# Volume Project

## Designing a Wedding Cake

*September 2015*

Name: Ashley V

Mr. Meyer's brother's uncle's sister is getting married in September and she needs your help designing her wedding cake! Before you begin, use the below box to brainstorm the different tasks that might be involved in designing a wedding cake for a large group of people.

Chocolate/Bottom = 80
Vanilla = 60
Red Velvet = 40 slices, 200 slices in all
Carrot/Top = 20

Deco:
groom + bride toys on top
edible pearls + gems
maroon fondant roses

Here are the criteria for the cake:

- The cake must serve between 200 and 250 people.
  - When cut, one slice (one serving) is 10 inches$^3$.
- The cake must have at least three layers.
- Each layer must be a rectangular prism.
- At least one layer must be vanilla.
- At least one layer must be red velvet.

Flavors:

- A cubic inch of vanilla is $.25
- A cubic inch of chocolate is $.25
- A cubic inch of red velvet is $.50
- A cubic inch of carrot is $.50

Budget:

- You cannot spend more than $650 dollars

*All other costs, including the cost of icing, decorations and tax, are included when you select your flavors.

**You must perform the following tasks:**

- Design a wedding cake that meets all the criteria
- Decide how many layers your cake will have and the volume and flavor of each layer
- Show the cost of each layer with considerations to size and flavor
- Sketch a cake design
- Persuade Mr. Meyer to choose your cake design

## Part 1: Understanding the problem

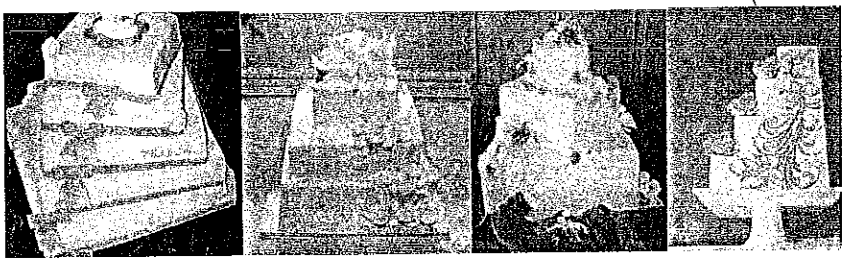
1) Write, in your own words, what you are expected to do to design this cake?

We're expected to design a tabled cake with different layers and flavors, enough to feed all the people, that looks good and is in budget.

2) What information is given to you to help you design the cake?

We're given a budget, an amount of people to feed, the cost of each flavor, the amount of layers needed, the flavors required, and the measurement of each serving.

## Part 2: Planning



*These are some examples of wedding cakes that could meet the criteria for the cake. Use these pictures to begin thinking about what you'd like your cake to look like.

1) What are the steps you will need to follow to design the wedding cake?

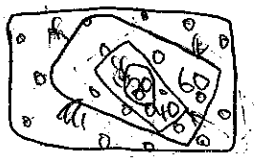
- Decide how many layers my cake will have
- Decide the flavors we will have
- calculate how much it will cost
- Decide on decorations
- Check my work

$10 \times 20 = 20$ inches 3

- 
- 
- 

**2) Use words, pictures, or symbols to help you make a plan for designing the cake. On the next page you will sketch a rough draft of your cake design.**

