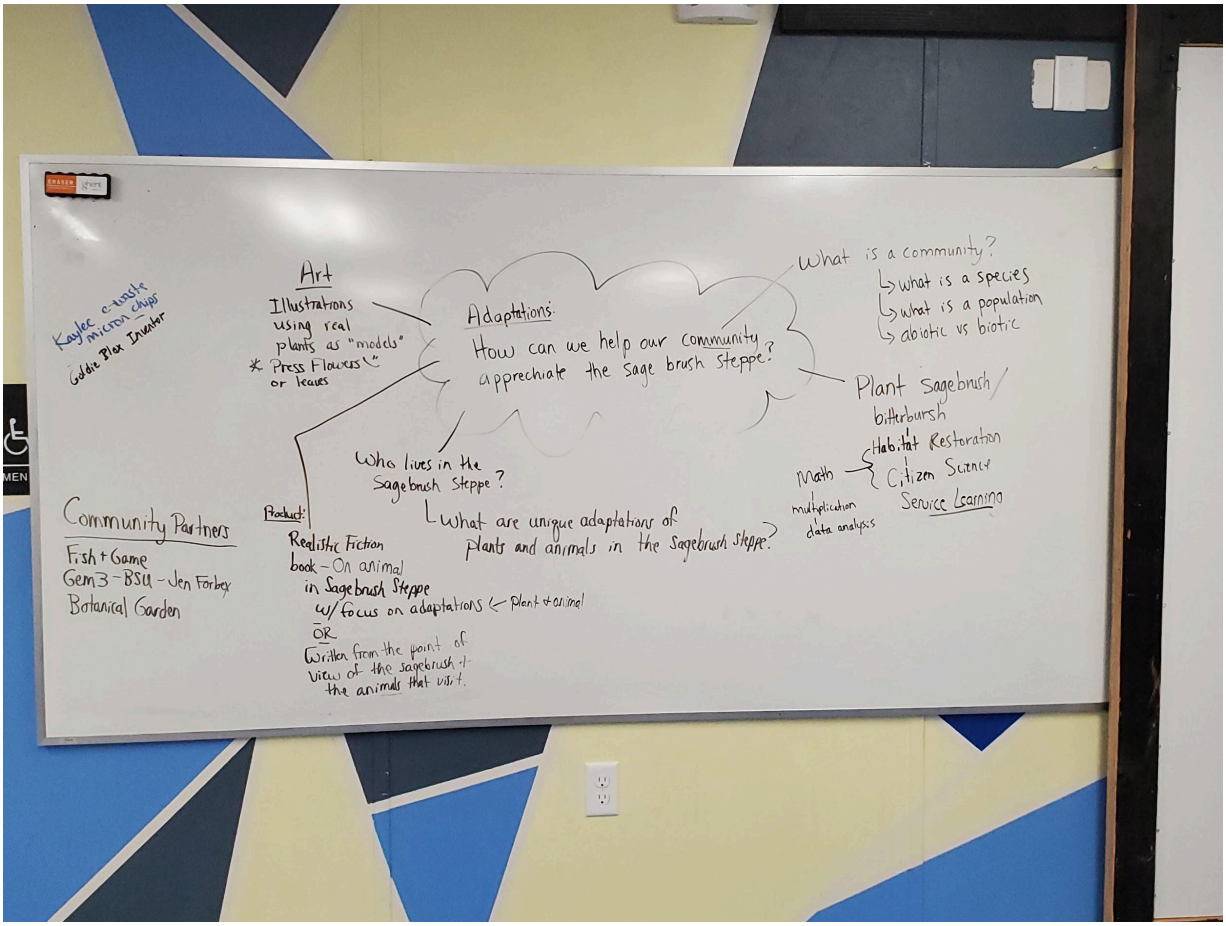
G3 Q3: Heredity and Immigration

DQ: What path did my family take to arrive in Idaho and what traits do I share with my ancestors?

