

REALITY OF WINNING THE LOTTERY

"What we anticipate seldom occurs; what we least expect generally happens."

Benjamin Disraeli

"Lottery: A tax on people who are bad at math."

Bumper Sticker



Objectives

■ 4-1 This section will supply students with information that will assist them in making wise decisions about whether to play the lottery in the future. After studying the material in this section, student will be more informed about the lottery's financial and mathematical reality. For example, even if a person manages to beat the astronomically large odds against winning, he or she will surrender a large proportion of it to taxes and inflation. The objective of this section is to help students make the transition from magical thinking to mathematical thinking, and to know when mathematical thinking is appropriate and useful.

Objectives

4-1

- Supply students with information allowing them to make wise decisions about playing the lottery
- Inform students about the lottery's financial and mathematical reality
- Help make transition from magical thinking to mathematical thinking

Teacher Background

Most of us have had conversations or fantasies that begin with the phrase, "If I won the lottery, I would ..." Three out of four American adults have purchased a lottery ticket, but even those who haven't participated in the lottery probably enjoy this mind game. The states have strategically poured enormous sums of money into advertising the lottery, promoting quick money, instant wealth, and the end of poverty and anxiety about money and the future. Last year 100 million Americans bought into this fantasy with \$30 billion dollars worth of tickets in total sales. We hold onto this magical thinking, this suspension of rationality, in the hope that our "lucky" number will change our lives.

What, then, is the reality of the lives of lottery winners? Does winning the lottery buy you happiness? Does it even bring you wealth? Lois Gould, a writer who interviewed lottery winners for the *New York Times Magazine*, claims that what “winning big” often brings you is “big, if not ruinous, trouble” (Gould, 1995, p. 40). Hearing true stories of real-life lottery winners helps to dispel the myths we so wistfully live by and replaces these myths with precautionary realities.

Myth: One Lump Sum

■ 4-2 One myth that is perpetuated by the media is that a check will be written out to the winner for the total amount won. In reality, the lottery commission distributes winnings to the lottery winners over the span of many years — the most common timespan is 20 years, although it is more in some states. For a million-dollar winner, the annual check would be \$50,000. In reality, there is no million-dollar “jackpot.”

The state pays out the winnings by buying an annuity that pays the winner \$50,000 a year for 20 years. In this way, the lottery manages to give away a million dollars over a long period of time at a cost much lower than a million dollars. The lottery can also obtain interest on the money that is temporarily withheld from the winners. The winners have no control over their million-dollar “jackpot.” They cannot invest their million-dollar jackpot or accumulate interest on it. In addition, winners are usually taxed at the state and federal levels. The \$50,000 check can quickly dwindle down to less than \$30,000 a year.

Myth: One Lump Sum

4-2

- Winnings are distributed to lottery winners over the span of many years (often 20 yrs.)
- A million dollar winner would get \$50,000 a year (before taxes)
- Winners cannot invest or accumulate interest on their “million dollars”
- State and federal taxes also take a big cut

Inheriting More than the Money

■ 4-3 Another issue the public is largely unaware of is what happens to the winnings if the winner should die somewhere in the span of collection time, which isn't all that unlikely given that the span is usually at least 20 years. Unfortunately, in spite of inheriting the winnings, heirs to this money also are obligated to pay estate taxes on the unpaid total immediately. If the taxes remain unpaid after nine months, penalties may be added. It makes no difference if the heirs are millionaires themselves or struggling to survive on meager welfare checks. This situation was highlighted in a recent Ann Landers column, which reported that the children of a Texas lottery winner would not be able to afford to inherit the jackpot if their father died: they would have to pay \$4.7 million in taxes *before* they could start receiving the annual checks from the lottery.

Inheriting More than the Money

4-3

What happens when the winner dies during the twenty years they are collecting money?

