Occupational Outlook Quarterly

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Paying for college:
Strategies to afford higher education today

A college degree is often the key to jumpstarting a career. And data from the U.S. Bureau of Labor Statistics (BLS) consistently show that workers who have a college degree earn more than workers who don't.

Not surprisingly, a college education is increasingly popular. For example, according to the U.S. Department of Education National Center for Education Statistics (NCES), postsecondary enrollment at all levels grew between fall 1980 and fall 2010—from about 12 million to 21 million students. Those students were less than half of the college-age population in 1980 but about 70 percent in 2010, according to the U.S. Census Bureau.

The cost of attending college rose during that time as well. NCES data also show that between academic years 1980–81 and 2010–11, the cost of college, adjusted for inflation, more than doubled at both public and private institutions. (See chart below.)

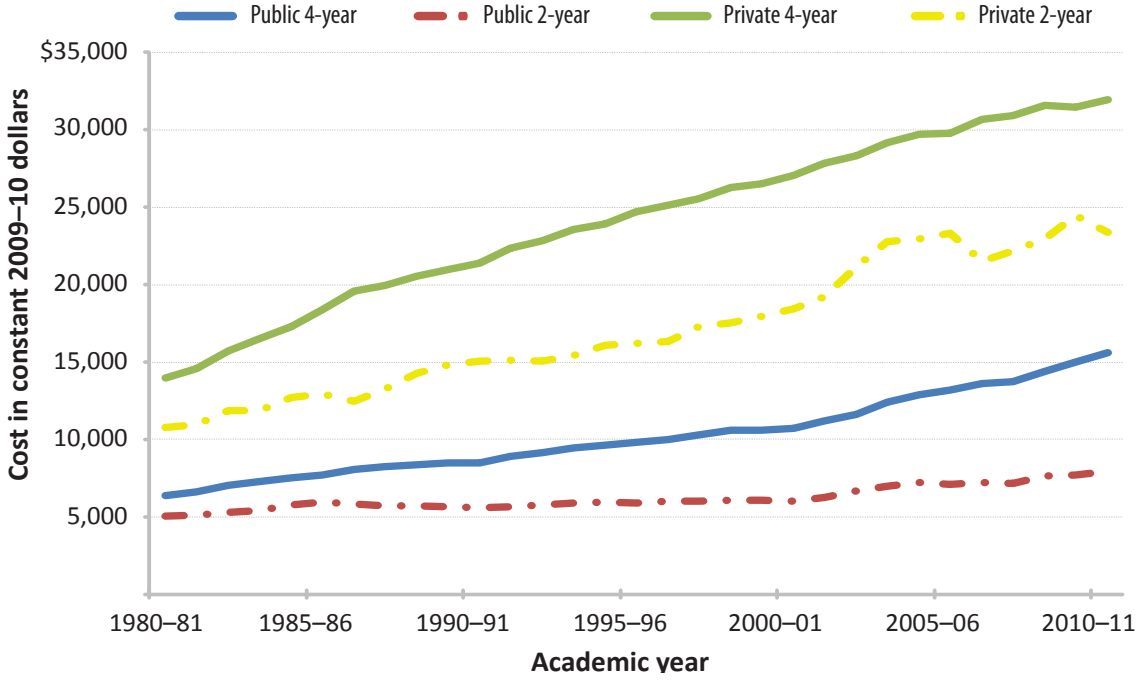
But sources of money to help students pay for college haven't kept pace. And some types of financial assistance, such as state-funded aid, have shrunk. "The result is that, today, student debt is largely unavoidable," says Mark Kantrowitz, publisher of financial aid websites Fastweb and FinAid.

This article is a guide to affording higher education. The first section describes ways to plan for college expenses before enrolling. The second section explains how to finance higher education. The third section offers tips for money management before, during, and after college. Resources for more information are listed at the end of the article.

Strategies described in this article focus primarily on attendance at 4-year colleges and universities. However, the information is broadly applicable to different levels of higher education. Also, keep in mind that some financial aid details, such interest rates and tax incentives, may change. (Check to see if rates and rules have changed since this article was published.)

Many students enroll in 2- or 4-year colleges immediately after high school.

Total costs for full-time undergraduate students at public and private 4- and 2-year colleges, by academic year, in constant 2009–10 dollars



Source: National Center for Education Statistics

Dennis Vilorio

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But older students also attend these colleges to improve their skill sets and prepare for higher level careers. The box on page 16 outlines some alternatives for students who are unsure whether enrolling in college right after high school is the best strategy for them.

Planning for college costs

Some of the most important strategies for making higher education affordable begin before it's time to enroll in college. Strategies such as saving money and earning college credits are most effective the earlier students start. Others, including choosing schools and applying for college admission and financial aid, may require waiting until the final year of high school.

Save money, earn money

In the long run, it's cheaper to pay for college by saving money than by borrowing it. That's because savers earn interest, whereas borrowers pay it. And the earlier students start saving, the better—but it's never too late to start.

529 Plans. One of the best ways to save money for future college expenses is to open a college savings plan. Commonly known as 529 Plans, after Section 529 of the Internal Revenue Service code that created them, these accounts permit investors to save money for college or prepay college tuition without being taxed on the earnings used to pay for education.

For most 529 savings plans, accountholders typically invest savings in one or more mutual funds. The best options, say experts, are usually target-date or index funds. Target-date funds select investments based on when a student is expected to go to college; index funds choose investments that are designed to mirror a particular financial market index.

Some states also offer prepaid tuition plans that allow payment for future tuition at state colleges' and universities' current rates, even if those rates increase over time. But these plans have drawbacks. School selection may be limited, for example, and few states offer unconditional guarantees on the investment—so many prepaid plans may pay out less than expected.

Many states offer tax deductions or credits for savings in a 529 Plan. "It's like getting a discount on tuition," says Kantrowitz.

Anyone can open a 529 Plan for oneself or for someone else, regardless of relationship, at

Families should begin saving for students' college education as early as possible.

any time. Also, 529 Plans do not require state residency to open. Each state has multiple 529 Plans available with different benefits and requirements, so it's important to shop around.

Earn rewards for shopping. Some credit card programs allow participants to make purchases for which they get cash back, and they can then invest the money or use it for college expenses.

For example, UPromise, an online subsidiary of student loan servicer Sallie Mae, partners with retailers that offer cash back on everyday purchases. These cash rewards can be directly deposited into a 529 Plan or other savings account, sent as a check for college expenses, or used to pay down student loans.

All major credit card providers also offer similar, but less formal, college rewards programs. By shopping with an eligible credit card, participants can use accrued cash-back or reward points toward college tuition or loan payments.

But like all credit cards, those that offer rewards can prove hazardous to credit health. Overspending with a credit card and not paying bills on time can lead to a bad credit rating, increase debt burden, and jeopardize future finances. See the section on managing money, beginning on page 12, for more about responsible credit card use.

Earn credits before college

Earning college credit can start as early as high school. Taking Advanced Placement (AP) classes in high school and completing basic courses at less expensive colleges are two ways to save on tuition later, while also getting a jump on credits toward a college degree.

Take AP classes. Students who successfully complete AP classes in high school may be able to apply those credits toward degree requirements or skip some prerequisites, depending on their scores on the AP exam and the policies of the college they attend. By completing degree requirements early, students may graduate earlier and save money on tuition, housing, and other expenses.

Students who take AP classes also demonstrate academic achievement. This often improves a student's chances to qualify for scholarships and to be admitted to his or her school of choice. Most high schools offer a variety of AP classes for free, but students usually must pay a fee (currently $89) to take the standardized AP exam at the end of the course.

Earn credits at another school. Many community colleges offer courses, sometimes at no cost, that are designed for high school students. Students who complete these courses earn college credits that may transfer to other 2- or 4-year schools.

Another option is dual enrollment programs. Offered by some high schools in partnership with a local community college, these programs allow high school students to concurrently earn an associate's degree and a high school diploma by the time they graduate. In many cases, the student's school district pays for the cost of tuition.

In addition, schools often have similar prerequisite and core courses for their associate's or bachelor's degrees. Degree requirements do not specify that all credits be earned from the degree-granting institution. Students can save money by completing some courses at a less expensive school, such as a community college, and then transferring the credits to the college or university in which they enroll.

Students who are considering taking courses for transfer should check with their schools of interest to verify transferability of credit.

Choose and apply to schools

Deciding where to apply differs for each student, but cost should be only part of the school selection process. Students should first evaluate their options, then choose the schools that are most likely to meet their academic, financial, extracurricular, and other needs—and plan to graduate in 4 years or less.

Evaluate options. Prospective college students should ask themselves several questions as they evaluate each college. Does this

Students should research and compare colleges to narrow their options.

school have the programs and features that I want? How likely will I be to graduate in 4 years? What kind of financial aid does it give students? Do graduates of this school find meaningful employment shortly after graduation?

Research should also involve considering future career plans. For example, some colleges might be renowned in the student's field of choice, which could help with getting an entry-level job after graduation. Students should also find out what their future earnings might look like, by studying wage data from sources such as the *Occupational Outlook Handbook*, so they know what type of student loan repayment they can afford.

Those who aspire to a military career may want to look into schools that pay expenses in exchange for service after graduation. For example, the five federal military academies provide students with tuition, room, and board; at four of the academies, students commit to serve in the U.S. military for a specific number of years after graduation. Some states also have public military academies that may pay partial tuition and expenses.

Shop for schools. Prospective students should research schools to find ones that fit them best. Whatever a student's personal criteria, graduating within 4 years should be part of any strategy for cutting back on expenses.

Students can usually find multiple schools that meet their conditions for attending. A list that includes more than one can mean big savings. "Even if you're set on a school, you should look at others," says Megan McClean, managing director of policy and federal relations at the National Association of Student Financial Aid Administrators. "You might be able to get the same education for less somewhere else."

Along with researching more obvious choices, students may want to consider alternatives that offer a unique curriculum, reduced tuition, or both. For example, bachelor's degree-level work colleges have free or low-cost tuition for students who take classes and also work, usually 10 to 15 hours per week, in activities on campus as part of their degree program.

Experts recommend taking time when evaluating each school that is being considered: stay overnight on campus, attend a class, speak to instructors and current students, and visit the financial aid office. "You're buying the equivalent of a really nice car," says

Robert Bardwell, a high school counselor in Monson, Massachusetts. "Test drive the school to make sure it's the right one for you."

Prospective students should compare their chosen schools using information such as costs, financial aid, graduation and employment rates, and the proportion of students whose financial needs are met. Unbiased, third-party sources of information provide the most accurate comparisons. (Suggested resources are at the end of the article.)

In fact, experts caution against relying on schools' self-published information, which is often misleading. For example, a school might claim that its students receive $15,000 in aid but doesn't specify that most or all of the aid is from student loans.

Apply to several schools. Students who plan to attend college right after high school usually complete applications for admission during the first semester of their senior year. Experts advise that students narrow their choices to at least three schools but no more than seven: Fewer than three limits a student's financial aid options (and chances of being accepted at all) but more than seven shows that the student failed to research schools well enough. The selections should be based on a student's research and include at least one "safety" school, an affordable option that would most likely admit the student.

By applying to several schools, students will see multiple financial aid packages that allow them to make an informed decision—and will position themselves to negotiate for more aid from the schools to which they are accepted. "Applying to one school limits your options," says Bardwell. "You might not be accepted, or their financial aid package might not be what you expected."

Usually, the least expensive option for most students is an in-state public school. But students shouldn't dismiss elite schools, such as those in the Ivy League, based solely on price. These schools typically have large endowments from which to provide substantial aid, much of it need-based, allowing them to lower the cost of attendance for individual students. This aid sometimes makes such schools more affordable than public options.

Apply for financial aid

Prospective college students vary in their economic backgrounds and abilities to pay for school, but they all have one thing in common: To get financial aid, they have to apply for it.

Financial aid packages may include any combination of gift aid, such as grants and scholarships; borrowed aid, such as student loans; and self-help aid, such as work study. Students can access most types of financial aid only after completing the Free Application for Federal Student Aid (FAFSA).

