

U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools



## *Rattlesnake Elementary School*

Montana Nominee to

U. S. Department of Education Green Ribbon Schools Sustainability

Award



## 2014-2015 District Nominee Presentation Form

### **PART I - ELIGIBILITY CERTIFICATION**

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#### **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

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Charter  Magnet  Private  Independent x Public School

Name of Principal: Jerry Seidensticker

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

Official School Name: Rattlesnake Elementary School

(As it should appear on an award)

Official School Name Mailing Address: 1220 Pineview Drive, Missoula, MT 59802

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

County: Missoula County Code Number \*: 0785

Telephone: 406-542-4050 Fax: 406-542-4059

Web site/URL: <http://www.mcpsmt.org/rattlesnake> E-mail: [jdseidensticker@mcps.k12.mt.us](mailto:jdseidensticker@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.

\_\_\_\_\_ 

\_\_\_\_\_ 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.

\_\_\_\_\_ 

\_\_\_\_\_ 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](mailto: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](mailto: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**

### **Rattlesnake Elementary School, Montana**

#### *Achieving Sustainability and Wellbeing in the Heart of the Rattlesnake National Recreation Area*

Rattlesnake elementary school is set within the wilderness of the Rocky Mountains. Surrounding this community are two of the largest sections of road less wilderness in the continental United States. To the west is the Frank Church Wilderness Area and to the east is the Bob Marshal Wilderness Area. This community has a profound relationship with the natural space the envelopes it. Incorporating sustainability programming provides a natural extension of the values contained within the community of Missoula. In promoting both current and future levels of sustainability Rattlesnake elementary school is committed to programming for sustainability.

The school has engaged 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 promotes 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.

The school has aligned itself to the three pillars contained within the Green Ribbon Schools program. The first pillar of reducing environmental impacts and costs has occurred through a well-developed recycling and resource efficiency program. The school has used is energy audit and data collection as the basis for analysis. The resulting analysis has led to the creation of an Energy Management Plan. The management plan is the result of many hours of planning, data analysis and behavioral change. In reducing waste the school is using resources more efficiently and empowering student to experience what waste reduction looks like in action. Waste reduction is tantamount to reductions in consumption. As the school continues to analyze the data received from its energy audit it continues to develop and implement specific energy conservation practices. Through careful documentation of energy use and resource conservation the school demonstrates it commitment to energy conservation and waste reduction. Through the work done in this initial year of programming for Green Ribbon Schools we know future data will show significant decreases in energy consumption thereby reducing the school's environmental impacts and costs.

In addressing the second pillar of improving the health and wellness of student and staff, the school continue to apply a multifaceted approach to wellness that includes incorporating strategic nutrition initiatives, improving student activity levels and developing emotional wellness programming. These activities serve to benefit and improve the overall school wellness. Given the interdependent linkages shared between the three pillars this pillar focuses on provide for the needs of the individual's health and wellbeing.

Curriculum integration is an ongoing and 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 enable them to incorporate sustainability topics into their lived experience. Through careful attention to scaffolding and the developmental needs of students this program will ensure that all students receive sustainability education that is meaningful, applied and ultimately transformative. Through support and mentoring from our strategic partnership with the University of Montana's department of Curriculum and Instruction the school has achieved professional development that has led to both vertical and horizontal alignment of sustainability curriculum. Helping students to see how their actions impact both themselves and others will be a primary goal of the program. In demonstrating the ways in which our behaviors shape our environment both now and in the future students will be changed through this sustainability program at Rattlesnake elementary school. School leadership on part of students plans a primary role in maintaining an inquiry-based learning approach to sustainability education.

Through partnerships with the University of Montana and various other community-based organizations our program will have the support it needs to succeed. The school has created numerous relationships with local non-profits that focus on wide variety of sustainability-related topic areas. The school has documented and demonstrated the success of its program through fidelity to the Green Ribbon School framework and structure. Through a reflective and deliberative process the needs of our school community and the broader community are being achieved through the ongoing sustainability programming that is occurring at the school.