- Heirs of the winner's money are obligated to pay estate taxes on the unpaid total immediately
- If taxes remain unpaid after nine months, penalties may be added onto the tax

Case Studies


The following case studies are not included to convince students that winning the lottery results in nothing but troubles and misery. They are included to counter the common message that winning the lottery will solve all your problems — that you are “set for life” if you win. As these case studies show, those who are prone to lead disorganized, troublesome lives are likely to continue to do so after winning the lottery. Furthermore, those who enjoy their work and their lives are not likely to change significantly after winning either.

All case studies except Harry Casey Jr.’s and Albert Knights’s are adapted from Gould (1995).

William (Bud) Post’s story. Bud Post, who comes from Oil City, Pennsylvania, had a job with a traveling circus cooking for the thin man and the lion tamer. In 1988, Bud thought he struck it rich when he won the \$16.2 million Pennsylvania jackpot. However, winning the lottery ended up creating more misery for Bud than he would have ever expected. Bud went on numerous spending binges and was completely broke in just five years. His brother was in jail, charged with hiring a hit man to murder Bud and his sixth wife for the lottery money. Friends and family had begged and borrowed from him. His business ventures failed. One of his ex-girlfriends sued him.

Eugene Peterson’s Story. Eugene, his wife, and their two daughters became millionaires in 1986 when they won the Washington State Lottery. The Petersons maintained some sense of their usual routine. They kept their jobs; Eugene drove a truck for the city and his wife worked for a company with a government contract. They were able to buy the kind of house that they had been dreaming about and for which they had been saving for the last 20 years. However, they did make mistakes with their money. One of their many friends had borrowed \$260,000 in 1988 and died in 1992 without repaying any of it. They had been the best of friends, and had no contract attesting to the deal made between them.

The Petersons struggled for a while, their debts slowly catching up with them. Finally they decided to sell the rest of the prize for whatever cash it was worth. They contacted Stone Street Capital, a company that specializes in “helping out” lottery winners by buying their annuity in one quick deal. The problem with the deal, however, is that companies like Stone Street Capital pay a lump-sum “present-value” price: about 40 to 45 cents on the dollar, of less than half the face value of those future checks. Stone Street Capital’s President offered the Petersons approximately \$250,000 cash, in addition to lending them money to forestall a bank foreclosure on their house.



Teresa Brunning's Story. Teresa was 25 when she won \$1.3 million in 1985. There was a huge party to celebrate her incredible luck. Today she says: "Of all the people who came, not one speaks to me now."

Bernice McCrawley's Story. Bernice McCrawley was driving a school bus in 1984, the year she won a million. She took a day off to go and claim her winning ticket, and took her four young sons out for a meal at their favorite restaurant to celebrate. The next day when she showed up for work she was told that her job had been given away. She and her family moved to South Dakota; she and her husband divorced. She has since moved several times, to Nevada, Washington, Mexico. She never tells anyone that she is a lottery winner. "I like to go places where nobody knows me." Although it may seem that gambling luck is with her, in other ways Bernice says she has been "not so lucky."

Debbie & John's Story. Debbie and John both worked in radio stations for years, always dreaming that one day they'd own a small-town station. Winning the jackpot suddenly made their dream possible. They were careful to buy their two stations out of state, where no one knew the money came from lottery winnings. However, the grapevine caught up with them quickly; friends and relatives couldn't resist telling at least one friend about the jackpot. Employees at both radio stations walked out of their jobs, demanding hugely inflated paychecks, claiming that Debbie and John were exploiting them as employees. They were forced to sell the radio stations, watching their dream crumble under them. Debbie and John moved about a year after they won. "Where we are now," says Debbie, "we don't talk about being winners. We want to hide the connotations of that."

Cindy Wade's Story. Ten years ago Cindy went out to the corner to buy some milk. As an afterthought, she asked for a Super Surprise lottery ticket and paid for it with some of the change from her milk purchase. When she got home, she asked her younger sister, then 8 years old, if she wanted to scratch the card for her. The Super Surprise ended up being true to its name when it turned out she was the winner of the \$2.5 million prize. Cindy's mother thought Cindy should share the money with her sister, who had participated in the event. Cindy disagreed. Cindy and her mother didn't speak to each other for six years.

