THAMES VALLEY DISTRICT SCHOOL BOARD
MTH1W – GRADE 9 MATHEMATICS

INDIVIDUAL CODING ASSIGNMENT

Complete the following questions by providing **full, well-communicated** written solutions (justifying your reasoning, explaining your logic, and detailing what operations you have used). Even if your calculations and codes are correct, you will not get full marks for a solution that is not clearly presented (notation, form, concluding statements, etc.). It might help if you imagine that you are explaining the entire solution to a friend who has no knowledge of volume and coding. There may be more than one way to solve a problem; however, you must communicate your method clearly, and you must **include flowcharts where appropriate**.

Permissible aids:

- You may use a calculator and your class notes for this assignment.
- You may ask your teacher for clarification.

Unauthorized aids:

- You may not receive assistance from other individuals on this assessment including, but not limited to, classmates, peers, tutors, other teachers, etc.
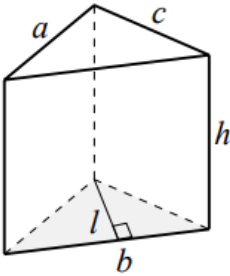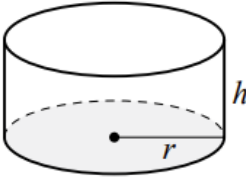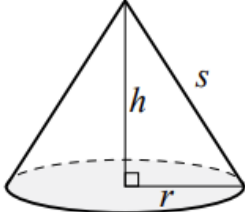
Please ensure:

- You write up your full solutions using neat handwriting or technology. If by hand, please make sure that you write clearly, and with a dark enough pencil or ink so that I can easily read your work.
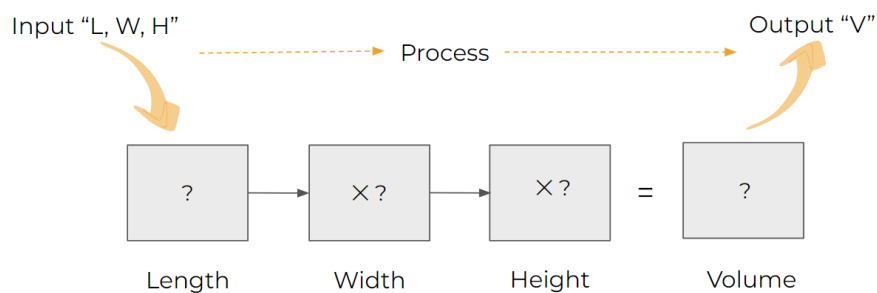- You will be creating a solution file that can be shared with me.

Submitting:

- Please ask your teacher for further instructions on how to submit your assignment and its due date.

For the following assignment, you will be choosing one task to calculate volume. Each task is classified as MILD (🌶), MEDIUM (🌶 🌶), or SPICY (🌶 🌶 🌶). You may choose which level of spiciness you would like to complete.

MILD (🌶)	MEDIUM (🌶 🌶)	SPICY (🌶 🌶 🌶)
Triangle-based prism	Cylinder	Cone

1. For your chosen shape, answer the following questions:

   a. How many unknowns (variables) will there be in the calculation?
   b. Are there any knowns (given values) in the calculation? If so, what is the value?

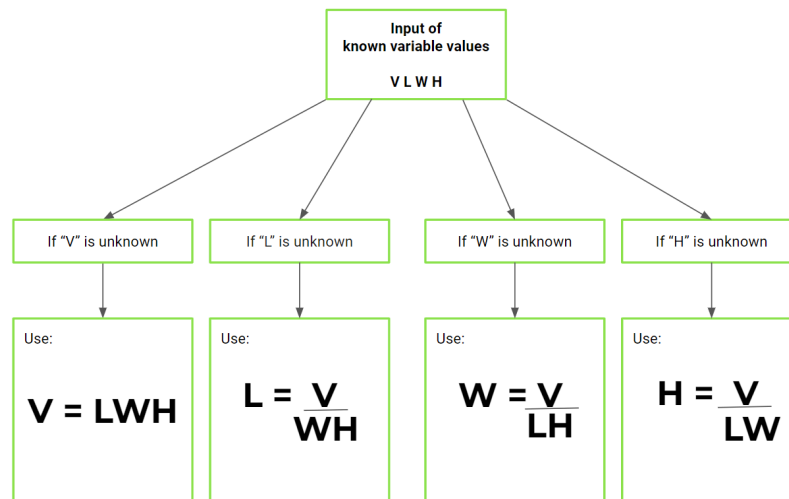2. Create a flowchart for the calculation of the **volume** of your shape.

   Hint: Your chart will look similar to this:

3. Develop a general calculation for the **volume** of your shape. "General" means that you have no information about the measurements of the shape.

4. Code your **volume** calculation into Scratch. Take a screenshot. Make sure that you save your code as you will be sharing this file at the end of the assignment.

5. Test your code. Choose values for your unknowns – make sure to write them down on paper.

   a. Calculate the volume by hand on paper. Show all your work.

b. Compare your answer on paper with the answer given by your code. Take a screenshot. (It is okay is they are different values).

c. Were the values the same? If yes – move to question 6. If no – continue with "d"

d. Did you need to debug your code? What was the bug? How did you change your code to get rid of the bug?

6. Create a flow chart to show the different calculations you would need to do if the different variables were unknown.

   Hint: Your chart will look similar to this:

7. Program the other branches of your flowchart. Take a screenshot.

8. Test your code. Choose values for your unknowns – make sure to write them down on paper.

   a. Calculate the volume by hand on paper. Show all your work.

   b. Compare your answer on paper with the answer given by your code. Take a screenshot. (It is okay is they are different values).

   c. Were the values the same? If yes – move to question 9. If no – continue with "d"

   d. Did you need to debug your code? What was the bug? How did you change your code to get rid of the bug?

9. Give your code to a classmate to look over – what suggestions do they have on how to make your code more efficient (faster with less code) and easier to understand?

Extension (optional)

10. You are given measurements that have decimals. Your teacher asks you to accurately round your answers to two decimal places.

a. In words, how can you modify your code so that it will round your answers to two decimal places?
b. Modify your code and test it.
c. Calculate the volume by hand on paper. Show all your work.
d. Compare your answer on paper with the answer given by your code. Take a screenshot. (It is okay is they are different values).
e. Were the values the same? If yes – you are finished! If no – continue with "f"
f. Did you need to debug your code? What was the bug? How did you change your code to get rid of the bug?