### **PART III – DOCUMENTATION OF STATE EVALUATION OF DISTRICT NOMINEE**

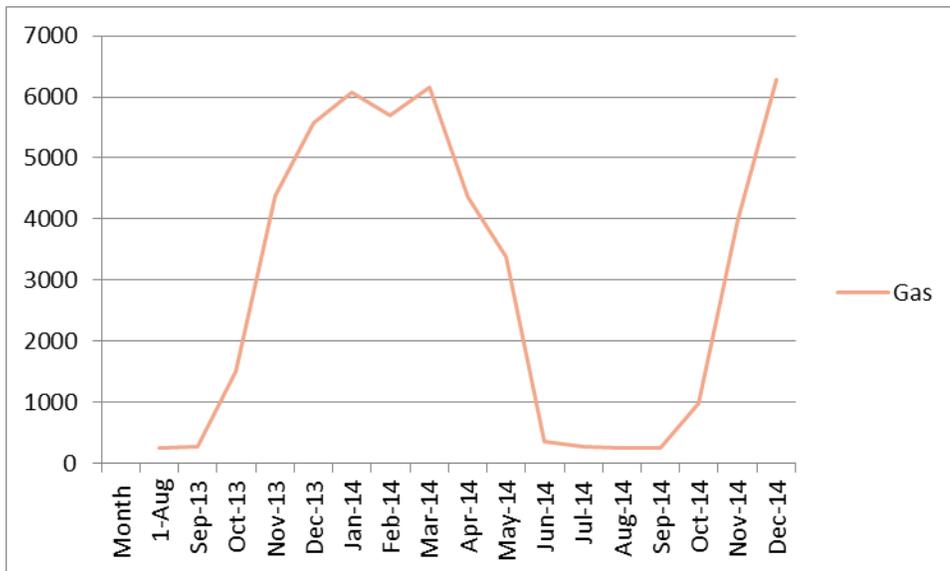
#### **Pillar I: Reduce Environmental Impact and Costs**

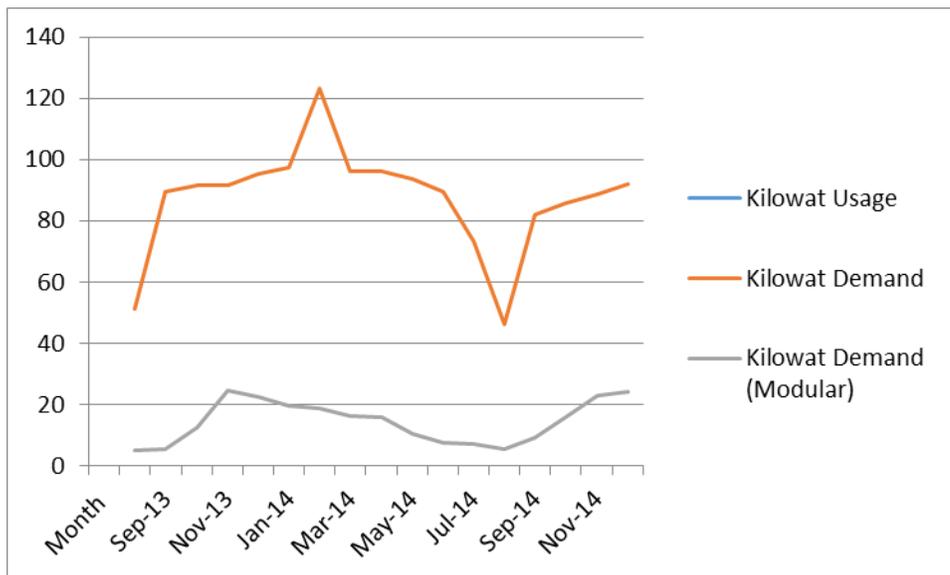
##### *Element IA: Energy*

The Energy/Facilities program is focused on increasing energy efficiency within Rattlesnake Elementary School. Our primary energy consumption needs occur 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. Increasing energy efficiency will reduce electricity usage, decrease the school’s contribution to climate change, and save Missoula County Public Schools energy costs in the facilities budget.

The first step that we took in developing our energy/facilities program was to examine existing practices regarding energy use and consumption. 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 identifying areas and strategies for conservation and efficiency gains. We will use the data gained from the EnergyCap software analysis and an energy audit conducted in 2008 by NorthWestern Energy to create a baseline of data that will inform future practices to conserve energy use and reduce energy waste.