Paul McNabb's Story. Paul McNabb is a doughnut baker who became Maryland's first lottery millionaire in 1963. He now drives a cab in Las Vegas. On the 20th anniversary of his win, in 1983, after his last lottery check had run out, he was tracked down by reporters curious about his life as a lottery winner/millionaire. McNabb had survived the kidnap threats to his children,

the break-ins, the loss of work he liked, the loss of trust in his fellow man, and the loss “of being human.” He wouldn’t give the money back, he said. He enjoyed it. But asked if he would do it again, if he would relive those 20 years as a winner, McNabb laughs. “No way,” he replied.

Harry Casey Jr.’s Story. Harry Casey Jr. became Pennsylvania’s first \$1 million winner in the early 1970s. Having won the big jackpot, he decided to quit his job as a liquor store manager and live off his winnings. When his \$50,000-a-year payments ended in the early 1990s, he was a flat broke 70-year-old with no job, no skills, and no pension. “All I can do,” he told a reporter, “is bag groceries or do janitorial work” (*Life*, April 1992, p. 20).

Albert Knights’s Story. In 1992, 64-year-old garbage collector Albert Knights won the \$5.9 million Maine lottery. He decided to keep his job, stating that his daily garbage collection route “is something I like to do.” Knights told reporters, “I’m not ready to retire. I promised myself I’d work another two years.” Aside from buying a new house, the Knights continued their everyday routine. “Why should we change?” said his wife Margaret. “We are what we are” (*People*, May 30, 1994, p. 86).

EXERCISES

♣ The Reality of Winning the Lottery

Classroom Discussion

■ 4-4 Ask the students the following questions. If the extremely improbable does occur and you win \$1,000,000, are you set for life? Can you quit your job, buy a house in a tropical paradise, and spend your life as a jet-setting world traveler?

If you win the lottery, are you set for life?

4-4

Imagine winning \$1,000,000

Can you:

- Quit your job
- Buy a house in a tropical paradise
- Spend your life as a jet-setting world traveler

The answer to these questions is, unfortunately, no. You would see your \$1,000,000 dwindle to a surprisingly small amount. The following steps will guide the students through the process that lottery winners actually go through.

Calculation

■ 4-5 First, you would get substantially less than the million you might be expecting, due to the way the state pays out lottery winnings. The state does not pay out the \$1,000,000 all at once, but instead pays \$50,000 a year for 20 years ($\$1,000,000 \div 20 = \$50,000$).

The case of the shrinking million: Part I

4-5

\$1,000,000 is much more than you actually get
State usually pays \$50,000/yr. for 20/yr.

Taxes are approximately 35%

$\$50,000 \times .35 = \$17,500$

$\$50,000 - \$17,500 = \$32,500$ net after taxes (assuming constant tax rate)

$\$32,500 \times 20 \text{ yrs} = \$650,000$

Next, the tax rate on lottery winnings would be approximately 35%.

Description

This rate is an approximate rate used for ease of instruction and calculation. The actual rate will vary with changes in tax codes and from one state to another.

Classroom Discussion

- 4-5 Assuming your annual \$50,000 was taxed at a rate of 35%, how much would you have left per year after taxes?

The case of the shrinking million: Part I

4-5

\$1,000,000 is much more than you actually get

State usually pays \$50,000/yr. for 20/yr.

Taxes are approximately 35%

$\$50,000 \times .35 = \$17,500$

$\$50,000 - \$17,500 = \$32,500$ net after taxes (assuming constant tax rate)

$\$32,500 \times 20 \text{ yrs} = \$650,000$

Calculation

$\$50,000 \times .35 = \$17,500$ is for taxes; $\$50,000 - \$17,500 = \$32,500$ is what you would keep.