But completing the FAFSA does not make students automatically eligible for all forms of gift aid. Students must research and apply separately for scholarships and some grants and waivers.

Complete the FAFSA. According to experts, all prospective college students, regardless of financial status, should complete the FAFSA. This application must be

Completing the FAFSA is the first step in applying for financial aid.

completed annually to determine a student's eligibility for federal financial aid. The student's financial need is greater in one of either two situations, or both: because of the high cost of attendance or the student's (or family's) low income.

Almost all colleges use the FAFSA to evaluate student need when developing financial aid packages. A student's financial need is based on the information that he or she (and his or her parents, if the student is a dependent) provides when completing the FAFSA. Student and family finances are calculated as part of each package.

For example, schools expect the student and his or her family to cover certain expenses, such as housing, food, and books. Families that cannot meet their expected obligation from income may choose to close the gap with private or Federal PLUS loans, which are also available to graduate students. At many schools, the financial aid package may change based on the school's finances and the student's accomplishments, among other factors.

FAFSA forms become available online January 1 for the academic year that spans July 1 of that year to June 30 of the following year. So, for example, the FAFSA for the 2013–14 academic year became available January 1, 2013. Students are advised to complete their applications as soon as possible after forms become available. Certain types of aid, such as grants and work study, are sometimes limited or disbursed on a first-come, first-served basis.

Yet some students postpone until the FAFSA deadline nears or, worse, don't bother to fill out the form at all. That's a mistake, says Chris Greene of the U.S. Department of Education's Office of Federal Student Aid. "Completing the FAFSA is free, easy, and may open up financial aid options, such as state and institutional grants, that you may have not considered," Greene says.

Apply for gift aid. To become eligible for many federal and state grants, prospective students must first complete the FAFSA. But students usually need to apply for other gift aid, such as scholarships and nongovernmental grants, in addition to filling out the FAFSA.

As early as possible, students should apply for any gift aid for which they may be eligible. Application-weary students might be tempted to skip the forms for gift aid, but experts say that those who take the time are often rewarded for their efforts. "Applying for gift aid is hard work, but it pays off," says Tammy Dodson, a high school counselor in Aurora, Colorado.

And if they receive a scholarship or nongovernmental grant, students must inform their school's financial aid office. Depending on the amount of the award, a student's financial aid package might change. For example, a large award might reduce or eliminate a student's proposed need for student loans.

Financing a college education

According to NCES, nearly 80 percent of all full-time undergraduate students received some type of financial aid for the 2007–08 academic year, the most recent year for which complete data are available. On average, these students received $12,700 in aid, mainly in grants and student loans. This was almost enough financial aid to cover the average cost of a public 4-year college during that academic year, but it was far less than the cost of a private one.

After students have received the financial aid package from schools that accepted them, they need to determine whether each school is affordable. They can calculate the real cost of attendance by adding up likely expenses—such as tuition, fees, housing, food, and books—and subtracting out any federal and state grants awarded in the financial aid package. (The package might also include loans, but because these must be repaid, they will not reduce the true cost of attendance.) Students can then rank their schools based on how much they will have to pay, potentially using one school's aid package as leverage against another to negotiate for more aid.

Students can accept, reject, or appeal all or parts of their financial aid package. To appeal an aid package, students or their parents must write a letter to the school's financial aid office. The letter should explain why the aid package would not fully cover expenses and should include supporting documentation. Students can file an appeal as many times as they like.

The financial aid process, from completion of the FAFSA to acceptance of the financial aid package, repeats every year the student is in school.

Gift aid

Gift aid is any financial aid that a student doesn't need to repay; it's free money for college. The main types of gift aid are grants, waivers, and scholarships.

Grants and waivers. Grants and waivers are similar: They are noncompetitive awards that cover tuition, fees, or both. Grants can be federal, state, or institutional and are often based on financial need. Waivers, however, are not necessarily based on financial need and are generally administered by the school.

Because grants are usually need based, students with greater financial need receive more aid, up to a particular grant's limit. According to the NCES, for the 2007–08 academic year, more than 64 percent of full-time undergraduate students received grant aid, worth an average of $7,100 per student.

Almost all federal and state grants become available upon completing the FAFSA and appear as part of the financial aid package that students receive. The Federal Pell Grant Program, the most common federal grant award, provided up to $5,500 in aid per student for the 2012–13 academic year. It is usually offered to undergraduate students who do not yet have a bachelor's degree.

Many schools offer institutional grants and waivers, but the number and amounts of these awards often depend on the size of the college's endowment. Federal and institutional grants make up the majority of grant aid that students receive. Some waivers are awarded as part of a student's financial aid package, but others require separate application.

Other grants and waivers are offered to students who pursue a particular field of study or who belong to an underrepresented group. For example, some states provide tuition waivers that encourage students to become teachers in high-need fields, such as mathematics and special education. These waivers require recipients to teach in their field of training for a designated number of years after earning their degree.

To receive a grant or waiver, students must meet eligibility requirements. Most federal

Students can gauge a school's affordability by comparing likely expenses minus gift aid awarded in the financial aid package.

grants require students to be U.S. residents in good legal and financial standing. For example, students who have previously defaulted on a student loan are not eligible for federal grants. In addition, many grants are limited to undergraduate students who don't already have a bachelor's degree.

State grants and waivers may have additional requirements. For example, the minimum eligibility requirements for a Pennsylvania State Grant include state residency, at least part-time enrollment at an approved postsecondary school in the state, and satisfactory academic progress. Some states have reciprocity agreements with neighboring states that allow nonresident students from those states to also receive grants.

Scholarships. Any individual, government, or organization may choose to award scholarships for any reason. For example, scholarships can target a particular group, such as minorities, women, or members of an organization. Some scholarships are for merit, such as academic achievement; for training to enter post-graduation military service, such as the Reserve Officers' Training Corps (ROTC); or for study in a specific field, such as engineering or nursing. Others are based on financial need.

Student loans must be repaid with interest. They don't reduce the cost of attending college.

Students can learn about scholarships from many sources, including the college's financial aid office, public library, through the awarding organization, or online. Each scholarship has its own requirements, terms, deadlines, and awards. Many scholarships have websites that explain all of these details. Others might list a phone number or email address of someone to contact for information.

But experts caution students to beware of scholarship scams. One giveaway includes those that require an application fee. "Never pay money to get money," says Kantrowitz, the financial aid website publisher. Students should check every scholarship against third-party sources to ensure its legitimacy.

Borrowed aid

Borrowed aid is any financial aid that a student must repay with interest. There are two types of borrowed aid: federal and private student loans.

Federal student loans. To help make college affordable, the federal government extends educational loans to both students and their parents. According to NCES, during the 2007–08 academic year, nearly half of full-time undergraduate students received federal student loans, for an average amount of $5,400.

Federal student loans offer a fixed, low interest rate; a 180-day grace repayment period after leaving school; and flexible repayment options. Students may also be able to defer or cancel some of their federal student loans under certain conditions.

Students become eligible for federal student loans after they complete the FAFSA. These loans come from the Federal Direct and Federal Perkins loan programs, both of which are administered by the U.S. Department of Education.

Federal Direct offers a variety of options. The most common loans it provides are Stafford Loans, which may be either subsidized or unsubsidized. Subsidized Stafford loans are available for up to a specific amount, currently $5,500 per year, to undergraduate students with financial need. Unsubsidized

Stafford loans, which are for college students at all levels regardless of need, are available to undergraduates for up to $12,500 per year currently. And while a student is in school, the federal government pays the interest that accrues on a subsidized loan—which currently has an interest rate that is half that of an unsubsidized loan.

Federal Direct also offers Federal PLUS loans up to the cost of attendance to the parents of dependent undergraduate students, as well as to graduate students. But Federal PLUS loans have additional fees and the highest interest rate (currently 7.9 percent) of all Federal Direct loans.

The Federal Perkins Loan Program offers low-interest loans to college students with exceptional financial need. Undergraduate students may borrow up to a specific amount, currently $5,500 a year, but there are limits to the total amount a student may borrow. Not all schools participate in the Perkins loan program.

Private student loans. Private student loans come from lenders such as banks, schools, and employers. Federal student loans almost always provide better terms, but the most competitive private loans offer terms similar to Federal PLUS loans.

Each private student loan has its own requirements and terms, which are determined by the lender. Private loans are usually available only to borrowers who have good credit, and they sometimes require someone else, such as a parent, to cosign.

Students may have difficulty finding and comparing private student loans because there are so many different lenders. A few websites host databases to help with making these comparisons.

Self-help aid

A student's financial aid package may include self-help aid, such as monetary contributions that are expected from students and their families. Students may also earn some of that money by working while they attend school.

Some students qualify for work-study jobs as part of their financial aid package. Students may also choose to work in jobs that are not part of a work-study program. They may work during the academic term, during school breaks, or year round. Others work for service organizations and earn monetary benefits to defray education expenses.

Work study. Most schools have work-study programs that pay students' wages in part-time jobs. The federal government funds most of these programs, but a few schools fund their own. According to NCES, during the 2007–08 academic year, more than 13 percent of full-time undergraduate students received work-study awards, for an average of $2,300 per student.

Some students work part-time to contribute to the costs of their education expenses.

Work study is available to students based on financial need, but funding may be limited. Students can work on or off campus with eligible employers, such as nonprofit organizations, public agencies, or the school itself. Employers who hire work-study students cover a portion of the students' wages, and the work-study program pays the rest. Programs may set rules, such as the number of hours per week students are allowed to work or a grade-point average that students must maintain to participate.

Work-study students earn at least the federal minimum wage, but their total amount of wages cannot exceed their work-study award. For example, a student who is eligible for $1,000 in work-study aid can earn no more than that in a work-study job. After reaching that threshold, he or she could continue working in the job only if the employer pays the full wage because the student would no longer be a work-study participant.

Other work during school. Many students work while they attend school, not as part of a work-study program. A common practice is to do one full time and the other part time. For example, a student might work full time during the day and attend classes in the evening, or vice versa. But self-discipline is important because the constraints on free time and added stress can be challenging: Experts say that students who work full-time while in school are less likely to graduate than students who work fewer hours.

Students who work and study might be able to use their experience to boost their resume and expand their skill set while they pursue a degree. And doing so could give them an advantage in the job market after graduation.

Students can find work on or off campus through a school's student employment office, job boards, or on their own. But students should plan to apply for jobs as soon as possible when they get to campus, says high school counselor Bardwell: "There are a lot of students looking for a limited number of entry-level jobs."

Earn service benefits. Some service organizations, such as City Year and AmeriCorps, have educational benefits for people who work in certain assignments.

During the time they serve in the organization, participants receive a small stipend. These organizations also typically offer scholarships, reduced tuition, or opportunities for students to earn college credit at participating schools.

Students who complete their service assignments may also qualify for deferment, forbearance, or partial cancellation of their student loans. A deferment allows borrowers to stop making loan payments during their service with the organization, but interest continues to accrue on subsidized loans. Similarly, forbearance suspends a borrower's obligation to make payments even as interest still accrues for both subsidized and unsubsidized loans. Partial cancellation excuses qualified borrowers from paying principal and interest on a portion of a loan.

Managing money

As the previous sections discussed, affording college involves more than paying tuition and related expenses. Making college affordable requires planning and finding sources of educational funding.

Taking charge of personal finances before, during, and after college makes paying for it less challenging. And knowing how to manage student loans and repayment can help borrowers become debt free more quickly and avoid defaulting.

Personal financial management

No matter their financial circumstances, students benefit from keeping their own finances under control. Learning about personal finance strategies, limiting their expenses, and borrowing responsibly are three ways that students help themselves to keep college costs in check.

Learn personal finance. Learning personal finance can help students to manage their money and control their expenses.

Learning personal finance can help students with budgeting, managing debt, and limiting their expenses.

Personal finance gives students the tools they need to manage money on their own.

Free personal finance lessons are available online; some schools also offer courses. Topics covered usually include budgeting, saving, and investing, as well as managing debt (such as from student loans and credit cards).

