



U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools



Seeley-Swan High School

Montana Nominee to

U. S. Department of Education Green Ribbon Schools Sustainability

Award



2014-2015 District Nominee Presentation Form

PART I - ELIGIBILITY CERTIFICATION

District's Certifications

The signatures of the district superintendent (or equivalent) on the next page certifies that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the superintendent's knowledge.

1. The district has been evaluated and selected from among districts within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
2. The district is providing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review.
3. OCR has not issued a violation letter of findings to the school district concluding that the nominated school district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.
4. The U.S. Department of Justice does not have a pending suit alleging that the school district has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
5. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the school district in question; or if there are such findings, the state or school district has corrected, or agreed to correct, the findings.
6. The district meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.



2014-2015 School Nominee Presentation Form

U.S. Department of Education Green Ribbon Schools 2014-2015

Charter Title I Magnet Private Independent

Name of Principal: Kathleen Pecora

(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name: Seeley-Swan High School

(As it should appear on an award)

Official School Name Mailing Address: 456 Airport Road, PO Box 416 Seeley Lake, MT 59868

(If address is P.O. Box, also include street address.)

County: Missoula County Code Number *: 1434

Telephone: 406-677-2224 Fax: 406-677-2949

Web site/URL: <http://www.mcpsmt.org/seeleyswan> E-mail: kpecora@mcps.k12.mt.us

**Private Schools: If the information requested is not applicable, write N/A in the space*

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

A handwritten signature in black ink that reads "Kathleen Pecora".

_____ Date: 2/23/2015

(Principal's Signature)

Name of Superintendent: Dr. Alex Apostle

(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in official records)

District Name: Missoula County School District

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

A handwritten signature in black ink that reads "Alex Apostle".

_____ Date: 2/23/15

(Superintendent's Signature)

Nominating Authority's Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of the Authority's knowledge.

1. The school has some configuration that includes grades Pre-K-12.
2. The school is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
3. The school meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency: MT Office of Public Instruction

Name of Nominating Authority: Ms. Denise Juneau

(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.



Date: 2/23/15

(Nominating Authority's Signature)

SUMMARY AND DOCUMENTATION OF NOMINEE'S ACHIEVEMENTS

Provide a coherent "snapshot" that describes how your school is representative of your jurisdiction's highest achieving green school efforts. Summarize your strengths and accomplishments in all three Pillars and nine Elements. Then, include documentation and concrete examples for work in every Pillar and Element.

SUBMISSION

The nomination package, including the signed certifications and documentation of evaluation in the three Pillars should be converted to a PDF file and emailed to green.ribbon.schools@ed.gov according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509

Expiration Date: February 28, 2015

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110, Sec. 501, Innovative Programs and Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address.

PART II – SUMMARY OF ACHIEVEMENTS

Seeley-Swan High School, Montana

Making Sustainability a Reality in the in the Lives of Students

To illustrate the uniqueness of Seeley-Swan High School, and its students' relationship with the natural world, consider its location: a remote, sparsely populated valley flanked by the Bob Marshall and Mission Mountain Wildernesses. This community has a profound relationship with the natural space that envelops it. Formalizing our school's commitment to sustainable practices provides a natural extension of our community's values. So, we are now engaged in an ambitious and transformative sustainability initiative. It is holistic and student-centered; by reinforcing broad program goals through curricular integration, sustainability is becoming more relevant to our students' personal and academic development. By nurturing students' awareness of sustainable practices and then empowering them to take action within the school environment, we help develop more conscientious, active citizens.

The school is engaging in an ambitious and transformative sustainability initiative. It is an initiative that is holistic and student-centered. By situating programming decisions in terms of student learning this program focuses on providing meaningful sustainability programming and learning. By balancing programming activities with curriculum integration sustainability is made meaningful and relevant to the students. Building a culture based on sustainability practices and values within a school ensures that not only the organization promote current and future sustainability but provides the basis for each student to lead a more sustainable life both now and in the future. By helping students to become aware of topics and issues related to sustainability and then empowering them to take action towards those issues within the school environment enables student to become engaged and active citizen in the future. Through assuming different leadership roles within the school different classes of students have the opportunity to learn about and experience sustainable behaviors and practices.

As part of our commitment, Seeley-Swan High School is aligning itself to the three pillars of the Green Ribbon Schools program. We are addressing the first pillar of reducing environmental impacts and costs through a well-developed recycling and resource efficiency program.

To address the second pillar of improving the health and wellness of students and staff, our school is applying a multifaceted approach to wellness that includes strategic nutrition initiatives, increased physical activity, and emotional wellness programming.

