South Carolina Academic/Career Development Integration Activity (DRAFT)

Title **Employment Outlook (HM-2)**
Subject **Data Analysis and Probability** **Grade Level(s) 9-12**

SC Content Standard Data Analysis and Probability - Standard I. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation D. Understand histograms, parallel box plots, and scatterplots and use them to display data.

I.D.1. Represent, display, and interpret data using scatterplots, bar graphs, stem-and-leaf plots, and box-and-whiskers diagrams including representations on graphing calculators and computers.

National Career Development Guidelines Goal/Indicator
Career Management GOAL CM5. Integrate changing employment trends, societal needs, and economic conditions into your career plans.

Indicator CM5.K3. Identify employment trends that affect your career plans.

Career Development Objectives
1. The student will represent, display, and interpret data using a variety of graphing techniques.
2. The student will be able to locate employment outlook and trend information.
3. The student will interpret employment outlook and trend information about occupations of interest.

Assessment
1. The student will represent, display, and interpret employment outlook and trend data, about selected occupations, using a variety of graphing techniques.
2. The student will access Bureau of Labor Statistics data about employment outlook and trends.
3. The student will complete the *Employment Outlook and Me* worksheet.
4. The student will recognize that employment outlook data projections are useful in making career plans and selecting an occupation to pursue. (Class discussion and Teacher observation)

* Adapted from *Career Development Tool Kit*, Linda Kobylarz & Associates, 2001. Used with permission

Preparation

• Prior Learning—Instruction on representing, displaying, and interpreting data using a variety of graphing techniques, experience with Internet research
• Handouts/Worksheets— *Employment Outlook and Me* handout/worksheet
• Resources/Materials—writing materials, graphing paper, Internet access, BLS website, www.bls.gov , *Where the Jobs Are* (for teacher reference)
• Time Required—90 minutes plus outside work for BLS research

Procedures

Part One (60 minutes)

• In this activity, students will practice representing, displaying, and interpreting data using a variety of graphing techniques. They will evaluate employment outlook and trend information in light of occupations in which they have an interest.
• Review with students the use of graphing techniques to represent, display, and interpret data.
• Give students a copy of the *Employment Outlook and Me* handout. Review the directions with them. Depending on the experience of the students, take them to a computer lab and lead them through the BLS research or assign the BLS research as homework.
• Give students time to complete the assignment.
• Have students display their graphs. What graph style worked best?

Part Two — Career Development Connections (30 minutes)

• Engage students in a discussion of what they learned about the occupations they selected. Were there any surprises? Did the outlook information have any impact on the students' thinking about the occupations they selected? Has the information caused students to re-evaluate their tentative occupational choices?
• Point out to students that, although important, occupational projections are just one of the things students need to consider when making decisions about career plans.
• Optional: Have students use the O*Net, SC Careers system, or other career information system to further research an occupation of interest.
• Optional: Use the graphs as artifacts in the student's career portfolios.

Crosswalks

SC Career Guidance Standard/Competency

Learning to Work Standard 5. Students will understand how community awareness relates to work.

Competency 5.3. Identify how occupational and industrial trends relate to training and employment.

Key Employability Skills

Thinking Skills—Decision-making, critical thinking, reasoning
Basic Academics—Arithmetic/Mathematics
Information—Obtains, evaluates, organizes, interprets, and communicates information

Employment Outlook and Me

Directions: Gather data about occupations in which you have an interest and create a graph or graphs displaying the data. Follow the steps outlined below.

Part 1 – Gather Information

Step 1

- Access the Bureau of Labor Statistics (BLS) website at www.bls.gov.

Step 2 - BLS Home Page

- Scroll down to: Occupations
- Click on Employment Projections

Step 3 – Office of Occupational Statistics and Employment Projections Page

- Click on Get Detailed Employment Projections Statistics

Step 4 - Get Detailed Employment Projections Statistics

- Click on Occupation Search

Step 5 – Occupations Search Page

- Click on Select from a list of occupations on the following page
- Click on Total employment in 2004
- Click on Continue

Step 6 – Occupation Level Search Page

- Scroll down the list of occupations
- Select 5 occupations of interest to you
- Hold down CTRL and click each occupation you want to select
- Click on Search

Step 7 – Occupation Report Page

- Print the report

Part 2 – Display the Information

Create a graph or several graphs that would allow a person to compare the following data for the occupations you selected. Note: Each graph should show data for all five occupations.