We established that the current energy usage is 448,300 kBTU annually. With 480 students and a building space of 61,000 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 location the school uses both electricity and natural gas to heat it. These energy sources and the data collected help us to frame our consumption amount and patterns.





Our second step was to create a school-wide data collection chart for classroom teachers and staff to identify specific classroom approaches to energy conservation in the classroom. This chart enables teachers to share in strategies and approaches that serve to help them reduce energy consumption. In addition to developing awareness and creating an internal database of classroom practices focused on reducing energy consumption, we conduct professional development seminars aimed at helping staff become informed in energy efficiency practices and strategies. We teach teachers how to refine and document their classroom energy conservation practices. This data in conjunction with an energy audit conducted by Northwestern Energy in 2008 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 has reached out for information technology support for the purpose of installing energy-saving software and technology on all possible appliances and computer equipment. For example through this program we will ensure that all computers, monitors, printers, copiers and other equipment is set to the highest degree of energy efficiency possible.

Curriculum integration plays 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 will also document and inventory those practices. The school currently has censored lighting. A survey was sent to teachers in October 2014 that asked teachers to document how they use their classroom lights during the day. The results showed that many teachers prefer using natural light or only turning on one row of lights. These practices are encouraged as they save on energy costs. Another plan of action is for students to create visual cues that highlight sustainable practices and activities. Having signs around light switches will be constructed to help build a sustainable classroom culture.

Another major area in which energy consumption occurs at the school is in terms of natural gas for heating. In addition to inventorying classroom practices regarding lightening, the energy/facilities committee has created an inventory of heating practices and experiences within each classroom. From this data different classroom practices such as creating better circulation of warm air with be developed and monitored. In identifying the needs of each classroom in terms of thermostat usage which will be a focus of the survey the committee will construct specific targets for each classroom and also support each classroom in developing and

implementing specific energy use practices and targets. Currently, four teachers are experimenting with plastic covers on their classroom windows to help insulate the glass during the winter. If the plastic improves the classroom temperature, more classrooms will use the plastic next winter. Monitoring changes in energy consumption both in terms of electricity and natural gas use will play a significant role in the programming to reduce energy consumption. By implementing specific classroom practices the school seeks to reduce overall energy consumption and thus conserve resources and minimize waste.

The school has in place a single solar panel that is intended to create energy and offset GHG production. The solar panel energy production is monitored by students and serves as an essential learning component within our sustainability program.

### ***Element IB: Water and Grounds***

One area of particular strength in our resource conservation programming is our water waste reduction efforts. After conducting our baseline data review we established that as a school we consume an annual amount of 789,500 gallons of water annually. This amounts to 1,935 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. 75% 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.

### ***Element IC: Reduced Waste Production***

Recycling has been a part of Rattlesnake Elementary School off and on for several years. Before this year the program was inconsistent and non-active in most classrooms. Due to the programming within the Green Ribbon School we have created a viable recycling program. Through our commitment to the Green Ribbon Schools a strong recycling program is now a reality at the school. We have transformed how waste reduction occurs at our school and how our school community relates to this essential practice. One of the most significant aspects of the recycling component of the sustainability program is the growth in recycling that has occurred. It is evident in the data that over the course of the school year recycling has increased significantly. In the last month the amount of recycling in terms of paper has almost than doubled from 124lbs to 241lbs. The program is transforming how waste is created and how it is understood at the school. Below is our average data regarding recycling and waste reduce. For a school of our size this is significant. Through our reuse program we strive to not create waste that can be recycled in the first place.

Average of 22.37 cubic yards of dumpster per month

Average of 1.16 cubic yards of recycling per month

Recycling Rate =  $(1.1637 / 22.37) \times 100 = 11.73$  cubic yards

Monthly waste generated per person =  $(22.37/408)$ : 0.054 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. Every two weeks third grade students collect the recycling from all of the classrooms. We have developed a documentation sheet that is filled out by the third graders when the recycling is taken. 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. The recycling material is stored in the recycling bins on the West side of Rattlesnake Elementary. Missoula Valley Recycling collects the recyclables twice a month. We will develop a documentation sheet that will be filled out when the recycling is taken and measured.

