

# WebQuest Design Template

## Teacher/Design Information

### Learners

My intended audience is algebra students who are learning about solving quadratic equations. The age range is 12 to adult who enjoy game plots.

### Educational Goal

The goal of the WebQuest is for students to learn the three methods of solving quadratic equations. The three methods are factoring, completing the square, and using the quadratic formula. In order to complete, students will have to learn all three methods and complete the practice problems. Students must accomplish all four tasks to have a completed quest journal.

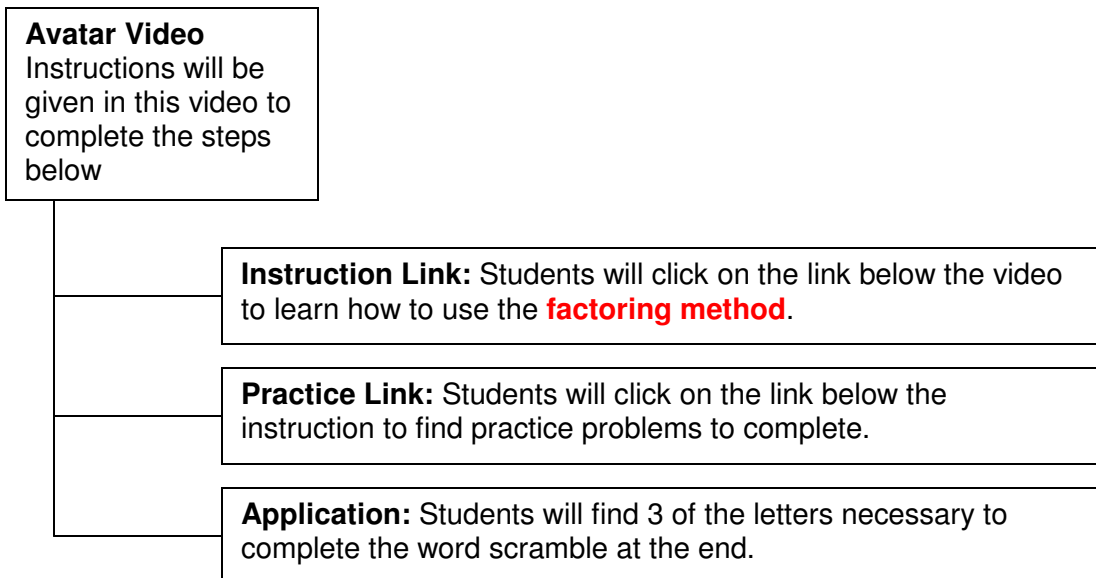
### Standards

The California math standards that are addressed are:

**14.0** Students solve a quadratic equation by factoring or completing the square.

**20.0** Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.

### Process



**Avatar Video**

Instructions will be given in this video to complete the steps below

**Instruction Link:** Students will click on the link below the video to learn how to use the **complete the square method**.

**Practice Link:** Students will click on the link below the instruction to find practice problems to complete.

**Application:** Students will find 3 of the letters necessary to complete the word scramble at the end.

**Avatar Video**

Instructions will be given in this video to complete the steps below

**Instruction Link:** Students will click on the link below the video to learn how to use the **quadratic formula method**.

**Practice Link:** Students will click on the link below the instruction to find practice problems to complete.

**Application:** Students will find 3 of the letters necessary to complete the word scramble at the end.

**Avatar Video**

Instructions will be given in this video to complete the steps below

**Last Steps:** Students will use the 9 letters found to complete the **word scramble**.

## Resources

Give a complete list of what is required to complete this WebQuest. The list may include books, supplies, resources, or other planning and preparation that would be needed. Also describe any additional resources or background material that may be helpful.