- Total Employment 2004 (000's)
- Total Employment 2014 (000's)
- 2004-2014 Change in Total Employment (Number – 000's)
- 2004-2014 Change in Total Employment (Percent)
- 2004 Median Annual Earnings (Dollars)

Where the Jobs Are

ABC International leaving the state. More than 2,000 workers to lose jobs!

Municipal Hospital offers sign-on bonus for nurses.

Construction industry projected to gain about 1 million jobs over the next 10 years.

Almost every day there's something in the news about jobs, the economy, layoffs, huge companies buying smaller ones, or competition from other countries.

You might be wondering what it all means...and asking yourself ***What does it mean to ME?***

Most people spend a lot of years working to earn a living. In fact, you're already working. You do work anytime you produce something or provide a service. You're working when you write a report for school or help at home to clean up after supper. Sometimes you get paid for the work you do and sometimes you don't.

Work can be physical like lifting boxes or mental like writing computer software or it can be a combination of both. It can involve making things (cars, cups, computers); moving things (driving a truck or flying a plane); providing services (waiting tables, selling clothes, putting out fires); or working with your mind (writing novels, creating new computer games, designing skyscrapers).

When you get a job or start looking for a job, you become part of something called the *labor force*. There are more than 145 million people in the US labor force today.

Wondering what occupations will be hot prospects in the future? Employment projections will help you see what occupations will be in demand and how many jobs there are likely to be. You can use the information to make better decisions about your education and career.

There's a lot of information out there. Most of it's free and on the Internet. But, trying to understand all the numbers and words can sometimes be confusing.

Want to know more? Read on!

Understanding the Basics

About jobs, occupations and your career…

So, what is a job? A **job** is a paid position with specific duties, tasks and responsibilities in a particular place of work (e.g., photographer at Best Pictures). In the year 2012, we expect to see more than 50 million job openings for new workers. You almost certainly will have many jobs over your lifetime.

Jobs are grouped into occupations. An **occupation** is a cluster of jobs with common characteristics that require similar skills (e.g., photographer). You'll probably work at several occupations over your lifetime.

Where the Jobs Are

All of the jobs you have and the occupations you work in add up to your **career**. Your career also includes how you prepare for jobs (your education and training), as well as how your work life is interwoven with other parts of your life such as family, community and leisure.

About employers and industries...

An **employer** is the person, company, or organization that pays you for doing work.

Do I have to work for someone else?

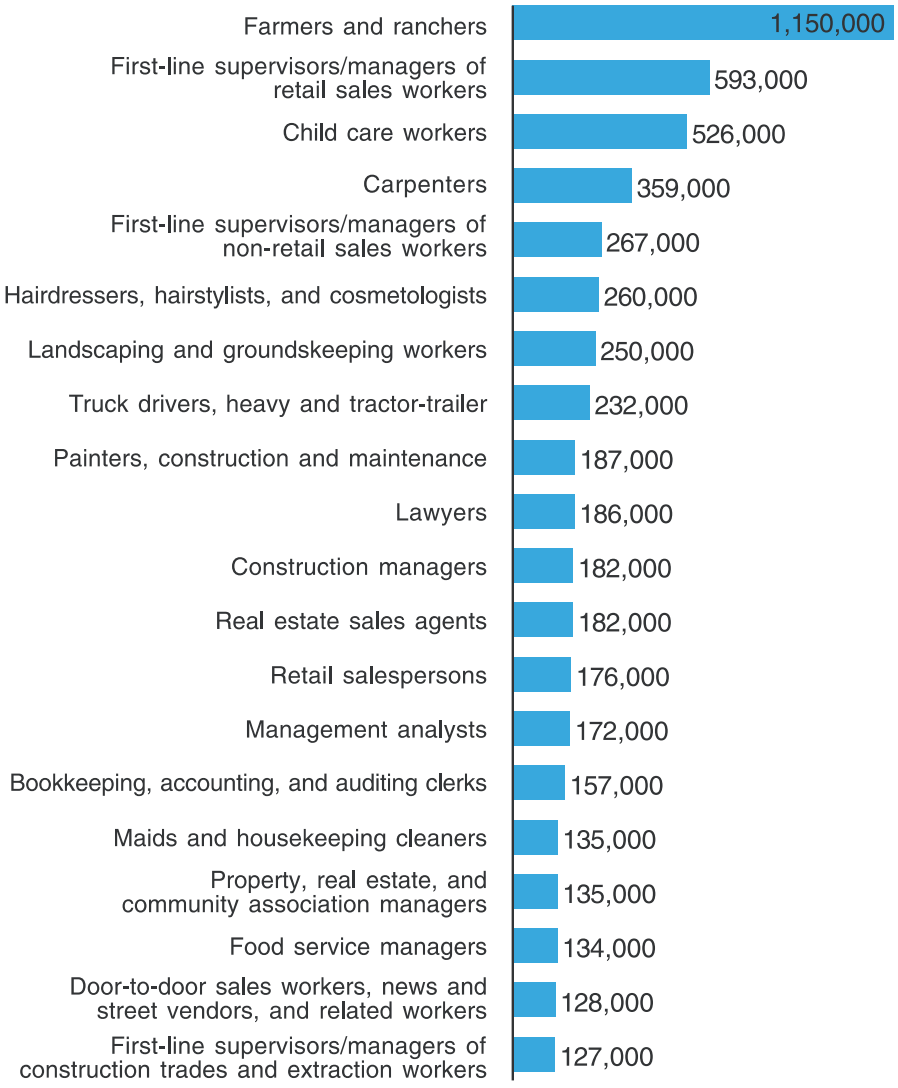
No. You can be **self-employed**. Many people–writers, doctors, lawyers, plumbers, farmers, etc. work for themselves and sell their skills or products directly to the public. If you have the skills and ambition, you can start your own small business. Bakeries, beauty parlors, restaurants and stores of all types provide opportunities for self-employed business people. Most people starting their own business have some experience working for others in their industry before setting out on their own.

