

18-1 Computing the Total Storage Space

Your business might have a **warehouse**, or storage space, to hold your materials or products until you're ready to use them, sell them, or ship them. Your space requirements depend on the size and quantity of the items you're storing. Most storage space is measured in cubic feet. A cubic foot is 1,728 cubic inches (12 inches by 12 inches by 12 inches), so you can change cubic inches to cubic feet by dividing by 1,728.

Example

Find the amount of storage space needed.

Smith Flooring needs a warehouse to keep rolls of carpeting and linoleum. Each roll measures 10 feet by 1 foot by 1 foot. How many cubic feet of storage space are needed for 500 rolls?

1. Find the volume of one roll.

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

$$10 \text{ ft} \times 1 \text{ ft} \times 1 \text{ ft} = 10 \text{ cubic ft}$$

2. Find the amount of storage space needed.

$$\text{Storage Space} = \text{Volume per Item} \times \text{Number of Items}$$

$$10 \text{ cubic ft} \times 500 = 5,000 \text{ cubic ft}$$

Practice

Find the amount of storage space needed in cubic feet.

	Item	Item Dimensions			Number of Items	Storage Space (in cubic ft)
		Length	Width	Height		
1.	DVD Player	25 in	10 in	4 in	1,000	
2.	Weed Whacker	6 in	6 in	30 in	25	
3.	Air Conditioner	2 ft	2 ft	1.5 ft	20	
4.	Refrigerator	2.5 ft	3 ft	6 ft	50	

5. Home Décor wants to store 500 cans of paint on its warehouse shelves. Each can measures 7 inches by 7 inches by 9 inches. How many cubic feet of shelving space are needed to store the paint?
6. Autographed Sports Cards needs to store 6,000 baseball display cases in its warehouse. Each display case measures 4 inches by 4 inches by 4 inches. How many cubic inches of storage space are needed? How many cubic feet?
7. Sal and Anita Warren want to store boxes with the following dimensions in their attic: 8 boxes with dimensions of 2 feet by 1.5 feet by 1 foot, and 12 boxes with dimensions of 10 inches by 12 inches by 12 inches. How many cubic feet of attic space will the boxes take up?
8. **Standardized Test Practice** Shoe Warehouse wants to store 1,500 boxes of shoes and 400 handbags. The dimensions of each shoebox are 12 inches by 6 inches by 4 inches. The dimensions of the handbags are 8 inches by 2 inches by 10 inches. How many cubic feet of storage space are needed?
 A. 287.04 B. 448 C. 250 D. 496,000

18-2 Calculating Your Total Inventory

Your **inventory** is the total number of each item your business has in stock. An **inventory card** keeps a record of the items you have on hand. The number of items you have coming in, called *receipts*, is added to your previous inventory. The number of items going out, called *issues*, is subtracted from your previous inventory.

Example

Find the inventory.

Smith Flooring had 500 rolls of linoleum in stock on June 1. During the month, it received 300 rolls and sold 450. What is the inventory at the end of June?

Find the inventory.

Inventory = Previous Inventory + Receipts – Issues

$500 + 300 - 450 = 350$ rolls

Practice

Complete the following inventory table for Fancy Furniture.

	Month	Opening Balance	Receipts (Qty. in)	Issues (Qty. out)	Number on Hand
1.	January	100	25	32	a.
2.	February	a.	30	45	b.
3.	March	a.	50	42	b.
4.	April	a.	15	37	b.

- Autographed Sports Cards had 6,000 baseball display cases in stock on January 1. Throughout the year, it had receipts of 2,500 and issues of 7,750. What is its year-end inventory of display cases?
- Save More Groceries had 15 loaves of bread in stock when it opened at 6 A.M. It received a delivery of 100 loaves at 7 A.M. Throughout the day, it sold 89 loaves. What is the bread inventory at the end of the day?
- Standardized Test Practice** Shoe Warehouse had 5,500 pairs of shoes in stock on June 1. On June 10 it received a shipment of 4,200 pairs. Throughout the month, it sold 6,384 pairs, of which 27 were returned to the store. How many pairs of shoes does it have in stock on July 1?
A. 3,316 B. 3,343 C. 3,289 D. 7,657

18-3

Computing the Inventory Cost Value by the Average-Cost Method

One way of calculating the value of your inventory is by the **average-cost method**. Since the cost of your incoming items is likely to change, you calculate the value of your inventory on the average cost of the goods you receive. Two other methods used in valuing an inventory are **first in, first out** (FIFO) and **last in, first out** (LIFO). FIFO assumes that the first items received are the first items shipped out. LIFO assumes that the last items received are the first items shipped out.

Example

Find the inventory value.