Calculation

The following equation shows another way to calculate the amount left after taxes: you get to keep $100\% - 35\% = 65\%$, in which case you would keep $\$50,000 \times .65 = \$32,500$.

An Illustration

If the tax rate stayed the same for the entire 20-year period you were collecting your winnings, how much would you receive in total? ($\$32,500 \times 20 = \$650,000$).

Classroom Discussion

- 4-6 You must also count on inflation taking its toll on your winnings. Post-tax, you would start out with \$32,500 a year ($\$50,000 \times .65 = \$32,500$). This is what the government would leave you, which believe it or not isn't a huge amount.

The case of the shrinking million: Part II

4-6

Remember Inflation?

- Each year the buying power decreases about 4%
- To calculate the effect of inflation on \$32,500 multiply by .96
- For each subsequent year multiply the previous years adjusted amount by .96

Calculation

Each subsequent year, the buying power of your \$32,500 would decrease about 4% (the average inflation rate from 1982 to 1993 was about 4% a year). To calculate the effect of inflation on \$32,500 after one year, multiply \$32,500 by .96 (the value of your original amount minus .04, or 4%). For each subsequent year, multiply the previous year's amount by .96. The following formula may be used once the concept underlying it is understood: $32,500 (.96)^x$, where x is [the number of years minus one]. The reason that x is [the number of years minus one] is because you are assuming that the first year you receive your money you are at a baseline rate, which decreases after the first year.

Example

■ 4-7 After five years, your income will have been reduced to the equivalent of \$27,593.

Calculation

■ 4-8 In 17 years, the actual value of your income from the lottery would have been nearly cut in half, to \$16,913. In the final year, you would receive the current equivalent of \$14,964. Over the 20-payment period, which would be distributed over 19 full years, you would have collected the equivalent of \$453,373, or an average of \$22,669 a year. Obviously, this amount is not even close to what you would need to live in leisure; probably, this amount alone wouldn't even be enough to allow you to buy a house, raise a family, start your own business, or do whatever else you want to accomplish in life.

The case of the shrinking million: Part III

4-7

$$\begin{aligned} & \$32,500 \times (.96)^x \\ & x = (\text{number of years} - 1) \end{aligned}$$

Example – after five years

$$\begin{aligned} & \$32,500 \times (.96)^5 = \\ & \$32,500 \times (.96 \times .96 \times .96 \times .96) = \\ & \$32,500 \times (.849) = \$27,593 \end{aligned}$$

Inflation's Toll

4-8

Calculate the actual value of your income from the lottery after 17 years

- How does this compare with the original \$32,500?
- Calculate the value of your income from the lottery after the full 20 payments (19 years)
- How does that compare to the original \$32,500?

Even if you did not have to factor in taxes and inflation, the difference between receiving all of your winnings now and receiving them over a 20-year period is enormous when we consider the effect of compounding interest. If you received the \$1,000,000 all at once and invested it, you would have over \$3,200,000 at the end of 20 years (assuming a conservative 6% return).

■ 4-9 If you wanted to invest the \$1,000,000 and live off the interest (or dividends or capital gains), you would have an income of \$60,000 every year while still preserving the \$1,000,000. Unfortunately for lottery winners, the state lotteries do not pay out the jackpot all at once.

Effect of Compounding Interest – Fantasy

4-9

Assume a 6% return

- If you invested \$1,000,000 @ 6% for 20 years, you would have more than \$3,200,000
- If you wanted to invest the \$1,000,000 and live off 6% interest that would be \$60,000/yr. And you would still have the original \$1,000,000

Unfortunately, this is merely a fantasy

Directions

This discussion should show students the significant effects of inflation and compound interest.