Another extension of our recycling program pertains to our reuse program. We plan to have boxes or bins in each classroom that serve as a place where student can reuse paper for other purposes. Reusing resources such as paper minimizes energy expenditures and further supports the culture of waste reduction and resource conservation.

### ***Element ID: Alternative Transportation***

The school conducted an extensive transportation survey and then implemented a safe route plan. This included the development of a drop-off and pick-up plan to ensure the safety of all students and faculty members. Bike routes have been established and the school is conducting an information seminar to help the school community understand and follow safe transportation practices.

Another area of focus promoting the health and wellbeing of the school is promoting healthy transportation choices. The transportation committee is focused on providing students and parents with information about sustainable ways of travel. The goal is to encourage students to use sustainable means to travel to and from school. The goal is also to educate students and parents about sustainable transportation in our community and how to use it in our daily lives.

The school participated in the Bike, Bus, Walk Week that was a city wide initiative. The next steps are to provide parents with information about safe routes to school and how to use sustainable transportation in Missoula. This program will also contact Missoula in Motion about them doing a sustainable transportation presentation at our school.

## **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 heat 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.

Rattlesnake Elementary encourages healthy and active lifestyles in many ways. The school staff actively promotes the practice of providing healthy food choices in their classrooms. Due to food allergies some teachers have stopped having food in the classroom and instead use other ways to celebrate different occasions. Classroom and staff meeting and celebrations have more fresh fruits and vegetables and less sweet treats. The school plans to offer a salad bar that features fruits and vegetables to the school's hot lunch program. These two strategic plans for improving the health and quality of food offerings will significantly help to create a culture within the school of healthy eating and awareness of nutrition.

Learning about nutrition and healthy diets is promoted within the extensive gardens that the school has. Each grade level at the school has their own garden space. Curriculum integration enables students to engage in experiential and authentic learning experiences as they not only eat nutritious food but also grow it. The gardening program serves to unify both the school and broader community. Different organizations such as Garden City Harvest and Missoula Urban Development actively serve to support the garden program and its integration into classroom learning. The garden committee reaches out to the parent community for support in programming. The staff interest survey ensures that programming is student-centered and applied. From that data specific programming targets have been developed for each grade level class's garden curriculum.

Our students spent at least 60 minutes per week over the past year in school supervised physical education. Students attend physical education class for 30 minutes twice a week. Additionally, the PE teacher, Craig Myers worked with Ms. Harmon's Fifth grade class to conduct a study on student movement during the day. The students wore a pedometer bracelet called a sqord that they used to connect to a computer to download the information for to see how many steps they have been taking, along with other information. The students then used this data to compare their movement habits over a period of time to see if it changed during the different seasons.

All K-5 teachers have submitted ideas for movement lessons and creative ways to engage students in the classroom. These were compiled and shared with the staff. The lessons showcase a balance of traditional and innovative ways to allow students a chance to move about during the school day. These movement opportunities helped improve student learning and contribute to an overall improvement in student health. The ideas for engagement applied to almost all of the subjects and will serve as a way for staff to stay

engaging and excited in the lessons they present. The movement lessons were quite useful for times when the students had to stay inside for recess due to inclement weather.

Much of our students' annual physical education takes place outdoors.

- K-5: Plant and maintain school garden, Jump Rope for Heart in February, Walk to Rattlesnake Creek, Running Club, Fun Run in June
- 5<sup>th</sup> grade: Stream monitoring, watershed education
- 4<sup>th</sup> grade: Montana Natural History visiting naturalist
- 3<sup>rd</sup> grade: Hike to the Glacial Lake Missoula line on Mount Jumbo
- 2<sup>nd</sup> grade: Walks to local community farm
- 1<sup>st</sup> grade: Monthly field trips using public transportation and walking to community businesses and non-profits

Our school is a part of the Montana Behavioral Initiative and student mental health is an integral part of this initiative. A part of this program beyond a systemic approach to behavior and bullying is providing Check-In and Check-out for some students, a Check and Connect with others as well as creating Meaningful Jobs for those who need another connection with an adult beyond the classroom teacher. Our school partners with Western Montana Mental Health Center to provide Comprehensive School and Community Treatment (CSCT) teams who work with students with severe emotional disabilities. This fall, we partnered with the University of Montana's Psychology department to provide therapy for students who don't qualify for CSCT but struggle with depression/and or anxiety.