But students can learn by doing before heading to college. Managing money begins with learning how to budget cash that comes in through an allowance or from paychecks for a part-time or summer job.

Limit expenses. While attending college, students will realize that everyday living expenses add up quickly. These expenses can increase the overall cost of college, especially if students fail to curb their discretionary spending. Discretionary spending is for anything that is optional, such as dining out or taking vacations.

Some students use credit cards to pay their expenses but are unable to pay the bill in full when those charges are due. The mounting debt can spell disaster for cash-strapped students. Their best strategy for avoiding credit card debt is to live within their means and to use a credit card only for expenses they could pay in full at the time of purchase.

By minimizing their expenses, students can also reduce their need for student loans. For example, they can live with roommates, commute from their family home, attend a nearby school, and limit discretionary spending. "Live like a student while you study," says Kantrowitz, "so you don't have to live like one after you graduate."

Borrow responsibly. When educational funding is limited, colleges are more likely to offer financial aid packages that favor student loans over grants, waivers, and scholarships. To avoid accumulating excessive debt while in school, students should appeal their financial aid package to get more gift aid and less borrowed aid.

Experts usually recommend that students limit their overall college borrowing to the amount they expect to earn in a first-year salary after graduation. Excessive borrowing can lead to higher default rates. According to the Federal Reserve Bank of New York, the percentage of student loan balances that were "seriously delinquent" as of September 30, 2012, was higher than the rates for any other type of household debt—including, for the first time, credit card debt.

In addition, experts advise students to exhaust all gift and federal aid options before considering private student loans. Private loans are generally less flexible and more expensive than federal loans. For example, many private loans have variable interest rates up to 18 percent and may require students to make payments while still in school. "It's far better for a parent to take out a Federal PLUS Loan than for a student to take a private loan," says the U.S. Department of Education's Greene.

Students should be cautious about borrowing money, especially when it's for school. Generally, student loans cannot be discharged when filing for bankruptcy, so students need to borrow responsibly. "Before you sign something, make sure you fully understand what you're committing to," Greene says. "Ask questions, talk to your financial aid officer, and compare aid offers from other schools."

Government resources can help people understand student loans. For example, students who take out a federal student loan must complete a brief counseling program twice: when they borrow for the first time and just before they leave school. The first program explains the details of the loan, and the second covers repayment options.

Take tax incentives. The Internal Revenue Service (IRS) provides a variety of tax incentives for higher education. Each incentive has its own eligibility requirements and benefits, but all can lower a student's, or his or her parent's, overall income tax bill. The most common types of incentives are tax credits and deductions.

Tax credits directly reduce the amount of income tax that students or their families pay. The American Opportunity Tax Credit offers an annual credit per student, currently up to $2,500, for the first 4 years of higher education. The Lifetime Learning Tax Credit also offers an annual credit per taxpayer, currently up to $2,000, but it is available for an unlimited number of college years. These tax credits have income restrictions, however, and each student can use only one in a tax year.

Tax deductions indirectly reduce taxes by lowering the amount of income that is subject to taxation. Students or their families can deduct from their income for tuition and fees paid (currently up to $4,000) and for student loan interest paid (currently up to $2,500). Both federal and private student loans are eligible for these deductions. However, some income restrictions apply.

The IRS also provides other tax benefits related to higher education. For example, earnings in 529 Plans are tax-deferred, many scholarships are tax-free, and employer-

Students should borrow responsibly. Government resources can help people understand student loans.

provided aid up to a certain amount (currently $5,250) can be excluded from income.

Managing loans and repayment

Like every other phase of preparing for and going to college, repaying borrowed money requires planning. Strategies for managing student loans and their repayment include choosing a good repayment plan, paying loans wisely, not skipping payments, taking advantage of lenders' incentives, and considering a public service job after graduation.

Choose a repayment plan. Most lenders offer more than one repayment option to borrowers. By learning about the repayment plans available from their loan servicer, borrowers can choose the best plan for their budget.

Federal student loans have a variety of repayment options. The most common is the standard repayment plan, which requires borrowers to make fixed, monthly payments for up to 10 years. Loans repaid through this plan accrue the least interest of all federal repayment options.

Borrowers worried about making payments early in their careers can choose the graduated repayment plan, which starts with lower monthly payments that increase every 2 years for up to 10 years. This repayment plan offers financial flexibility, which is often helpful for workers just starting out, but loans accrue more interest than those under the standard plan.

Not all borrowers are able to pay off their student loans in 10 years. Several options allow these borrowers to extend their loan repayments for up to 25 years, with interest continuing to accrue for the life of the loan. Some of these plans have fixed, monthly payments, but others vary with income levels. Oftentimes, the best choice for borrowers who can prove financial hardship is the income-based repayment plan that caps payments at 15 percent of discretionary income. After 25 years of monthly payments, any remaining debt is forgiven.

A new version of income-based repayment, called Pay as You Earn, became available in December 2012 to borrowers who have

at least one federal student loan disbursed on or after October 1, 2011, and no loans prior to October 1, 2007. The monthly payment is 10 percent of discretionary income, and the remaining balance is forgiven after 20 years in repayment.

Repayment plans for private student loans vary by lender. Borrowers should discuss payment options with the lender.

Repay loans wisely. Student loan repayment schedules set the minimum amount borrowers must pay each month. But borrowers can save a lot of money by repaying loans ahead of schedule or repaying loans that have higher interest rates first.

To repay loans ahead of schedule, borrowers can pay extra each month, pay biweekly instead of monthly, or make extra half payments during months in which they receive three paychecks. The last two strategies have the same result: Borrowers make an extra monthly payment each year.

To repay loans with higher interest rates first, borrowers must have more than one loan.

(Continued on page 17)

If repaying loans ahead of schedule, start with those that charge the highest interest rate.

Alternatives to attending college

For some people, college isn't the best choice—at least, not right now. It might cost too much, take too long to finish, or lack options of interest. But there are alternatives for those who want to delay or forego getting a bachelor's degree.

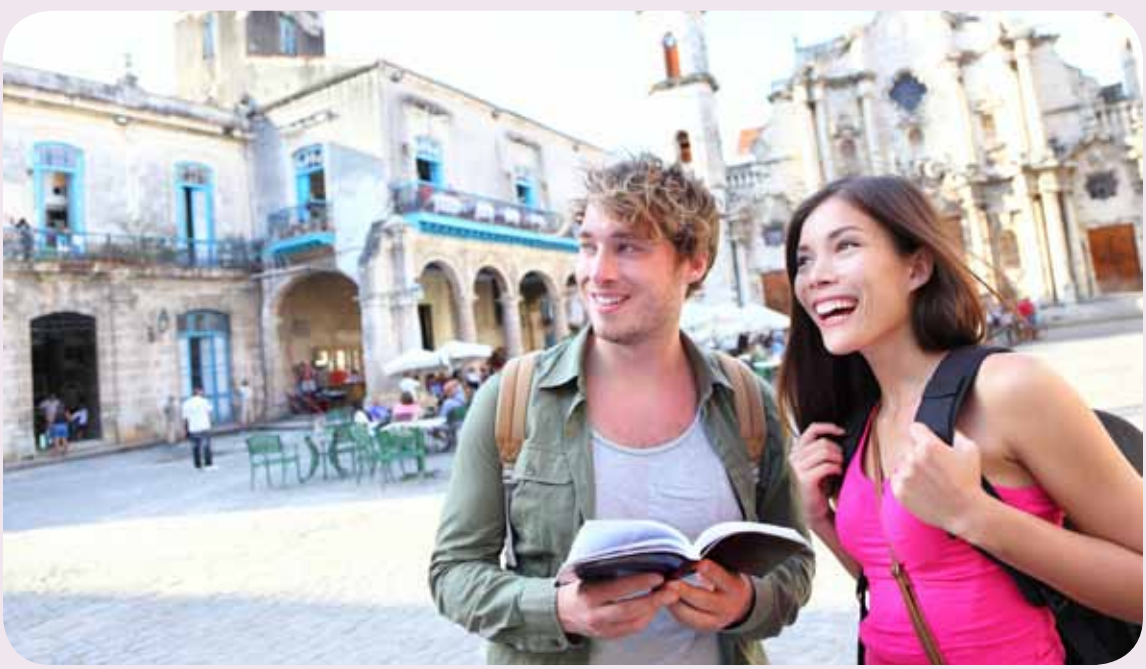
Career school. Career schools—also known as vocational, technical, or trade schools—teach job-specific skills in programs that usually last 2 years or less. Unlike community colleges and 4-year colleges or universities, these schools do not offer degrees. Instead, students typically earn a diploma or a certificate. Some programs help students prepare for state licensing exams, which are required to work in certain occupations. Others offer skilled-trade apprenticeship or journey-level studies.

Students attend career schools to train for a variety of occupations, including those in construction, culinary arts, and fashion. Training in these programs generally involves both taking classes and gaining hands-on experience. For more information, see "Certificates: A fast track to careers," in the winter 2012–13 issue of the *Quarterly*, online at **www.bls.gov/ooq/2012/winter/art01.pdf**.

Gap year. A gap year—which may be longer or shorter than a year—is the term for taking time off, often before starting college. Gap years include working, traveling abroad, or volunteering, to name a few possibilities. People save money, learn skills, and experience personal growth that better prepares them for attending college. "It takes courage to delay college," says high school counselor Robert Bardwell, "but colleges often prefer these students because of the skills and maturity they acquire."

A gap year that is carefully thought out has the best chance for successfully bridging the transition to college. Learn more in the fall 2009 *Quarterly* article "Gap year: Time off, with a plan," available at **www.bls.gov/ooq/2009/fall/art04.pdf**.

Other options. Not every occupation requires a college degree, of course, and not every worker has one. A recent *Quarterly* article focuses on occupations that don't typically require a bachelor's degree but still offer rewarding careers. See "High wages after high school—without a bachelor's degree" in the summer 2012 *Quarterly*, available at **www.bls.gov/ooq/2012/summer/art03.pdf**.



Borrowers who have trouble repaying their student loans should contact their lender to explore options.

(Continued from page 15)

Lenders typically split monthly payments proportionally across all of the borrower's loans, so borrowers should ask that extra payments be used to pay down a specific loan. By making payments to the higher interest loan first, borrowers save money on the additional interest that accrues more quickly on those with a higher rate.

Don't miss payments. Student loans, unlike other forms of consumer debt, are almost never forgiven if the borrower declares bankruptcy. If borrowers stop making payments, they can get into trouble. One day after missing a payment, the borrower becomes delinquent. After 90 days, lenders report the borrower's delinquency to all major credit bureaus. After 270 days (about 9 months), lenders consider the borrower in default.

When a borrower enters default, the full unpaid balance is due immediately, deferment and forbearance options become unavailable, and court and collection fees may be tacked on atop the loan. "Defaulting on student loans is incredibly bad. You won't be able to get federal student aid again, your credit rating will take a large hit, and your paychecks might be garnished," says Megan McClean, of the National Association of Student Financial Aid Administrators. "There are ways to regain aid eligibility if you resume repayment, but it will take investments of time, effort, and funds."

Borrowers who have trouble making payments should contact their lender immediately. The lender may defer payments on the loan due to economic hardship or may change the repayment plan. "With all the options available," says Greene, "there's just no reason for you to default."

Take lenders' incentives. Both federal and private student loan lenders offer repayment incentives. But the type and amount of incentive vary by lender.

The most common incentives are discounts to either the loan's principal or interest rate. For example, the Federal Direct Loan Program currently awards a 0.25-percent reduction for setting up automatic payments.

Other lenders award discounts to borrowers at graduation and to borrowers who already have a relationship with the bank, such as having a savings account.

Consider public service. To encourage students to enter public service, the federal government forgives any outstanding Federal

Photo courtesy of Peace Corps/Morocco

Some public service organizations, such as the Peace Corps, offer educational benefits to participants who complete a tour of duty.