Grade:3	Semester:Q3
Community Partners:	Curriculum Connections:
Basque Museum and Cultural Center Idaho State Museum	● Science: SSC Similarities & Differences Between Organisms? ● ELA: ● Math: ● Art: ● PE: ● Social Studies: Amanda will develop this area ● Ag/Tech:
What Worked	What Didn't
● Students had amazing stories ● Animal mashups were fun ● Adopted/Foster care students are given a choice to look at biological family or adopted family.	● Genetics was way over their heads ○ Minimal resources at their level ○ ● Writing needed a lot of adult revision
Changes	Resources

• Social studies: Analyze past and present settlement patterns of the community (3.SS.2.3.1) • Social studies: Goal 1.2: Trace the role of migration and immigration of people in the development of the United States (3.SS.1.2.1-3). **FINAL PRODUCT: Students write their own story of their history. They will add photographs and pictures.** Maybe best as a ELA, Math, and Social Studies PBL with Science teaching about similarities and differences between organisms. **End Product from 2020-21 School Year: Quilt**	• SSC What Explains Similarities and Differences Between Organisms? • Ancestry.com

G3 Q4: Animal Habitats and Adaptations
DQ: How can we protect animals when their habitat changes? (Smithsonian Social Studies Kit)



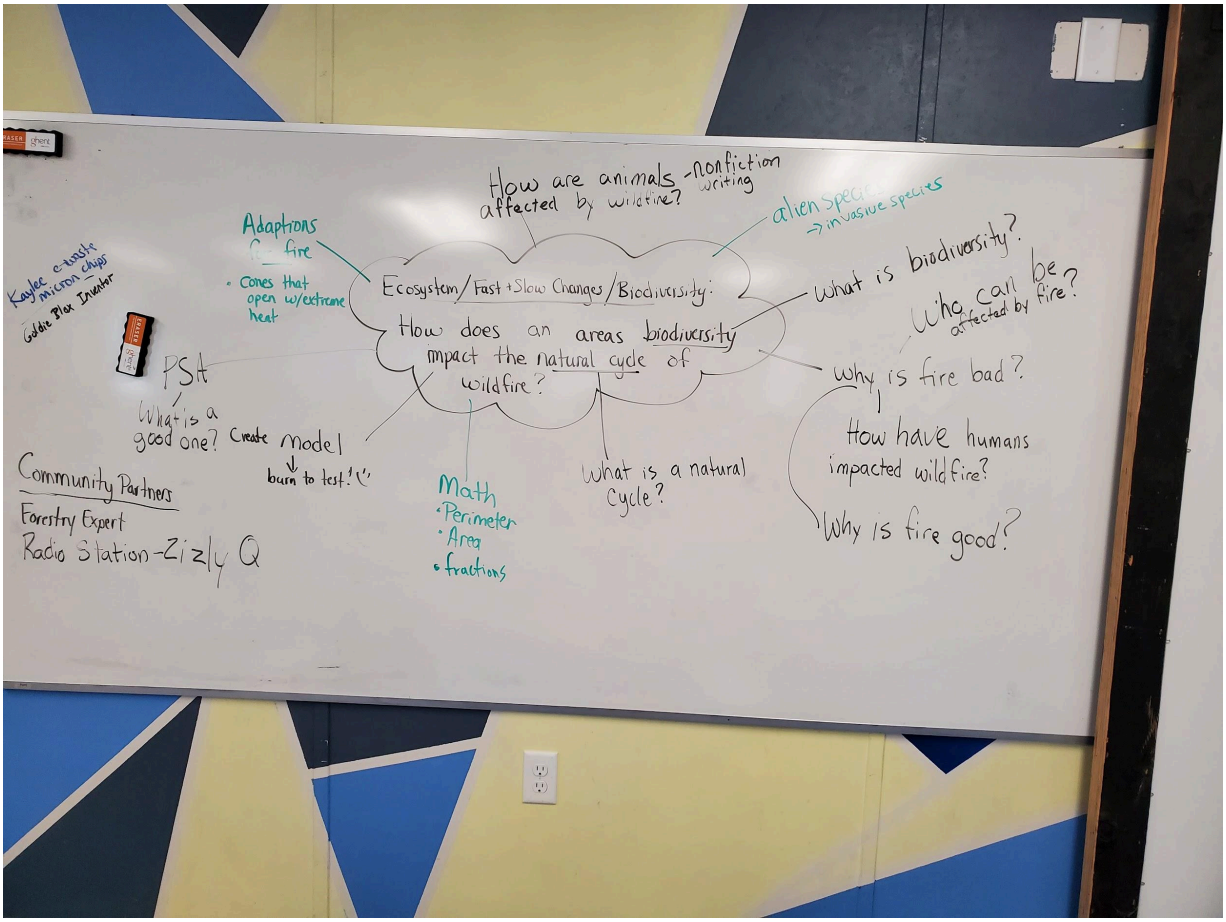
Grade:3	Semester: Q4
Community Partners:	Curriculum Connections:
Bureau of Land Management Birds of Prey MK Nature Center Fish and Game Botanical Gardens Zoo Boise Aquarium	• Science: SSC How Can We Protect Animals When Their Habitat Changes? • ELA: • Math: • Art: • PE: • Social Studies: • Ag/Tech:
Community Partners:	Curriculum Connections:
	• Science: SSC How Can We Protect Animals When Their Habitat Changes? (include