What are industries?

Industries are collections of companies and establishments that do the same sort of work. The computer industry makes computers. The movie industry makes movies.

Self- Employment

Occupations with the most self-employed workers, 2002



Source: Occupational Outlook Quarterly, Winter 2003- 04

Where the Jobs Are

Large companies often do business in more than one industry. When you think about what you are going to do for work, consider whether you find one industry more interesting than another.

Skills are the key…

No matter what job you want you'll need some skills.
Skills are the combination of knowledge and abilities needed to do a job. The more skills you have, the more likely you are to find a satisfying job that pays well.

Want to learn more about occupations and the skills they require?
Visit www.bls.gov/oco/.

Why do some jobs pay more than others?

There are a number of reasons why wages vary. Mostly it has to do with the value the employee can bring to the employer and the availability of jobseekers with the needed skills. A highly skilled baseball player attracts thousands of paying customers and there are only a few really skilled baseball players. The people that take the tickets at the stadium, while important to the smooth operation of the stadium, don't bring as much value to their employer and there are lots of people who have the skills to do that job. So, the baseball player gets paid much more than the ticket taker.

For more information about wages, check out http://www.acinet.org/acinet/ Click on *Wages and Trends* or visit www.bls.gov/oes.

What does education have to do with it?

Education is the main way you get the work skills you need. You develop many work skills in school. Reading, writing, speaking clearly, understanding math and science, problem solving and knowing how to work with other people are all important work skills. By continuing your education/training after high school, you can learn the special skills required by an occupation.

Is getting more education/training after high school worth it?

Studies show that people with a postsecondary degree earn more money over the course of their careers than those without a degree.

Level of education attained Median weekly earnings in 2003 (Dollars)	
Doctoral degree	$1,349
Professional degree	$1,307
Master's degree	$1,064
Bachelor's degree	$900
Associate degree	$672
Some college, no degree	$622
High-school graduate	$554
Some high-school, no diploma	$396

Source: Bureau of Labor Statistics; Earnings, March 2003: Bureau of the Census.

Check Out Where the Jobs Are

What is a labor market?

A market is where things are bought and sold. When employers are looking for employees and people are looking for jobs, together they create a **labor market**. It would probably be better called a "skills" market since that is what employers are looking for and what jobseekers have to offer. Generally, the more skills you have, the better you will do in the labor market. **A labor market area** is a geographic area like a city or county within commuting distance of many employers.

What about all the numbers?

Some people are a little afraid of numbers, but numbers help us compare things. That's why we have scores in football, baseball, soccer and tennis. Workforce information numbers can tell you the score as well. For example, they tell you how many jobs are in different occupations, how fast they're growing, how much they pay and where they're located.