Direct Loans, tax free, after 10 years of service. Public servants include federal and state employees, firefighters, teachers, tax-exempt nonprofit workers, and doctors and lawyers who work in low-income communities.

To qualify, borrowers must make their minimum monthly loan payments on time for 10 years while working full-time at an eligible public service organization. Only payments made after October 1, 2007, on specific types of repayment plans qualify.

In addition, some service organizations—including Teach for America, the National Guard, and the Peace Corps—offer loan repayment, cancellation, or other benefits to people who complete a tour of duty. For example, Teach for America members who complete their service are eligible for an education award that may be used to repay student loans. The National Guard offers a monthly educational stipend, tuition assistance, and student loan repayment. And Peace Corps volunteers may have a portion of their student loans cancelled based on the length of their service.

For more information

The *Occupational Outlook Handbook* (*OOH*) has detailed profiles on hundreds of occupations. These profiles have information about each occupation's education and training, along with its job duties, wages, employment outlook, and more. Students can study career options to learn, for example, whether a specific occupation typically requires a college degree and whether its wages would likely cover student loan payments. The *OOH* is available online at **www.bls.gov/ooh**.

BLS data from the Occupational Employment Statistics program have even more detailed information about wage estimates by occupation. See **www.bls.gov/oes**.

For most prospective college students, the information in this article requires further research. To compare 529 Plans, for example, visit the College Savings Plans Network's online comparison tool at **www.collegesavings.org/planComparison.aspx**. To learn more about work colleges, visit the Work College Consortium at **www.workcolleges.org**. And for a complete list of the 74 colleges with favorable financial aid policies for low-income students, allowing them to graduate with little or no debt, visit **www.finaid.org/noloans**.

The U.S. Department of Education National Center for Educational Statistics provides a wealth of data related to education, including information about school costs, student enrollment and graduation rates, and

financial aid. It also hosts College Navigator, a college comparison tool that can help students find the right school. Visit online at **www.nces.ed.gov/collegenavigator**. (College Navigator and other college comparison tools are featured in the Grab bag item "Online tools for comparing colleges," in the winter 2012–13 issue of the *Quarterly*, online at **www.bls.gov/ooq/2012/winter/grabbag.htm**.)

The U.S. Department of Education also hosts a website with comprehensive information about federal student aid. Topics covered include the Free Application for Federal Student Aid (FAFSA), types of financial aid, choosing and applying to schools, and repaying student loans. Visit online at **www.studentaid.ed.gov** or call toll free at 1 (800) 4-FED-AID (433-3243).

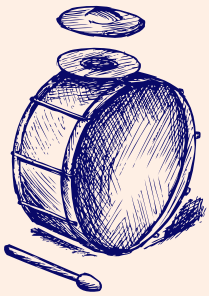
The U.S. Department of Labor hosts a scholarship search tool at **www.careerinfonet.org/scholarshipsearch/default.asp?nodeid=22**.

For more information about the educational benefits of public service, read "Serving, learning, and earning: An overview of three organizations" in the summer 2011 *Quarterly*, available at **www.bls.gov/ooq/2011/summer/art01.pdf**.

For more information about federal tax incentives for higher education, visit the Internal Revenue Service's online resource at **www.irs.gov/uac/Tax-Benefits-for-Education:-Information-Center**.

The federal government isn't the only provider of unbiased resources on college-related topics. For example, FinAid online covers financial aid and offers tools to calculate the true cost of a college education, future loan payments, how much a student can safely borrow, and more. Visit **www.finaid.org**. To use its assessment of comparison websites for private loans, visit **www.finaid.org/loans/loancomparisonsites.phtml**.

And Fastweb, a sister website to FinAid, describes the college process in its entirety, from filling out applications to repaying loans. Topics include choosing the right college, finding scholarships, planning a career, and creating a budget. Experts offer advice on subjects such as personal finance, student loans, and interview etiquette. Visit online at **www.fastweb.com**.



My career

Composer

Patrick Morganelli

Los Angeles, California

BLS fast facts: Music directors and composers

- May 2011 wage and salary employment: 25,290
- 2010–20 projection: 10 percent growth (about as fast as average)
- May 2011 median annual wage: $47,410
- Typical education and training: Bachelor's degree
- May 2011 top employing industries: Elementary and secondary schools, religious organizations, and performing arts companies. Composers are often self-employed.

What do you do?

I work as a composer in the movie industry, creating music that supports a film's story. Other composers work on television shows, and some do both television and film. The composer uses music to tell the audience what kind of movie it is and to help convey what the actors are expressing. The music can vary, depending on the emotion in each scene. I study each project and decide where music will be most effective.

When I begin working on a project, I meet with the director to "spot" the picture. We go through every scene and decide the precise start and end times for each piece of music. Then I create a list of all the pieces of music that I'll need to write and begin to write the pieces, but not necessarily in order. For instance, I normally write the main titles, which are at the beginning of the picture, last. That's because the main titles are the one opportunity for the composer to make a musical statement that's unobstructed by dialogue and to set the tone of the picture.

While I'm writing the music, the director comes to the studio for "show and tells," where I play a digital mockup of the music with the picture. I do about 10 minutes of the picture at a time so the director can give me feedback about whether I'm going in the right direction with the music. All in all, it takes me about 6 to 8 weeks to score (compose the music for) a feature film.

Describe a typical project.

When I do live recordings of music for a project, I write sheet music for each instrument, rent a studio, record the pieces, then edit and mix the tracks. I may also hire a music contractor, who finds musicians based on the number and type of instruments needed. The contractor also manages the recording session.

After the music is recorded, I send it to the production company along with a list of the precise locations where the music needs to be put into the picture. The quality of music is always best when it's recorded live. But sometimes, for financial reasons, we decide to record the music digitally instead. If this is the case, I prepare and digitally mix the tracks myself.

Do you compose music outside of film projects?

If I'm not working on a project, I try to sit down and compose something every day, even if it's something small. Creativity is a muscle that needs to be exercised. It helps when I actually have a gig so that I don't panic staring at a blank page.

Networking and making cold calls are also something I do on a daily basis. I look in trade magazines for projects for which I'm a good fit, and I contact the director or producer. I've gotten some good jobs this way and met many people, some of whom have become good friends and have referred me to others. I can't overstate the importance of developing a professional contact list.

What is your educational background?

I've played the piano since I was a kid, and I have an undergraduate degree in music. I also have a master's degree in classical piano performance and a postgraduate certificate in scoring for music and television.

What was your first job out of college?

I worked as a professional pianist for a year or so. It wasn't quite what I had imagined it would be when I had dreamed of being a musician. The work was incredibly hard, I had to deal with really difficult people, and the pay was not good.

When the reality of being a musician wasn't what I'd expected, I decided to join the Navy. My dad had been a military pilot, and the only other thing I had wanted to do other than be a musician was fly military airplanes.

So you decided to change career paths?

Yes, but it wasn't easy. Musicians aren't often accepted into the Navy, and I was rejected twice. The recruiters thought I would give up, but I got a personal recommendation from the captain of Navy recruiting in Los Angeles.

I was assigned to the F-14 Tomcat fighter jet. I was selected to be sent to Top Gun, which trains you to be a tactics instructor for your squadron. Then I spent the next 14 years in the Navy as a flight instructor, working all over the country.

How did your Navy career lead to getting your current job?

While doing my last tour with the Navy at the Pentagon in Washington, D.C., I had become friends with some professional strings players. I had a few opportunities to play some chamber music with them. They encouraged me to pursue music professionally.

After I left the Navy, I met a local film director. He learned that I had been a musician and asked if I wanted to write the score for his

latest film. I jumped at the chance to give it a try. I really had no idea what I was doing, but it seemed to go OK.

I got a few other offers to score short films and such. I thought, if I'm going to do this professionally, then I need more education. I need to learn how this is really done. That's when I decided to go back to school to get my master's.

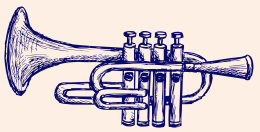
What's your best advice for aspiring composers?

There is no minimum education and no particular career path to become a composer. Spend a lot of time studying the art of composition. You need to have a firm grasp of the technical stuff.

I make a concerted effort to keep up with the technological changes in the industry. I read a lot of magazines and music websites online. I also spend a lot of time exchanging ideas with my colleagues and peers and hearing what they're doing.

Also, it doesn't hurt to plan for a day job. In the arts, there's a lot of intense competition, and it can take years before you make enough money to support yourself. Be realistic!

Patrick Morganelli was interviewed by Sara Royster, an economist in the Office of Occupational Statistics and Employment Projections, BLS. She can be reached at (202) 691-5645 or at royster.sara@bls.gov.



Resources work:

Careers in mining, oil, and gas

How would you like to make $40,000 or more per year with a high school education? Or make twice that with a college degree? If those earnings sound intriguing, consider exploring a career in mining or in oil and gas extraction.

Overall, the industry pays better than most: U.S. Bureau of Labor Statistics (BLS) data show that median annual wages of workers in mining, oil, and gas extraction were $46,100 in May 2011, compared with $34,460 for workers in all industries. And the industry had the highest starting salaries of any industry for 2012 bachelor's degree recipients, according to the National Association of Colleges and Employers.

Earnings are high, in part, because of working conditions. For example, jobs might require workers to live in remote areas, be out at sea for weeks at a time, or spend long periods underground. And mining, oil, and gas workers can face potentially hazardous conditions.

Still, much of the industry now relies on technology that has helped to make the work safer and more efficient. "It's not a pick-and-shovel operation. We have high-tech machines underground," says Jeff Tutalo, manager of human resources at an underground coal mine in Grafton, West Virginia. "The skills you need to play video games are the types of skills you need to operate our equipment."

This article describes occupations in the mining, oil, and gas extraction industry. It does not include occupations related to the processing or distribution of these resources. The first section covers the industry's employment and outlook. The second section highlights some common occupations. The third section discusses pros and cons of the work. The fourth section describes how to start a career in mining or oil and gas. And the fifth section provides sources for more information.

About the industry

Workers in the mining, oil, and gas extraction industry locate and remove a variety of natural resources—including coal, stone, and natural gas—from the earth. These resources are essential to our economy. They are used in many products around us. For example, oil is processed to make petroleum products, such as plastics, and minerals are used in computers. Stone provides building materials for construction, and coal and natural gas are used to create electricity.

Current and projected employment levels in the industry vary by location, type of resource extracted, and other factors.

Industry employment

Mining, oil, and gas extraction is a relatively small industry in terms of employment. In May 2011, the industry employed about 693,000 workers, BLS data show. This contrasts sharply with the 11.6 million workers employed in manufacturing and the 5.5 million workers employed in construction, two other goods-producing industries.

The extraction industry's jobs include those in mining—in which workers remove minerals and other non-oil and gas resources from the ground—and in oil and gas extraction. Mining jobs differ, depending on whether the extraction of resources takes place closer to the earth's surface or deep underground. Underground mining, for example, usually employs workers in occupations such as mine shuttle car operators and roof bolters, among others, that are not part of surface mining. Oil extraction jobs are often similar to natural gas extraction jobs, and workers can be involved in recovering both because natural gas is sometimes mixed with oil.

Within the mining, oil, and gas extraction industry, there are two types of employers: firms that own the oil and gas wells or mines and firms that offer support services. Support services firms have an important role in the industry, employing nearly half of all workers in May 2011.

The resources that workers extract influence where they find jobs. Workers who extract nonmetallic minerals (such as limestone, granite, and sand) are employed in a number of states. Those who extract coal often work in states that include West Virginia,

Elka Torpey

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Kentucky, or Pennsylvania. Large numbers of workers in metal ore mining are employed in Nevada, Arizona, and Minnesota. And many workers who extract oil and gas are employed in Texas, Oklahoma, and California.

Industry outlook

BLS projects employment in the mining, oil, and gas extraction industry to grow by about 4 percent between 2010 and 2020—slower than the 14.3 percent growth projected for all industries during the decade. Most of the industry's growth is expected to come from oil and gas extraction and nonmetallic mineral mining, which are projected to grow at 15 and 14 percent, respectively. Coal and metal ore mining employment is expected to decline, in part because of technologies that boost worker productivity.

