



Ultimate Design Challenge

Scimatics 8

Max “Meerkat” Louie and Patrick “Toaster” Jelstad



The object we decided to make is a Mongoose ATV from The Halo Franchise. It is a four-wheeled vehicle, so it is generally designed with maximum surface area in mind.

Surface area

Original formula: $(l \times w) + (l \times w) + (w \times h) =$

$$576 + 448 = 1,024 \times 5 = 5,120$$

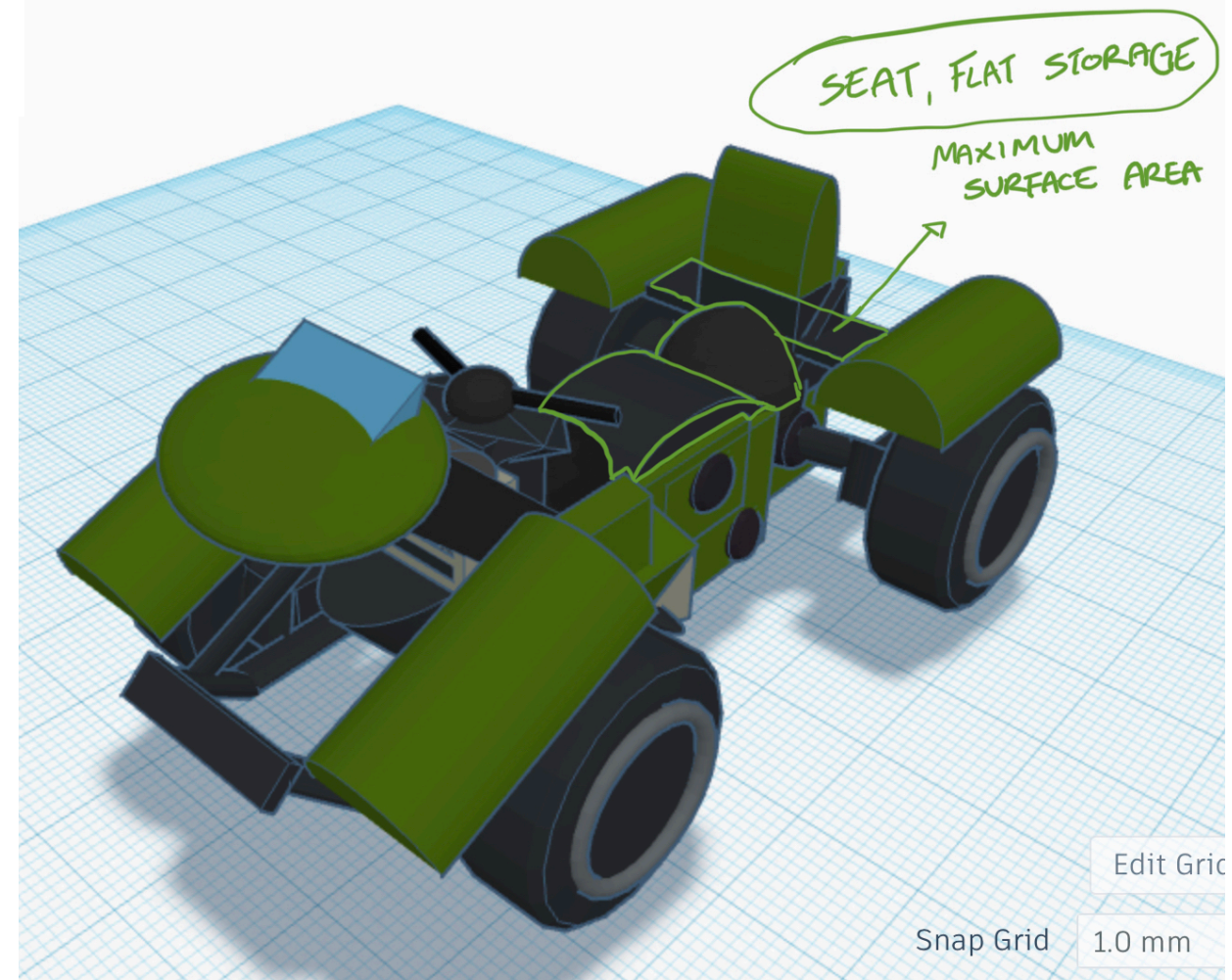
$$22 + 4 = 26 \times 4 = 104$$

$$(48 + 54 + 288) \times 2 = 780$$

Total surface area: 8,918 mm²

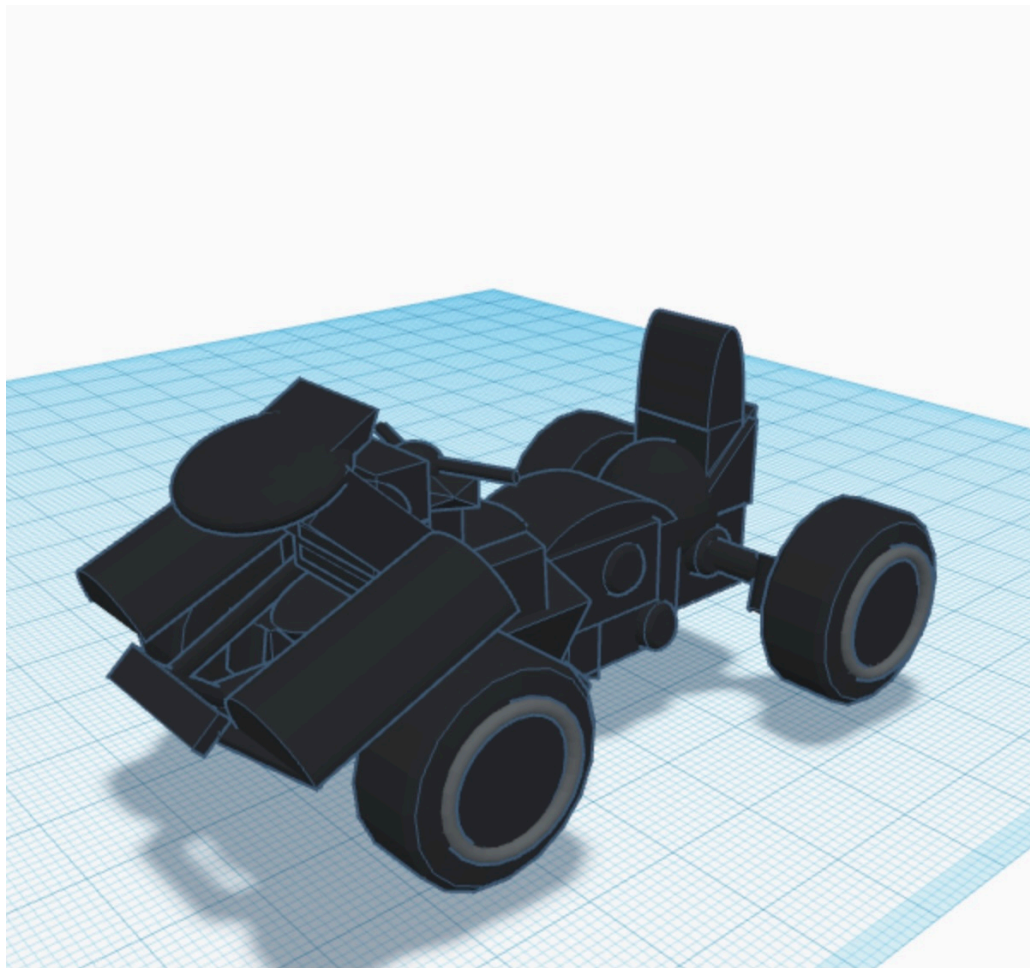
$$147 + 77 + 231 = 455 \times 2 = 686$$

$$(117 + 180 + 260 = 557 \times 2 = 1,114) \times 2 = 2,228$$

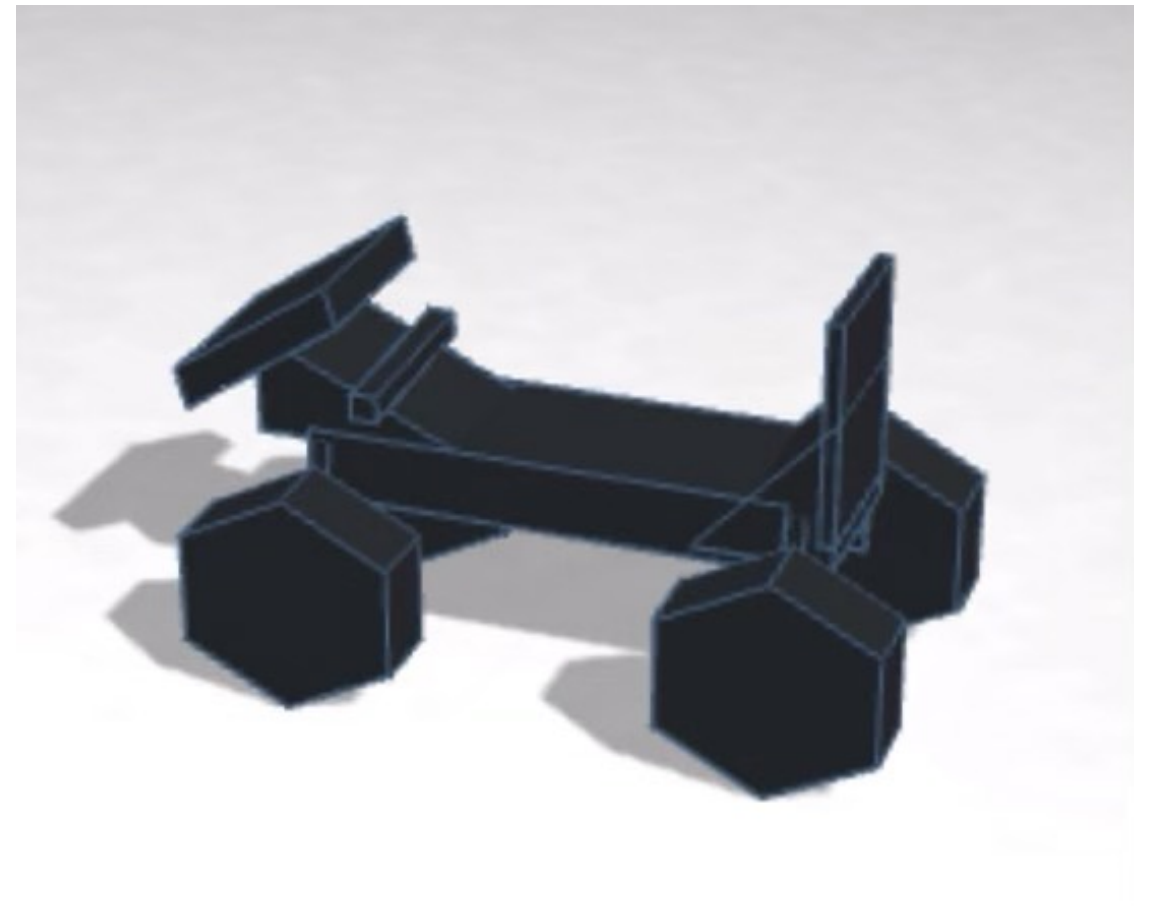


Our final product was too advanced to find the surface area and volume in it, so we had to make a simplified model, which wasn't pretty, but we could accurately do our calculations with.

Before:



After:



We also needed to know the volume of our vehicle, so we used the volume formula we learned in class, to calculate and find the volume of our vehicle.