	migration, patterns, connect with immigration also, compare immigration and migration - as seasons change, adaptations, migration) ● Science: Producer and Consumer Food Web ● ELA: ● Math: ● Art: ● PE: ● Social Studies: Producer and Consumer Food Web ● Technology:
What Worked	What Didn't
● Students really enjoyed learning about the sagebrush food web ● They had a connection to it since it is all around them	● Some concepts were a little too over their head
Changes Maybe a PBL on endangered animals Student choice of animal.	Resources

• More structure/expectations for books • Focus more on animals and food webs **FINAL PROJECT: (Associated with the Smithsonian PBL Kit)**	• https://www.fws.gov/greatersagegrouse/education.php • https://www.fws.gov/greatersagegrouse/documents/Education/Sagebrush_Ecosystem_Curriculum_FINAL.pdf • Steelhead in the classroom (?) SSC How Can We Protect Animals When Their Habitat Changes? (Project: Find actual endangered species that have lost their habitat, students problem solve how we can protect these animals when their habitat changes) Raise money for tiger at the zoo. Problem, Solution, Call to action Bring in guest speakers to discuss animals in need: Jill- McKaws, Kara - zoologist, reptile place, Boise Zoo (gorgongoza)

G3 Q2: Weather and Climate

What steps can we take to reduce the effects of weather-related hazards?



Grade:3rd	Semester:Q2
Community Partners:	Curriculum Connections:
Forestry Expert Radio Station-Zizly Weather expert Scott Dorval Kuna Fire Department	• Science: FOSS Water & Climate • ELA: • Math: • Art: illustrating weather events such as volcanos, tornados, and floods. EPIC ties to reading. • PE: • Social Studies: • Ag/Tech:
What Worked	What Didn't

•	• Rushed for time (especially with testing)
Changes	Resources
• Add examples of weather around the world and how it impacts their schooling • DIY Barometer (balloon over a glass jar with straw) • Tim Axford - warning coordination meteorologist NWS Pocatello **FINAL PRODUCT:** **Create a design solution in a climate that reduces the effects of weather-related hazards. (barriers for flooding, controlled burns, fire-proof surroundings, etc.)**	• https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA • https://www.frames.gov/fireworks/curriculum/sagebrush-ecosystem • FOSS Water & Climate, NGSS • Project Wild Curriculum (Project Learning Tree)