

We Built This City!
Math 8

Name: _____

Together, the Math 8 community at Burnaby North is going to build a city! We have looked at some examples of amazing architecture from around the world, and as a class have come up with some ideas for the types of buildings that are needed in order to create a city. With a partner you will create a building for our city; as a class we will put them all together to build the city; and as a school we will put our cities together to create a metropolis!

You will need to agree with your partner on a design as soon as possible. Be sure to check in with Ms. Young once you've decided what kind of building you want to create, to make sure we don't have multiple types of the same buildings. You may use any materials you want to create your building (boxes, cans, yogurt containers, etc...). Each group will get a square plot with dimensions 40 cm by 40 cm. This means that the base of your building may not be any larger than this. The building can be as tall as you want, but no bigger than the height of a standard classroom door.

Stage 1: Design and Construction (Due Feb. 2nd)

- Determine the shapes your building will be made out of. You must include at least 2 of the following shapes:
 - Rectangular prism
 - Triangular prism
 - Cylinder
 - Square pyramid (optional)
- Determine and obtain the necessary materials to create your building.
- Construct your building. Make sure all the pieces are securely attached (glue, tape, duct tape...) You should also consider painting your building or covering it with paper.
- Accessorize! Make the outside of your building look like it would in real life. Draw on or attach doors, windows, roofing, etc...

Stage 2: 3-D views and nets (Due Feb. 8th)

- Build an architecture plan by creating isometric drawings of your building to show the front, top and side views.
- Draw the nets for all the shapes included in your building.
- Measure and record the dimensions of each part of your building. Include these dimensions on your isometric drawings and on your nets.

Stage 3: Volume and Surface Area (Due Feb. 15th)

- Calculate the total volume of your building. This represents the total space that will need to be heated/cooled inside the building. Remember to include all of your shapes! This must be done on a separate piece of paper showing all calculations. Please label each calculation, using diagrams if necessary, so anyone looking at your work can follow your steps.
- Calculate the total surface area of your building. This represents the total area that will need to be painted. This means every part that you can see (so which surfaces will you need to subtract?). This must be done on a separate piece of paper showing all calculations. Please label each calculation, using diagrams if necessary, so anyone looking at your work can follow your steps.

Stage 4: Individual Unit Test (Feb. 22nd)

- Individually, you will be given an example of a building and asked to determine the surface area and volume of the structure as well as draw 3-D views and nets.

Stage 5: Presentation (Due Feb. 26th)

- At the end of February we will be setting up our city in the Gallery and presenting to the Burnaby North community. After this presentation, you will submit all of the above. Use the checkboxes to ensure you have completed everything!

Stage 6: Reflection

- What went well? What didn't go well? What would you do differently?
- What surprised you?
- Explain how your understanding of surface area and volume has deepened.
- How has this activity helped you perceive the world with a mathematical lens?