Some studies, such as a November 2012 report by the International Energy Agency, predict stronger growth for mining, oil, and gas. These studies note some variables, such as increased demand and advances in extraction techniques that make it possible to access previously untapped resources, that could result in greater U.S. production and greater need for workers in the industry.

Increasing retirements of workers should lead to good job prospects in this industry. "There's a huge amount of brain drain as far as aging workers," says Brett Liming, a geologist in Golden, Colorado. "Baby-boomer retirements are happening everywhere, but they're accentuated in oil and gas because there was tremendous hiring in the early 1970s and '80s." As the large group of people hired during that period starts to retire, industry employers will likely need to hire workers to replace them.

But the industry is often marked by highs and lows in employment, and its future is hard to predict. Prices and demand for many of these resources fluctuate, for example, and employment and hiring reflect this volatility. A variety of global or political events, such as changing environmental laws, may also affect employment.

Working in mining, oil, and gas extraction

There are many occupations in mining, oil, and gas extraction. The table starting on page 26 shows some of the ones that employ the most workers.

For most of the occupations in the table, workers typically have a high school diploma or less, plus on-the-job training. Occupations with the highest wages typically require a college degree.

Three occupational areas critical to mining, oil, and gas extraction are geoscientists and engineers, equipment operators, and roustabouts, laborers, and helpers. Typical tasks and wages differ for each.

The largest percentage of the industry's growth is projected to come from oil and gas extraction.

Geoscientists and engineers

Workers from many geoscience and engineering specialties help to find and remove oil, gas, coal, and minerals.

Geoscientists study the earth to locate natural resources, advise on how to extract these resources, and restore mine and drill sites. Engineers design systems and develop procedures for exploring and extracting resources, as well as for reclaiming the land.

Geoscientists and engineers sometimes work together on teams with other specialists. When determining which course of action to take, geoscientists and engineers might use modeling software or do simulation studies to assess options.

A variety of geoscientists work in mining and oil and gas extraction. Engineering occupations involved in this industry include petroleum, mining and geological, and other engineers.

Geoscientists. These workers analyze geological information from many sources, including rock or sediment samples and aerial photographs. They sometimes plan and conduct field studies or surveys to gather this information, but they might also work in a laboratory or on a computer to interpret findings. And they produce geologic maps, charts, and scientific reports to describe results.

Geoscientists specialize in fields such as engineering, mine, petroleum, exploration, and environmental protection geology. For example, a petroleum geologist might test samples collected from drilling to determine whether oil or gas is present.

Petroleum engineers. Petroleum engineers focus on a range of issues associated with oil and gas extraction. Specific job titles and tasks are often based on the different phases of the extraction process. Occupations include reservoir, drilling, completions, and production engineers.

Reservoir engineers estimate how much oil or gas can be recovered from underground deposits, known as reservoirs. They study a reservoir's characteristics and determine which methods will get the most oil or gas out of the reservoir. And they monitor operations

Many different types of geoscientists and engineers work in mining, oil, and gas extraction.

to ensure that the optimal levels of these resources are being recovered.

Drilling engineers determine the best way to drill an oil or gas well, taking into account a number of factors, including cost. They also ensure that the drilling process is safe, minimally disruptive to the environment, and efficient.

Completions engineers decide the optimal way to finish building a well so that the oil or gas will flow up from underground. They oversee this well-completions work, which might involve the use of tubing, hydraulic fracturing, or pressure control techniques.

Production engineers take over after a well is completed. They typically monitor the well's oil and gas production. If a well isn't producing as much as it was expected to, production engineers figure out ways to help increase the amount being extracted.

Mining and geological engineers. In mining, engineers develop plans for where and how to extract coal, metals, and nonmetallic

(Continued on page 27)

Selected mining, oil, and gas occupations' employment and wages, May 2011, and education and training, 2010

Occupations	Employment	Median annual wage	Education	Work experience	On-the-job training
Geoscientists and engineers					
Petroleum engineers	20,170	$126,240	Bachelor's degree	None	None
Geoscientists, except hydrologists and geographers	9,000	118,820	Bachelor's degree	None	None
Mining and geological engineers, including mining safety engineers	2,810	83,590	Bachelor's degree	None	None
Other types of engineers	9,460	Varies	Bachelor's degree	None	None
Equipment operators					
Rotary drill operators, oil and gas	20,980	51,350	Less than high school	None	Moderate-term
Continuous mining machine operators	12,180	50,680	High school or equivalent	None	Moderate-term
Derrick operators, oil and gas	19,380	45,240	Less than high school	None	Short-term
Operating engineers and other construction equipment operators	31,040	41,510	High school or equivalent	None	Moderate-term
Earth drillers, except oil and gas	6,350	41,400	High school or equivalent	None	Moderate-term
Wellhead pumpers	12,970	41,220	Less than high school	Less than 1 year	Moderate-term
Service unit operators, oil, gas, and mining	44,330	40,560	Less than high school	None	Moderate-term
Excavating and loading machine and dragline operators	13,090	38,610	Less than high school	1 to 5 years	Moderate-term
Heavy and tractor-trailer truck drivers	30,210	36,740	High school or equivalent	1 to 5 years	Short-term
Roustabouts, laborers, and helpers					
Helpers--extraction workers	20,460	34,060	High school or equivalent	None	Short-term
Roustabouts, oil and gas	46,840	33,110	Less than high school	None	Moderate-term
Construction laborers	10,440	29,570	Less than high school	None	Short-term
Laborers and freight, stock, and material movers, hand	9,410	26,470	Less than high school	None	Short-term
Other					
General and operations managers	16,010	111,070	Associate's degree	More than 5 years	None
Accountants and auditors	9,100	69,200	Bachelor's degree	None	None

Selected mining, oil, and gas occupations' employment and wages, May 2011, and education and training, 2010 *(continued)*

Occupations	Employment	Median annual wage	Education	Work experience	On-the-job training
First-line supervisors of construction trades and extraction workers	28,950	68,050	High school or equivalent	More than 5 years	None
Electricians	9,040	56,820	High school or equivalent	None	Apprenticeship
Industrial machinery mechanics	12,930	49,600	High school or equivalent	None	Long-term
Mobile heavy equipment mechanics, except engines	9,980	48,410	High school or equivalent	None	Long-term
Maintenance and repair workers, general	10,400	39,020	High school or equivalent	None	Moderate-term
Secretaries and administrative assistants, except legal, medical, and executive	11,340	30,890	High school or equivalent	None	Short-term

Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics (employment and wages) and Occupational Employment Projections (education, experience, and training).

(Continued from page 25)

minerals. For example, they might decide what types of workers, equipment, and processes to use. And they monitor construction and operations for safety and efficiency.

These engineers also might determine how to reclaim land or to solve problems related to water or air pollution. Mining safety engineers specialize in making sure that a mine, including its workers and practices, complies with all applicable safety rules.

Other engineers. A range of other types of engineers work in the mining, oil, and gas industries. These workers include industrial, mechanical, civil, environmental, chemical, and electrical engineers. Their tasks vary, and they often work on teams with other types of engineers, helping to solve problems related to resource extraction.

Equipment operators

It takes a lot of expensive, high-tech equipment to get resources like oil, gas, coal, and minerals out of the ground. Job tasks for these workers include operating, maintaining, and, sometimes, fixing equipment. They also might oversee processes and direct other workers.

Equipment operators typically need on-the-job training, work experience in a related occupation, or both. Industry sources suggest that these jobs are not usually available for entry-level workers; most people start out as helpers or have experience operating other types of large equipment.

Occupations include drillers, derrick operators, wellhead pumpers, service unit operators, roof bolters, mining machine operators, and other equipment operators.

Drillers. Both mining and oil and gas extraction rely on drillers to help reach resources deep in the earth. Modern drilling techniques often involve drilling down vertically and then drilling horizontally or in other directions for better access to resources.

These workers operate a variety of types of drills. They select the proper drill and drill bits to use and attach additional drill bits, rods, and pipes as the drill reaches farther in the earth. They also control the drill's pressure and speed. When drilling, they use gauges to monitor critical information, such as the pressure in a well or how much debris is being pumped out. And they keep records of where they've drilled, how deep they've gone, and the nature of the layers they've penetrated.

Drillers operate a variety of drilling equipment.

Rotary driller operators usually work in the oil and gas industry, drilling wells to find or extract petroleum or natural gas. Other types of earth drillers are also employed in mining. These workers might drill holes to search for resources underground, for example, or to create tunnels in rock for blasting.

Derrick operators. A derrick, or drilling rig, is the tower-like structure over a well that holds the drilling machinery and supports the drilling equipment. Usually supervised by the driller, oil and gas derrick operators set up and oversee the operation of the derrick and derrick equipment. For example, they might clean and lubricate the derrick or help to position and align it.

These workers also operate pumps that circulate mud or other drilling fluids through the well. These fluids help to keep the drill bit cool, flush out the drilled earth, prevent well cave-ins, and equalize the pressure inside the hole. Derrick operators also might create drilling mud by mixing clay, water, and chemicals. And they control the consistency and weight of the fluids being pumped into the well.

Wellhead pumpers. These workers are responsible for tasks relating to the wellhead. A wellhead, which sits on top of an oil or gas well, helps pressure seal the well and provides other functions.

Wellhead pumpers attach pumps and hoses to wellheads and operate the power pumps and other equipment that helps to produce the flow of oil or gas. During pumping, these workers monitor control panels to make sure that the oil or gas is being pumped at the right speed, pressure, and concentration. They also operate engines and pumps to shut off wells and to move oil or gas into storage tanks. And they transport equipment to the well site.

Service unit operators. Once a well has been drilled and is producing oil or gas, the drilling rig is taken down and a service rig is put up. Service unit operators may transport and set up this rig. They also operate the equipment that services the well. Their goal is to make sure that the well continues to perform as it should. They monitor well operations—by listening to engines or studying gauges or pressure indicators, for example—to identify possible problems.

If they find a problem, service unit operators work to fix it. They might, for example, run pumps that circulate water or other fluids through wells to remove obstructions. Or they might install devices into a wellhead to control the pressure of the well, which helps to keep the oil or gas flowing up and out of the well.

These workers also close and seal wells that are no longer in use. Some operators perform similar services at mines.

Roof bolters. Roof bolters operate machines that install support bolts in the roof of underground mines. The long, steel bolts help to prevent the mine from collapsing.

First, roof bolters support a mine's roof with safety jacks. Next, they drill holes into the roof and force bolts into the holes, using a self-propelled bolting machine. Finally, they secure and tighten the bolts and test to be sure the bolts have enough tension to hold up the roof.

Mining machine operators. There are several types of mining machine operators. Many of these workers operate continuous miners, self-propelled machines that extract coal, rock, sand, stone, and other resources from mines. Others operate longwall shears, cutting machines, and other machinery that cuts or channels along mining surfaces.

Continuous mining machine operators determine where and what depth of a hole or channel should be dug. They position the machine and move controls to operate it. They might also control the conveyors onto which the continuous mining machine loads coal or other resources. And they check their equipment for malfunctions.

Other equipment operators. There are many different types of equipment operators in the mining, oil, and gas industry, only some of whom are described in this article. Most of the equipment these workers operate is similar to that found in the construction industry.

For example, operating engineers and other construction equipment operators use machines such as bulldozers, graders, scrapers, and front-end loaders to do tasks such as moving or grading earth. Excavating and loading machine and dragline operators use equipment with scoops, shovels or buckets to dig and move dirt and other materials. And heavy and tractor trailer truck drivers operate a variety of trucks, including big dump trucks that carry loads as heavy as 300 tons.

Roustabouts, laborers, and helpers

Many people start out in the mining, oil, and gas industry as roustabouts, laborers, or extraction worker helpers. Workers in these occupations usually do different tasks, as needed. The jobs are often physically challenging.