Smith Flooring had 500 rolls of linoleum in stock on June 1 that it purchased at a cost of \$87.00 per roll. During the month, it received 300 more rolls at a cost of \$91.00 per roll. On July 1 it had 415 rolls of linoleum on hand. What is the value of the inventory on July 1?

1. Find the total cost and the total number received.

$$\text{Total Cost} = (500 \times \$87.00) + (300 \times \$91.00) = \$70,800$$

$$\text{Total Received} = 500 + 300 = 800$$

2. Find the average cost per roll.

$$\text{Average Cost per Unit} = \text{Total Cost of Units} \div \text{Number Received}$$

$$\$70,800 \div 800 = \$88.50$$

3. Find the Inventory Value

$$\text{Inventory Value} = \text{Average Cost per Unit} \times \text{Number on Hand}$$

$$\$88.50 \times 415 = \$36,727.50 \text{ inventory value}$$

Practice

Use the table below for Problems 1–4.

Week of	Receipts	Unit Cost	Total Cost
April 1	10	\$485.00	\$4,850.00
April 15	15	479.00	7,185.00
April 28	8	505.00	4,040.00

1. Comfy Couches is valuing its inventory of loveseats. On May 1 it had 12 loveseats on hand. What is the total number of loveseats received?
2. What is the total cost of the loveseats received?
3. What is the average cost per loveseat?
4. What is the value of the inventory on May 1?
5. **Standardized Test Practice** Shoe Warehouse has 5,500 pairs of shoes in stock on June 1 that cost \$10.50 per pair. It receives another shipment on June 21 of 2,000 pairs at a cost of \$10.00 per pair. On June 30 it has 3,500 pairs in stock. What is the value of the inventory on June 30?
 A. \$36,295 B. \$35,000 C. \$35,875 D. \$36,750



18-4

Determining the Annual Cost of Carrying an Inventory

Your business must keep a sufficient inventory of goods on hand to meet your production or sales needs. Using past records, you can estimate the annual cost of maintaining, or *carrying*, your inventory at a certain level for the upcoming year. The annual cost is usually expressed as a percentage of the inventory value.

Example

Find the annual cost of carrying the inventory.

Smith Flooring maintains an inventory of products to meet customers' last minute requests. It estimates the annual cost of carrying its inventory is 22.5 percent of its inventory value. This year the company plans to maintain an inventory totaling \$1,000,000. What is the estimated cost of carrying the inventory for the year?

Find the annual cost of carrying the inventory.

Annual Cost of Carrying Inventory = Inventory Value × Percent

$1,000,000 \times 22.5\% = \$225,000$ **annual cost**

Practice

Find the annual cost of carrying the inventory.

	Value of Inventory	Percent	Annual Cost of Carrying Inventory
1.	\$ 9,500	27%	
2.	47,250	32%	
3.	88,975	17.5%	
4.	246,871	24.25%	

- Autographed Sports Cards estimates the annual cost of carrying its inventory to be 20 percent of the value of its inventory. The company normally carries an inventory of \$418,000, but to save money it has reduced the value of its inventory to \$350,000. How much less is the cost of carrying the inventory?
- Save More Groceries estimated the annual cost of carrying its inventory to be 15 percent of the value of its inventory. It discovered that this figure was too low. It now estimates the cost of maintaining its inventory to be 18 percent of the inventory value. If it normally keeps an inventory valued at \$174,000, by how much has the cost of carrying the inventory increased?
- Standardized Test Practice** Shoe Warehouse estimates the cost of carrying its inventory to be 25 percent of its inventory value. The company usually keeps an inventory valued at \$1,800,000. It discovered it can decrease its inventory by $\frac{1}{3}$ of its value and still meet customers' demands. How much does Shoe Warehouse save on the cost of carrying the inventory?
A. \$450,000 B. \$300,000 C. \$600,000 D. \$150,000



Calculating Total Door-to-Door Shipping Costs

Your business might transport items door-to-door. That means the shipper picks up the items and delivers them to their destination. The cost of shipping depends on the weight of the items and the speed of delivery.

Example

Find the shipping costs.

Smith Flooring is shipping 1,000 pounds of carpeting from Syracuse to New Orleans. The shipment will be sent Standard Second Day. Use the Shipping Cost for Selected Routes table on page 181 to find the total cost of shipping the carpeting.

- Find the base rate per 100 pounds from the table.
Standard Second Day from Syracuse to New Orleans is \$119.25.
- Find the shipping cost.

Shipping Costs = Weight × Base Rate

$(1,000 \div 100) \times \$119.25 = \$1,192.50$ shipping costs

Practice

Find the cost per 100 pounds and the shipping costs using the Shipping Cost for Selected Routes table on page 181.