How do I make sense of the numbers?

A page of numbers can look confusing, but it really isn't that hard to understand. You just need the key to get the message.

This chart shows how to understand a typical page of employment projection numbers. It gives you a chance to practice reading this kind of information.

- Employment projection numbers are reported either in thousands or millions. To save space the zeros are left out. You have to add the correct number of zeros. Add three zeros for thousands and six zeros for millions to get the real numbers. For example, in this chart the number 610 really means 610,000.

Employment by major industry division, 1992, 2002, and projected 2012

Table 1. Employment by major industry division, 1992, 2002, and projected 2012
(Numbers in thousands of jobs)

Actual Number

Add three zeros to all numbers to get the real value

Shows change

Industry division	Employment			Numeric change		Percent change	
	1992	2002	2012	1992 to 2002	2002 to 2012	1992 to 2002	2002 to 2012
Total	123,325	144,014	165,319	20,689	21,305	16.8	14.8
Mining	610	512	451	-98	-61	-16.1	-11.8
Construction	4,608	6,732	7,745	2,124	1,014	46.1	15.1
Manufacturing	16,799	15,307	15,149	-1,492	-158	-8.9	-1.0
Utilities	726	600	565	-126	-34	-17.4	-5.7
Wholesale trade	5,110	5,641	6,279	531	638	10.4	11.3
Retail trade	12,828	15,047	17,129	2,219	2,082	17.3	13.8
Transportation and warehousing	3,462	4,205	5,120	744	914	21.5	21.7
Information	2,641	3,420	4,052	779	632	29.5	18.5
Financial activities	6,540	7,843	8,806	1,303	964	19.9	12.3
Professional and business services	10,969	16,010	20,876	5,040	4,866	45.9	30.4
Education and health services	11,891	16,184	21,329	4,293	5,145	36.1	31.8
Leisure and hospitality	9,437	11,969	14,104	2,532	2,135	26.8	17.8
Other services	5,120	6,105	7,065	985	960	19.2	15.7
Federal government	3,111	2,767	2,779	-344	12	-11.1	0.4
State and local government	15,675	18,722	21,240	3,047	2,518	19.4	13.4
Agriculture	2,639	2,245	1,905	-394	-340	-14.9	-15.1
Self-employed and nonfarm family	9,009	9,018	9,162	10	144	0.1	1.6

Even though the percentage growth is higher, the actual number can be lower

SOURCE: BUREAU OF LABOR STATISTICS

This tells you who did the research

- You'll see information about changes (increases or declines) expressed two ways: numeric change and percentage change.

Numeric change means the actual number of people employed or expected to be employed (e.g., 100,000).

Percent change is the rate of growth or decline in employment (e.g., 13%).

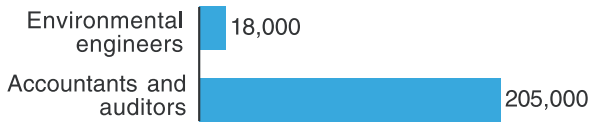
- Be careful when you see percentage of growth on a chart or graph. Just because a high percent rate of growth is shown, it doesn't necessarily mean that there will be a lot of jobs for that occupation.

The top chart shows the projected increase in the number of jobs for environmental engineers (18,000) compared with that for accountants and auditors (205,000).

The bottom chart shows the percent change for both occupations (38% for environmental engineers and 19% for accountants/auditors).

Two Views of Employment Growth

Numeric employment growth in two occupations, projected 2002-12



Percent employment growth in two occupations, projected 2002-12

Source: Occupational Outlook Quarterly, Winter 2003- 04.

Even though the percent change is greater for environmental engineers, there will be more jobs for accountants/auditors. So don't jump to conclusions. Get the whole picture.

What do the numbers tell about my chances?

The numbers can tell you a lot about your chances to get a job.
A small number of jobs in a very popular field (e.g., athletes, actors) means you will have to be **very** good to compete for the jobs.

A large number of jobs may mean chances are better that you can get a job in the field. But, if there are a lot of people who are qualified for those jobs, you will still have to be better prepared than other people.