Volume

Original formula: $l \times w \times h =$

$$(18 \times 7 \times 16) \times 5 = 10,080$$

$$(1 \times 7) \times 4 = 28$$

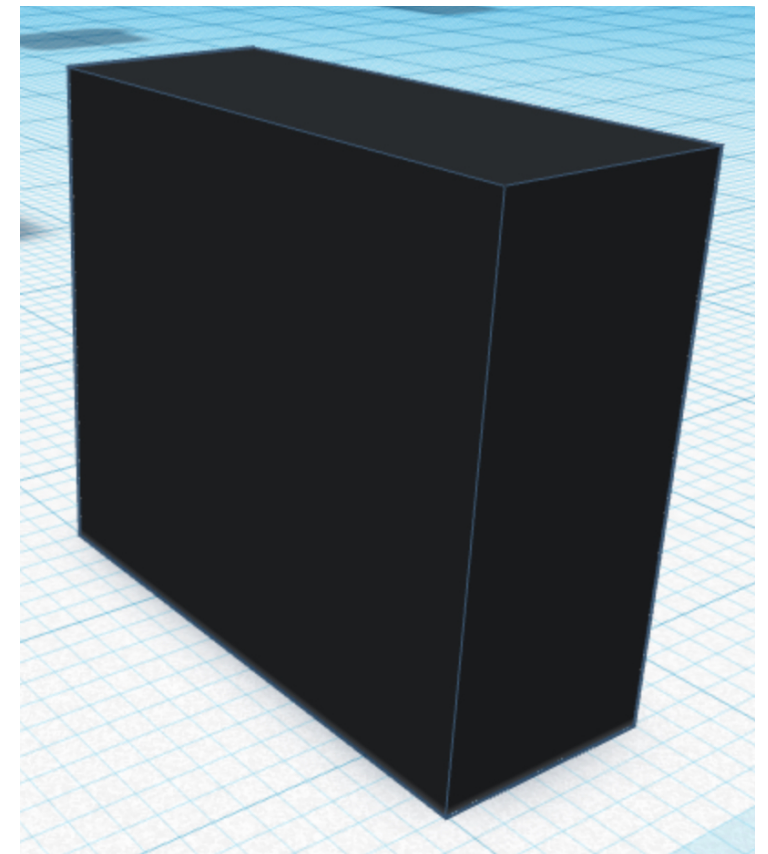
$$18 \times 16 \times 3 = 864$$

$$(21 \times 11 \times 7) \times 2 = 1,617$$

$$43 \times 15 \times 6 = 3,870$$

Total Volume: 16,459 mm²

When making our simple version we unintentionally used almost all rectangular prisms. This made doing the calculations easier but after the fact I thought it was a bit less creative.



We also had to find the surface area to volume ratio to find out if our vehicle was in the end maximized for surface area

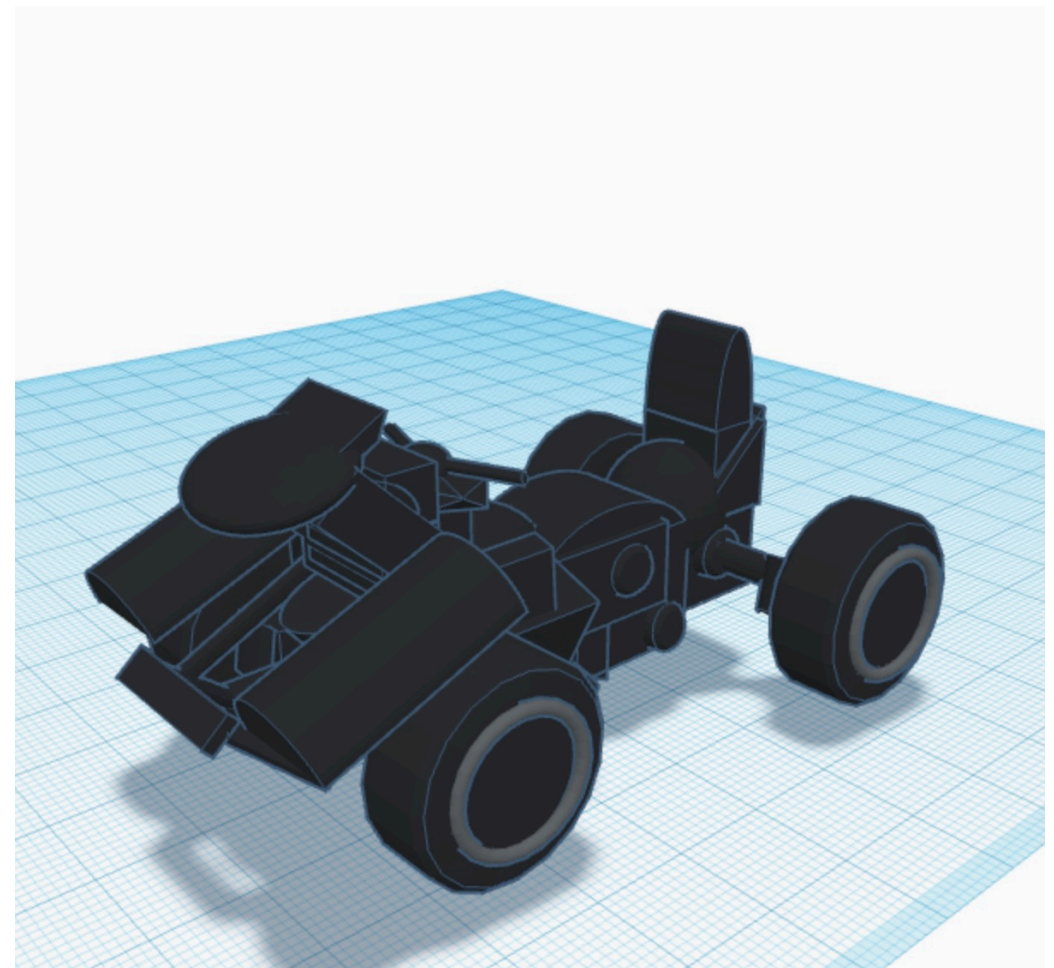
SA - V ratio:

$$8,918 \text{ mm}^2 : 16,459 \text{ mm}^2$$

$$8,918 \text{ mm}^2 / 16,459 \text{ mm}^2$$

$$= 0.45$$

$$0.45 : 1$$



Exit Slide

Bottom text