As they gain experience, these workers may move up to more complex jobs, which pay more than entry-level ones. A roustabout, for example, might eventually become a rotary driller helper, then advance to derrick operator before becoming a rotary driller.

Roustabouts. On oil and gas rigs, roustabouts have a range of duties, including general maintenance and construction work. For example, they might paint, sweep, or mop decks and other rig structures. Or they might move or assemble pipes, equipment, or other materials and machinery.

Other roustabout tasks include inspecting, maintaining, and fixing rig equipment.

Many people start out in the industry doing different tasks to gain experience.

For example, roustabouts might look for leaks in oil or gas flow lines. If they find a leak or other problems, they then help to fix it.

Laborers. Employed in both mining and oil and gas extraction, laborers are often in one of two categories: construction or material moving.

Mining and extraction laborers who do construction-related tasks might, for example, put braces in place to support the sides of a mining excavation. Or they might put up or take apart oil rig scaffolding. These laborers also dig tunnels and mine shafts and refill excavations.

Other laborers in mining and extraction move materials by hand from one place to another. These hand laborers might load and unload cargo from trucks, ships, or containers. They sometimes sort the cargo. Or they help to carry pipes or equipment.

Extraction worker helpers. Doing diverse tasks, extraction worker helpers assist other, more experienced workers at a mine, oil, or gas site. They work closely with a range of extraction workers, including drillers, derrick operators, and continuous mining machine operators. The types of tasks they do depend a lot on the types of extraction workers they help—and on the specific needs of those workers.

For example, rotary driller helpers, sometimes called roughnecks, might help on an oil or gas rig by connecting pipes so that a drill can reach farther into the ground. Roof bolter helpers might align a roof bolting machine into the correct position so that the machine operator can accurately place support bolts in the roof of a mine.

Other tasks for extraction worker helpers include monitoring equipment, helping to maintain equipment, and notifying workers of problems.

Pros and cons of extraction work

High pay attracts many people to the mining, oil, and gas industry. And the recent job market has been strong, BLS data show: In December 2012, the unemployment rate for workers in the industry was about 6.3 percent, lower than the 7.6 percent rate for all workers.

The mining, oil, and gas extraction industry isn't for everyone. But many who work in it enjoy what they do. "I love my job," says Sandeep Pedam, a completions engineer in Houston, Texas. "I like knowing that I'm helping people to drive to work every day and to heat their homes during the winter."

Other workers like the opportunity to travel and see new places. "If you want to be part of one of the last industries with some adventure to it, this is one way to do it," says Sid Banerjee of his job as a reservoir engineer in the oil and gas industry. His work has taken him to places as far away as Saudi Arabia and Argentina.

However, mining, oil, and gas jobs are often in rural or remote areas that might require workers to be away from family and friends for long periods. "It's hard work and long hours, especially if you're in the field all the time," says Pedam.

Chemical engineer Elyse Landry of Houston, Texas, occasionally works offshore. "You work and sleep in the middle of the ocean on a platform," she says.

Nonstandard hours and schedules—including 12-hour shifts and work at night or on holidays and weekends—are common in some mining, oil, and gas jobs. For example, many extraction operations run 24 hours a day, so workers can be on the clock at almost any hour. Offshore, workers typically stay on an ocean platform for a week or more, working consecutive days without a break, and then have a block of time off.

When a specific phase of a mine or well operation is complete, field workers often must change jobs or locations. And some jobs are seasonal; for example, a mineral mine might operate only during the warmer months.

The frequent change is not for everyone. "If you're the type of person who wants to be sure you know what happens next," says Banerjee, "this probably isn't the industry for you." Banerjee doesn't count himself among

those types, however: the variety of jobs and experiencing new locations is what he likes best.

Some workers in the industry are outside in all types of weather; others are underground. In both cases, their jobs may be hazardous. In 2011, the rate of injury and illness in the mining, oil, and gas industry was lower than that for all workers, BLS data show. But the fatality rate was higher in the industry than that for all workers.

In spite of workers' hardships in the industry, they enjoy the camaraderie among colleagues and crew. "I really like the people that I work with, both offshore and onshore," says Landry. "I think the job that I'm doing is neat, but it wouldn't be as fun if it wasn't for the people."

Workers also share in their frustrations about how others view their work. "The perception of the industry is that we're out there taking advantage of the environment," says geologist Liming. "But the people I've known in the industry are conscientious, responsible people. We are not in any way trying to damage the planet."

Others agree, while at the same time expressing pride in their work. "I grew up in Alaska," says Banerjee. "I know how pretty that place is, and I want the work that we do there to be done well."

Some occupations, such as heavy equipment operators, require special training or licensure.

Getting started in a career

There are many ways to get started in an occupation in the mining, oil, and gas industry. Some requirements are general for most workers; others are specific to occupations. Mining, oil, and gas workers often must be at least 18 years old, pass a drug test, and be in good physical condition.

Many of these jobs require special skills, training and licensure, or work experience. And for some occupations, higher education is important.

Skills. Employers prefer to hire people who work well on teams and have good decision-making and problem-solving skills. Communication skills, flexibility, and a willingness to learn a variety of tasks are also important.

To succeed in the industry, workers also need determination. "You definitely need to be open to asking questions and be persistent and self driven," says Landry.

Another key for many workers is technological expertise, which may involve performing computer simulations, using joysticks and computers to operate equipment, or handling electronic detectors to identify leaks in oil or gas lines. And workers who operate or move heavy equipment or machinery need physical strength, eye-hand coordination, and good depth perception.

Training and licensure. Many mining, oil, and gas workers learn on the job from more experienced workers. The training needed for competency varies by occupation. For example, extraction worker helpers typically need 1 month or less of on-the-job training. Equipment operators usually need more, typically between 1 and 12 months of on-the-job training.

To work at a mine or on an oil rig, workers often must complete mandatory safety

training. This training is usually provided or paid for by employers after workers are hired.

In addition, some workers need special licenses, such as those required to drive heavy trucks or operate equipment. And employers occasionally require, or prefer to hire, engineers who are licensed.

Work experience. Work experience in a related occupation is typically needed for some mining, oil, and gas occupations. Excavating machine operators, for example, often must have worked as construction laborers or construction equipment operators.

In many cases, workers start out in the industry as helpers or laborers before they are promoted to more specialized jobs. Sometimes, an oil and gas employer may require workers to have experience at an onshore oil or gas rig before it assigns them duties offshore. And employers often prefer to hire construction or other heavy equipment operators who have experience using similar types of large equipment.

Apprenticeships are available in some occupations. For example, heavy equipment operators, such as those who operate graders or excavators, sometimes complete apprenticeship programs through the International Association of Operating Engineers.

Education and internships. Workers can qualify for many mining, oil, and gas jobs with little formal education. Other positions have specific educational requirements, with internships recommended.

Roustabouts, laborers, rotary drill operators, wellhead pumpers, and service unit operators typically need less than a high school diploma. Some employers, however, might prefer to hire workers in these occupations who have finished their secondary education. Other workers, such as continuous mining machine operators or construction equipment operators, typically need a high school diploma.

Most engineers need a bachelor's degree in engineering. Although employers hire college graduates from a variety of engineering disciplines, mining or petroleum engineering studies are beneficial. Some engineers have a master's degree or Ph.D. in a related field. A limited number of schools offer bachelor's, master's, or higher degrees in petroleum or mining engineering.

Participating in internships during college is also important for engineering students who hope to start a career in mining, oil, and gas, say workers in the industry. "An internship is how you get jobs," says Landry, "and it gives you a chance to test out the company and see if you enjoy this type of work."

Digging deeper

To read more about many of the occupations discussed in this article, as well as hundreds of others, visit the *Occupational Outlook Handbook* online at **www.bls.gov/ooh**.

Two recent articles in the BLS publication *Beyond the Numbers* cover mining-related topics. "Coal: A key player in expanded U.S. energy exports," which describes recent trends related to coal mining, is online at **www.bls.gov/opub/btn/volume-2/coal-a-key-player-in-expanded-us-energy-exports.htm**. And "Injuries, illnesses, and fatal injuries in mining in 2010" is available at **www.bls.gov/opub/btn/volume-2/injuries-illnesses-and-fatal-injuries-in-mining-in-2010.htm**.

BLS also publishes *Industries at a Glance* profiles for industries and their sectors. The profile for the mining, quarrying, and oil and gas extraction sector is online at **www.bls.gov/iag/tgs/iag21.htm**.

Recent articles in the *Occupational Outlook Quarterly* cover topics that might also be of interest. "Career in geothermal energy: Power from below," at **www.bls.gov/ooq/2012/winter/art02.pdf**, describes the geothermal energy-related work of some of the same occupations in oil and gas extraction, such as roustabout and rotary drill operator. Another article, "High wages after high school—without a bachelor's degree," **www.bls.gov/ooq/2012/summer/art03.pdf**, highlights other high-paying occupations that typically don't require a 4-year college degree.

The U.S. Department of Labor Occupational Safety and Health Administration has

information about oil and gas well drilling and servicing hazards, as well as a glossary of industry terms. Check out its e-tool at **www.osha.gov/SLTC/etools/oilandgas**.

To learn more about the oil and gas industry, contact:

American Petroleum Institute
1220 L St. NW.
Washington, DC 20005
(202) 682-8000
www.api.org

Association of Energy Service Companies
14531 FM 529, Suite 250
Houston, TX 77095
(713) 781-0758
aesc.net

International Association of Drilling Contractors
PO Box 4287
Houston, TX 77210
(713) 292-1945
www.iadc.org

Society of Petroleum Engineers
PO Box 833836
Richardson, TX 75083
Toll-free: 1 (800) 456-6863
www.spe.org
service@spe.org

The Society sponsors a website that describes energy careers, including those in petroleum engineering and geology, at **www.energy4me.org**.

To learn more about the mining industry, contact:

Mine Safety and Health Administration
1100 Wilson Blvd., 21st Floor
Arlington, VA 22209
www.msha.gov

National Mining Association
101 Constitution Ave. NW.
Suite 500 East
Washington, DC 20010
(202) 463-2600
www.nma.org

Society for Mining, Metallurgy, and Exploration, Inc.
12999 E. Adam Aircraft Circle
Englewood, CO 80112
Toll-free: (800) 763-3132
www.smenet.org
cs@smenet.org

United Mine Workers of America
18354 Quantico Gateway Dr.
Suite 200
Triangle, VA 22172
(703) 291-2400
www.umwa.org

Gift aid at for-profit colleges

To encourage enrollment at for-profit colleges, the Imagine America Foundation has established three gift aid programs. Each program gives $1,000 tuition awards to students enrolling at participating schools.

The first program offers a scholarship for high school seniors. Eligibility requirements include a grade-point average of 2.5 or higher, financial need, and demonstrated community service. School guidance counselors can nominate up to five graduating seniors, who must apply by December 31.

The second program is a grant for veterans and military students. Eligibility requirements include financial need and an active duty, reserve, honorably discharged, or veteran status with the U.S. military.

The third program is a scholarship for adult students. Applicants must be U.S. citizens or permanent residents, at least 19 years old, have a high school diploma or its equivalent, and complete an assessment.

For more information about the Imagine America Foundation's gift aid programs, visit **www.imagine-america.org**.

To learn more about for-profit institutions—including how to avoid scams, diploma mills, excessive borrowing, and other pitfalls of unaccredited programs—see page 14 of "Certificates: A fast track to careers" in the winter 2012–13 *Quarterly*, available at **www.bls.gov/ooq/2012/winter/art01.pdf**.

For more information about affording college, see "Paying for college: Strategies to afford higher education today" elsewhere in this issue of the *Quarterly*.

Free online training for solar inspectors

If you're interested in learning how to inspect and grant permits for residential solar installations, you no longer have to attend an onsite workshop or seminar. An online training program is now available for free from the U.S. Department of Energy.

Known as Photovoltaic Online Training (PVOT), the program increases the availability of training for residential solar inspectors, solar installers, and students. PVOT uses photographs, videos, and interactive activities to teach proper solar installation techniques that comply with building and electrical codes.