Curriculum integration has been ongoing and functions as a reflective practice within the sustainability program. Through achieving the third pillar, which consists of effective environmental and sustainability education, students have engaged in experiential and place-based learning activities which enabled them to incorporate sustainability topics into their lived experience. Sustainability programming was integrated through a Professional Learning Community Approach. Through a strategic partnership with the University of Montana's department of Curriculum and Instruction our staff and faculty received a great deal of support and mentoring. Professional development was provided to help frame the program and integrate curriculum into the classrooms. Through careful attention to scaffolding and the developmental needs of students this program ensured that all students receive sustainability education that is meaningful, applied and ultimately transformative. Helping students to see how their actions impact both themselves and others was a primary goal of the program. In demonstrating the ways in which our behaviors shape our environment both now and in the future students have been changed through this sustainability program at Seeley-Lake elementary school. Attention to the third pillar consists of effective environmental and sustainability education. Our students engage in experiential and place-based learning activities which enable them to incorporate sustainability topics into their lived and learning experience.

Through partnerships with the University of Montana, the US Forest Service, and various other community-based organizations such as the Clearwater Resource Council, our program will have the support it needs to succeed. We are already demonstrating and documenting its success. Through our efforts, the sustainability program at Seeley-Swan High School is reinforcing the value of personal, social, and environmental responsibility.

PART III – DOCUMENTATION OF STATE EVALUATION OF DISTRICT NOMINEE

Pillar I: Reduce Environmental Impact and Costs

Element IA: Energy

The Energy/Facilities program is focused on increasing energy efficiency within Seeley Elementary School. Our primary energy consumption needs arise from using energy derived from electricity and gas. The approach taken by the Energy/Facilities Committee is to identify areas in our school that could become more energy efficient and program for that reduce in use. Increasing energy efficiency is reducing electricity usage, decreasing the school's contribution to climate change, and saving the school energy costs in the facilities budget.

The first step in developing the energy/facility program was to have an energy audit conducting by the Bonneville Power Administration (BPA). On September 24th the BPA conducted an extensive audit that in conjunction with our collected energy data created a baseline of data that will inform future practices to conserve energy use and reduce energy waste. By using recommendations from that extensive audit we are implementing energy conservation and waste reduction strategies.

Our school's Energy and Water conservation focus for this initial year was to create a baseline of data and build partnership with energy providers. Although it seems intangible in terms of hard data, the relationships we formed energy providers and regulators is essential for the long-term success of our sustainability programming. Over a period of several months between August and November of 2014 countless phone calls and follow-up calls emails were made for the purpose of requesting and gathering data. The significance of this is that these providers had never received request of this nature from schools.

Through our efforts we have built a lasting framework and partnership with schools and energy providers to program for sustainability. Now that we have the data we have taken steps to aggregate it and format it into data management systems. We are engaging in EnergyCap software analysis for the purpose of identify areas and strategies for conservation and efficiency gains. Through the EnergyCap analysis are gaining GHG data equivalents and those are being used to inform curriculum and behavioral changes within the school. Given the nature of establishing a baseline for data analysis and consumption we are working to integrate a very focused behavioral plan to reduce energy consumption and increase energy use efficiency. Through classroom integration we are actively changing the energy use culture of the school. Through this profound cultural change we will work to use the data we have gathered to inform school policy related to facilities, management and logistics.

We established that the current energy usage is 606,240 kBtu annually. With 102 students and a building space of 46,000 square feet we now have the tools to understand our energy use. Our data serves to indicate usage patterns and ways in which we can anticipate and make seasonal adjustments in future years. We drew energy data from two sources. Given our rural location the school uses both electricity and propane to heat it. These energy sources and the data collected help us to frame our consumption amount and patterns.

The second step that we have taken in developing our energy/facilities program is examining existing classroom and school-wide practices regarding energy use and consumption. With this data we have developed strategies for minimizing energy use. This data in conjunction with an energy audit conducted by BPA served to guide the creation of our Energy Management Plan. The plan consists of practices and procedures that are currently being implemented on both the level of the classroom and across the school overall. Using the energy audit data we identified specific areas in which energy conservation could occur through feasible structural/facilities and behavioral changes. Specific classroom approaches to energy conservation have been identified by classroom teachers and entered into a school-wide data collection chart. This chart enables teachers to share in strategies and approaches that work for them in reducing energy consumption through the formation of our sustainability-based Professional Learning Communities.

The school reached out to the IT support to install energy-saving software and technology on all possible appliances and computer equipment. Another area of documenting and recording energy use that came

directly from the energy audit is from the walk-in freezer and cooler. Through this program we are working to ensure that all computers, monitors, printers, copiers and other equipment is set to the highest degree of energy efficiency possible.

