

# WHAT'S IN THE BANK?

## Key Question

How can you use symbols to keep track of what's in the bank?

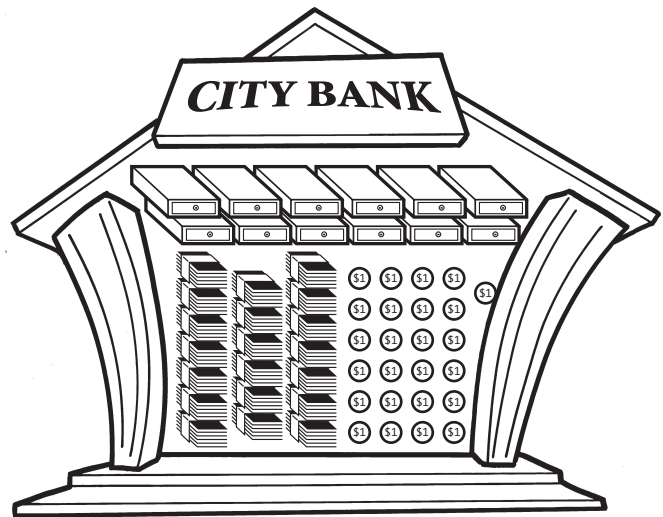
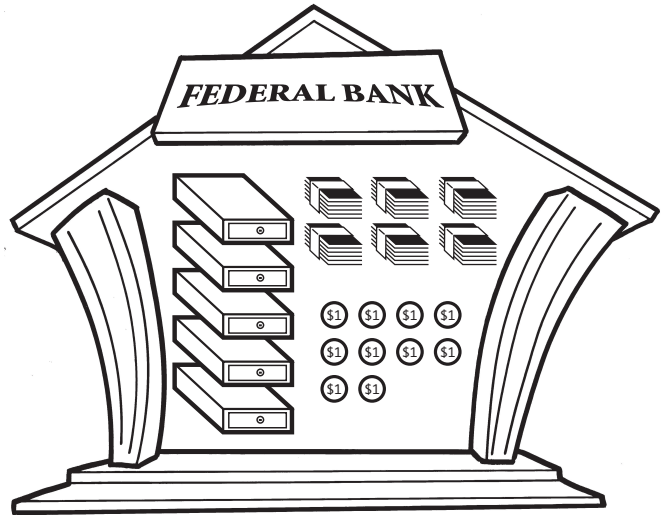
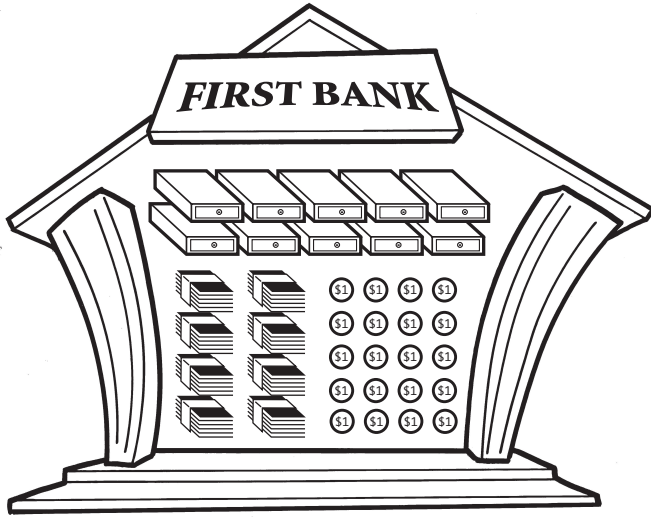
## Learning Goals



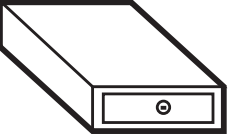
### *Students will:*

- translate the contents of a bank into algebraic expressions,
- symbolically combine the contents of several banks to conceptualize combining of like terms, and
- develop an understanding of the distributive property by considering the contents of like vaults in a bank.