PVOT includes seven lessons and tracks each participant's progress and score. The first six lessons teach the fundamentals of photovoltaic inspection, such as expedited permitting and equipment ratings. The final lesson has participants work on a virtual roofline, similar to what an inspector would do on the job.

For a fee, those who complete PVOT can get six continuing education credits from the International Association of Electrical Inspectors. Be sure to check first to learn whether your local jurisdiction or state recognizes the association's credits.

To participate in PVOT, visit **www.nterlearning.org/web/guest/course-details?cid=402**.

Federal service opportunities for students and recent graduates

To attract more students and recent graduates to public service, the federal government has established the Pathways Program. This program offers paid work and career development opportunities in Federal agencies. Applicants choose from three different "paths" based on their education level and field of study.

The first path is an internship for students currently enrolled in a wide variety of educational institutions, from high school through post-graduate school. Interns choose to work part- or full-time during school breaks for up to a year, or during school until they graduate.

The second path targets recent graduates who have a qualifying certificate or degree, such as an associate's or master's. The program lasts 1 year and includes an orientation, mentorship, and at least 40 hours of formal training. Graduates may apply up to 2 years after completing their certificate or degree; veterans may apply up to 6 years after.

The last path, the Presidential Management Fellows Program, is a 2-year, entry-level leadership development program for recent graduates who have an advanced degree. The program includes an orientation, senior-level mentorship, and at least 80 hours of formal training per year. Candidate selections are based on experience, accomplishments, and an assessment. Only the chosen finalists can apply to Presidential Management positions, and, if appointed, must receive a satisfactory performance rating each year.

The positions available in all three paths offer pay, but benefits vary. All participants who work at least 90 days earn vacation leave and sick leave. Participants in the last two paths are eligible for retirement contributions, health insurance, and other benefits.

After completing the program, a participant's position may be converted to permanent status. To be eligible, participants must meet the qualification standards for the position, do their job successfully, and complete all program and agency requirements.

For more information about the Pathways Program and to browse current job listings, visit **www.usajobs.gov/studentjobs**. To apply to be a Presidential Management Fellow, visit **www.pmf.gov**.

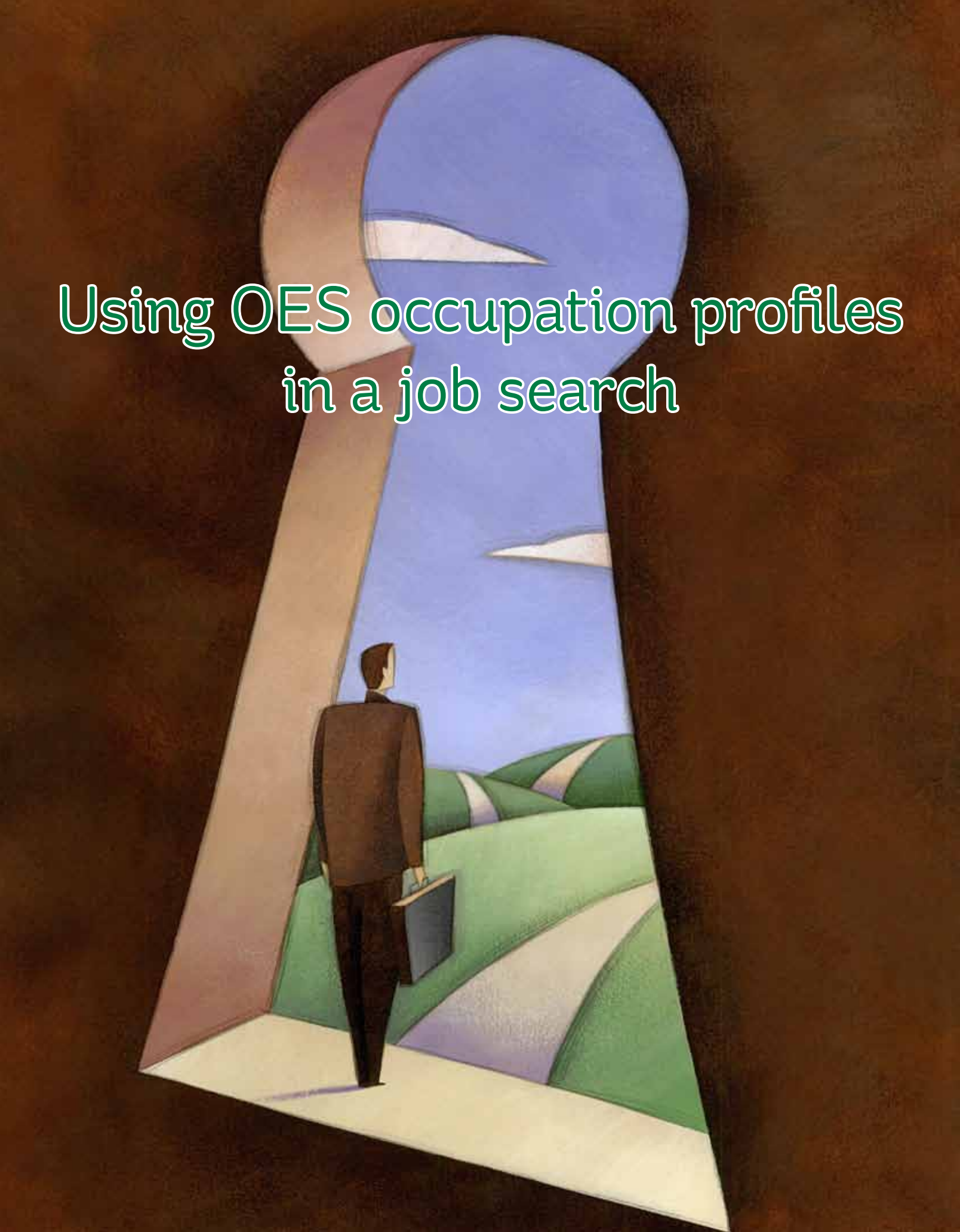
Resources for struggling jobseekers

Getting back on track after a job loss can be challenging. A new website, "Help for Difficult Financial Times" from USA.gov, provides resources from the federal government to help with unemployment, jobs, training, and more.

The site provides links for people looking for work, applying for unemployment benefits, or seeking education and training. For example, clicking on "Find a Job" takes visitors to a page with links to government information and services for jobseekers, including some to U.S. Department of Labor resources.

Topics are not limited to those for jobseekers. There is also help for those seeking family support, housing assistance, healthcare and insurance coverage, and debt assistance. Visit **www.usa.gov/citizen/topics/family/help-for-difficult-financial-times.shtml**.

Using OES occupation profiles in a job search



When looking for work in your area or in a new city, it's helpful to know where the jobs are—and how much they pay. Occupation profiles from the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) program offer this information and more.

Using occupation profiles, jobseekers can see which industries employ the most workers in a particular field, which geographical areas have high concentrations of those jobs, and how wages differ by industry and geographical area. These OES data are useful as part of an overall evaluation in making career decisions. Keep in mind, however, that many other factors are involved in choosing an occupation.

This article gives an overview of the data in the OES occupation profiles. It describes different jobseeking situations and shows how employment and wage data could be useful in each case. The first section describes how to use the three types of data in each profile: national, industry, and geographic. The second section explains how to get additional data by creating customized tables. The final section provides more information, including how to use industry profiles of occupations.

How to use occupation profiles

To find the most recent OES occupation profiles, start with the list of occupations at **www.bls.gov/oes/current/oes_stru.htm**. If you don't know which major group an occupation is in, use your browser's search feature—or the "Search OES" tool to the left of the list of major groups.

Each profile begins with a description of the occupation. Then it provides employment and wage data in three separate sections: with national information, by industry, and by geographic location.

Using national information

National estimates in each profile show employment and wage data for the occupation. (See illustration 1 below.) This information provides a snapshot of the overall occupation, including the number of U.S. workers employed and the annual and hourly wage. The wages section includes both what workers earn, on average (mean wage estimates), and what the highest and lowest ranges are (percentile wage estimates).

Chris Cunningham

Illustration 1: Employment and wage data for telemarketers, May 2012

Occupational Employment Statistics

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Occupational Employment and Wages, May 2012

41-9041 Telemarketers

Solicit donations or orders for goods or services over the telephone.

National estimates for this occupation
Industry profile for this occupation
Geographic profile for this occupation

National estimates for this occupation: Top

Employment estimate and mean wage estimates for this occupation:

Employment (1)	Employment RSE (3)	Mean hourly wage	Mean annual wage (2)	Wage RSE (3)
245,550	1.7 %	$12.29	$25,570	0.7 %

Percentile wage estimates for this occupation:

Percentile	10%	25%	50% (Median)	75%	90%
Hourly Wage	$8.17	$9.00	$10.74	$14.05	$18.58
Annual Wage (2)	$17,000	$18,710	$22,330	$29,210	$38,640

Chris Cunningham is a statistician in the Office of Occupational Statistics and Employment Projections, BLS. He is available at (202) 691-5729 or cunningham.john@bls.gov.

National wage estimates can give a general idea of what an occupation pays. For example, suppose there's a job advertised for an entry-level telemarketer, but there's no information about how much the job pays. As a potential applicant, you could use the OES occupation profile for telemarketers to find a typical wage for this job.

The occupation's description at the top of the page, which states that telemarketers "solicit donations or orders for goods and services over the telephone," is likely to be similar to the job description in the want ad. Below that description, there are national employment, mean wage, and percentile wage estimates for telemarketers.

The mean hourly wage for telemarketers in May 2012 was $12.29. The percentile wages show that telemarketers had a median hourly wage of $10.74—meaning half of telemarketers earned more than that amount, and half earned less. Wages ranged from $8.17 per hour for the lowest paid 10 percent (10th percentile) to $18.58 per hour for the highest paid 10 percent (90th percentile).

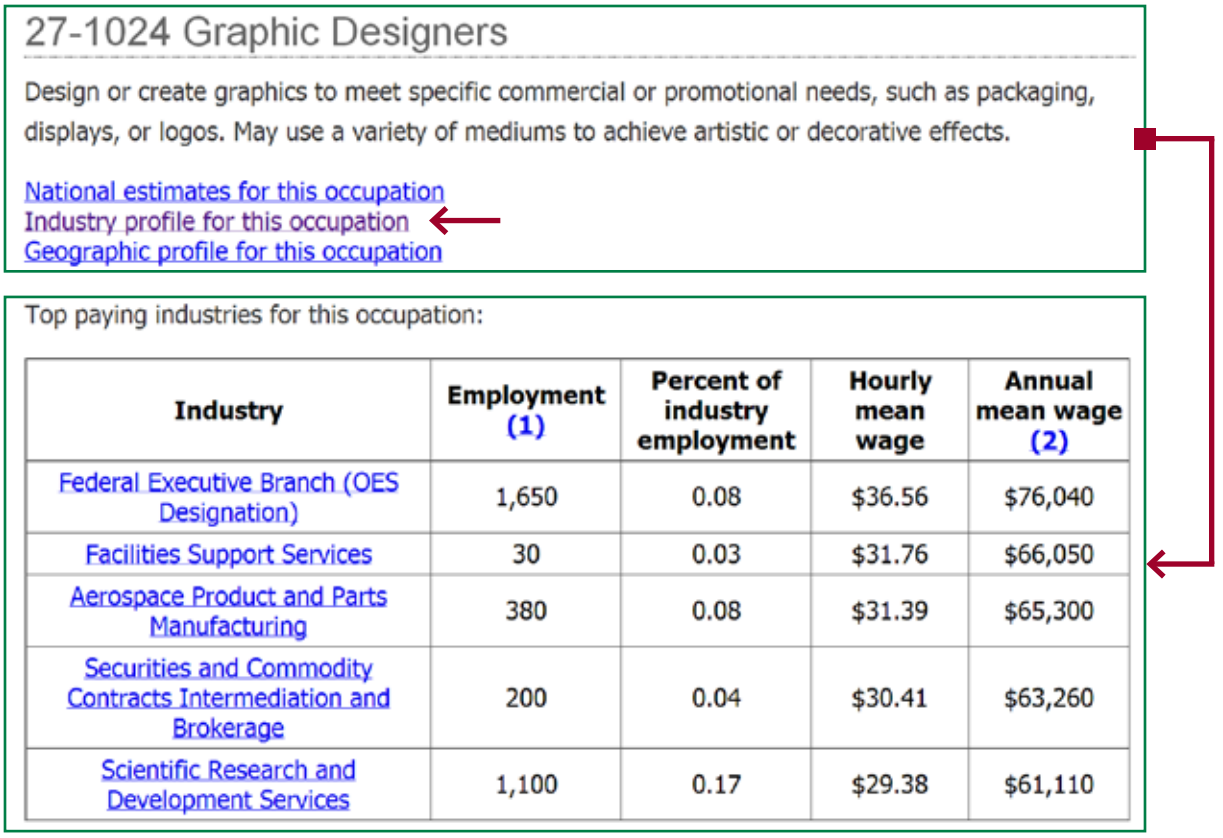
Because the advertised position is entry-level, the starting wage is likely to fall in the lower ranges. If the telemarketing position were for a more experienced worker, the starting wage might be closer to the mean or median wage estimate.

