### THE LONG HAUL – SCAFFOLDED Freight Worksheet

Product	Apple
Rail Car	Refrigerated Box Car
Shipping Information	<b>7,500 cases</b> Case: 23 ½" L x 15 ½" W x 11" H Pallet Dimensions: 40" L x 48" W Cases per pallet: 30 Cases per layer: 6
Rail Car Questions	What are the dimensions of the rail car?
	What is the cost per leg for this rail car?
Apple Freight Questions	What are the dimensions of a pallet stacked with six layers of cases? (Note: The cases fit onto the pallet without overhang. The length and width of a pallet do
Conversions	not change when it is loaded with freight.)
1 oil drum = 42 gallons	
1 cubic foot = 7.5 gallons	
1 cubic yard = 202 gallons	
1 cubic yard = 27 cubic feet	
1 cubic foot = 1,728 cubic inches	
1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	

#### Apple Freight Questions (continued)

How many pallets will fit into a rail car? (Hint: First, convert the dimensions of the rail car to inches.)

#### Conversions

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)  How many pallets will fit lengthwise? (The pallets can be loaded in two ways. Be certain to figure out which configuration will fit the most pallets.)

• How many pallets will fit widthwise?

· How many pallets can be stacked one on the other?

· How many pallets will fit into a rail car?

#### Apple Freight Questions (continued)

How many pallets of apples must be shipped?

#### Conversions

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher) How many rail cars will be needed to ship all the pallets?

How many legs will each car of apples travel? (A leg is one trip between stops. This information is provided in the Train Route. The first leg is from Boston to Newark.)

What is the cost to ship the apples?

Product	Molded Dashboard Covers
Rail Car	Covered Box Car
Shipping Information	<b>500 pallets</b> Loaded Pallet Dimensions: 40" L x 48" W x 48" H
Rail Car Questions	What are the dimensions of the rail car? (This car comes in two sizes. You will need to do the math for
Conversions	both to decide which is less expensive to use.)
1 oil drum = 42 gallons	What are the dimensions of each rail car?
1 cubic foot = 7.5 gallons	60' Car:
1 cubic yard = 202 gallons	
1 cubic yard = 27 cubic feet	
1 cubic foot = 1,728 cubic inches	50' Car:
1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	What is cost per leg for this rail car? 60' Car:

50' Car:

Molded Dashboard Cover Freight Questions	How many pallets will fit into a rail car? (The pallets can be loaded in two ways. Be certain to figure out which configuration will fit the most number of pallets.)
Conversions 1 oil drum = 42 gallons 1 cubic foot = 7.5 gallons 1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches 1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be	<ul> <li>How many pallets will fit lengthwise? (Remember to show your work.)</li> <li>60' Car:</li> <li>50' Car:</li> </ul>
stacked higher)	<ul> <li>How many pallets will fit widthwise?</li> <li>60' Car:</li> </ul>

50' Car:

How many pallets can be stacked one on the other?
60' Car:

Molded Dashboard Cover Freight Questions (continued)	What is the total number of pallets that will fit into a rail car?
	60' Car:
Conversions	
1 oil drum = 42 gallons	
1 cubic foot = 7.5 gallons	
1 cubic yard = 202 gallons	50' Car:
1 cubic yard = 27 cubic feet	
1 cubic foot = 1,728 cubic inches	
1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	How many rail cars are needed to ship all the pallets? 60' Car:

50' Car:

How many legs will each car travel? (A leg is one trip between stops. The first leg is from Boston to Newark. This information is provided in the Train Route.)

What is the cost to ship the molded dashboard covers?

60' Car:

50' Car:

Product	Road Salt
Rail Car	Covered Hopper
Shipping Information	<b>200 tons</b> 2,160 lbs. per yd³ of salt
Rail Car Questions	What are the dimensions of the rail car?

#### Conversions

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher) The diagram shows the compartments in a Covered Hopper Car.



What are the total dimensions of all three top compartments? (Assume that the space taken by the dividers is too small to consider.)

Length =

Width =

#### Height =

#### Rail Car Questions (continued)

#### Conversions

1 oil drum = 42 gallons
 1 cubic foot = 7.5 gallons
 1 cubic yard = 202 gallons
 1 cubic yard = 27 cubic feet
 1 cubic foot = 1,728 cubic inches
 1 standard pallet (loaded) =
 40" L x 48" W x 48" H
 (some products may be stacked higher)

What is the volume, in cubic feet, of the top compartments? (Hint: First convert all measurements to decimals, in feet.)

Because the product shipping information speaks of cubic yards, you will need to convert cubic feet to cubic yards. What is the volume, in cubic yards, of the top compartments?

#### Rail Car Questions (continued)

#### Conversions

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)



What is the volume, in cubic feet, of ONE bottom compartment? (Hint: First convert all measurements to decimals, in feet.)

What is the volume, in cubic yards, of ONE bottom compartment?

Rail Car Questions (continued)	What is the volume, in cubic yards, of all three bottom compartments?
Conversions 1 oil drum = 42 gallons 1 cubic foot = 7.5 gallons 1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches 1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	What is the total volume, in cubic yards, of all compartments (top and bottom)?
	What is the shipping cost per leg for this Hopper Car?
Road Salt Freight Questions	What is the volume, in cubic yards, of road salt being shipped?
	On the basis of volume, how many rail cars are needed to transport the road salt?

#### Road Salt Freight Questions (continued)

#### Conversions

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher) What is the weight of the freight?