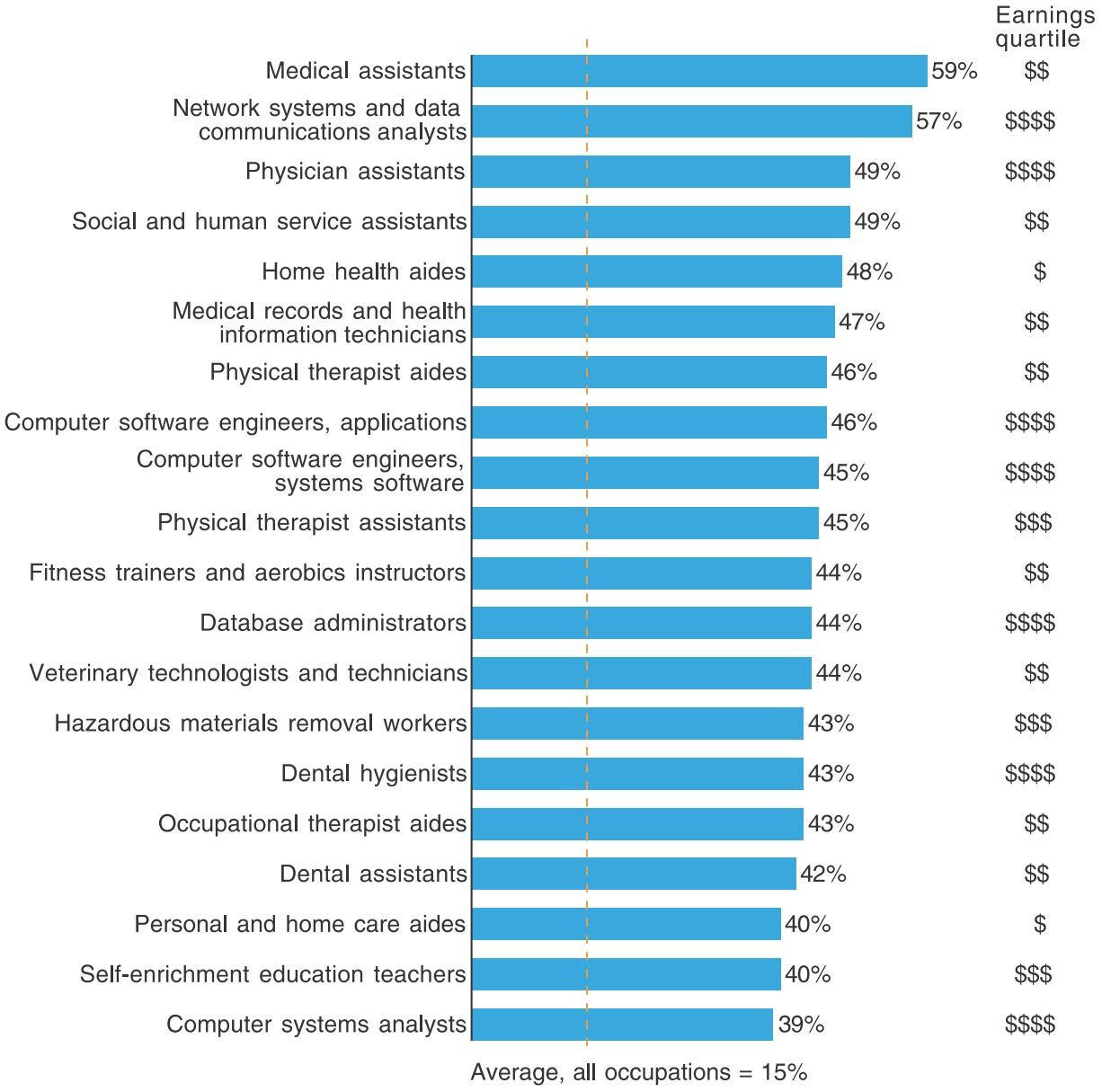
Why are trends and projections important?

Employment and industries are always changing; some are growing some are shrinking.
Trends tell you what happened from one year to the next **in the past**.
Projections seek to predict what the trend will be **in the future**.
A long term rising trend and projections might mean that there will be more opportunities when you are ready to look for a job.
A declining trend might be a sign that you should show caution and get more information before choosing that occupation or industry.

Where the Jobs Are

Fastest Growing Occupations

Percent growth in employment, projected 2002-12



Source: Occupational Outlook Quarterly, Winter 2003- 04.