The school has integrated the different spheres contained within school health. Through the wellness committee the school plans to ensure that the school environment is healthy and safe in terms of the physical environment and the social/emotional climate. The school plans to achieve this through health education, physical education, health services, nutrition services, counseling/psychological services, providing a healthy school environment and supporting health promotions for staff. Finally a critical piece of the coordinated school health approach is fostering family/community involvement.

## **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.

Each grade level at the school has their own garden space. Curriculum integration enables students to engage in experiential and authentic learning experiences as they not only eat nutritious food but also grow it. The gardening program serves to unify both the school and broader community. Different organizations such as Garden City Harvest and Missoula Urban Development actively serve to support the garden program and its integration into classroom learning. The garden committee reaches out to the parent community for support in programming. The garden committee has developed data specific programming targets for each grade level class's garden curriculum.

Curriculum integration occurred as students learn about different phases of decomposition of biological matter. This experience working with compost will be highlighted in terms of broader concepts of sustainability in terms of closed-systems and feedback loops. The school has 2 compost bins and uses them to support the garden program and as a learning tool.

The school wanted the recycling program to be successful and student-centered. The third grade students collect recyclable materials bimonthly. In addition to having students collect the recycling materials they also

created and presented recycling presentation for the different classes. The recycling program measures the volume of the recycled material. In every room with a recycling bin there is a document indicating what can be recycled and the steps to recycling the item. Providing visual cues and ongoing curriculum integration helps to develop and support the transformation of the school culture to more sustainable practices.

### ***Element IIIB: STEM Content, Knowledge, and Skills***

We use the recycling program as the basis for important experiential education approaches and themes. We weave this experiential learning process into the classroom by making explicit connections to math, science and writing. Having students collect, measure and reflect on what and how they are recycling serves as a profound learning experience that has helped to build a school culture around minimizing waste and conserving resources. One of the most important elements of measuring the waste that is recycled is the creation of data over the course of the year that demonstrates the purpose of recycling. In observing changing quantities and amounts the school has built a purpose and approach for recycling within the school.

Outdoor education is an integral part of our sustainability education. Students in grades K-5 are learning how to keep a nature journal. Individual students create an achieved learning portfolio through their writings and reflection within the nature journal. Not only does this journal demonstrate students learning in regards to specific concepts of sustainability it also demonstrates and provides evidence of student learning across the spectrum of their experience within the school in regards to sustainability and their relationship to it.

### ***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 grade level 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 future years. 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.

### ***Evidence of Sustainability Curriculum Integration***



Kindergarteners learning about bear and human interactions



Bulletin board about the importance recycling created by Rattlesnake Third Graders



Third Graders collecting and weighing recycling

| <b>Lesson Plan Title</b><br>Grade Level  | <b>Weighing in on Recycling</b>  |
|--|--|
| <b>Objective</b><br>What is the learning outcome of the activity?  | Students will measure the weight of the recycling bins and materials from each classroom at Rattlesnake. Students will calculate, record, and graph the results.   |
| <b>Vocabulary</b><br>What terms will be used to conduct this lesson, what roles will students have in understanding these terms? | The terms to be used to conduct the lesson will be as follows...scale, pounds, weight, estimate, actual weight, and true weight.<br><br>These terms will be discussed in small groups. Students will show their understanding of the concepts when completing the chart. |

|  |  |
|--|--|
| <p><b>Topics/Concepts</b><br/>What concepts/topics will guide inquiry and exploration of the topics/concepts?</p>  | <p>Recycling – How many pounds of materials are recycled in each classroom at Rattlesnake?</p> <p>Measurement – Why do some classrooms produce more materials than others?</p> <p>Does K-2 produce more recyclable materials than 3-5?</p>   |
| <p><b>Learning Activity</b><br/>Description of learning activity. What methods will I use promote student. How can I incorporate place-based or experiential learning into the activity?</p> | <ol style="list-style-type: none"> <li>1. Students will collect the recycling bins from assigned rooms.</li> <li>2. Students will predict the weight of each bin before they weigh it.</li> <li>3. Students will record the information on the form.</li> <li>4. Students will calculate the weight of all the bins.</li> <li>5. Students will create a graph to show the results for each grade level.</li> </ol> |
| <p><b>Assessment</b><br/>What role does reflection on learning serve to help my students connect with and relate to what they experienced?</p>   | <ol style="list-style-type: none"> <li>1. Did you enjoy this activity?</li> <li>2. What did the data show you?</li> <li>3. How does this activity connect to the outside world?</li> <li>4. Why is it important to recycle?</li> </ol>   |