In addition to establishing awareness and having created an internal database of classroom practices focused on reducing energy consumption we conducted a professional development seminar with the support of The University of Montana department of Curriculum and Instruction, aimed at helping staff to become proficient in energy efficiency practices, strategies and curriculum integration approaches.

Curriculum integration continues to play a significant role in developing and implementing our energy conservation plan. Having students identify strategies for energy conservation is the first step in building a strong classroom culture of conservation. In addition to identifying and developing shared classroom practices students are also documenting and inventorying those practices.

Different curricular integration strategies have been identified, implemented and documented to ensure that programming aligns with learning practices. Ensuring a student-centered approach enables alignment of school practices with student learning. Each class either has or is creating a documentation chart that identifies how and when energy topics are engaged in by students.

Element IB: Water and Grounds

The school site sits on 80 acres of forest land. 95% of landscaping consists of native, water-efficient and/or regionally appropriate. As a result of this it does not require any additional irrigation. Drought resistant native plants on school sites and nature trails include pine and spruce trees and native grasses. Ensuring this commitment to maintaining native flora allows for outdoor learning to be integrated into the surrounding natural landscape. Water conservation is being achieved through data monitoring and behavioral change within the school. The school pumps water from morel creek to irrigate the largest green space on the campus. The football field is irrigated solely from creek water to minimize ground water use and municipal water usage.

After conducting our baseline data review we established that as a school we consume an annual amount of 212,160 gallons of water annually. This amounts to 2,080 gallons of water per student annually. A component of our energy management plan is water conservation. We are exploring rain catchment systems. Mainly our approach has been to create and implement water conservation strategies within the classroom and across the school in order to reduce our usage overall. Our bench mark target after conservation efforts is to have a consumption rate of 1,700 gallons per student annually.

Element IC: Reduced Waste Production

Seeley-Swan High School has taken the recycling aspect of the Green Ribbon School program very seriously. The resulting quantity of waste that is being diverted and recycled at the school as a percentage of total weight is significant. The school recycles more than 330lbs. The range of recycled products varies from paper to plastic. The school utilizes student leadership to guide and facilitate the practice of recycling within the school. Students have assumed a profound leadership role and have created a lasting culture of resource conservation and stewardship through our recycling program. Given the challenges of being a small rural school this is not small task. The school had to negotiate that fact the recycling pick-up could not occur because of their rural location. As a result teacher and administrators take the recycling to the City of Missoula on a monthly basis.

Average of 13.63 cubic yards of dumpster per month

Average of 6.18 cubic yards of recycling per month

Recycling Rate = $(6.18 / 13.63) \times 100 = 45.19$ cubic yards

Monthly waste generated per person = $(13.63/102)$: 0.113 cubic yards

Each classroom has a bin for recycling. Every teacher has been given a list of items that can be and cannot be recycled by our local recycling company. In addition to the classroom bins, recycling bins are located in the teacher's lounge, office, copy room, and computer lab. A list of recyclable items is posted next to recycling bins that are located in the common areas around the school. When the bins fill students from the math class collect them and measure them. The school is recycling all the materials that the local refuse takes with the future goal of students implementing recycling in their own house based on their experience at school.

The materials are transported and measured by students. Paper will be collected in each classroom. Plastic and Aluminum will be collected in 4 bins throughout the school. In the staff lounge, there are two bins, one for recycled magazines and one for newspapers. There is a cardboard recycling bin that has been established, as well. Twice a month, students with the help of a designated staff member will collect the recycling from the bins and the Annette Johnson's math students. A staff member will deliver the recycled material to our county transfer site or to Missoula. The recycling material is stored in the recycling bins on the in large bins outside the school. Then teachers or administrators load the materials up in their trucks when they make trips to Missoula.

We are also encouraging teachers to save paper and toner by maximizing digital assignments. If paper copies are needed, teachers are encouraged to use a low-toner font and select paper from the student-maintained "one side used" box next to our copy machine, and to print on both sides if using new paper. We are also eliminating disposable flatware in our cafeteria, and recognizing students for choosing reusable bottles for their beverages. In addition, we have recently undergone an energy audit; as we analyze the resulting data, we are developing more specific energy conservation practices and goals. Through more careful documentation in these and other areas of resource use, our school will clearly demonstrate its commitment to conscientious use of precious resources.

Element ID: Alternative Transportation

The students in the school conducted a transportation survey and ride share program. They coordinated ride shares for students living in rural areas to minimize fuels expenditures. The student council is creating a car ride share program that was implemented in November. This car-share program will allow students to share rides and coordinate between each other. The school also developed a smart route plan. This included the development of a drop-off and pick-up plan to ensure the safety of all students and faculty members. The school partnered with the Elementary School to provide and establish safe bike routes. Additionally outreach was conducted to provide an information seminar to help the school community understand and follow safe transportation practices. The school has reached out to local charity organizations to ensure that all students have a bike helmet and safety equipment. The school will partner with local organizations and community member to conduct several bike safety meeting and distribute bike helmets at that meeting.