Bird's eye view




* = rose
o = gem
80 slices

✓ digonal, spiral

✓ gems, roses

✓ lights, bride + groom

Budget $650

Price $650

Serves 200 people

80 slices = chocolate, bottom

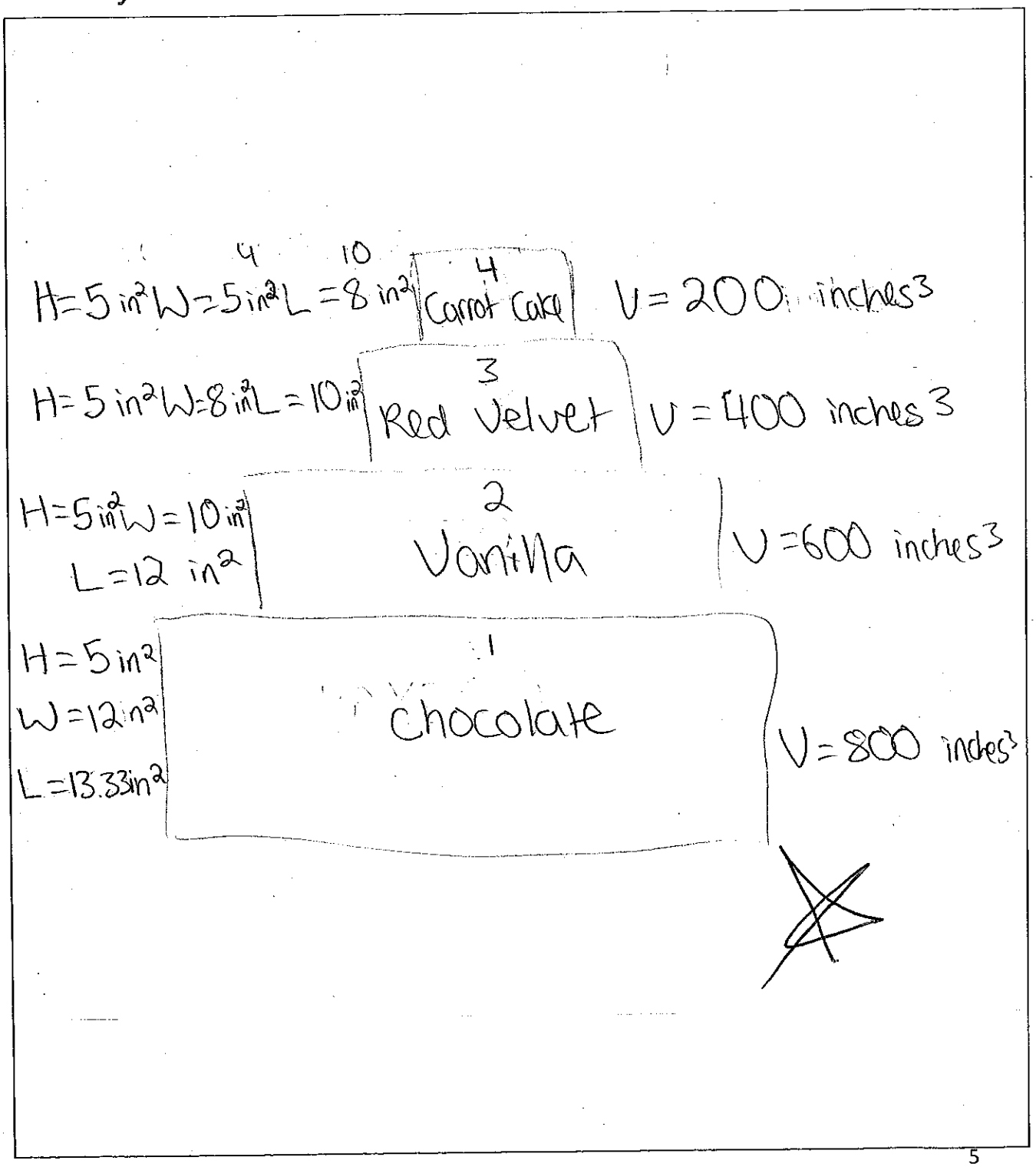
60 slices = vanilla

40 slices = Red velvet

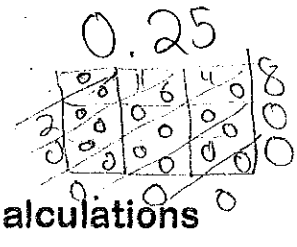
20 slices = Carrot Cake, top

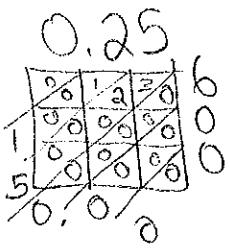
## Part 3: Initial Draft of the Wedding Cake

