

# Shipping Container Conundrum

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## *Challenge Problem and Resources*



### **Developed by:**

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Gaming Research Integration for Learning Laboratory™ (GRILL™)  
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## 1. CHALLENGE PROBLEMS: SHIPPING CONTAINER CONUNDRUM

When goods, such as food, electronics, and cars have to be transported across the globe, they are often packed and shipped in large, steel containers. The container sizes are standardized - most commonly 20 or 40 feet long by 8 feet wide - so that they can be efficiently stacked and so that ships, trains, trucks, and cranes can be fitted or built to a single, specific size. These containers can then easily be moved between ships, trucks and trains. Once a container reaches its destination, the goods are unloaded, and if

possible the container is reused to ship goods to somewhere else in the world. However, in countries that import more goods than they export, such as the United States, shipping containers accumulate because it is cheaper to build new shipping containers than it is to transport them back to the country of origin. An estimated 700,000 to 2 million shipping containers are lying unused in shipping yards across the US.



Wendel Construction plans to reuse these containers as housing. Shipping containers are repurposed as housing for a number of reasons: emergency housing after natural disasters, low cost housing, reduced ecological impact, or for people adopting a minimalist lifestyle (i.e., tiny house movement). Many of the features that make the containers practical for transporting goods are also advantageous for housing - they are water-tight, strong, and can be stacked.



Wendel Construction has tasked your team with designing a shipping container home.

## 1.1. THE TOOLS

Use SketchUp to create the design for the containers.

## 1.2. THE CHALLENGE

Design and model a 40 foot high-cube shipping container home for 2 or more people using SketchUp. The solution should include a list of essential household items, a 1/24 scale floor plan, the container home model, and a technical description of the home.

**Note:** Use the following charts to construct the container dimensions and pace the project.

		20' container		40' container		40' high-cube container		45' high-cube container	
		imperial	metric	imperial	metric	imperial	metric	imperial	metric
external dimensions	length	20' 0"	6.096 m	40' 0"	12.192 m	40' 0"	12.190 m	45' 0"	13.716 m
	width	8' 0"	2.438 m	8' 0"	2.438 m	8' 0"	2.438 m	8' 0"	2.438 m
	height	8' 6"	2.591 m	8' 6"	2.591 m	9' 6"	2.896 m	9' 6"	2.896 m
interior dimensions	length	18' 10 <sup>5</sup> / <sub>16</sub> "	5.758 m	39' 5 <sup>45</sup> / <sub>64</sub> "	12.032 m	39' 4"	12.000 m	44' 4"	13.556 m
	width	7' 8 <sup>19</sup> / <sub>32</sub> "	2.352 m	7' 8 <sup>19</sup> / <sub>32</sub> "	2.352 m	7' 7"	2.311 m	7' 8 <sup>19</sup> / <sub>32</sub> "	2.352 m
	height	7' 9 <sup>57</sup> / <sub>64</sub> "	2.385 m	7' 9 <sup>57</sup> / <sub>64</sub> "	2.385 m	8' 9"	2.650 m	8' 9 <sup>15</sup> / <sub>16</sub> "	2.698 m
door aperture	width	7' 8 <sup>1</sup> / <sub>8</sub> "	2.343 m	7' 8 <sup>1</sup> / <sub>8</sub> "	2.343 m	7' 6"	2.280 m	7' 8 <sup>1</sup> / <sub>8</sub> "	2.343 m
	height	7' 5 <sup>3</sup> / <sub>4</sub> "	2.280 m	7' 5 <sup>3</sup> / <sub>4</sub> "	2.280 m	8' 5"	2.560 m	8' 5 <sup>49</sup> / <sub>64</sub> "	2.585 m
volume		1,169 ft <sup>3</sup>	33.1 m <sup>3</sup>	2,385 ft <sup>3</sup>	67.5 m <sup>3</sup>	2,660 ft <sup>3</sup>	75.3 m <sup>3</sup>	3,040 ft <sup>3</sup>	86.1 m <sup>3</sup>
maximum gross mass		66,139 lb	30,400 kg	66,139 lb	30,400 kg	68,008 lb	30,848 kg	66,139 lb	30,400 kg
empty weight		4,850 lb	2,200 kg	8,380 lb	3,800 kg	8,598 lb	3,900 kg	10,580 lb	4,800 kg
net load		61,289 lb	28,200 kg	57,759 lb	26,600 kg	58,598 lb	26,580 kg	55,559 lb	25,600 kg

