

## Demonstration Problem 4-1 Solution

a.  $\$84,000 \div 3 = \$28,000$  of overhead cost per house.

This allocation scheme assigns more overhead than seems reasonable to the lower cost houses. A house that requires greater amounts of direct materials cost and direct labor cost is likely to also require greater amounts of such indirect costs as supervisory salaries and indirect materials. In other words, a bigger, more expensive house probably also requires more of the supervisor's time and consumes greater quantities of indirect materials. An equal share allocation is likely inaccurate under these circumstances.

Allocations based on the number of units assign the same amount of overhead cost to each unit of product. Consequently, the number of units is a rational allocation base (cost driver) only when the products are homogeneous. If the builder were constructing identical houses, an equal share allocation based on the number of houses would provide a reasonable estimate of overhead cost.

b. Total direct costs are as follows:

	House 1	House 2	House 3	Total
Direct Materials	\$140,000	\$ 70,000	\$90,000	\$300,000
Direct Labor	210,000	130,000	60,000	400,000
Total Direct Cost	\$350,000	\$200,000	\$150,000	\$700,000

Step 1. Determine the allocation rate:

$$\frac{\text{Cost to be Allocated}}{\text{Allocation Base}} = \text{Allocation Rate}$$

## Demonstration Problem 4-1 Solution b. continued

$$\frac{\$84,000}{\$700,000} = \$0.12 \text{ per direct cost dollar}$$

Step 2. Determine the amount to be allocated by multiplying the allocation rate by the weight of the base.

House	Allocation Rate	x	Weight of Base	=	Allocated Cost
1	\$0.12	x	\$350,000	=	\$42,000
2	\$0.12	x	\$200,000	=	\$24,000
3	\$0.12	x	\$150,000	=	\$18,000
<b>Total</b>					<b>\$84,000</b>

This method benefits buyers of lower cost houses. It assigns a lower percentage of total overhead cost to less expensive homes. Conversely, the buyers of more expensive homes will pay a higher proportion of the overhead costs.

c. The most rational allocation scheme uses different bases for allocating indirect materials costs and fringe benefit costs. The amount of indirect materials used is probably closely related to the amount of direct materials used. Direct materials cost is a rational allocation base for indirect materials cost. Fringe benefit costs are tied to supervisory time; direct labor cost is a rational allocation base for fringe benefit costs. The allocation follows.

### Allocation of Indirect Materials Cost

Step 1. Determine the allocation rate:

$$\frac{\text{Cost to be Allocated}}{\text{Allocation Base}} = \text{Allocation Rate}$$

## Demonstration Problem 4-1 Solution c. continued

$$\frac{\$63,000}{\$300,000} = \$0.21 \text{ per direct material cost dollar}$$

Step 2. Determine the amount to be allocated by multiplying the allocation rate by the weight of the base.

House	Allocation Rate	x	Weight of Base	=	Allocated Cost
1	\$0.21	x	\$140,000	=	\$29,400
2	\$0.21	x	\$ 70,000	=	\$14,700
3	\$0.21	x	\$ 90,000	=	\$18,900
<b>Total</b>					<b>\$63,000</b>

### Allocation of Fringe Benefits Cost

Step 1. Determine the allocation rate:

$$\frac{\text{Cost to be Allocated}}{\text{Allocation Base}} = \text{Allocation Rate}$$

$$\frac{\$21,000}{\$400,000} = \$0.0525 \text{ per direct labor cost dollar}$$

## Demonstration Problem 4-1 Solution c. continued

Step 2. Determine the amount to be allocated by multiplying the allocation rate by the weight of the base.

House	Allocation Rate	x	Weight of Base	=	Allocated Cost
1	\$0.0525	x	\$210,000	=	\$11,025
2	\$0.0525	x	\$130,000	=	\$ 6,825
3	\$0.0525	x	\$ 60,000	=	\$ 3,150
<b>Total</b>					<b>\$21,000</b>

Total Overhead Allocated to Each House:

	House 1	House 2	House 3	Total
Indirect Materials	\$29,400	\$14,700	\$18,900	\$63,000
Fringe Benefits	\$11,025	\$ 6,825	\$ 3,150	\$21,000
<b>Total Indirect Costs</b>	<b>\$40,425</b>	<b>\$21,525</b>	<b>\$22,050</b>	<b>\$84,000</b>

Note: the total cost of each house using the allocation scheme in part c is:

	House 1	House 2	House 3
Direct Materials	\$140,000	\$ 70,000	\$ 90,000
Direct Labor	210,000	130,000	60,000
Overhead	40,425	21,525	22,050
<b>Total Cost</b>	<b>\$390,425</b>	<b>\$221,525</b>	<b>\$172,050</b>