SUBMISSION FORM

APPLICANT INFORMATION

While the proposal may involve multiple people working together, list one district person responsible for the submission of the grant and the final report. Please list the others involved with the grant in the field below

FIRST NAME

Raquel

LAST NAME

Sandoval-Gonzalez

MY POSITION WITH HIGHLINE PUBLIC SCHOOLS:

Teacher

OTHERS INVOLVED WITH THIS PROPOSAL

Joanna Rodriguez

EMAIL (PLEASE USE YOUR HIGHLINE PUBLIC SCHOOLS EMAIL ADDRESS)

DAYTIME PHONE

◉   ◯

US/CANADA   OUTSIDE
US

CELL PHONE

◉   ◯

US/CANADA   OUTSIDE
US

SCHOOL OR DEPARTMENT

Sylvester Middle School - CTE

PRINCIPAL'S OR SUPERVISOR'S NAME

Gil Parsons

**PRINCIPAL'S OR SUPERVISOR'S
EMAIL**

GRANT SPECIFICS

I AM APPLYING FOR AN

Impact Grant (up to $10,000 to fund a program or project that serves a school or whole department.)

PROJECT TITLE

Sustainable Technology in STEM/Engineering

Provide a descriptive, but succinct, title for your project. Be creative and have fun with the name!

MAIN AREA OF PROJECT FOCUS:

Sustainable Tech.

NUMBER OF STUDENTS INVOLVED

300

NUMBER OF TEACHERS INVOLVED

6

Be as accurate as possible in your estimate. Consider how many schools, classrooms, and grade levels will be involved.

PLEASE DESCRIBE WHO WILL BE INVOLVED (TEACHER, STUDENTS, PARENTS, COMMUNITY REPS, ETC.) AND HOW THEY WILL THEY BE INVOLVED.

Students involved in this project include those enrolled in STEM, Natural Resources, as well as students who are not able to take these courses but are interested in environmental or sustainable technology (including students in after school STEM Club or Environmental Club). Sylvester has a committee of teachers who are part of SMS Environmental and Sustainability Committee, this project would be open for these teachers as well. Community organizations involved include Washington Green Schools and King County Green Schools - as a campus, we are currently working to advance in both programs and receive the next level of recognition as a Green School. This grant would help us bring all of these stakeholders together to focus our efforts through two projects.

OVERALL PROJECT DESCRIPTION

Students are currently being taught lessons around climate change and sustainable technology but have had limited exposure to hands-on tools that will help them better understand these technologies (specifically, solar and wind). This project will help us deliver lessons to our students using real-world models and give them hands-on exposure using industry tools to facilitate understanding about how these technologies work (specifically, how wind turbines and solar panels generate electricity). The items in this grant will be incorporated in lessons about solar power, wind turbine technology, and electric generation in STEM. For Natural Resources, students will use these items to measure efficiency and conduct a site-analysis (using the solar path finders) to connect to their Aquaponics/sustainability lessons. The goal for the after school program is to have students install a solar panel that can power a pump for the Aquaponics system that Sylvester received last year.

What will you be doing in this project? Feel free to explain who or what inspired you, where you got the idea or how you identified the need, and why it is important to you and others.

WHAT MAKES THIS PROJECT INNOVATIVE OR ESSENTIAL?

Climate change is one of the biggest problems that this generation of students will have to solve. Solving this multi-layered problem will require an exponential increase in workers as well as college graduates who are knowledgeable (and passionate) about sustainable technology. With our world moving towards more electric vehicles, improving our electric grid infrastructure, and commitments to reduce our carbon emissions to zero by 2050 - preparing our students is the most essential thing we can do.

During this summer, Ms. Rodriguez (Natural Resources) and I (STEM) participated in a Solar Institute course for educators at Shoreline Community College (along with the Center for Renewable Energy Technology Education, a National Science Foundation program). During this course we learned how to operate the equipment necessary to teach our students the basics of electrical engineering to operate solar panels (the items included in this grant). We also received training and lessons regarding how to implement these activities in the classroom. Additionally, we had the opportunity to tour Shoreline's TESLA Electrical Engineering Labs and learned that there is a significant shortage of electrical mechanics who are prepared to work on the increasing supply of electric vehicles. We hope to partner with Shoreline and have their students come out to Sylvester and help us with the after school project as well as provide information regarding the need to fulfill these future jobs.