- The videos will be using <https://vhost.oddcast.com/admin/index.php>. This site allows me to create videos using avatars and text to speech options. It will explain the process in a game format.
- Instruction resources will include videos and tutorials for students to follow to learn all three methods. These can either be found on the internet or made. Some sites that have already been found are:

Complete the square

[http://www.teachertube.com/viewVideo.php?video\\_id=161716&title=Completing the Square](http://www.teachertube.com/viewVideo.php?video_id=161716&title=Completing_the_Square)

Quadratic Formula

<http://www.youtube.com/watch?v=EeVqtpuMFOU>

- Practice resources will be examples provided and found on the website. Students will be writing them down on the handout provided to them. The algebra text book will provide the examples I will be using.
- A handout will need to be made for students to record their work.
- Since the WebQuest will be put into a game format, planning will include story plots, graphics, and interactive components.

## PICTURES FOR INTRODUCTION

### Quadramagic Land



Made in Paint program



Copied from

<http://plus.maths.org/issue30/features/quadratic/index-gifd.html>

## WebQuest Elements

Title: The Quest for the Quadratic Equations

Audience (grade level): 7-12, adult, Subject matter: Algebra, Author: Jennifer Waters

### Introduction

What would happen if there were no quadratic equations?

In Quadramagic Land, quadratic equations are the key to architecture, roller coasters, sports, transportation, gravity, and the solar system. Without these equations the land would fall into great peril.

On the night of the last eclipse, Daygon, an evil demon, stole all the quadratic equations from the land. Your quest is to find the quadratic equations and solve them for the secret codes. The secret codes will allow you to banish Daygon to his lair. The only way to solve the equations is to learn the three ancient methods. You will learn these methods as you travel Quadramagic Land.

Good luck on your quest and remember that Quadramagic Land needs you to save it from the evil Daygon. If you choose not to accept this quest your grade will be a zero.

### Task

Students will:

- Find the two solutions for quadratics
- Solve quadratics by factoring
- Solve quadratics by completing the square
- Solve quadratics by quadratic formula
- Complete quest journal

### Process

#### 1: Travel to Land of Factors (video explanation)

You will learn the ancient method of solving quadratics by factoring. Click on the link to learn the method. (link to lesson) Write down any important clues in your journal. Once you understand, click on the link to practice your skills. (Link to 3 examples) Copy down and answer the examples on your handout. When you master the examples you will receive a code at the bottom. Use the code to determine which ones of Daygon's minions below are the key to saving Quadramagic Land.

#### 2: Travel to the Land of Complete Squares (video explanation)

You will learn the ancient method of solving quadratics by completing the square. Click on the link to learn the method.  
[http://www.teachertube.com/viewVideo.php?video\\_id=161716&title=Completing\\_the\\_Square](http://www.teachertube.com/viewVideo.php?video_id=161716&title=Completing_the_Square)  
Write down any important clues in your journal. Once you understand, click on the link to practice your skills. (Link to 3 examples) Copy down and answer the examples on your handout. When you master the examples you will receive a code at the bottom. Use the code to determine which ones of Daygon's minions below are the key to saving Quadramagic Land.

### 3: Travel to Land of the Last Formula (video explanation)

You will learn the ancient method of solving quadratics by the quadratic formula. Click on the link to learn the method. <http://www.youtube.com/watch?v=EeVqtpuMFOU> Write down any important clues in your journal.

Once you understand, click on the link to practice your skills. (link to 3 examples)







Copy down and answer the examples on your handout. When you master the examples you will receive a code at the bottom. Use the code to determine which ones of Daygon's minions below are the key to saving Quadramagic Land.

### 4: Banish Daygon to his Lair

Using the codes from all three lands you will find 9 letters of the word used to banish Daygon from Quadramagic Land. The letters are out of order, so collaborate with your peers to help figure out the word. Be sure to write down the word on your handout to receive credit for finishing! (Letters are R-C-A-T-Q-I-U-A-D, students will unscramble to make QUADRATIC)

#### \*\*Note

The table below will be given at the end of each task 1, 2, and 3. The letters will appear in the boxes. They will only choose the letters that are being carried by the minions that have the correct solutions to the examples under them. This will quickly show me if they got the correct answers. If the wrong letters are picked by the student, then I will know whether or not they understand the method correctly. Each task will result in 3 letters to end up with 9 letters for task 4.