Pillar II: Improve the Health and Wellness of Students and Staff

Element IIA: Environmental Health

The school works hard to ensure the environmental health and wellbeing its school community. The school utilizes support from local, regional and state entities. The school plan to use the IMP approach to pest management. In using this management approach the school will work to make effective decisions that minimize pests and reduce potential for reoccurrence of pests in the future. The school is in the process of evaluating the pesticide usage amount and will determine ways to minimize usage.

Safeguards are put in place to ensure that neither staff nor students have any potential risk exposure to cleaning products. In addition to all cleaning products being secured in a locked room, they are also clearly labeled and marked. The school purchasing practices seek to purchase environmentally safe and non-harmful products.

Air quality within school is a high priority. Each classroom's air quality is regulated and monitored to minimize potential asthma triggers. HVAC maintenance and filter changes occur at regular intervals. Moreover the HVAC systems is set to conduct a 24 hour system flush. In this way air movement and quality is ensured for the entire school community. Our school has local exhaust systems for major airborne contaminant sources.

Mold abatement is an important element for the school in ensuring a healthy school environment. When mold is identified the school immediately contact external mold abatement experts to check and conduct a mold abatement. Given the climate of Missoula this is not a common problem but is addressed when necessary.

On a regular basis facilities personnel inspect the classroom dampers, heating ventilation filters and ventilation fans on to ensure optimal air quality. Healthy air quality is important to the school and efforts are made to ensure that quality.

Each classroom's air quality is regulated by a damper and fan. When the head is running a ratio of fresh air is taken in to ensure clear air quality. That damper opening is set and checked on a regular basis to ensure the correct amount fresh air intake.

The school plans to use the IAQ tools to follow the framework outlined by the EPA. Through careful **organization** the school will take steps to create a taskforce that addresses facility/health needs through the IAQ framework. These needs will be **communicated** in a manner that calls for appropriate personnel to **assess** the issues addressed within the school. In conjunction with the personnel the taskforce will **plan** appropriate strategies to **act** to address the issues. Finally both the taskforce and the appropriate personnel will **evaluate** the measures taken to solve the issues pertaining to HVAC, moisture and mold, integrated pest management, cleaning and maintenance, materials selection, source control and energy efficiency.

Element IIB: Nutrition and Fitness

[✓] Our school prohibits smoking on campus and in public school buses.

[✓] Our school has identified and properly removed sources of elemental mercury and prohibits its purchase and use in the school.

[✓] Our school uses fuel burning appliances and has taken steps to protect occupants from carbon monoxide (CO)

[✓] Our school does not have any fuel burning combustion appliances

[✓] Our school has tested all frequently occupied rooms at or below ground level for radon gas and has fixed and retested all rooms with levels that tested at or above 4 pCi/L OR our school was built with radon resistant construction features and tested to confirm levels below 4 pCi/L.

[✓] Our school has identified any wood playground or other structures that contain chromate copper arsenate and has taken steps to eliminate exposure.

A focused approach adopted by the school to promote the overall wellness of students is the development of a 10 minutes advisory wellness course. The school is working with the University of Montana and Let's Move Missoula to develop this program. The school has created the time and space to promote wellness within the advisory program. The school has made an initial purchase of exercise bands for each student and is exploring curriculum programming options for use and implementation.

Through a grant given by Plum Creek the school is beginning construction of a large greenhouse. This will be done through support from the kitchen staff and the greenhouse program. At the heart of this effort is 1300 square feet of organic food production in our student-managed greenhouses. Using only passive heat and low-tech, sustainable methods inspired by dedicated small-scale farmers, students are growing, harvesting, and eating vegetables *year-round*. The nutritious food we produce is already making its way into our school lunches, and our lunchroom scraps will soon make their way back to the greenhouse soil via various composting methods. The food growing opportunities and student learning will increase significantly as this greenhouse is full constructed. The amount of yield from these two greenhouses will have a significant impact on the ability for the school to provide improved offerings of healthy food. Curriculum integration will serve to guide the process of construction, growing food and serving it to the school community. Ultimately, we hope this program will help our students become more capable and resourceful, more mindful of their own health and the health of the planet, more disciplined in their application of research and evidence to decision making and more employable in their future. We have also added a ten-minute period wherein small groups of students engage in physical activity, and teachers have incorporated "brain break" physical activities into their classes after pursuing professional development in body/brain research.