Where the Jobs Are

Most New Jobs

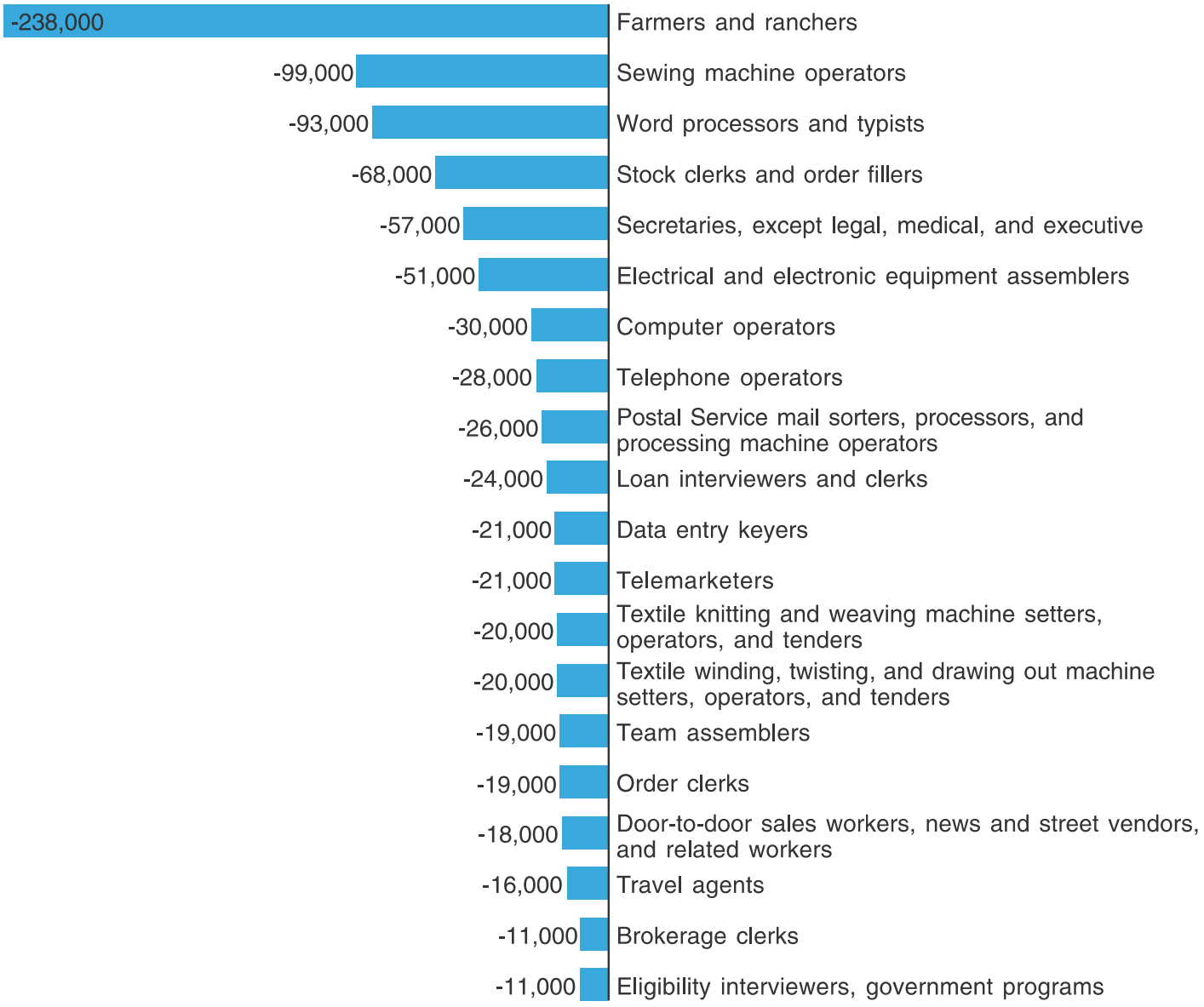
Numeric growth in employment, projected in 2002-12

Source: Occupational Outlook Quarterly, Winter 2003- 04.

Where the Jobs Are

Most Job Losses

Numeric change in employment by occupation, projected 2002-12



Source: Occupational Outlook Quarterly, Winter 2003- 04.

Most New Jobs, Highest Paying: Bachelor's or Graduate Degree

Numerica change in employment in the top 20 large-growth, high-paying occupations that usually require a bachelor's or graduate degree, projected 2002-12

Source: Occupational Outlook Quarterly, Winter 2003- 04.