♣ Gambling vs. Investing

The per-capita expenditure on lottery products in Massachusetts was approximately \$9.20 per week in 1996 (*International Gaming & Wagering Business*, August 1997). Suppose you are the average person spending \$9.20 a week on lottery tickets. If you continue this pattern for 30 years, you will have spent \$14,352 ($9.20 \times 52 \text{ weeks} \times 30 \text{ years}$). Although it is possible that you would make some of this money back over the 30-year period, it is not likely that you will break even, and highly unlikely that you will hit a big jackpot.

Note:

Although the following exercise may involve mathematics that the students are unfamiliar with, it is presented so the teacher has the option of showing the students how the answer was derived.

Suppose that instead of gambling \$9.20 a week (\$478.40 a year), you invested it. Assuming a conservative annual gain of 6% (for example, in a moderate-term certificate of deposit), you would have \$40,090 at the end of 30 years. Given the options of a probable loss of \$14,352 or a definite gain of \$40,090, do students see gambling in a different way?

**That's a difference
of \$54,442!**

Derivation or Calculation

The following explanation describes how to calculate the profit from a 6% annual yield. You start with your annual investment, \$478.40. The first year, you will earn 6% on \$478.40. The equation for the first year looks like this: $478.40 \times (1) + 478.40 \times (.06) = 478.40 \times (1.06) = 507.10$. That is, you add 100% of your initial sum with 6% of that sum, which mathematically means you multiply your initial sum by 106%.

The next year, you will add \$478.40 to the first year total, and you will earn 6% of that total: $(507.10 + 478.40) \times (1.06) = 1,044.63$. If you continue this pattern, adding \$478.40 and multiplying the total by 1.06 for each of the 30 years, you will arrive at the total \$40,090. Another way to arrive at this figure is with the following formula:

$$478.40 (1.06^{30} + 1.06^{29} + 1.06^{28} + 1.06^{27} + 1.06^{26} + 1.06^{25} + 1.06^{24} + \dots + 1.06^3 + 1.06^2 + 1.06^1).$$



Facing the Odds:

The Mathematics of Gambling and Other Risks



♠ Section 4 Worksheet A

Forming and Testing a Hypothesis

The Kaplan Study

Forming a hypothesis.

A **hypothesis** is defined by the American Heritage Dictionary (Soukhanov, 1992) as “a tentative explanation that accounts for a set facts and can be tested by further investigation; a theory.” A hypothesis is a prediction about the distribution of data. For example, students could hypothesize that lottery winners do not change their work behavior after they win. An alternate hypothesis could be that lottery winners do change their work behavior after they win.

Form a hypothesis about the work behavior of lottery winners.

For example: “Hypothesis: the majority of lottery winners quit their jobs after they win”. Students should consider what variables they think will affect winners’ decisions.

Write the hypothesis on a sheet of paper. Write or think about reasons for their hypothesis. For example, “I think lottery winners would quit their jobs because they’d have enough money to last them the rest of their lives without working.”



After having written down a hypothesis, complete Worksheet 4A either in class or for homework. Refer to instructions on the following page.

Instructions

1. Your teacher has asked you to form a **hypothesis** about what lottery winners do about their jobs after they win the lottery. You should have your hypothesis written down on another piece of paper. After you complete the following exercise we will test your **hypothesis**.



2. The table shown on “Worksheet A” presents **data** from Dr. Kaplan’s study on lottery winners. The **data** shows the various work behaviors chosen by lottery winners after their win. First, calculate the percentage of winners and their spouses who chose each work option. Enter your answers in the columns marked %.



3. What do lottery winners do after they win the lottery?

4. What do lottery winners’ spouses do after their spouses win the lottery?

5. Was your **hypothesis** correct?



6. Can you come up with a reason why the **data** fell the way it did? (What are some possible reasons the results came out this way?)

Type of Change in Work Behavior of Winners and Spouses after Winning

	Winners		Spouses of Winners	
Type of Change	#	%	#	%
Quit	49		34	
Retire	59		35	
Quit Second Job	10		3	
Work with Reduced Hours	37		11	
Increase Hours	15		5	
Stayed Same	249		157	
Other	4		—	
TOTALS	446*	**	253*	**

* Not all respondents answered every question.