## CONCEPTS

- **RECYCLING – How many pounds of materials are recycled in each classroom at Rattlesnake?**
- **MEASUREMENT – Why do some classrooms produce more materials than others? Does K-2 recycle more than 3-5?**



### Vocabulary

- Scale
- Pounds
- Weight
- Estimate
- Actual weight
- True weight



## Recycling Rubric

|  | 1                      | 2                    | 3  | 4  |
|--|------------------------|----------------------|--|--|
| Explanation of recycling                     | Inaccurate explanation | Accurate definition  | Accurate definition which includes an example  | Thorough explanation including multiple examples       |
| Explanation of how recycling helps the Earth | Inaccurate explanation | Accurate explanation | Accurate explanation which includes an example | Extensive explanation which includes multiple examples |
| Vocabulary Use                               | No vocabulary use      | Used one term        | Used two terms                                 | Used three or more terms                               |

Novice 7%

Nearing Proficiency 5%

Proficient 82%

Advanced 8%

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| <b>Lesson Plan Title</b><br>Grade Level | <b>1<sup>st</sup> Grade</b>  |
| <b>Objective</b>                        | <p><b>Science:</b> The Sun is a star. It is the single most important source of energy for the Earth. This energy travels through “energy chains” and is used by all living creatures on Earth.</p> <ul style="list-style-type: none"> <li>Standard: Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1),(1-ESS1-2)</li> </ul> |
| <b>Vocabulary</b>                       | Sun  |

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|                          | <p>Star<br/>Energy<br/>Energy Chains<br/>Plants<br/>Animals<br/>People</p>  |
| <b>Topics/Concepts</b>   | <p>The Sun is a star. It is the single most important source of energy for the Earth. This energy travels through "energy chains". The energy for all living things on Earth comes from the Sun.</p>  |
| <b>Learning Activity</b> | <p>We used our first lesson to discuss the concept of energy, and briefly touched on the fact that we need energy in order to do things. We used the example of going outside at nutrition break (using our energy), then coming in for lunch (getting more energy). We discussed other situations in which we have heard the term energy, and followed that up by making a list of words that we associate with energy.</p> <p>We watched a video on the energy chain on We then brainstormed information we knew about the sun (provides light, warmth, energy etc). We discussed what the world would be like without the sun and what would happen to people, animals and plants (none would be able to live). Finally we discussed the fact that the sun is the single most important energy source to the planet Earth. At the end of class students were to draw pictures to show the importance of the sun and what the sun does for us.</p> <p>After reviewing the concept of energy and the idea of eating to get energy, we talked about different foods and how they get the energy inside them. This led to a discussion about the sun and how the sun gives energy to the plants, and in the end is the source of all our food energy. Once the concept of food energy from the sun was taught, we discussed "<b>energy chains</b>" as a means of following the path the energy takes to get to all living things. This was reinforced when we played our game together.</p> <p>At the start of the activity each student was handed a card with a word on it. We played a game in which each student had to find their source of energy (another student, i.e., if they were a frog they would need to find an insect). Once everyone had found their food source we sat down and found that we were all sitting in radial lines around the student holding "sun." The sun then passed "energy" to the people nearby, all of whom were plants. The plants then passed that energy back to the animals behind them. This reinforced that all energy for living things comes from the sun. The students then sat down and drew their own energy chain.</p> |
| <b>Assessment</b>        | <p>For an assessment students were given paper to draw the energy chain using the four links that we learned about. Students were assessed on their understanding of the energy chain and their use of the proper vocabulary.</p> <p>While we didn't do a formal reflection, the students had some wonderful discussions while they were drawing their energy chains. They also had numerous comments and thoughts about what we were learning while we played the game. It was an engaging successful lesson that was attainable for all levels.</p>   |

