**Mathematical Landscaping**

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Welcome to Mathematical Landscaping, sounds scary right? I never thought of what I do for a living as mathematical but after being in this course I realized that it is full of mathematical equations, problems and solutions. Designing a garden takes many forms of mathematics to create from the area of the garden to the placement of the plants and sprinklers, not only to give an aesthetic appeal but to allow the plants and sprinkling system to work their best at all times.

Your assignment if you choose to accept it, and I know you will, will be to design a garden. This is a shade garden that has several mature trees already in place. You will need to determine what and where plants will be placed. You will need to put in a sprinkler system so that your plants will survive and remember that you need to place them so that they do not over water other areas. This means that you will need to be careful of placement and type of sprinkler head you place. I will provide you with a graph to work with, the type of plants to be used with pictures, the different types of sprinkler heads that are available to use. You may need some tools to help you complete this like a protractor, colored pencils or markers, scissors. Feel free to be creative in your design.

Your Garden dimensions are 106 feet by 43 feet by 33 feet by 108 feet you will need to determine the area of your garden in square feet so that you may accurately use the graph.

The plants you have to choose from are the following:

HOSTAS

Name size at maturity diameter full/part shade picture

Eye declare 18” full/part shade [](http://www.hostasdirect.com/hostas-for-sale/eye-declare)

Golden Tea Cup 11” Full/part shade [](http://www.hostasdirect.com/hostas-for-sale/golden-teacup)

Heavenly Tiara 14” Part Shade [](http://www.hostasdirect.com/hostas-for-sale/heavenly-tiara)

Hacksaw 11” Full/part shade [](http://www.hostasdirect.com/hostas-for-sale/hacksaw)

Hadspen Blue 18” Part Shade [](http://www.hostasdirect.com/hostas-for-sale/hadspen-blue)

The Razor’s Edge 9” Full/part shade [](http://www.hostasdirect.com/hostas-for-sale/the-razors-edge)

FERNS

Name size at maturity diameter full/part shade picture

Japanese Painted Fern 12” Full Shade **[](http://www.halcyonplants.co.uk/index.php?page=product_details&product_id=360)**

Japanese Shield 24” Full Shade **[Dryopteris 'Erythrosora' ('Japanese Shield Fern')](http://www.halcyonplants.co.uk/index.php?page=product_details&product_id=39)**

Lady Fern 30” Sun/part/full shade 

Christmas fern 24” part/full shade [](http://www.nathankramer.com/garden/plants/ferns/fern_christmas.jpg)

Maiden Hair Fern 12” Sun/part shade **[](http://rainforest-australia.com/Rainforest_ferns.htm)**

OTHER FLOWERING PLANTS

Name size at maturity diameter full/part shade picture

Cimicfuga Ramosa 24” Full Shade ****

Helleborus 12” Full/part shade 

Lenten Rose 18” Full/part shade 

Now that you have chosen your plants you will need to decide where to place the sprinkler system to be the most efficient that it can be you will have different heads to choose from.

When designing a sprinkler system you will need to determine the size of the line you will be using and the amount of water you would like put out over the area. This is measured by gallons per minute. ½ inch line provides five gallons of water per minute, ¾ inch line provides ten gallons per minute and a one inch line provides twenty gallons per minute. Because there are factors you are not aware of like soil condition, how much sun the area gets per day, plant requirements, slope or grade of area it would be best to use the ½ line this will provide adequate water and give you something to work with.

As for timing of the sprinkler heads the rule of thumb is at least ten minutes per area during the spring and fall, summer requires more time due to less precipitation. Maximum time for sprinklers in grassy areas usually is twenty minutes.

The heads to choose from are spray type and roto head types. The spray head throws water evenly across an area at about 5 foot radius at all times and are used most often in small areas. The pattern of these heads is fixed and is available in 45, 90, and 180 degree increments.

The roto head throws water further usually throws water in a ten to seventy foot radius; this depends on the various settings available. This head also comes in 45, 90, 180 and 360 degree rotations. Unlike the spray this head rotates on an axis to provide coverage.

Here are some helpful websites to guide you along the way.

[www.worsleyschool.net/science/files/circle/area.html](http://www.worsleyschool.net/science/files/circle/area.html)

[www.mathopenref.com](http://www.mathopenref.com)

[www.mathsisfun.com/area-calculation-tool.html](http://www.mathsisfun.com/area-calculation-tool.html)

[www.wikihow.com](http://www.wikihow.com)

Bibliography

Making the Most of Shade Larry Hodgson

Types of sprinkler heads [www.life123.com/home-garden/landscaping/lawn-care](http://www.life123.com/home-garden/landscaping/lawn-care)

The circle area formula [www.worsleyschool.net/science/files/circle/area.html](http://www.worsleyschool.net/science/files/circle/area.html)

Diameter of a circle definition [www.mathopenref.com](http://www.mathopenref.com)

Area Calculation Tool [www.mathsisfun.com/area-calculation-tool.html](http://www.mathsisfun.com/area-calculation-tool.html)

Sprinkling Systems Spartan Distributors, Sparta Michigan