** May not total to 100 due to rounding.

Data taken from Kaplan, H.R. (1987). Lottery winners: The myth and reality. *Journal of Gambling Behavior*, 3, 168-179.

Section 4 Worksheet A: Teacher's Lecture & Discussion Notes

Scientific Method: Lottery Winners

Background: Kaplan (1987) took a scientific approach to examining lottery winners.

■ 4-10 Kaplan sent questionnaires to 2,319 lottery winners in 12 states between July and September of 1984. Winners included those who had won prizes ranging from \$50,000 to millions. Data on leisure activities, work behavior before and after winning, voluntary associations, and spending behavior were obtained.

Kaplan Study I: Forming and Testing a Hypothesis

4-10

Questionnaires went to 2,319 lottery winners from 12 states

Winners defined as those who won \$50,000 or more

Data collected on leisure activities, work behavior before and after winning, voluntary associations, and spending behavior

■ 4-11 A total of 576 usable questionnaires were returned. In addition, the U.S. Postal Service returned 280 questionnaires because the addresses were not correct, and 20 potential respondents were found to be deceased.

Kaplan Study II: Forming and Testing a Hypothesis

4-11

576 usable questionnaire returned

280 questionnaires returned by the US Postal Service

20 potential respondents were found to be deceased

In this study, Kaplan investigated the effects of the lottery on the lives of lottery winners. Although the case studies earlier in this section presented a wide variety of choices and decisions about work, this study provides a much larger sample, and therefore more representative data.

The table on the following page depicts the work behavior of winners after winning the lottery. Various factors influenced this data.

■ 4-10 For example, would you hypothesize before seeing the data that age was an important variable affecting people's decision to remain in or leave the labor force? In fact, 39% of working winners 65 or older chose to retire early. Other variables affecting work behavior are salary and educational level of winners. Workers earning less than \$10,000 had the highest amounts of quits and retirees. Winners with lower educational levels were more likely to quit their jobs, decrease their hours, and retire. These findings could imply that less-educated, lower-income individuals held jobs that were less satisfying and meaningful, and therefore, when given the opportunity, chose to leave their jobs more often than higher-educated, wealthier individuals. Another explanation could be that less-educated, lower-income individuals were willing to live only on the annual income the lottery provided because they were accustomed to living on a smaller income, whereas higher-educated, wealthier individuals could not support their present lifestyles on their annual lottery payments alone.

Kaplan Study I: Forming and Testing a Hypothesis

4-10

Questionnaires went to 2,319 lottery winners from 12 states

Winners defined as those who won \$50,000 or more

Data collected on leisure activities, work behavior before and after winning, voluntary associations, and spending behavior

Section 4 Worksheet A Answers

2. Type of Change in Work Behavior of Winners and Spouses after Winning

	Winners		Spouses of Winners	
Type of Change	#	%	#	%
Quit	49	11	34	13
Retire	59	13	35	14
Quit Second Job	10	2	3	1
Work with Reduced Hours	37	8	11	4
Increase Hours	15	3	5	2
Stayed Same	249	56	157	62
Other	4	1	—	—
TOTALS	446*	100**	253*	100**

* Not all respondents answered every question.

** May not total to 100 due to rounding.

- 56% of lottery winners don't change their work behavior after winning the lottery, while 11% quit their jobs.
- 62% of the spouses of lottery winners don't change their work behavior after winning the lottery, while 13% quit their jobs.
- Students should determine if they formed a hypothesis that is proven correct by the table.
- Students are encouraged to discuss the results of this study. For example, why wouldn't everyone quit their jobs if they won the lottery? What would be the advantages of "staying the same"? Are the students surprised that only 3% of the winners and 2% of the spouses of winners increased their hours?