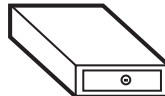



# WHAT'S IN THE BANK?



KEY	 = Loose Money
	 = Bundled Stack (s)
	 = Cash Drawer(d)

# WHAT'S IN THE BANK?

PART ONE • A

<p>Banks have drawers of money (<math>d</math>),</p>  <p>bundled stacks of money (<math>s</math>),</p>  <p>and loose money. </p>	<p>Change each picture into an algebraic expression of what's in the bank.</p> 	<p><b>First Bank</b> = <math>10d + 8s + 20</math></p> <p><b>Federal Bank</b> = _____</p> <p><b>Golden Bank</b> = _____</p> <p><b>City Bank</b> = _____</p> <p><b>National Bank</b> = _____</p>
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1. What are the combined contents of **First Bank** and **Federal Bank**?
2. What are the combined contents of **Golden Bank** and **City Bank**?
3. What is the difference in contents of **City Bank** and **First Bank**?
4. What are the combined contents of **Federal Bank** and **Golden Bank**?
5. What are the combined contents of **First Bank** and **National Bank**?
6. What is the difference in contents of **First Bank** and **Federal Bank**?
7. What are the combined contents of **City Bank** and **National Bank**?
8. What are the combined contents of **Federal Bank** and **National Bank**?
9. What is the difference in contents of **City Bank** and **National Bank**?
10. What are the combined contents of **First Bank** and **Golden Bank**?

# WHAT'S IN THE BANK?

PART ONE • B

Record the description of each bank's contents algebraically.

**Valley Bank** has 12 drawers, 15 stacks, and \$30.

**Delta Bank** has 15 drawers, 25 stacks, and \$50.

**Lakeside Bank** has 9 drawers, 24 stacks, and \$20.

**River Bank** has 6 drawers, 12 stacks, and \$30.

**Summit Bank** has 8 drawers, 16 stacks, and \$32.

**Capitol Bank** has 10 drawers, 20 stacks, and \$30.

Use the algebraic expression of each bank's contents to solve the problems.

1. What is the difference in the contents of **River Bank** and **Capitol Bank**?
2. What is the difference in the contents of **Valley Bank** and **Delta Bank**?
3. **Valley Bank** and **Summit Bank** merge to become **County Bank**. What are the contents of **County Bank**?
4. **River Bank** splits its contents evenly between two branches. What are the contents of each branch?
5. **Summit, Capitol, and Delta Banks** merge to become **State Bank**. What are the contents of **State Bank**?
6. In a bank robbery, 10 stacks and 20 dollars are stolen from **River Bank**. What's left in the bank?
7. A deposit of eight stacks and eight dollars is made to **Summit Bank**. What's in the bank?
8. A withdrawal of two drawers and 25 dollars is made at **Valley Bank**. What's in the bank?



# WHAT'S IN THE BANK?

Record the description of each bank's contents algebraically. Then condense (simplify) the account so it tells the quantity of drawers, stacks, and loose money in the bank.