Most New Jobs, Highest Paying: Less Than a Bachelor's Degree

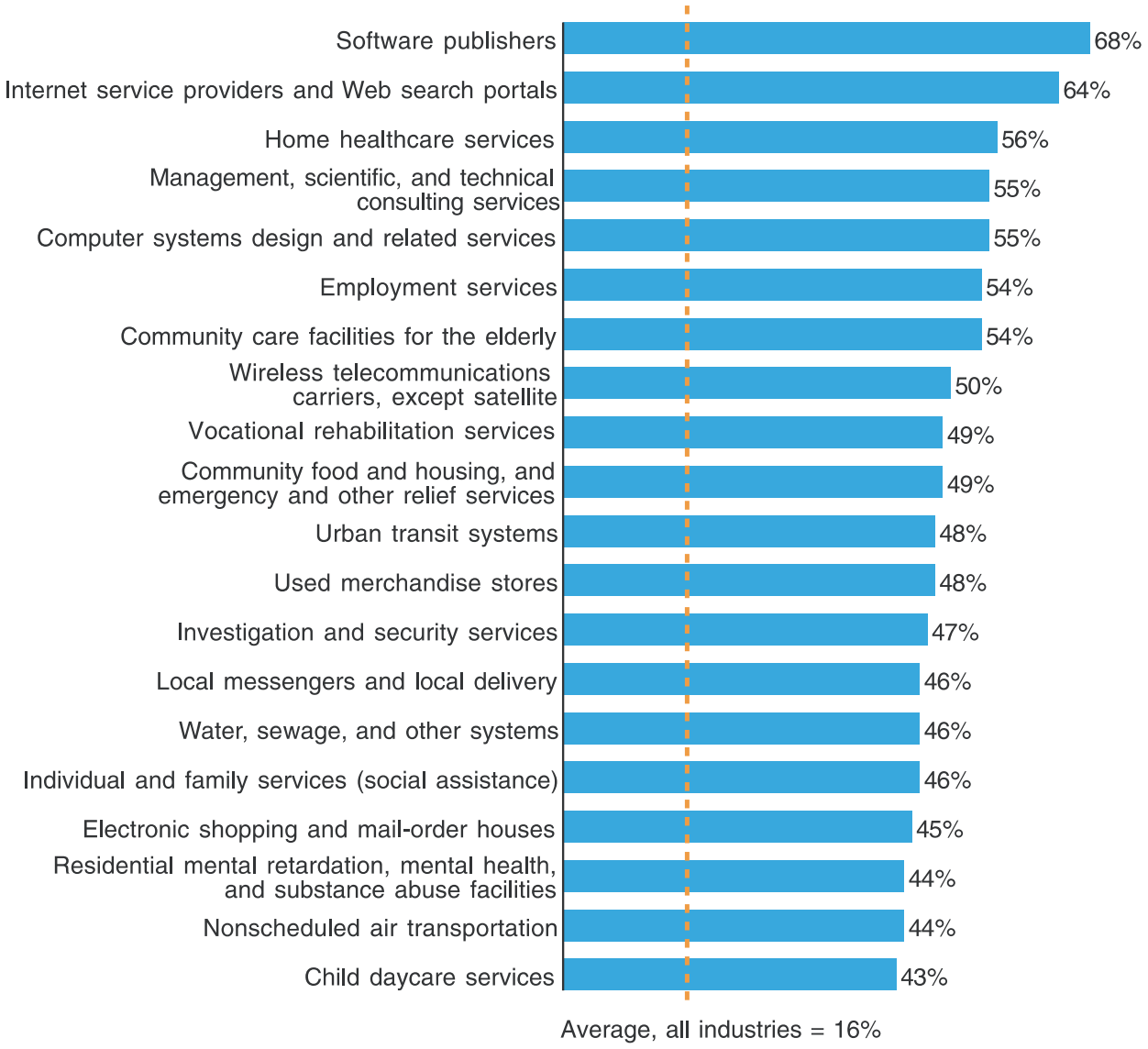
Numeric change in employment in the top 20 large-growth, high-paying occupations that usually require less than a bachelor's degree, projected 2002-12

Source: Occupational Outlook Quarterly, Winter 2003- 04.

Where the Jobs Are

Fastest Growing Industries

Percent growth in wage-and-salary employment by detailed industry, projected 2002-12



Source: Occupational Outlook Quarterly, Winter 2003- 04.