The goal of the wellness program is to improve overall health and wellness for students and staff at Seeley-Swan High school by focusing on promoting and attaining better physical fitness, hygiene and diet. Our Wellness Committee will propose action steps towards these ends with both short and long term goals. The committee will then communicate them to staff and students and involve our student TA's in the documentation process.

Another target initiative for building a green school will be improving student physical activity. Meeting the needs of individual student's by promoting physical activity will support overall health and wellbeing of the school community. The entire staff is working to identify and use the "My Student in Need" programming to obtain exercise clothing and shoes. This program is on-going as needs are identified.

In addition to promoting student health and activity levels, staff needs are also being addressed through identifying potential exercise class options. Steps are being taken to identify the different programming options that could be made available. One specific approach is to increase staff activity by increasing the number of outdoor club offerings. This winter programming will focus on providing skiing opportunities which will help ensure that this target is achieved.

Pillar III: Provide Effective Environmental and Sustainability Education

Element IIIA: Interdisciplinary Learning

Topics of sustainability are integrated throughout the curriculum. The comprehensive nature of the content allows for sustainability to be addressed through both formal and informal learning experiences. Learning is made real as students collect recycling and then measure it through different mathematical procedures and processes.

Through careful attention to scaffolding and the developmental needs of students, this pursuit will ensure that all students receive sustainability education that is sound, meaningful, and ultimately transformative. Helping students to see how their actions impact both themselves and others is a primary goal of the program. Major efforts at implementation can be seen in our Geography of Food class, where students combine service learning, food production, and research in food issues. Another ongoing effort involves stream health monitoring; students record data from a sensitive bull trout spawning area, and the data informs Forest Service and watershed groups' policies. Given the location of the school, curriculum integration

Outdoor learning plays a critical role at the school throughout the year documentation will be provided that demonstrates the schools commitment to this approach to learning. Examples include field studies conducted in science, nature journaling in English and specific sustainability learning activities that are integrated throughout the curriculum. Each year the outdoor club provides three full day learning experiences in which students are provided transportation to wilderness areas for the purpose of engaging in activity and learning. Given the location of the school, curriculum integration often comes in the form of applied experience. Students learn firsthand the implications of human degradation on the land as they receive instruction about 'Leave no trace' and education about the importance of the Wilderness Act. Students get to experience nature through the schools commitment to programming the 'Outdoor Discovery Days'. These learning experiences are place-based learning activities that help student connect with nature and their community.

Element IIIB: STEM Content, Knowledge, and Skills

The school is using resources more efficiently and empowering student to experience what waste reduction looks like in action. Both students and staff are now challenging each other to use resources conscientiously. For example, Algebra students recently collected data on each classroom's use of lighting. They noted whether lights were on in empty rooms and whether teachers were taking advantage of natural light and turning off some overhead lights. Students analyzed the data, and by means of a clever game show format, presented findings to the entire student body at an assembly. As a result, we are transitioning to occupancy sensing lighting, and students are calculating the energy savings. Mary Stone the math teacher has taken on the responsibility of collecting data on lighting in the classrooms and her students analyze and run statistical

calculations on the numbers for the purpose of providing education to the broader student body through a school-wide presentation.

Scientific processes and methods were used to collect data that is applied to a working science database and the students Morrell Creek monitoring and stocking action project. Students learned about the implications on policy that resulted from science data collection and analysis. Their actions informed policy decisions. They realized their scientific work had lasting policy and habitat implications. Based on the data that they collected and analyzed policy recommendations for fish stocks and regeneration rates were made.

Element IIIC: Civic Knowledge and Skills

Faculty and staff have developed professional learning communities pertaining to sustainability programming. In addition to this, the faculty has begun to promote sustainability within the school by offering guidance and instruction to their fellow teachers. In January, every content area shared a sustainability lesson that was taught in their classrooms. The lessons were compiled into a resource folder that is accessible to all teachers. The goal is to continue to compile sustainability and environmental lessons plans that can be used in futures years.

Civic engagement is evident in the stream restoration project. Student moved beyond the monitoring of the waterway to stocking the stream with fish. They work in collaboration with the Clearwater Resource Council and are building lasting community relationships while they engage in learning.

Students in the Geography course working regularly in the greenhouse and have shaped that experience into service learning projects. To examples come from students who themselves want to be teachers. They have created project in which they built an education unit around the topic of reducing carbon footprint. They worked with 2nd graders every week for three months. They planted food with them and taught them about caring for the soil. They started a worm bin for the classroom. Two other students created a model for community gardens after having conducted research. Their project resulted in a recommendation to start a community garden in their community.