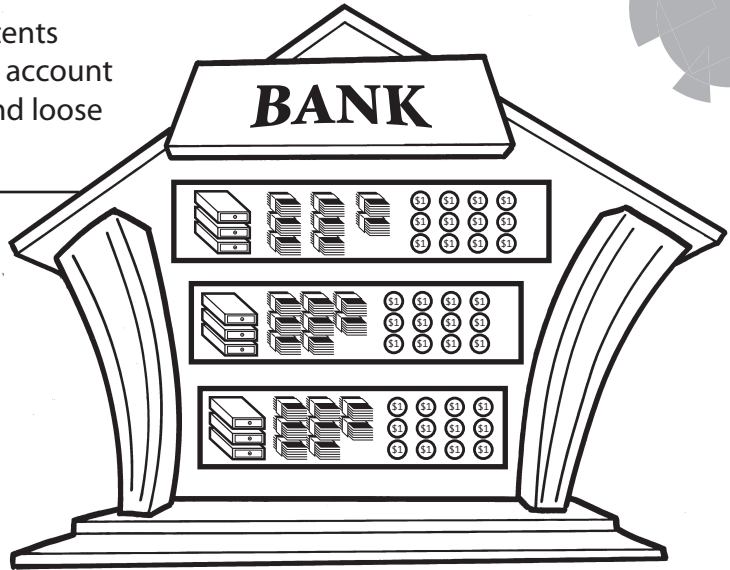
**Example:**

The bank has 3 vaults. Each vault contains 3 drawers, 8 stacks, and \$12. What's in the bank?

$$3(3d + 8s + 12) = B$$

$$9d + 24s + 36 = B$$

The bank has 9 drawers, 24 stacks, and \$36.



1. The bank has 5 vaults. Each vault contains 5 drawers, 5 stacks, and \$25. What's in the bank?
2. The bank has 7 vaults. Each vault contains 2 drawers, 3 stacks, and \$8. What's in the bank?
3. The bank has 3 vaults with 3 drawers, 3 stacks, and \$3, and 5 other vaults with no drawers, 8 stacks, and \$12. What's in the bank?
4. The bank had 4 vaults with 7 drawers, 5 stacks, and \$20. The bank was robbed, and 2 drawers, 12 stacks and \$50 were taken. What's in the bank?
5. One bank has 2 vaults. Each vault contains 8 drawers, 10 stacks, and \$24. A second bank has 4 vaults, and each vault contains 2 drawers, 5 stacks, and \$12. The two banks merge into one. What's in the bank?
6. The first bank had 5 vaults. Each vault contains 6 drawers, 5 stacks, and \$15. A second bank opens and fills each of its 3 vaults with 5 drawers, 5 stacks, and \$5 from the first bank. What's left in the first bank?

Make up your own *What's in the Bank?* problem to give to another student. Make a key that shows the steps to find the correct solution.

# WHAT'S IN THE BANK?

Use the algebraic expression describing what is in each bank to determine what's in the bank.

**Valley Bank** =  $3(4d + 5s + 10)$

**Delta Bank** =  $5(3d + 5s + 10)$

**Lakeside Bank** =  $2(5d + 10s + 15)$

**River Bank** =  $2(3d + 6s + 15)$

**Summit Bank** =  $5(4d + 4s + 20)$

**Capitol Bank** =  $4(5d + 8s + 20)$

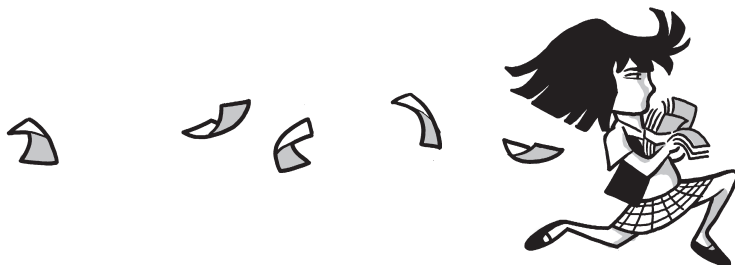
Simplify each expression and then make up a "bank story" to go with each problem.