What is the rail car weight limit?

On the basis of weight, how many cars will be needed to transport the freight?

How many legs will each car travel? (A leg is one trip between stops. This information is provided in the Train Route.)

What is the cost of shipping the road salt?

Product	Barley
Rail Car	Covered Hopper
Shipping Information	<b>2 full grain silos</b> Dimensions of grain silo: 26'9"H x 30'Diameter
Rail Car Questions	What are the dimensions of the rail car?
Conversions 1 oil drum = 42 gallons 1 cubic foot = 7.5 gallons 1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches 1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	The diagram shows the compartments in a Covered Lopper Car. $\int_{1}^{3} \int_{1}^{3} \int_{$

Width =

Height =

Rail Car Questions (continued)	What is the volume, in cubic feet, of the top compartments? (Hint: First convert each measurement to a decimal, in feet.)
Conversions	
1 oil drum = 42 gallons	
1 cubic foot = $7.5$ gallons	

1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches 1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be

stacked higher)

What is the volume, in cubic feet, of all three bottom compartments?

What is the total volume of all compartments (top and bottom) in cubic feet?

(some products may be

stacked higher)

Barley Freight Questions	How many cubic feet of barley are in each silo?
Conversions	
1 oil drum = 42 gallons	
1 cubic foot = 7.5 gallons	
1 cubic yard = 202 gallons	
1 cubic yard = 27 cubic feet	How many cubic feet of barley need to be shipped?
1 cubic foot = 1,728 cubic inches	
1 standard pallet (loaded) = 40" L x 48" W x 48" H	How many rail cars does it take to transport the barley?

How many legs will each car travel?

What is the cost of shipping the barley?

Product	Liquid Fertilizer
Rail Car	Tanker
Shipping Information	140,000 gallons
Rail Car Questions	What are the dimensions of the rail car?
Conversions 1 oil drum = 42 gallons 1 cubic foot = 7.5 gallons 1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches	What is the volume of the car?
1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	

What is the cost per leg for this rail car?

#### Liquid Fertilizer Freight Questions

How many cubic feet of liquid fertilizer must be shipped?

#### Conversions

 oil drum = 42 gallons
 cubic foot = 7.5 gallons
 cubic yard = 202 gallons
 cubic yard = 27 cubic feet
 cubic foot = 1,728 cubic inches
 standard pallet (loaded) =
 40" L x 48" W x 48" H
 (some products may be stacked higher)

On the basis of volume, how many rail cars are needed to transport the liquid fertilizer?

How many legs will each car travel?

What is the cost of shipping the liquid fertilizer?

Product	Plastic Chemicals
Rail Car	Tanker Car
Shipping Information	160,000 gallons
Rail Car Questions	What are the dimensions of the rail car?
Conversions 1 oil drum = 42 gallons 1 cubic foot = 7.5 gallons 1 cubic yard = 202 gallons 1 cubic yard = 27 cubic feet 1 cubic foot = 1700 cubic feet	What is the volume of the car?
1 cubic foot = 1,728 cubic inches 1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	

What is the cost per leg for this rail car?

#### Plastic Chemical Freight Questions

How many cubic feet of plastic chemicals must be shipped?

#### Conversions

stacked higher)

1 oil drum = 42 gallons
 1 cubic foot = 7.5 gallons
 1 cubic yard = 202 gallons
 1 cubic yard = 27 cubic feet
 1 cubic foot = 1,728 cubic inches
 1 standard pallet (loaded) =
 40" L x 48" W x 48" H
 (some products may be

On the basis of volume, how many rail cars are needed to transport the plastic chemicals?

How many legs will each car travel?

What is the cost of shipping the plastic chemicals?

Product	Fresh-Cut Logs
Rail Car	Plain Gondola
Shipping Information	<b>20 Fresh-Cut Logs</b> 65'7" L x 3' Diameter
Rail Car Questions	What are the dimensions of the rail car?
<b>Conversions</b> 1 oil drum = 42 gallons	What is the cost per leg for this rail car?
<ol> <li>1 cubic yard = 202 gallons</li> <li>1 cubic yard = 27 cubic feet</li> <li>1 cubic foot = 1,728 cubic inches</li> </ol>	The logs are too long to lie flat in the car. The logs cannot extend above the top of the car. Will the logs fit? (Hint: Change the measurements to decimals, in feet, and use the Pythagorean Theorem. Make a diagram.)
1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)	

### Fresh-Cut LogHoFreight Questionstop

How many rows of logs fit without extending above the top of the car?

#### Conversions

1 oil drum = 42 gallons
1 cubic foot = 7.5 gallons
1 cubic yard = 202 gallons
1 cubic yard = 27 cubic feet
1 cubic foot = 1,728 cubic inches
1 standard pallet (loaded) =
40" L x 48" W x 48" H
(some products may be stacked higher)
How many logs can fit in each layer?

How many logs can fit into each car?

How many cars will be needed to transport the logs?

#### Fresh-Cut Log Freight Questions (continued)

#### Conversions

How many legs will each car travel?

What is the cost of shipping the logs?

- 1 oil drum = 42 gallons
- 1 cubic foot = 7.5 gallons
- 1 cubic yard = 202 gallons
- 1 cubic yard = 27 cubic feet
- 1 cubic foot = 1,728 cubic inches

1 standard pallet (loaded) = 40" L x 48" W x 48" H (some products may be stacked higher)