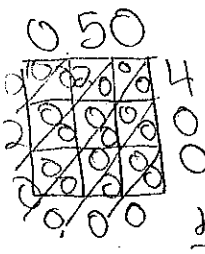
1) Use this page to create a rough sketch of the cake design. Label each layer with its length, width, and height. Also, label each layer's flavor. A table for your calculations for each layer's volume and cost is on the next page.



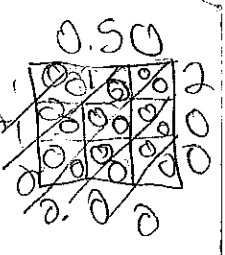
200
+150
$350







350
+200
$550
+100
$650



## Part 4: Work and Calculations

Complete the table below and use the rest of this page for calculations. Show your work! If you only have three layers to your cake, you will only use the first three rows.

| Layer | Flavor | Cost per cubic inch | Length in inches | Width in inches | Height in inches | Volume in cubic inches | Amount of people layer feeds (Volume / 10) | Total cost of layer (cost per cubic in x volume) |
|---|---|---|---|---|---|---|---|---|
| 1-top | Carrot Cake | $0.50 | 8 in | 5 in | 5 in | 200 $in^3$ | 20 | $100 |
| 2 | Red Velvet | $0.50 | 10 in | 8 in | 5 in | 400 $in^3$ | 40 | $200 |
| 3 | Vanilla | $0.25 | 12 in | 10 in | 5 in | 600 $in^3$ | 60 | $150 |
| 4 | Chocolate | $0.25 | 13.33 in | 12 in | 5 in | 800 $in^3$ | 80 | $200 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | TOTAL | 2000 $in^3$ | 200 | $650 |

Beautiful work

## Part 5: Explanations

1) Explain how you found a way to have enough cake to feed between 200 and 250 people. What is the total volume of the cake?

We first decided how many slices/servings/cubic inches we were gonna have so we could have one serving for every person. The total volume of our cake is 2000 $in^3$.

2) How many people does your cake feed? (10 cubic inches = one person)

Our cake feeds 200 people in all.

3) What is the cost of the entire cake? How close were you to reaching the budget?

The cost of the entire cake is $650. We are exactly one the budget.

Do sketch anyways

## Part 6: Final Sketch / Model?

Construct a final sketch of your wedding cake design on the provided construction paper. Your final sketch should include labels of all of the dimensions of each layer as well as the total volume. You should also label the flavors of each layer and show the costs of each layer. Be creative and decorate your cake!

## Part 7: Persuasive Letter

Now that you and all of your classmates have designed a wedding cake, he needs to choose one design to use. Write a letter to Mr. Meyer about why he should choose your cake for his family's wedding.

Include the following descriptions: Add to letter

Describe your cake and discuss each layer. What are the dimensions and the volume of each layer? What flavor is each layer? What is the total volume of the cake? How many people does it serve? How much money does the cake cost to make? How is your cake decorated?

*Your letter will be written on a separate piece of loose leaf paper.

**Part 8: Reflections**

1) You have just encountered a problem where you had to make a wedding cake to feed many people. This required many math skills. Can you think of other situations where you or someone else may need to use these same types of skills?

Another situation could be designing boxes to fit furniture for a moving company. You would have to find the space each piece of furniture takes up, and decide the volume of the boxes.

Yes!! :)

2) Explain what you found difficult to do in this problem.

One thing that was difficult, was to find enough time to do everything while still putting a good amount of effort into it.

Great point

3) If you had to do this situational problem again, explain what you would do differently.

I would manage our time better, so that we could get things done more efficiently.