Facing the Odds:

The Mathematics of Gambling and Other Risks



♠ Section 4 Worksheet B

- 1.** If you won the \$1 million lottery jackpot, what would you rather do, get your money all in one lump sum, or have it parceled out to you in small payments?



- What are the advantages of each option?

- What are the disadvantages of each option?

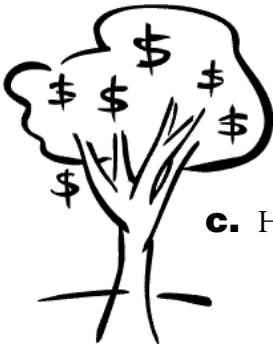


2. You have just scratched the winning ticket for the \$1 million lottery jackpot. When you go into your local convenience store to report your win, you find out that you will be getting your \$1 million over the next 20 years.

a. Assuming you would pay no tax on this money (which would be an inaccurate assumption), how much money would you be getting per year?



b. How much would that annual sum be worth 10 years from now?



c. How much would it be worth 20 years from now?

3. Susan will never forget the date September 11, 1993. That was the day her family and friends threw a big party celebrating the wonderfully unexpected event of her mother winning the \$35 million jackpot. Everyone seemed perfectly happy with the idea of her receiving a payment each year over the next 20 years, which was the arrangement set by the Lottery Commission. On September 15, 1995, Susan's mother was tragically killed

in a car accident. Her father died 10 years ago. As the next-of-kin, Susan receives a letter from the IRS letting her know that she owes 26% estate taxes on the rest of the money that was due her mother. How much would this be?

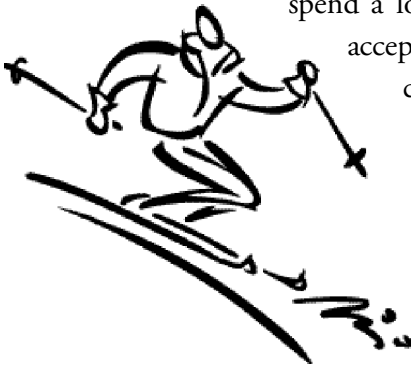


- 4.** A lottery winner is having a hard time financially, and there is the option of selling the annuity to a company that will offer a lump sum payment.

- What would be the advantages of choosing this option?



- Imagine this scenario: Five years ago you won \$5 million, to be paid out over the next 20 years. This year you have had extremely high medical expenses, and have had to spend a lot of money supporting your new passion for skiing. You decide to accept the offer of Stone Street Capital to buy your annuity at the rate of 40 cents on the dollar. How much cash will you receive now and how does it compare with what you would receive if you continued to get some of your winnings every year?



- 5.** If you won the lottery, would you still want to pursue a career?

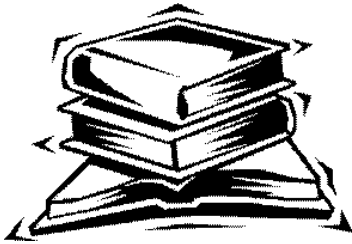


- Could you be happy without a job for the next 20 years?

- What would happen after 20 years when the payments stopped?



- 6.** If response rate is defined as the percentage of those who replied divided by the total number of people eligible to participate in the survey, what is the response rate of Kaplan's study of lottery winners?



- 7.** Think about the sample in Kaplan's study.

- Do you think this is a representative sample?
- Would there be any particular characteristics about the individuals who didn't return the questionnaires?



- 8.** How much do you lose from your lottery winnings as a result of state and federal tax? If you had to guess a percentage, what would it be? Complete the following two exercises to find out how much two winners paid in tax from their winnings.

- *Case One:* In 1993, John won a \$3 million lottery jackpot. This jackpot will be paid out over 20 years. The first year's after-tax payment totaled \$97,500. What percentage of his winnings is he paying in tax?



- *Case Two:* Last year, Wanda won a \$5 million lottery jackpot. Her winnings will be paid out in equal annual installments over 20 years. If her winnings are taxed at a rate of 35%, how much money will Wanda actually receive each year?



