

**EDUCATIONAL ASSIGNMENT for JOSEPH JOHN WUNDERLICH** for his 3<sup>rd</sup> trimester of 10th grade

This assignment covers the following Educational Objectives (Subjects marked with a "■" are the main subject, and those marked with an "□" are secondary subjects):

- 1. READING (ENGLISH)
- 2. WRITING (ENGLISH)
- 3. ALGEBRA 2
- 4. CHEMISTRY
- 5. WORLD HISTORY
- 6. LATIN II
- 7. WORLD CULTURAL ARTS
- 8. PHYSICAL EDUCATION

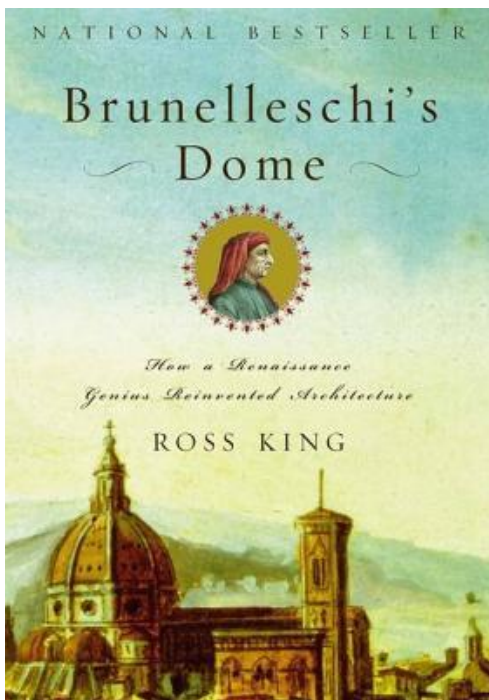


*Picture is of Joseph reading an Architectural book in the University of Florence Architectural School Library (Joseph selected a book on Architectural Structures to read):*



**ASSIGNMENT:** Recall Florence from your 3-1/2 week May 2014 trip to Europe. Describe how you experienced it and discuss:

A) What you learned about the Duomo from your reading "Brunelleschi's Dome" before your trip, and what you learned about the Duomo during your trip to Florence



*The book you read before your trip to Florence*



*Il Grande Museo Del Duomo*  
*(Duomo Museum Ticket)*

B) Discuss your visit to the statue of David.



*Uffizi Gallery Museum ticket*  
*(with Michael Angelo's "David" statue)*

## JOSEPH'S WORK:

All pictures taken by me – except the ones above.



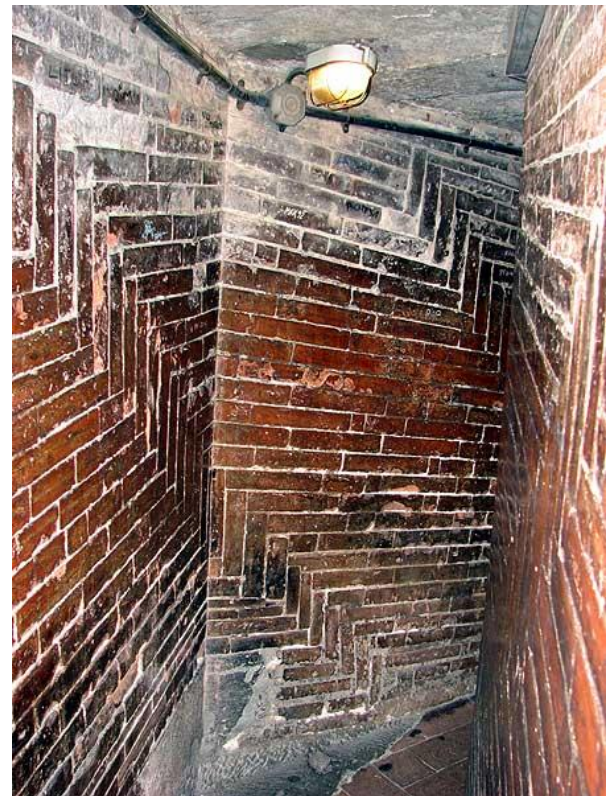
After our stay in Padua, Italy, we took a side trip to the city of Florence. Here we visited several art museums, churches, the statue of David, and of course the Basilica di Santa Maria del Fiore (Basilica of Saint Mary of the Flower). This basilica began its construction in 1296 with the name Il Duomo di Firenze. It was completed in 1436.

The building up close was beautiful; there were layers of square patterns made of green rock eventually leading up to arches. Some windows were actually off center with some parts of the wall, though there was so much detail surrounding everything that I hardly noticed.