Kat Pecora the English/ELA teacher and school Principal has integrated sustainability as topic area in her class. She required students to have a semester writing project focus on the topic of sustainability and what they have learned as a result of their experience with the Green Ribbon School program. Learning is ongoing as new initiatives are taken on and documentation is conducted. Leadership and civic engagement is occurring as students become leaders within the school for sustainability.



Outdoor Discovery Day



Student Action Project: Morrell Creek Fish Monitoring and Stocking



Outdoor Discovery Day: Indian Education



Students in the Greenhouse



Outdoor Discovery Day



Evidence of Sustainability Curriculum Integration

Social Studies Integration:

Lesson # 1: Market Garden Tour: See local growers in action

Grade: 10-12

Standards:

Goals for Lesson:

Students will begin the unit with a tangible introduction to all three themes. They will observe the methods and philosophies involved in local, small-scale agriculture, and incorporate aspects of these into our operation.

Materials Needed:

Journals, lunch, appropriate clothing

Time Needed:

one school day

Lesson Outline:

1. Board bus and travel north to Condon area (30 miles)
2. Tour four operations, take notes on crops, methods, opinions
3. Return to Seeley

Assessment:

formative- participate...prepare at least two questions in advance, and ask questions/offer comments as new information arises at each site

summative: At home, students will prepare written responses to the following: Compare and contrast methods and motivations of each grower, and reflect on your opinion of the operations- Which aspects would we like to use as a model for our own/ our school's operation? Which are we doubtful that we'd use? Why? Do you/would you buy their produce/meat at a premium price? Why/not? What crops appear to grow well in our climate? What should we grow?

Extension Ideas:

Mimic some of their methods, grow something you've never grown/eaten, volunteer your time at one of the locations, interview other growers at a farmers market

Lesson Reflection: Market Garden Tour

Grade Level: 10-12

Summary of Lesson: It was a beautiful day to be outside. We toured four sites, guided by Laura Arvidson of Northwest Connections. We encountered a variety of microclimates, heard plenty of unfiltered, unsolicited opinions from each grower about various aspects of local and industrial agriculture, and also experienced a wide range of foods- from standard cold-weather vegetables to grapes, goats, rabbits, turkeys, and guinea fowl. We ate lunch in a yard shaded by aspen, munched sorrel and spinach, and pulled weeds at the NW Connections garden. Each grower was delighted to host us, and the students were attentive and inquisitive. Each student asked the prepared questions and formulated others in the various situations.

Challenges Encountered: Time constraints kept us from staying longer at the kids' favorite place, and some kids fatigued in the afternoon.

How lesson was adapted for this class: The trip happened on our seventh day of school, and the class is full of gardening enthusiasts... it was an obvious match. We'll take at least one similar trip in the spring, to Missoula or to the Flathead.

Suggestions for next time: Camp. Why not keep heading north and make it a 2-day affair?! I should come up with more focused nuts-and-bolts question- a form with: name of grower/what he/she grows, etc.

Lesson # 2: Prepare to grow

Grade: 10-12

Standards:

Goals for Lesson:

Deliberate and come to a consensus, on what we will grow, and in what proportions.

Materials Needed:

written reflections from yesterday

Time Needed:

50 minutes

Lesson Outline:

1. Discuss written reflections in pairs, small groups, and finally as a class.
2. Produce a class-generated list of crops
3. Deliberate the appropriate allotment of greenhouse space for each crop (pairs, group, class...)
4. Sketch a site plan for the greenhouse

Assessment:

In the discussion, does the student offer reasonable rationale for crop choices and allotment?

(I have a good idea about what crops students will choose, and have seeds at the ready)

Lesson # 3: Prepare the brain for the ground!

Grade: 10-12

Goals for Lesson:

Summarize the general composition of soil
Summarize the nitrogen cycle

Materials Needed:

Copies of *Soil: A Primer*
Appropriate clothing (to pair-read outside)

Time Needed:

Two 50 minute periods

Lesson Outline:

1. Pair-read (A Mark Forget technique that I regularly employ) *Soil: A Primer*
2. Write distilled notes on soil composition and the nitrogen cycle

Assessment: Quiz- Summarize the general composition of soil, and summarize the nitrogen cycle

Lesson # 4: Prepare the ground and plant the seeds!

Grade: 10-12

Standards:

Goals for Lesson:

Prepare beds for crops based on new knowledge (nitrogen level, pH, moisture content)

Materials Needed:

appropriate clothing, garden tools, soil, compost, pH tester, moisture meter, nitrogen test kit

Time Needed:

50 minutes

Lesson Outline:

1. Prepare soil in greenhouse (proportionately mix soil and compost)
2. Test pH and record
3. Test nitrogen level and record
4. Water
5. Plant seeds according to the plot devised by the class.