Section 4 Worksheet B Answers

- The first question is a matter of opinion, though almost all jackpots are paid to the winner over a 20-year period. Some states have a “cash option,” which allows the winner to take the winnings in one lump sum but cuts the winnings by 55 to 60%. The following table describes the advantages and disadvantages of each choice.

	Advantages	Disadvantages
Parceled out in small payments	Enforced self-discipline. Consistent payout each year for 20 or 25 years.	Cannot invest total winnings. Seems much smaller than what you expected from winning the jackpot.
One lump sum	Could invest money and make even more.	Winner may impulsively spend all of winnings, leaving nothing for future years.

- $\$1,000,000 \div 20 = \$50,000$

This \$50,000 will decrease in value every year. In 10 years, for example, at an inflation rate of 4%, the \$50,000 will have the purchasing power of \$34,627. In 20 years, at the same rate, the \$50,000 will have the purchasing power of \$23,021.

- $\$35,000,000 \div 20 = \$1,750,000$

- Assume her mother has collected 2 of the 20 payments. $2 \times \$1,750,000 = \$3,500,000$
- $\$35,000,000 - \$3,500,000 = \$31,500,000$
- At a tax rate of 26% she would owe $\$31,500,000 \times .26 = \$8,190,000$

- Selling the annuity to a company for one lump sum would provide the lottery winner with more money in the present but a smaller amount in the long run. This option would be advisable only if the lottery winner needed money immediately to pay off debts.

- $\$5,000,000 \div 20 = \$250,000$
- You’ve collected 5 payments: $5 \times \$250,000 = \$1,250,000$
- 15 payments remain: $15 \times \$250,000 = \$3,750,000$
- If Stone Street Capital buys this remaining amount at 40 cents on the dollar, you will receive $.40 \times \$3,750,000 = \$1,500,000$
- It becomes a choice of \$1,500,000 now or \$250,000 a year for the next 15 years.

5. This is a matter of opinion. Most middle school students have not yet started working. Have the students discuss their ideas and opinions about what it would be like to have a full-time job. What would it be like not to work? After 20 years of not working and collecting lottery payments, what skills would you have developed? Would it be harder to find a job with no work experience on your resume?
6. A total of 576 usable questionnaires were returned. In addition, 20 potential respondents were found to be deceased.
- Response rate = $\% \text{ replied} \div \text{total \# eligible}$
 - Response rate for this survey = $576 \div (2319 - 20) = 576 \div 2299 = 25.1\%$.
7. Questionnaires were sent to 2,319 lottery winners in 12 states between July and September of 1984. Winners included those who had won prizes ranging from \$50,000 to millions. Data on leisure activities, work behavior before and after winning, voluntary associations, and spending behavior were obtained.

The sample of 2,319 could be representative of winners in the 12 states chosen. The article does not state how many states had lotteries in 1984. If more than 12 states held a lottery in 1984, then the winners in the 12 sampled states might be different than the winners in the other states.

In addition, the fact that only 25.1% of the sample returned the questionnaires is troublesome in terms of representativeness. Those who did not return the survey could differ significantly from those who did return the survey on the characteristics Kaplan was investigating: leisure activities, work behavior, voluntary associations, and spending behavior.

8. The total percentage of taxes taken from lottery winnings is usually approximately 35%.
- Case One:* First, calculate what the pre-tax payment would be: $\$3 \text{ million} \div 20 \text{ installments} = \$150,000$. If John got \$97,500, then \$52,500 was deducted by tax. Thus, $\$52,500 \div \$150,000 = 35\%$ that was paid in taxes.

Case Two: First, calculate what the pre-tax payment would be: $\$5 \text{ million} \div 20 \text{ installments} = \$250,000$. Next, determine what is left after taxes: Since her winnings are taxed at 35%, she receives **$\$250,000 \times .65 = \$162,500$** .