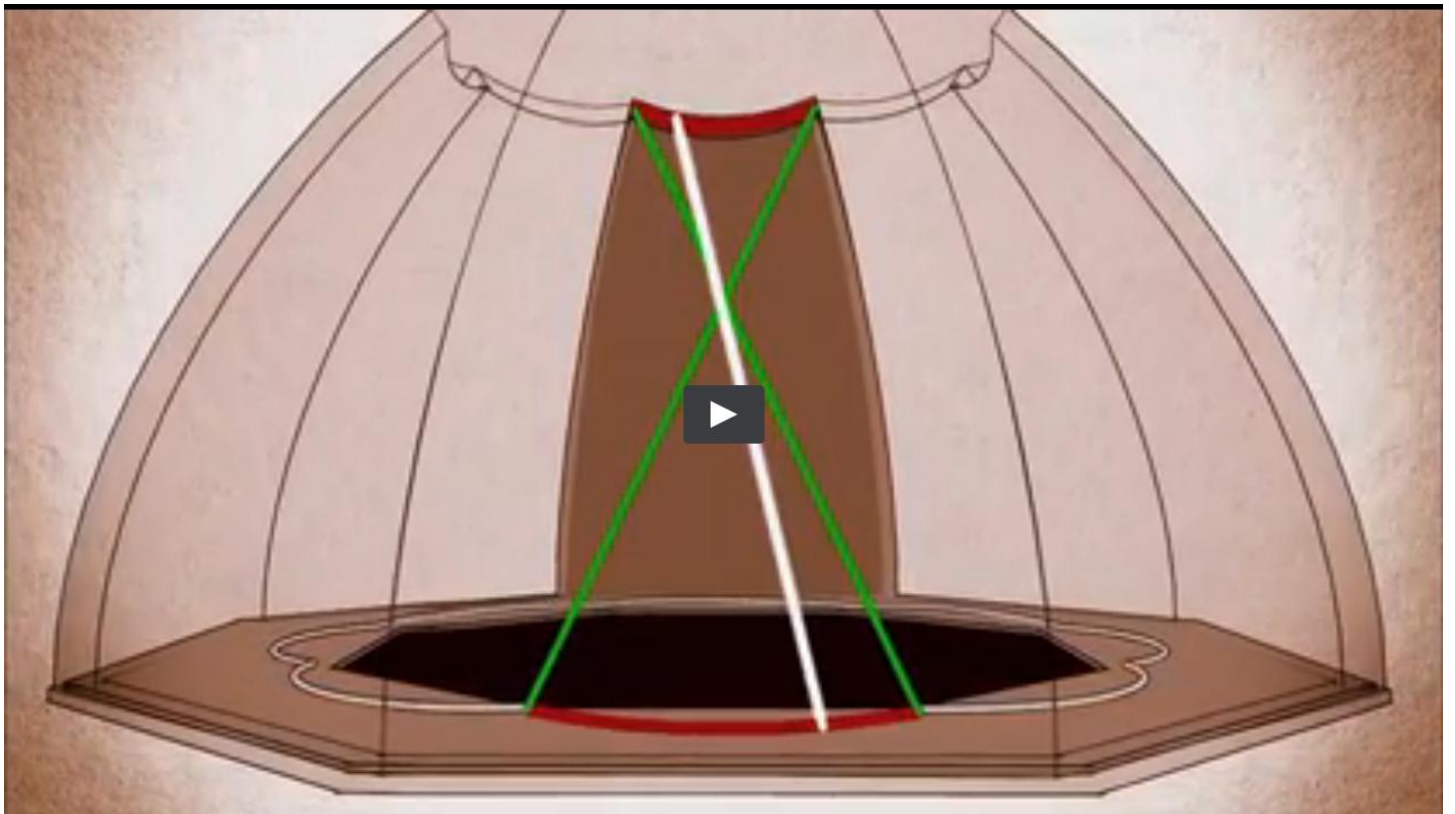
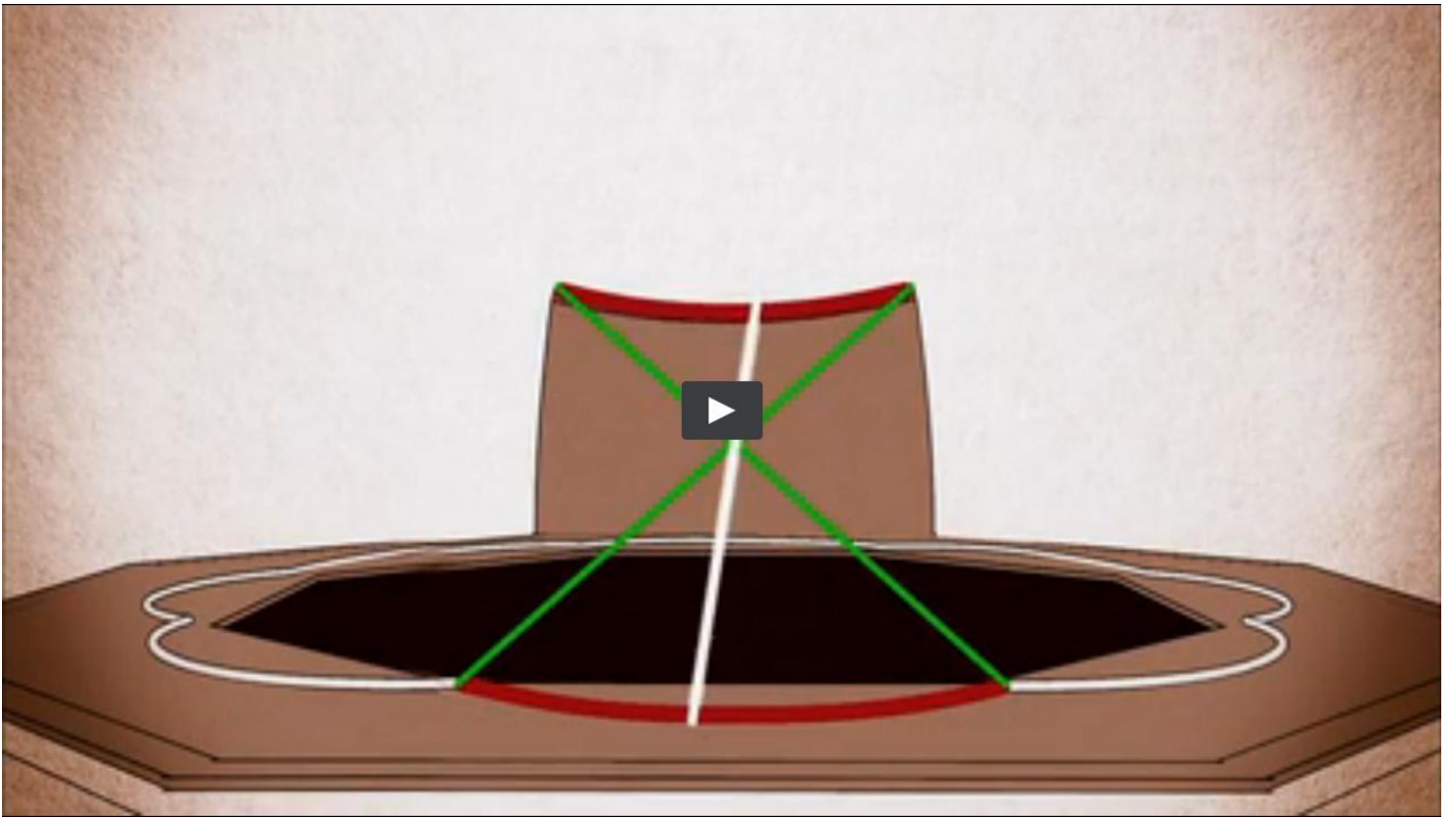
600 Years ago, a goldsmith named Filippo who had no training as an architect would be the engineer and architect who designed the Basilica di Santa Maria del Fiore. He inspired the beginning of the renaissance. Consisting of over 4 million bricks and weighing over 40 thousand tons, it is the largest masonry dome in the world. There are actually 2 domes, one inner layer concealing a stairwell. There are no known drawings or notebooks of Filippo's work left behind. It is possible that he had sent them to someone. His tomb is actually kept beneath the cathedral. The Florentine people were competitive and were determined to surpass the Romans' pantheon. To use a scaffold to hold the dome in place while building would have taken hundreds of trees and years of more construction. They therefore needed to find a way to keep walls that curve inward in place while they are built upward. 80 Years before Filippo began work on the Cathedral, it had already been decided that it would be enormous. He began working at 14 years old as a goldsmith. Any sculpting profession such as metallurgy was considered a perfect prerequisite to architecture. After he lost a competition for the bronze doors on the baptistery in