How does this program or project fill a need, build on an existing program, or provide a unique opportunity not currently available through regular school classroom activities or district funding?

HOW WILL THE STUDENTS BENEFIT BY THIS PROJECT? (WHAT DO YOU HOPE TO ACHIEVE?)

Students in STEM also participate in Future City, a nationally recognized competition where students imagine, build, and present a model of what they imagine a city will look 100 years from now. In the past, I have taught them about these technologies using models made of cardboard or grouping them to work on one mini-solar panel project. Though my students enjoy doing this and learn a great deal, I believe they would benefit from being able to take real-time measurements with these technologies. It would also help give them a better understanding of how these work and the differences in their efficiency based on real-world conditions using industry level tools (as of now, we have only been able to do this theoretically).

My hope is that they become interested in these technologies and consider careers/advanced education opportunities in these fields. Students who participate in the after school program will also have the opportunity to contribute to our school in multiple ways. One of these would be to help reduce our electricity consumption for

the Aquaponics system through the solar panel that they install. We have many students on campus who are already passionate about climate change and the environment, this project would give them an opportunity to do something long-lasting that other students would get to use when they learn about solar installation.

HAS HIGHLINE SCHOOLS FOUNDATION FUNDED A SIMILAR EXCEL OR IMPACT GRANT FOR YOU IN THE PAST?
No

HOW WILL YOU MEASURE THIS PROJECTS SUCCESS? (WE ARE LOOKING FOR 2 - 4 SMART GOALS FOR EACH PROJECT.)
Goal 1: Students enrolled in STEM for the 2019/2020 school year will demonstrate an in-depth understanding of how electricity is generated utilizing sustainable technology, how to measure the efficiency of these sources, and how to utilize the industry tools. It is expected that they will begin with a minimal understanding *based on a standards based rubric specific to each activity* of how these technologies and tools work. It is expected that on these standards, 90% of students will demonstrate an understanding of 3 or higher *based on the rubric*. This will also be assessed through their Future City models/essays where students demonstrate the ability to apply these technologies to real-world scenarios with 90% efficiency or higher. This growth is expected to happen over the semester as this is a semester long class.

Goal 2: Students enrolled in STEM will use this knowledge in other courses. Last year, a formative assessment was conducted that demonstrated students were discussing issues of climate change in core classes. This year, the Environmental and Sustainability Committee will conduct a formative assessment of how students are using knowledge across disciplines. During first semester, this committee will conduct a formative assessment of student understanding/use of environmental related topics across disciplines. It is expected that from this cohort of students, at least 70% of them will integrate knowledge of sustainable technologies across one or more subject areas when given an assignment or task related to solving these types of issues.

Goal 3: During the first week of STEM, students conduct a pre-assessment where they are assigned a STEM related job and are asked to reflect how much they know about this job and whether or not they would consider it as a future career. It is expected that the number of students interested in sustainable technology related jobs increase from less than 40% to more than 80% and that the understanding of what these jobs do increases from 45% to 95% or higher.

Please note: We are looking for measurable evaluation criteria that can be shared with the funders of these grants to encourage future support.

WHERE AND WHEN WILL THIS PROJECT TAKE PLACE?
This implementation of the in-class lessons will happen as soon as we receive the equipment as they can be phased in to the lessons that we are already covering in STEM. The after school program implementation will happen towards the middle of second semester (March 2019).

Please include start and completion dates

IS THERE ANY REASON THIS GRANT WILL NOT BE COMPLETED BY THE END OF THE SCHOOL YEAR?
No

WILL THIS PROJECT BE SUSTAINABLE AFTER BEING FUNDED BY HIGHLINE SCHOOLS FOUNDATION OR WILL YOU NEED TO APPLY FOR FUNDING TO KEEP IT GOING?
Sustainable

BRIEF SYNOPSIS
Students need to be prepared to enter a world where tackling climate change is one of the highest priorities- this requires that our students be passionate and knowledgeable about STEM careers related to sustainable technology. Whether they want to attend trade school to become a Wind Turbine Technician or earn a Doctorate in Environmental Policy, early exposure to these fields and hands-on problem based learning will help pave their pathway. These are the jobs of the future and this project will help put our students ahead of the curve!

This is the paragraph that we will show on our website if your grant is funded. Only 3-4 sentences please.

Excel Grants are designed to align with Highline Public Schools' strategic plan. Please tell us how your program aligns with the districts strategic plan and describe the alignment below.

