

DUNMAN HIGH SCHOOL

SECONDARY ONE MATHEMATICS – Web Learning 2006



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INTRODUCTION

Web learning is an adaptation of webquest, you can find out more about webquest at

<http://middle.usm.k12.wi.us/faculty/taft/technology/webquests.htm>

This project is designed to engage learners to a task that is challenging, achievable and interesting. In your team of 3, design and construct a rain gauge, collect rain for a short period of time and write a report of the task. An important feature of web learning is that you will be given a role that will be different from your friends in the team and together the members learn from each other and help each other to complete the task. The whole project should take about 1 month to complete.

TASK

A **rain gauge** is a very simple device used to measure the amount of rain that falls. In a small tropical island like Singapore, yearly rain fall is fairly adequate, but the amount of rain received is not the same in different parts of Singapore, the task is to design and make a rain gauge, collect rain from one part of Singapore for a period of time and write a report of the rain gauge designed, data collected. Test the acidity of the water collected each day using pH paper and record the results.



Your team will consist of 3 members. Each member needs to choose one of the following jobs.

- 1) Designer – the designer **design** the rain gauge and **evaluate** the design based on the data collected.
- 2) Researcher – the researcher **read** about rain gauge and **compile** pictures and information on design and construction of rain gauge and **gather** information of rain fall in Singapore.
- 3) Technician – the technician **make** the rain gauge, **collect** rain for about 2 - 3 weeks.

PROCESS

Information on the design and construction of rain gauge are given in the resources. The team needs to communicate with each other so that the designer can come up with a draft of the design and to give the draft to the technician to see if he is able to make the rain gauge. The technician and researcher can provide feedback and only then should the designer come up with the final design. Only **recycled material** is to be used to make the rain gauge. The technician will then collect the rain one part of Singapore and send the data to the designer for evaluation. The data should be tabulated and presented in graphs (example bar chart, line graphs etc). The researcher will then compile the report of the project which should include

- i) draft and final design of rain gauge
- ii) data collected
- iii) information gathered and use for the design
- iv) evaluation of the design

- v) reflection of the project
- vi) picture the rain gauge
- vi) evaluation of group work - Annex B

EVALUATION

In your final report, the team needs to compile the work of each member as the evaluation is of two parts. Each member of the team will be graded individually and as a team. Cooperative work will result not only in a finished product but a job well done. A total of 20 marks will be given, 10 marks for individual part and 10 marks for the team. Please refer to the rubric for evaluation.

Your project will be evaluated on the following criteria:

- Each member needs to complete the task and hand in a report of your work according to the following guidelines

Designer	Design of rain gauge, evaluation of design.
Researcher	Compile all materials of final report.
Technician	Construct the rain gauge and collect data of rain fall.

Refer to [ANNEX A](#) for details of evaluation.

Submit report together with [ANNEX B](#)

RESOURCES

1. Build Your Own Weather Station

<http://school.discovery.com/lessonplans/activities/weatherstation/itsrainingitspouring.html>

2. Measure Rainfall

<http://www.miamisci.org/hurricane/rainmeasure.html>

3. Make Your Own Rain Gauge

<http://sln.fi.edu/weather/todo/r-gauge.html>

4. Building a Rain Gauge

http://forum.swarthmore.edu/geopow/print_puzzler.ehtml?puzzle=119

5. Rainfall in Singapore

<http://app10.internet.gov.sg/scripts/nea/cms/htdocs/article.asp?pid=1088>



CONCLUSION

I hope you will have fun designing the rain gauge and collecting rainfall with your very own instrument. In doing this project, I wish for you to experience and appreciate working together to do a good job and learn something in the process.

This project will provide you with an opportunity to see the practical use of Mathematics in daily living and understand the issue of water conservation.

ANNEX A - EVALUATION

Your project will be evaluated in two parts, project work component and team work component. Each part will be awarded a maximum of 10 marks, making it a total of 20 marks for the project. The evaluation of team work will be by members of the team using the given rubric and the final mark decided by the teacher in charge.

I Rubric for project work component- 2 marks for each element.

Elements of project	Excellent	Very Good	Good	Satisfactory
1. Content	Facts given is well researched and very accurate	Facts given are understandable and correct	There are few minor inaccuracies	There are many inaccuracies
2. Design	Most attractive, appealing and elegant. Highly functional	Attractive and very functional	Pleasant to the eye and functional	Reasonable and functional
3. Analysis of information	Demonstrate the ability to use research findings in coming up with an excellent product	Demonstrate the ability to understand information gathered and design a good product	Demonstrate understanding of information gathered and design a product	Demonstrate understanding of information
4. Critique	Ability to analyze strength and weaknesses of product and come up with possible improvements	Ability to analyze strength and weaknesses of product and come up with good suggestions for improvements	Ability to analyze strength and weaknesses of product and suggest improvements	Ability to analyze strength and weaknesses of product
5. Presentation	Proper and very clear documentation of process and product	Good documentation of process and product	Some documentation of process and product	Little documentation of process and product

II Rubric for Peer Evaluation- Team members to grade each element for himself and other individual members of the group. 2 marks for each element- giving a total of 6 marks and the rest of the 4 marks to be given by teacher's evaluation of team work.

Elements of Project	A	B	C	D
1. Team contribution	Very cooperative and helpful	Cooperative and helpful	Cooperative	Minimum cooperation
2. Resources supply	Very giving and forthcoming with information	Giving information required promptly	Giving information accordingly	Sufficient information given
3. Team Objectives	Able to accomplish all objectives and beyond	Able to accomplish all objectives	Able to accomplish most of the team objectives	Able to accomplish some of the team objectives

ANNEX B

WEB LEARNING- EVALUATION FORM

(Each team member to fill the form for himself and the other two members of the team.)

NAMES OF TEAM MEMBERS _____

TITLE OF PROJECT (OPTIONAL) _____

Use the following rating scale to evaluate. Assign a mark to each element

A = 2 B = 1.5 C = 1 D = .5

Elements of Project	Name of member	Name of team member	Name of team member
1. Team contribution			
2. Resources supply			
3. Team Objectives			
Total score	/ 6	/6	/6

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1. Team contribution			
2. Resources supply			
3. Team Objectives			
Total score	/ 6	/6	/6

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1. Team contribution			
2. Resources supply			
3. Team Objectives			
Total score	/ 6	/6	/6

	Project component (A)
1. Content	
2. Design	
3. Analysis of information	
4. Critique	
5. Presentation	
Total Score	/10
	Team work component (B)
Score by team member (Average of peer evaluation)	/6
Score by teacher	/4
Total Score for project A+ B	/20