

1.8 Cancer Survival Times A medical researcher wants to estimate the survival time of a patient after the onset of a particular type of cancer and after a particular regimen of radiotherapy.

- a. What is the variable of interest to the medical researcher?
- b. Is the variable in part a qualitative, quantitative discrete, or quantitative continuous?
- c. Identify the population of interest to the medical researcher.
- d. Describe how the researcher could select a sample from the population.
- e. What problems might arise in sampling from this population?

1.9 New Teaching Methods An educational researcher wants to evaluate the effectiveness of a new method for teaching reading to deaf students. Achievement at the end of a period of teaching is measured by a student's score on a reading test.

- a. What is the variable to be measured? What type of variable is it?
- b. What is the experimental unit?
- c. Identify the population of interest to the experimenter.

APPLICATIONS

1.12 Election 2012 During the spring of 2010, the news media were already conducting opinion polls that tracked the fortunes of the major candidates hoping to become the president of the United States. One such poll conducted by *CNN/Opinion Research Corporation Poll* showed the following results:¹

"If Barack Obama were the Democratic Party's candidate and [see below] were the Republican Party's candidate, who would you be more likely to vote for: Obama, the Democrat, or [see below], the Republican?" If unsure: "As of today, who do you lean more toward?"

4/9–11/10	Barack Obama (D)	Mitt Romney (R)	Neither (vol.)
	%	%	%
	53	45	1
4/9–11/10	Barack Obama (D)	Mike Huckabee (R)	Neither (vol.)
	%	%	%
	54	45	1
4/9–11/10	Barack Obama (D)	Sarah Palin (R)	Neither (vol.)
	%	%	%
	55	42	3
4/9–11/10	Barack Obama (D)	Newt Gingrich (R)	Neither (vol.)
	%	%	%
	55	43	1

Source: www.pollingreport.com

- Define the variable that has been measured in this table.
- Is the variable quantitative or qualitative?
- What do the numbers represent?
- Construct a pie chart to describe the age distribution of *Facebook* users as of January 4, 2009.
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- Refer to parts d and e. How would you describe the changes in the age distributions of *Facebook* users during this 1-year period?

1.13 Want to Be President? Would you want to be the president of the United States? Although many teenagers think that they could grow up to be the president, most don't want the job. In an opinion poll conducted by *ABC News*, nearly 80% of the teens were not interested in the job.² When asked "What's the main reason you would not want to be president?" they gave these responses:

Other career plans/no interest	40%
Too much pressure	20%
Too much work	15%
Wouldn't be good at it	14%
Too much arguing	5%

- Are all of the reasons accounted for in this table? Add another category if necessary.
- Would you use a pie chart or a bar chart to graphically describe the data? Why?
- Draw the chart you chose in part b.
- If you were the person conducting the opinion poll, what other types of questions might you want to investigate?



1.14 Facebook Fanatics The social networking site called *Facebook* has grown quickly since its inception in 2004. In fact, *Facebook's* United States user base grew from 42 million users to 103 million users between 2009 and 2010. The table below shows the age distribution of *Facebook* users (in thousands) as it changed from January 2009 to January 2010.³

Age	As of 1/04/2009	As of 1/04/2010
13–17	5675	10,680
18–24	17,192	26,076
25–34	11,255	25,580
35–54	6989	29,918
55+	955	9764
Unknown	23	1068
Total	42,089	103,086

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1.15 Back to Work How long does it take you to adjust to your normal work routine after coming back



from vacation? A bar graph with data from the Snapshots section of *USA Today* is shown below:⁴

- Are all of the opinions accounted for in the table? Add another category if necessary.
- Is the bar chart drawn accurately? That is, are the three bars in the correct proportion to each other?
- Use a pie chart to describe the opinions. Which graph is more interesting to look at?

1.21 Navigating a Maze An experimental psychologist measured the length of time it took for a rat to

successfully navigate a maze on each of 5 days. The results are shown in the table. Create a line chart to describe the data. Do you think that any learning is taking place?

Day	1	2	3	4	5
Time (seconds)	45	43	46	32	25



1.22 Measuring over Time The value of a quantitative variable is measured once a year for a 10-year period. Here are the data:

Year	Measurement	Year	Measurement
1	61.5	6	58.2
2	62.3	7	57.5
3	60.7	8	57.5
4	59.8	9	56.1
5	58.0	10	56.0

- Create a line chart to describe the variable as it changes over time.
- Describe the measurements using the chart constructed in part a.