1.  $5(3d + 5s + 10) + (8s + 15)$

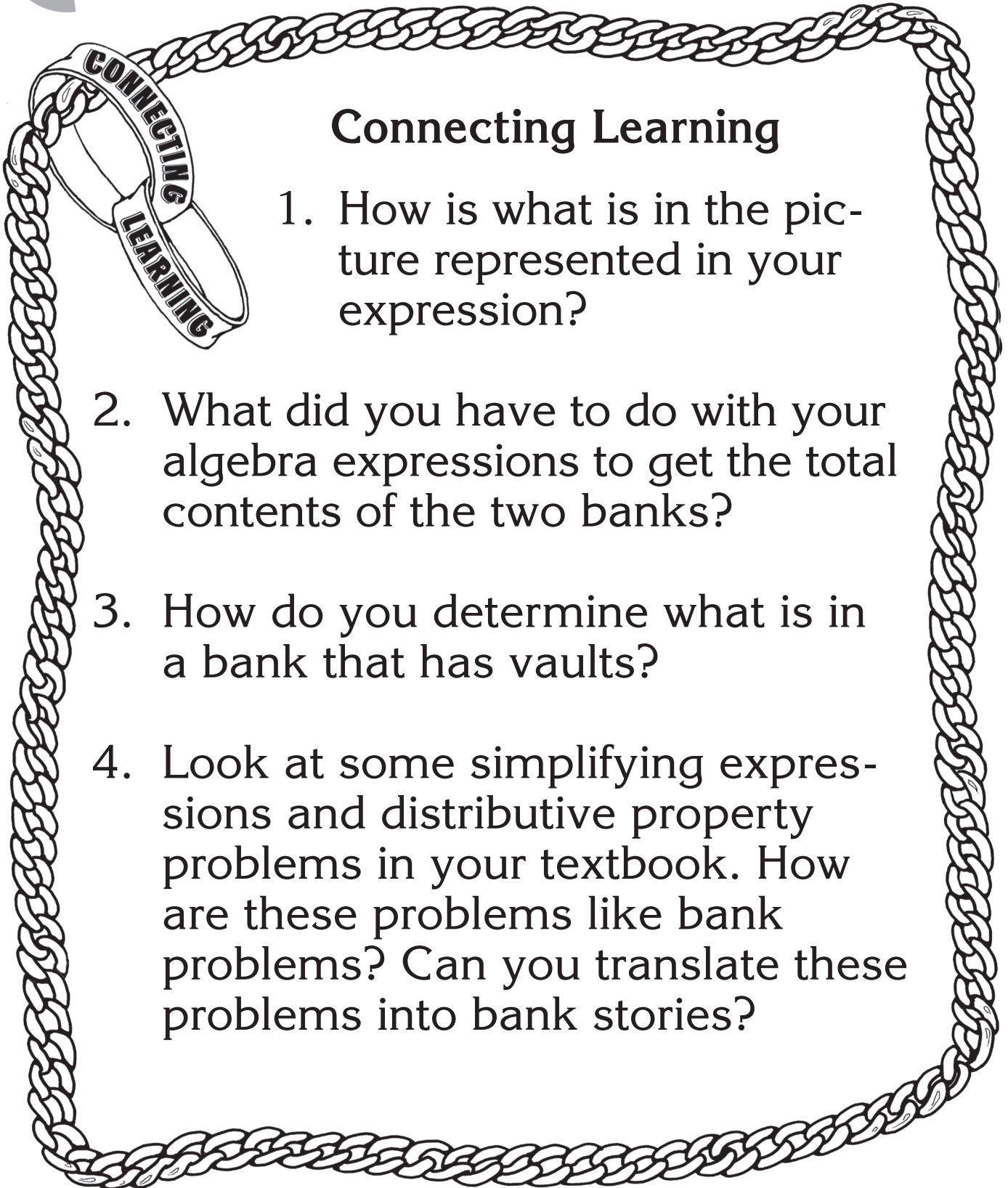
2.  $4(5d + 8s + 20) + 3(4d + 5s + 10)$

3.  $\frac{2(3d + 6s + 15)}{3}$

4.  $5(4d + 4s + 20) - (12d + 50)$



# WHAT'S IN THE BANK?



## Connecting Learning

1. How is what is in the picture represented in your expression?
2. What did you have to do with your algebra expressions to get the total contents of the two banks?
3. How do you determine what is in a bank that has vaults?
4. Look at some simplifying expressions and distributive property problems in your textbook. How are these problems like bank problems? Can you translate these problems into bank stories?