Assessment: Journal/Notes: Based on your knowledge of soil and our readings, what do you suggest to further build the quality of our soil?

*from this point on, students organize a daily rotation for watering and weeding.

Lesson # 5: Prepare our greenhouse crops for winter!

Grade: 10-12

Standards:

Goals for Lesson:

Learn core elements of the Four Seasons model and employ them to keep our operation viable throughout the winter

Begin our transition from GROW to KNOW by asking, "Why bother following the Four Seasons model?"

Materials Needed:

appropriate clothing, garden tools, soil, compost, pH tester, moisture meter, nitrogen test kit

Time Needed:

One-two 50 minute periods

Lesson Outline:

1. View two short segments that highlight techniques used at the Four Seasons Farm in Maine
2. Discuss clips... are these methods viable in MT? Are they expensive? Are they worthwhile? What are the costs and benefits?
3. Pair read chapter five of *The Winter Harvest Handbook*
4. Journal: "Why bother following the Four Seasons model?"

Assessment: Quiz- List the core elements of the Four Seasons model, and explain why the elements are central to their operation.

Math Integration:

Algebra 2 (grade 11)

Energy Consumption in the Classroom

Students will collect observational data on the use of classroom lights and student computers. Information collected will be on the number of lights on in each classroom and whether the room is occupied, the number of student computers that are on, and the number of student computers that are being used. Data collection

will continue for 4 weeks, with observations being made periodically throughout each day. Electrical energy use will be recorded as well.

At the end of the collection period, data will be analyzed and students will organize their results into charts or graphs that can be presented and displayed in each Student Advisory Group. They will make a case for decreasing electric consumption by using fewer lights, turning off lights when the room is unoccupied, and turning off computers when not in use.

Following presentations, students will again collect the same observational data and record electrical energy consumption. Analyze, inform, educate. Repeat as needed.

Common Core Standards for Mathematics: Statistics and Probability

- o S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable.
- o S.IC.1,2 Understand and evaluate random processes underlying statistical experiments.
- o S.IC.3,4,5,6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

Data Collection Sheet

Room	# lights on	Room empty Y/N	# of Computers on	# In Use
T. Stone				
Messenger				
M. Stone				
Smith				
Read 180				
Anders				
Johnson				
Dougherty				
Holmes				
Sexton				
Writing Lab				
Business Lab				
Weight Room				
Green				
Haines				

English/Language Arts Integration:

Final Exam

Your assignment is first to formulate a question or statement that is related to the issue of *sustainability* and to your own life experience. Include this question/statement at the top of your essay. Then, answer this question in 3-4 pages; your question and answer should meet the criteria described below. Please use these as a checklist. As always, I encourage you to brainstorm and share ideas with your classmates. Feel free to answer a question that is similar to that posed by a fellow student. However, your answer must reflect your own argument and writing. Submit your essay as a double spaced MSWord document and

send it as an attached file in the appropriate section on Moodle. I *strongly* encourage you to prepare your question/argument before our exam time begins.

Criteria:

- Is of appropriate breadth for a 3-4 page essay – question/statment must be narrow enough in scope to be answerable within these limitations.
- Focuses on one particular issue related to your own experience (e.g. land use, power generation, human relationships, the economics of small businesses, life in Seeley Lake, etc.).
- Clearly addresses one of the principles of sustainability.
- First paragraph provides a thoughtful and tailored definition of sustainability for the particular issue addressed. Be certain that this definition is specific to your topic; do not provide a generic definition that applies to all things.
- Writing is of high quality; logic is well organized; first paragraph contains clear thesis statement; each paragraph contains a clear topic sentence; assertions and opinions are supported with evidence; conclusion draws together ideas and follows from essay; grammar is used correctly; references are appropriately cited; spelling and typographical errors are minimal.
- Use at least three references from readings and be certain to cite them in MLA style.

Student Sample Work

Writing 101

Dr. Pecora

Sustainability

Is the current lifestyle and activity sustainable in Seeley Lake?

Sustainability has been defined in many different ways and is still defined differently today based on the situation where it is being used. For the purpose of this essay sustainability will have its own unique definition which I will use to answer the question of the current sustainability for the lifestyle in Seeley Lake. Sustainability is the combination of three main factors which can cover the different aspects of living in Seeley Lake (Defining Sustainability 2015). Social sustainability the ability of the town of Seeley to function at a certain level of social well being indefinitely; Environmental sustainability is the ability of the environment to support a defined level of environmental quality and natural resource extraction rates indefinitely; Economical sustainability is the ability of the economy to support a defined level of economic production indefinitely (Defining Sustainability 2015). All these are the broader definitions that are part of sustainability for a system such as the town of Seeley Lake; some of the factors are not even a real problem or concern for most of the people that are living here. The goal of sustainability for our town is to not only survive with the current levels of economic and social levels but to also improve them and enrich the area around (Defining Sustainability 2015). In terms of sustainability Seeley Lake is a small town that has the ability to be sustainable; however at the rate our town is going it will not be sustainable unless changes are made.