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| <p><b>Lesson Plan Title</b></p> <p>Grade Level</p>  | <p><b>2<sup>nd</sup> Grade</b></p>  |
| <p><b>Objective</b></p> <p>What is the learning outcome of the activity?</p>  | <p>Competency 6.4 – Implement the principles of conservation (reduce, reuse, and recycle)</p>   |
| <p><b>Vocabulary</b></p> <p>What terms will be used to conduct this lesson, what roles will students have in understanding these terms?</p>   | <p>Terms: recycle, sort</p>   |
| <p><b>Topics/Concepts</b></p> <p>What concepts/topics will guide inquiry and exploration of the topics/concepts?</p>  | <p>Teachers will use a “Mix and Mingle” structure for students to share their background knowledge of recycling, and/or a KWL chart will be used</p> <p>Students will read differentiated texts to validate or further explore what recycling is, what recyclables are, and how conservation benefits Earth</p>   |
| <p><b>Learning Activity</b></p> <p>Description of learning activity. What methods will I use promote student. How can I incorporate place-based or experiential learning into the activity?</p> | <p>Teacher will fill bins with trash and recyclables found in a classroom environment</p> <p>Each group will sort their bin</p>   |
| <p><b>Assessment</b></p> <p>What role does reflection on learning serve to help my students connect with and relate to what they experienced?</p>   | <p>Sorted bins will be rotated, and groups will assess another groups sorting</p> <p>Students will write an explanation of what recycling is and how it benefits the earth</p> <p>Teachers will encourage students to use details and vocabulary from the text to support their answer</p> <p>Students will participate in classroom recycling throughout the school year</p> |

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| <p><b>Lesson Plan Title</b></p> <p>Grade Level</p>                                   | <p><b>4<sup>th</sup> Grade: Population/Community/Ecosystem</b></p> <p>How do organisms interact with each other and their environment?</p>  |
| <p><b>Objective</b></p> <p>What is the learning outcome of the activity?</p>         | <p><b>Science/ELA</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to define vocabulary words.</li> <li>2. Students will be able to understand that an ecosystem, community and population are interconnected and interrelated: Every part plays a role in an ecosystem.</li> <li>3. Students will be able to understand that the size of an ecosystem and how it relates to its population and community</li> </ol> |
| <p><b>Vocabulary</b></p> <p>What terms will be used to conduct this lesson, what</p> | <p>Population: Members of one species that live within an area of an ecosystem</p> <p>Community: All living things within the area of the ecosystem.</p>  |

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| <p>roles will students have in understanding these terms?</p>  | <p>Ecosystem: All living and non-living things and the way they interact with each other.<br/>Ex. Climate, landforms, air, water, animals, plants, Etc..</p>   |
| <p><b>Topics/Concepts</b><br/>What concepts/topics will guide inquiry and exploration of the topics/concepts?</p>  | <p>What do you already know about ecosystems, populations, and communities?<br/>How do they fit together?<br/>Ask students for the population of the classroom? Discuss why students would not include our plants or a fly in the room?</p>  |
| <p><b>Learning Activity</b><br/>Description of learning activity. What methods will I use promote student. How can I incorporate place-based or experiential learning into the activity?</p> | <p>Lead a classroom discussion on ecosystems. Discuss how size relates to its population and community.<br/>Define vocabulary words. Demonstrate how to fill out the graphic organizer using Montana animals as the topic.<br/>Students will fill out a graphic organizer on their own demonstrating the relationship between an ecosystem, population and community.<br/>Students will draw and label all living and non-living things in each part of the graphic organizer.<br/>A follow up activity: Take a class field trip/walk down near Pine View Park. Have students pick a population they can see and describe its ecosystem, population and community. Guide students in their understanding that an ecosystem can be small like a decomposing log with ants or large as in themselves and everything around them.<br/>Enrichment ELA activities: Read Pink Dolphin and The Great Kapok Tree in Reading Street. Discuss the different ecosystems, populations and communities in each story. How are they similar? How are they different?</p> |
| <p><b>Assessment</b><br/>What role does reflection on learning serve to help my students connect with and relate to what they experienced?</p>   | <p>Look at their graphic organizers and see how well students filled them out. Are they understanding the similarities and the differences?</p>  |