front of the Cathedral, he left for 15 years to Rome to study. The Dome has 8 arched pillars that work as a ribcage. Once the Cathedral was nearly complete, it still lacked a dome, and no one knew how to build it. A competition was held for possible models of how it should be built. Of all the contestants, he was the only person who had never designed a building before. Filippo was also the only finalist to not show his methods as he wanted to keep some secret. He asked for every other finalist to try to keep an egg standing upright on a tabletop, no one could. He then breaks the egg in half and stands it on the table. The other contenders say they would have done the same if they had known. Filippo says that they could have built the dome as well if they knew what he had known. He invented a machine that is powered by oxen walking in a circle to power a pulley system that lifts materials up 170 feet to the rim of the dome. This machine was able to move things up and down, he invented the first reverse wheel in history. He was able to keep the dome in place by inventing a method of laying brick shown right; vertical spirals of brick interrupt the horizontal brick. This style is called Spinapesce, or “spine of the fish”. In English this is called Herringbone. Laying brick this way blocks the mortar’s plains of weakness and prevents sections of wall from separating or sheering. The brick dips down between the spine of the dome, creating inverted arches between each arched pillar.



Records of a flower pattern drawing on a platform level with the base of the dome is related to the dome’s walls’ curvature to guide the laying of bricks with wire (shown below)

This connection between the flower and how strings were used to build the dome perfectly symmetrical from all sides is considered to be the true secret of Brunelleschi’s dome.



We also visited the statue of David in a museum along with several other plaster casts and paintings that depict stories from the bible. I was impressed and felt the emotion portrayed in many of these statues.



