The CO2 Racer Challenge
Thinking Assignment #1
Day 1

You are an Engineer who has been given the task of designing the fastest CO2 Racer. Working with students from Grade 10 Math and Tech, you will design, build and race your own Race Car. You will be provided with all of the supplies that you will need.

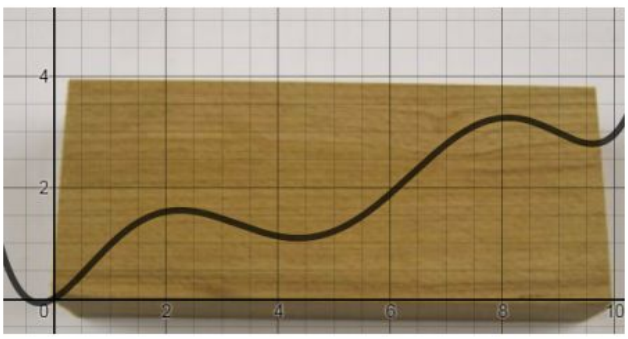
As the Engineer on the project, you are responsible for creating the overall design, testing the race car, determining how closely the real race car met the design and making a hypothesis about how you could make your car go faster.

Follow the steps below to create your Race Car Design.

1) Using technology, take a side profile picture of the block of wood that you will be using to make your car.
2) Insert this picture into Desmos and place the bottom left corner of the wood block at the origin.
3) Using a polynomial equation of your own design, create and draw a curve that will represent the overall shape of your race car. Be sure to discuss your design with your group members as they are the ones building the race car.
4) Save a copy of your Desmos film and make sure you share it with your group members. Include a link to your Desmos file below. Feel free to draw or record your design directly onto your race car.

My Desmos File is available here:_____

If you are having trouble creating a curve, regression can help! Create some points on your image and use a regression model to help find a curve that comes close to those points



This assignment will be marked based on this rubric.

The CO2 Racer Challenge
Thinking Assignment #1
Day 2

Your design for a race car has been made into reality. Today, you will test your design. The remainder of this assignment must be done individually.

1) Take a profile picture of your finished race car.
2) Determine the speed of your car by measuring the distance it has travelled and dividing by the time in seconds it took to travel that distance. Show your calculation below.
3) Insert your picture into Desmos and place the bottom left corner of your race car at the origin.
4) Using a polynomial regression that is the same degree as your original design curve, determine a curve of best fit for your Race Car. Record your equation and r-squared value below. Include a picture of your graph or a link to your Desmos file.

My Equation:_____

My r-squared value:_____

5) Collect speed and r-squared values from at least five other teams. Using your collected data, do you feel that there is a relationship between the r-squared value and the speed of the race cars? Fully justify your answer.

r-squared	Speed (m/s)

6) Are there other factors that may impact the speed of your race car?

7) What design changes would you make if you were to build a race car again?

Note: If you do not wish for this assignment to be marked, delete the entire assignment and submit the blank document