

STEM Webquest

WebQuest Description: Teachers will learn how to integrate technology in a lesson

Grade Level: 9-12

Curriculum: Business / Economics

Keywords: Germination, Centimeter, Length, Width, Profit and Loss, Column chart

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Introduction

You will be utilizing STEM (Science Technology Engineering and Mathematics) methodology in your lesson to allow students to be engaged in solving real world problems. Through this medium you will obtain more information on how you can integrate concepts from other subject areas into Business Basic y lesson thus providing your students with skills ready for the working world. Teaching should not be done in isolation. Your students should be equipped to transfer concepts learnt in one subject area to the next. You will see how the you can facilitate same while integrating technology and building critical thinking, collaboration and communication skill.

Tasks

You will be engaged in arriving at a solution to a real world problem that could be given to students as a project activity. It will require students to work in Groups/ Teams.Task to be completed will require you to use a spreadsheet (Microsoft Excel preferable) to create charts and perform calculations. perform measurements in metric and or perform conversion from inches to centimeters (calculations should be in metric)Understand about germination and green houseMake profit projectionResearch or collect information on factors that would impact negatively on crop productionMake recommendations TaskThe school would like to convince the farmers in the school community to gradually implement greenhouse technology in the production of sweet peppers for the hotel sector. You will conduct an investigation using the existing green house at school to determine how efficient it would be to grow sweet peppers in the green house so as to convince the community farmers.The students will provide income and expenditure related to project.You will provide your findings at a community meeting.

Process

The process will require that the class be divided in groups or teams. It is assumed that student would have had prior knowledge in using spreadsheet and word processing software. Task:The school would like to convince the farmers in the school community to gradually implement greenhouse technology in the production of sweet peppers for the hotel sector. You will conduct an investigation using the existing green house at school to determine how efficient it would be to grow sweet peppers in the green house so as to convince the community farmers. You will provide your findings at a community meeting. The aim is to convince farmers of economic benefits from farming.Step 1:You will need to visit the School's Green house to ascertain the length and width. Using the measurement you will then calculate the number of rows that can be placed in the green house given that the with of each row is 2 feet. Determine the number of seedlings that it would require to be planted in the green house given that each seedling is to be planted 12 inches a part. Step 2: Conduct and investigation on how long it would take for seeds to germinate, and what is the best suited way of sowing seeds for planting in the green house. Select a preferred method and note the expense that you would incur using the method you have chosen. You can choose to research on the internet or interview Agriculture Science teacher.Step 3: Investigate what are the major factors that would affect the plants and document any cost associated in solving or reducing the impact on the production of the crop.Step 4: On average given that 90% of the plants matured and bore fruits. You will estimate the yield per tree to be 150 pounds per week. The crop lasted for 5 weeks. The market price was \$300 per pound at the first week. Using your spreadsheet calculate your total expenditure as well as the total income if the price increase by 15% each week.Step 5: Using your knowledge of spreadsheets create a chart to compare your weekly income. Compare your Total expenditure vs. Total Income.Step 6: Provide a written report stating factors that would limit production, ways of improving productivity of the crop. Your report should capture why you would recommend planting the crop into a green house as opposing to open field. State which method would be more profitable. The presentation should be done using slide presentation and should include audio, video and text.

Evaluation

The following evaluation will be used to score the project. Students will be required to show research and economic benefits of growing peppers in a green house instead of open field.

Category and Score	Category 1 (0 -2)	Category 2 (3-5)	Category 3 (6 -7)	Category 4 (8- 10)	Score
Provide information relevant to task (germination, green house) . Research is adequate. With Findings a recommendations. Incorporate audio, video and text	Limited research and recommendations	Shows research with at least 3 recommendations	Detail research with at least 5 recommendations	Adequate research with more than 5 recommendations	10
Perform measurements in metric and or perform conversion from inches to centimeters (calculations should be in metric)	Measurements completed but not converted	Measurements converted for some values	Measurements and estimates are realistic for some values	All measurement and estimates are realistic and properly converted to metric	10
Create Graph	Graph created but not labelled	Graph created for correct values	Graph created with labels and some labels	Graph created having correct values	10
Perform accurate calculations	Perform some calculations correctly	Perform calculations for some values	Perform most values with estimates	All estimates and values are calculated correctly	10
				Total Score	40

Conclusion

The lesson aims at promoting collaboration among students and interdisciplinary learning. Students are expected to use scientific inquiry integrate technology and master mathematical operations. The lesson serves to inculcate problem solving, critical thinking and collaboration.

Teacher Page

This activity is consistent with the National Standards Curriculum.

Standards

The National Standards Curriculum (NSC) currently implemented at grades 7-9 requires students to collaborate, be creative, and communicate. The curriculum also requires students to become problem solvers hence the use of real world problems is encouraged. The use of STEM methodologies and project based learning are encouraged.

Credits

Reference Jolly, A (2014). Six Characteristics of a Great STEM Lesson accessed November 28, 2017 from https://www.edweek.org/tm/articles/2014/06/17/ctq_jolly_stem.html Video link <https://www.youtube.com/watch?v=2Yrme1q5gFw>

Other