 Stolen Solutions: x =    or x =	 Stolen Solutions: x =    or x =	 Stolen Solutions: x =    or x =
 Stolen Solutions: x =    or x =	 Stolen Solutions: x =    or x =	 Stolen Solutions: x =    or x =

**START  
NOW**

## Evaluation

	<b>Beginning 1</b>	<b>Developing 2</b>	<b>Accomplished 3</b>	<b>Exemplary 4</b>
<b>Method 1: Solving by Factoring</b>	Examples written on handout. No work shown or complete.	Examples written on handout. Work attempted but not complete.	Examples written on handout. Enough work completed to attain the correct answers.	Examples written on handout. Each step of the work is shown. Answers are boxed.
<b>Method 2: Solving by Completing the Square</b>	Examples written on handout. No work shown or complete.	Examples written on handout. Work attempted but not complete.	Examples written on handout. Enough work completed to attain the correct answers.	Examples written on handout. Each step of the work is shown. Answers are boxed.
<b>Method 3: Solving by Quadratic Formula</b>	Examples written on handout. No work shown or complete.	Examples written on handout. Work attempted but not complete.	Examples written on handout. Enough work completed to attain the correct answers.	Examples written on handout. Each step of the work is shown. Answers are boxed.
<b>Word Scramble</b>	No letters were found using work. Code was found with the help of peers.	Some letters were found using work. Code was found with the help of peers.	Most letters were found using work. Code was found with the help of peers.	All letters were found using the work on the handout. Code word was correctly found.
<b>Quest Journal</b>	Journal has little information about methods. Some correct answers.	Journal has information about methods. Some work shown for correct answers.	Journal has information about methods. Most work shown for correct answers.	Journal has thorough information for methods. All work and answers correct.

## Conclusion

This WebQuest allowed me to think beyond the usual lesson methods for teaching how to solve quadratic equations. Math can be difficult to relate to and even harder to turn into a game. I think providing students with a quest similar to modern day video games will help them become more interested and engaged in their learned. Using video avatars and graphics made the site more appealing to the viewer. Extended learning opportunities may include a challenge mode where students are given random quadratic equations and have to determine which method to use.

## Credits

Site Pal- website for creating video avatars

YouTube- authors of the videos and site creator

Teacher Tube- authors of the video and site creator

James Waters- technical support

Seth Harrison- creative help for characters

Site <http://plus.maths.org/issue30/features/quadratic/index-gifd.html> - graphic

## Quest Journal

Complete the following information as you work through your quest. This will be turned in to your teacher for credit.

1. Land of \_\_\_\_\_.

a. Click on link to lesson: Write down any clues you find important.

Method:
Clues:

b. Click on link to examples: Write down examples below and solve them.

#1	#2	#3

c. Secret Code: Write down the three letters that the minions have, only if the minion has a correct answer to one of your examples.

\_\_\_\_\_

2. Land of \_\_\_\_\_.

a. Click on link to lesson: Write down any clues you find important.

Method:
Clues:

b. Click on link to examples: Write down examples below and solve them.

#1	#2	#3

c. Secret Code: Write down the three letters that the minions have, only if the minion has a correct answer to one of your examples.

\_\_\_\_\_



3. Land of \_\_\_\_\_.

- a. Click on link to lesson: Write down any clues you find important.

Method:
Clues:

- b. Click on link to examples: Write down examples below and solve them.

#1	#2	#3

- c. Secret Code: Write down the three letters that the minions have, only if the minion has a correct answer to one of your examples.

\_\_\_\_\_

4. Banish \_\_\_\_\_ to his \_\_\_\_\_.

a. Write down all nine letters you have found through your quest.

\_\_\_\_\_

b. Rearrange the letters to find the correct word to banish Daygon.

\_\_\_\_\_