ALIGNMENT (PLEASE CHOOSE AS MANY AS APPLY)
High School Graduation, Digital & Media Literacy, Growth & Mastery, School Culture

ALIGNMENT
School Culture: Students are already passionate about climate change but often feel helpless about what they can do. This project gives students the opportunity to see that they CAN solve this problem while also helping them learn the complexities of the systems that come along with it. They build the incentive to want to learn more about how to do this, or just simply get the opportunity to let their imagination run wild with solutions - this creates an authentic rationale for learning. It is my experience that problem-based learning MUST come with hands-on activities and combining these I have been able to reach students where they are at. I've heard students say, "I didn't think I was smart enough to do science" right after they've explained exactly how CO2 is generated through technology powered by fossil fuels using evidence from the lab or project we just completed.

Growth and Mastery: This project will be incorporated into units that I have covered in the past. In these units, students are engaging in discussions that are often reserved for high school or even college settings. Taking the theoretical to more direct hands-on projects/labs will help them have a more dynamic understanding of how these science/engineering/social ideas really work. The standards that they encounter throughout these projects are interdisciplinary.

Digital and Media Literacy: Students will showcase their critical thinking and problem solving skills to community members and professionals in relevant fields. They will present the data they collected, publish their findings, and really embrace what it means to be digitally and scientifically literate.

High School Graduation: The ultimate goal of this project is for students to become deeply engaged in not only how the technologies work but in wanting to tackle these issues themselves. This grant would help plant the seeds sooner and allows students to have conversations that are necessary in order to carve out the pathway most authentic to them. Throughout these lessons, students learn that we need trade-educated technicians just as much as we need engineers or scientists with degrees, exposing students to the vast options of what their future could look like is essential to ensuring that they are prepared to solve this problem as adults.

IF AWARDED FUNDING, HOW WILL YOU PROMOTE THE RECEIPT OF THIS GRANT?
The Environmental and Sustainability Committee will host a STEM night related to Climate Change by the end of January. We will invite Washington Green Schools, King County Green Schools, Shoreline Community College and other programs (we partnered with UW's Clean Energy Institute last year, and other community partners and parents. During this time, Sylvester students will present projects across different disciplines related to Climate Change and we plan on showcasing other awards or recognitions that Sylvester as a whole or Sylvester students have earned in this area.

BUDGET

Budget

We changed the way that funds are awarded in 2018-19. If you haven't done so yet, please read through the page for answers to common questions and information on changes to the grant process.

MY APPLICATION INCLUDES TECHNOLOGY
No

MY APPLICATION INCLUDES TRANSPORTATION
No

Remember to include any technology and/or transportation costs in the "Total Amount Requested" box below.
Also, include tax, shipping and any other costs associated with your project. The Foundation will not calculate these additional costs for you. IOnce awards are made, we are not able to provide additional funds if you forget to include these costs

TOTAL AMOUNT REQUESTED
$6,489.84

Maximum $2,500 for Excel Grants and $10,000 for Impact Grants. Please include any technology and/or transportation costs in your total.

DETAILED BUDGET – YOU MAY EITHER TYPE IN YOUR BUDGET HERE OR UPLOAD AN EXCEL SPREADSHEET UNDER BUDGET SUPPLEMENTAL. IF YOU UPLOAD THE BUDGET SUPPLEMENTAL, PLEASE JUST PUT "SEE ATTACHED" IN THIS BOX.

Please explain how the funds will be used. Please include anticipated categories of expenditures and amounts for the complete project and if you have a preferred supplier. You may upload a copy of an invoice or purchase order if you feel that this will complement your request - but it is not necessary. Remember to include shipping and/or sales tax in your request. The Foundation will not research this for you.

The name of the attachment should be the same as your grant title, so it can be matched with your grant application

BUDGET SUPPLEMENTAL

IF THE COST OF THE PRODUCT/SERVICE EXCEEDS YOUR GRANT AWARD, DO YOU HAVE ACCESS TO OTHER FUNDS?
NA

If you know that the amount of your program will exceed the amount of the grant you are requesting, please use this box to tell us where the additional funds will come from. If an Excel Grant will completely cover your costs, you may leave this box blank.

IF WE ARE UNABLE TO FUND THE ENTIRE GRANT, COULD YOU ACCEPT PARTIAL FUNDING TO COMPLETE SOME OF THE WORK THIS YEAR?
Yes