Social sustainability is one of, if not, the largest sustainability issues that Seeley Lake as a community has at this point in time. Social sustainability is the hardest to define because to understand social sustainability you have to also understand what the goals of life are for the entire human race; in this case we will be using Seeley

Lake as our population so it is manageable to understand. As the town of Seeley Lake the goal of social sustainability should be to provide a good environment for people to raise their children and to live there themselves (Social Sustainability 2015). Currently however, I have seen how the Seeley Lake area itself, and the children growing up in it have declined in the quality of life that is necessary for good sustainability.

From my own personal view I have seen the way that drugs can affect people and their lives, friends, and career. In the most general sense drugs are extremely bad and cause many problems. From what I lived through during my time in Seeley Lake I have noticed that there has been a steady increase in the amount of people that are doing drugs in and around the school and other kids. Now I don't know for sure what the kids are doing but I know that it is a gateway problem for the community. If there isn't something done about the use of these drugs more and more kids are going to start using, and keep using, these drugs and the town is going to suffer from it. Seeley Lake cannot be socially sustainable if the town is full of drug addicted children and adults because eventually the drug use will influence people to make bad decisions that can lead to a much higher crime rate. In addition to the potentially problem of drug increase in town there also is a problem in social sustainability that is the growing difference between groups of people both in high school and out of it. High school is where children such as myself find other people like themselves and those are the people that they socialize with during most of their high school career, and even after they leave high school. The problem with having a strict social group is that people tend to stay only within their social group and don't associate with others. An example of this currently as SSHS is the division between the people who do sports and those that do not. During breaks between classes, at lunch, before school, and after school these groups will huddle together and socialize, but when they are with people not from their group many are harsh and do not want to socialize with them. This is an issue when there are new families and children that move to Seeley because they are accepted into one group and harshly rejected from the others. This is also a problem for a town attempting to be socially sustainable when opposing groups of people are seemingly at war with each other when they are trying for harmony.

Along with social sustainability Seeley Lake needs to be environmentally sustainable as well. Seeley Lake is a town that survives in a very rich ecosystem and a beautiful environment. In order to be sustainable however, Seeley needs to pay close attention to the impact that it has on the surrounding land area (Sustainability Articles for Students.). The main source of income for the people of this town is working at the mill; the mill runs off of trees harvested around the Seeley Lake area. If the mill overuses the land around town the forests will die off and the town will be left with nothing but clear cut grassland around town. The more relevant issue that Seeley has a problem with is pollution. This town needs a proper way to dispose of waste, both sewage and household trash alike. I know from my own experience that there is a small portion of the town that recycles; it is such a small portion because the local dump makes it difficult to recycle with all of its new rules. Because you are no longer allowed to leave the recyclables in the back and have to put them into the bin one at a time through a small opening my family has stopped recycling; it is not worth the time to recycle when it takes over 30 minutes my family has decided to stop, and this is not a sustainable action. There has been in recent months trouble around the town with people's septic tanks become too old and either backing up into the house, or simply collapsing and leaving a mess of a hole in the ground. Septic systems are failing

because there are too many people living too close together for the system to properly drain and filter correctly without potentially contaminating the water supply for the entire town. A sewer system is needed for the town in order for it to become an environmentally sustainable area that will last into the future for the people living in the town.

To keep the town from slowly dying off and turning into a ghost town there needs to be a reason for people to stay; people need to make a living in Seeley Lake (Economic Sustainability 2015). This is where the goal of being economically sustainable comes into play. There is no doubt that Seeley Lake is a tourist town, the people and businesses in town make the most money during the winter when the population of the town gets exponentially bigger. The goal of the town is to increase the average amount of money people make in a year so that they can survive and also grow. I don't believe that Seeley has done a very good job of growing our economic capability, people have to take risks in opening a new business. There have been attempts by different stores to open new businesses that haven't been successful, such as the pawn shop and bowling alley; other stores have simply closed such as Video Vision and the Bison and Bear gift shop.

The lifestyle of many of the people and businesses in Seeley Lake is not sustainable as they are today. If the people of this town are willing to change some of their habits and to work with their children to get them on a better path they can change the town for the better so that it will last longer if not indefinitely. The largest problem for Seeley Lake is social sustainability and even more specifically the drug use and large divide between social groups across town. This town is eventually going to fail because no one is following sustainable practices.