Applications

In the old days a man who saved money was a miser; nowadays he's a wonder.

—Author Unknown

1. How might the words in the quote apply to what you learned about interest and savings in this section? See margin.
2. Jerome deposits $3,700 in a certificate of deposit that pays 1.8% interest, compounded annually. How much interest does Jerome earn in 1 year? $66.60
3. Sally deposits $4,000 in a certificate of deposit that pays 2.12% simple interest. What is her balance after 1 year? $4,084.80
4. Pierre deposits $9,000 in a certificate of deposit that pays 1.4% interest, compounded semi-annually. How much interest does the account earn in the first 6 months? What is the balance after 6 months? $63; $9,063
5. Kevin has x dollars in an account that pays 2.2% interest, compounded quarterly. Express his balance after one quarter in an algebraic formula. $x\left(\frac{1+0.022}{4}\right)^4$.
6. Regina deposits $3,500 in a savings account that pays 1.05% interest, compounded semi-annually. In a-g, round to the nearest cent.
   a. How much interest does the account earn in the first 6 months? $18.38
   b. What is the balance at the end of the first 6 months? $3,518.38
   c. How much interest does the account earn in the second 6 months? $18.47
   d. What is the balance at the end of the year? $3,536.85
   e. How much interest does the account earn the first year? $36.85
   f. How much interest would $3,500 earn in 1 year at 1.05% interest, compounded annually? $36.75
   g. How much more interest does Regina earn at an interest rate of 1.05% compounded semi-annually than compounded annually? $0.10
7. Liam deposits $3,500 in a savings account that pays 0.8% interest, compounded quarterly. In a-i, round to the nearest cent.
   a. Find the first quarter's interest. $7
   b. Find the first quarter's ending balance. $3,507
   c. Find the second quarter's interest. $7.01
   d. Find the second quarter's ending balance. $3,514.01
   e. Find the third quarter's interest. $7.03
   f. Find the third quarter's ending balance. $3,521.04
   g. Find the fourth quarter's interest. $7.04
   h. What is the balance at the end of 1 year? $3,528.08
   i. How much interest does the account earn in the first year? $28.08
8. Janine opens a savings account with a deposit of $720. The account pays 1.4% interest, compounded daily. What is the first day's interest? Round to the nearest cent. $0.03
9. Laura deposits $2,000 in an account that has an annual interest rate of 1.96%, compounded monthly. How much interest will she earn at the end of 1 month? Round to the nearest cent. $3.27

TEACH

Exercises 2 and 3
Note that Exercise 2 asks for the interest and Exercise 3 asks for the balance. Remind students not to skim math problems—every word is important.

Exercises 4–7
It is too much work to compute several years' interest using these methods of compounding.

Exercise 8
Ask students how much work it would be to compute an entire year's interest under daily compounding! This motivates the need for a formula, which is introduced in the next lesson.

ANSWERS

1. Compound interest is better than simple interest, but it won't make you rich. Time is very influential in making savings grow, so the earlier an account is started, the longer the money earns interest.

10.
a. $0
b. $4,550
c. $4,550
d. $0.14
e. $4,550.14
f. $4,550.14
g. $300
h. $4,850.14
i. $0.15
j. $4,850.29
k. $4,850.29
l. $900
m. $3,950.29
n. $0.12
p. $3,950.41

11.
a. $0
b. $6,000
c. $0
d. $6,000
e. $0.24
f. $6,000.24
g. $6,000.24
h. $500
i. $0
j. $6,500.24
k. $0.26
l. $6,500.50
m. $6,500.50
n. $0
p. $2,500
q. $4,000.50
r. $0.16
s. $4,000.66

10. Jacob opens a savings account in a non–leap year on August 10 with a $4,550 deposit. The account pays 1.1% interest, compounded daily. On August 11 he deposits $300, and on August 12 he withdraws $900. Find the missing amounts in the table. Round to the nearest cent. See margin.

Date	Aug. 10	Aug. 11	Aug. 12
Opening balance	a.	f.	k.
Deposit	b.	g.	-----
Withdrawal	-----	-----	l.
Principal used to compute interest	c.	h.	m.
Day's interest rounded to nearest cent	d.	i.	n.
Ending balance	e.	j.	p.

11. On December 18 of a leap year, Stacy opened a savings account by depositing $6,000. The account pays 1.45% interest, compounded daily. On December 19 she deposited $500, and on December 20 she withdrew $2,500. Find the missing amounts in the table. Round to the nearest cent. What is her opening balance on December 21? See margin.

Date	Dec. 18	Dec. 19	Dec. 20
Opening balance	a.	g.	m.
Deposit	b.	h.	n.
Withdrawal	c.	i.	p.
Principal used to compute interest	d.	j.	q.
Day's interest rounded to nearest cent	e.	k.	r.
Ending balance	f.	l.	s.

12. On May 29, Rocky had an opening balance of x dollars in an account that pays 1.3% interest, compounded daily. He deposits y dollars. Express his ending balance on May 30 algebraically. See Additional Answers.

13. Linda has d dollars in an account that pays 1.4% interest, compounded weekly. She withdraws w dollars. Express her first week's interest algebraically. See Additional Answers.

14. The table represents the compound interest calculations for an account that pays 2% interest compounded daily. Represent a–g algebraically. See Additional Answers.

Date	Feb. 2	Feb. 3
Opening balance	P	d.
Deposit	D	-----
Withdrawal	-----	W
Principal used to compute interest	a.	e.
Interest	b.	f.
Ending balance	c.	g.

15. One day before the end of the month, George had an opening balance of m dollars in an account that pays 1.25% interest compounded monthly. On the last day of the month, he made a deposit equal to twice his opening balance. Express his ending balance on the last day of the month algebraically. See Additional Answers.