	From	To	Arrival	Weight in Pounds	Cost/100	Costs
1.	St. Louis	Cedar Rapids	Guaranteed Overnight	500	a.	b.
2.	Boston	Miami	Guaranteed Second Day	750	a.	b.
3.	San Diego	Portland	Standard Overnight	826	a.	b.
4.	Memphis	Miami	BAX Saver	1,358	a.	b.

- Home Décor shipped 1,750 pounds of paint from its headquarters in Toledo to a store in Missoula, Montana. How much would it cost to ship the paint Guaranteed First Arrival? How much would it cost to ship Standard Overnight?
- Autographed Sports Cards in Fairbanks received a 625-pound shipment from Basically Baseballs in Salt Lake City. How much did it cost Basically Baseballs to ship its product Standard Second Day to Autographed Sports Cards?
- Save More Groceries in Boston received an 850-pound shipment of citrus fruit from Orange Orchards in Miami, Florida. How much did it cost Orange Orchards to ship its citrus fruit Standard Overnight?
- Standardized Test Practice** Shoe Warehouse is shipping 1,500 pounds of shoes from its headquarters in Denver to its store in Sacramento. If it ships BAX Saver rather than Guaranteed Second Day, how much will it save?
A. \$81.75 B. \$1,226.25 C. \$1,916.25 D. \$690.00



18-6

Calculating Total Shipping Costs by Truck

If your business uses expedited door-to-door direct trucking, it means your shipment is given exclusive use of a driver and a truck to move your shipment as quickly as possible. The basic rates for expedited direct trucking depend on the weight of the goods and the distance they are shipped. You might also have accessorial charges for special services beyond just moving goods.

Example

Find the shipping cost.

Smith Flooring is shipping 1,000 pounds of carpeting from Syracuse to New Orleans via Freight for Less. The distance is 1,572 miles. Using the Expedited Door-to-Door Freight Rates table on page 181, what does it cost to ship the carpeting?

1. Find the basic rate per mile.
1,000 pounds, 300 + miles = \$1.73 per mile
2. Find the shipping cost.
Shipping Cost = Number of Miles × Rate per Mile
1,572 × \$1.73 = **\$2,719.56 shipping cost**

Practice

Use the Expedited Door-to-Door Freight Rates table on page 181 to find the basic rate, the shipping cost, and the total costs.

	Weight (pounds)	Distance (miles)	Basic Rate	Shipping Cost	COD	Hazardous Materials	Hand Loading	Total Costs
1.	75	98	a.	b.	Yes	No	No	c.
2.	515	122	a.	b.	No	Yes	No	c.
3.	3,011	218	a.	b.	No	Yes	2 hrs	c.
4.	5,002	5	a.	b.	Yes	No	4 hrs	c.

5. Home Décor shipped a 1,700-pound piano from its warehouse in Chicago to a customer in San Francisco. The distance is 1,627 miles. It is delivered on a holiday and requires 1 hour of hand loading and 1 hour of hand unloading. It also requires a second person for those 2 hours. What is the total shipping cost?
6. Autographed Sports Cards shipped 1,000 basketballs to Professional Sports Agents to be signed by its clients. The shipment weighed 2,850 pounds and the distance was 218 miles. What was the shipping cost?
7. **Standardized Test Practice** Shoe Warehouse is shipping 1,500 pounds of shoes from its headquarters in Denver to its stores in Sacramento, Oakland, and San Francisco. The distance is 237 miles. The shipment requires three drop-offs, one at each store, and unloading charges of three hours. What are the total shipping costs?
A. \$519.75 B. \$564.75 C. \$614.75 D. \$669.75

18 Chapter Review

Household Warehousing

For this review, you will need a tape measure or a yardstick and a friend or relative to help you. Convert all measurements and estimates to the nearest whole number.

1. Measure the length, the width, and the height of a closet in your home. What is the volume of the closet, rounded to the nearest cubic foot?
2. Measure the length, the width, and the height of a box in your home. What is the volume of the box, rounded to the nearest cubic inch?
3. How many cubic inches of storage space would you need to store 50 of these boxes?
4. How many cubic feet of storage space would you need to store 100 boxes?
5. How many of these boxes could you store in the closet you measured for Problem 1?
6. Count the number of chairs in your house. If you sold half of the chairs at a yard sale and your mom purchased four new chairs, what would your new chair inventory be?
7. Locate four similar items, such as magazines or books, with retail prices on them. Compute the average cost per item.
8. You decide to donate two of the items in Problem 7 to your local school. Using the average-cost method, what is the inventory value of your remaining items?
9. Roughly calculate the value of the clothing in your closet. Your mother estimates that the annual cost of maintaining (carrying) your clothing is 15 percent of its value. What is the estimated cost for maintaining your clothing?