But experience isn't the only factor affecting wages. For example, wages often vary by industry and geographic area. Additional data in the profiles give this specific information.

Using industry data

If you want a job in a specific field, such as healthcare, you might want to look at employment and wage data for that field. These fields are known as industries, and OES data show the types of businesses that employ

Illustration 2: Top paying industries for graphic designers, May 2012



27-1024 Graphic Designers

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

National estimates for this occupation
Industry profile for this occupation
Geographic profile for this occupation

Top paying industries for this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Federal Executive Branch (OES Designation)	1,650	0.08	$36.56	$76,040
Facilities Support Services	30	0.03	$31.76	$66,050
Aerospace Product and Parts Manufacturing	380	0.08	$31.39	$65,300
Securities and Commodity Contracts Intermediation and Brokerage	200	0.04	$30.41	$63,260
Scientific Research and Development Services	1,100	0.17	$29.38	$61,110

occupations—such as, for healthcare-related occupations, hospitals.

Every profile has an industry section that shows industries with the most overall employment for the occupation, industries with the most concentrated employment for the occupation, and industries that pay the most for the occupation.

The industry data show which industries have the highest wages for an occupation. Let's say, for example, that you're an experienced graphic designer working for a commercial printer. You're unhappy with your annual salary of $40,000 after learning at a recent trade show that many of your colleagues in other industries earn more than you do. Using the OES occupation profile for graphic designers, you can research wages by industry.

By scanning the national employment and wage estimates at the top of the page, you'll notice that your current salary is below the mean annual wage of $48,730 for this occupation. Click on the "Industry profile for this occupation" link or scroll down the page for the industry section.

Illustration 2 above shows the employment and the hourly and annual mean wages of the top-paying industries for graphic designers in May 2012. The mean annual wage for these industries fell between $61,000 and $77,000, well above your salary. These wages are comparatively high, but employment of graphic designers in these industries was small—and three industries employed fewer than 500 workers: facilities support services, aerospace product and parts manufacturing, and securities and commodity contracts intermediation and brokerage. The top-paying industry that employed the largest number of graphic designers was the federal executive branch (1,650), followed by scientific research and development services (1,100).

Illustration 3 below shows data for the five industries that employed the most graphic designers in May 2012. Your industry, printing and related support activities, is among the largest; however, it paid the least among these top five industries. Two other industries shown—specialized design services and advertising, public relations, and related services—paid, on average, at least $10,000 more than your current salary.

These data from the OES occupational profile show that you have several options for increasing what you earn as a graphic designer. By changing industries, you might be able to increase your annual salary.

Using geographic data

Each profile also has a geographic section with maps and tables showing the states and metropolitan areas (defined as one or more urban areas with 50,000 or more people) that have the most overall employment, the most concentrated employment, and the top pay for the occupation. For nonmetropolitan areas, the same type of information is provided in tables that are below the maps.

State and area data help jobseekers who are considering relocation. For example, suppose you're a tool and die maker earning $21 per hour in Augusta, Georgia, and you're thinking about relocating. Your preference to relocate to the Northeast or Midwest, where you have family, may depend on which locations pay the highest wages for tool and die makers.

The OES profile for tool and die makers shows, at the top of the page, that your current wage is below the May 2012 national

Illustration 3: Top employing industries for graphic designers, May 2012

27-1024 Graphic Designers

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

National estimates for this occupation
Industry profile for this occupation
Geographic profile for this occupation

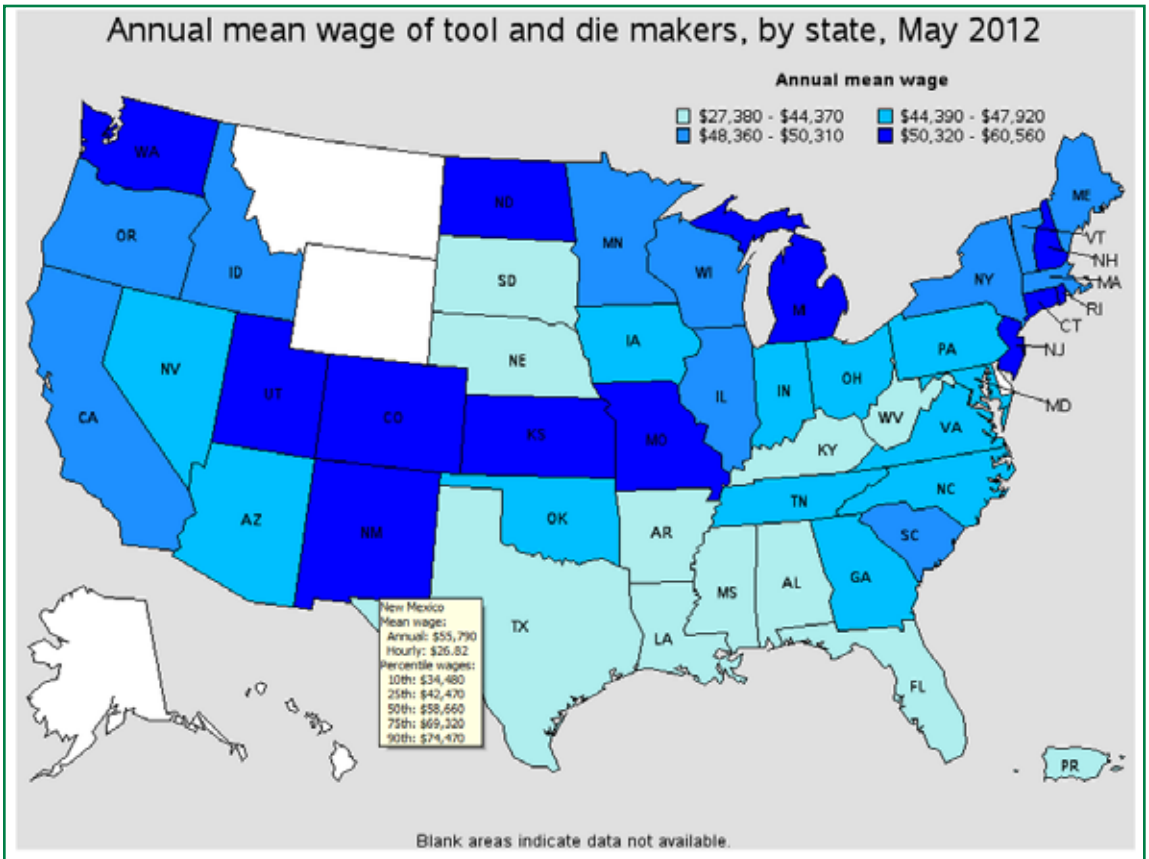
Industry profile for this occupation: Top

Industries with the highest published employment and wages for this occupation are provided. For a list of all industries with employment in this occupation, see the Create Customized Tables function.

Industries with the highest levels of employment in this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Specialized Design Services	25,140	21.60	$24.67	$51,300
Newspaper, Periodical, Book, and Directory Publishers	23,410	5.09	$20.90	$43,470
Advertising, Public Relations, and Related Services	20,560	4.77	$24.32	$50,590
Printing and Related Support Activities	16,290	3.50	$18.60	$38,690
Other Miscellaneous Manufacturing	7,670	2.84	$19.49	$40,530

Chart: Top paying states for tool and die makers, May 2012



Top paying States for this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Washington	1,480	0.54	0.91	$29.12	$60,560
New Mexico	50	0.06	0.11	$26.82	$55,790
Connecticut	1,890	1.17	1.99	$26.08	$54,250
Kansas	920	0.70	1.19	$26.03	$54,140
Colorado	280	0.13	0.22	$25.10	$52,210

hourly wages of $23.31 (mean) and $22.60 (median). The national wage data tell you that there are areas of the country that pay more. To find out which areas these are, click on the "Geographic profile for this occupation" link or scroll down the profile for the geographic section.

The first map in the geographic section shows that several states in the Midwest and Northeast employed a high number of tool and die makers in May 2012. The table below the map shows that Michigan, Ohio, Indiana, Illinois, and Pennsylvania employed the most tool and die makers. The map also shows that many tool and die makers were employed in Connecticut, New York, and Wisconsin.

The third map (see chart above) in the geographic section shows wages by state for tool and die makers in May 2012. Among the five top-paying states, Connecticut had a mean hourly wage of $26.08 and employed about 1,900 tool and die makers.

However, the map indicates that Michigan also paid a relatively high mean wage. To help narrow your choices, you can look at metropolitan area data for the states with the

largest employment and highest wages. Three metropolitan areas in Michigan and one each in Illinois, Ohio, and Wisconsin employed at least 1,400 tool and die makers in May 2012. Scrolling down further, you can see that Detroit-Livonia-Dearborn, which was among the highest employing metropolitan areas for this occupation, is also one of the highest paying areas, with a mean hourly wage of $29.37 in May 2012.

After examining the OES profile for tool and die makers, you can make an informed decision about where to focus a job search.

How to create customized tables

The OES occupation profile page gives an informative snapshot of employment and wages. But what if jobseekers need even more detail?

OES has more data than what appears on each profile page. Jobseekers can create customized tables using the Multi-Screen Data Search tool. This tool is accessible from within the occupation profiles and from the main OES homepage. It allows jobseekers to choose the geographic or industry data they want for one or more occupations and then download the tables.

Creating geographic tables

Relocating for one person's career can be difficult. Adding another person's career into the decisionmaking process can make relocating twice as challenging. A customized geographic table can pull together data for two occupations to help with planning.

For example, let's say you and your spouse have started thinking about retirement. Both of you want to work a few more years, but you'd like to relocate first. You've decided to trade the cool summers and frigid winters of Upstate New York for the milder year-round climate of Scottsdale, Arizona.

Check the OES occupation profiles to find wage levels that are close to your current ones. With many years of experience as an electrical engineer, for example, your current salary of $111,500 annually is near the 75th percentile wage estimate of $110,850 for this occupation nationally in May 2012. Your spouse, a dental assistant with fewer years in the labor force, earns $34,900 annually—higher than, but close to, the median annual wage of $34,500 for this occupation nationally in May 2012.

By hovering your mouse over the annual mean wage maps in each occupation profile, you learn that your wages are fairly typical for your state. Electrical engineers in New York had an annual wage of $112,970 at the 75th percentile in May 2012, and dental assistants earned a median wage of $34,690 annually. Compared with your current employers, employers in Arizona appear to have paid higher wages for electrical engineers and similar wages for dental assistants. Now it's time to get specific data about Scottsdale, which is part of the Phoenix-Mesa-Glendale metropolitan area.

You can create one customized geographic table that shows May 2012 wages for

both of your occupations in the Phoenix area by doing the following:

- From either occupation profile, scroll up from the wage map and click "Create Customized Tables" under "Geographic profile for this occupation."
- Select "Multiple occupations for one geographical area" as the search type.
- On the next page, choose "Metropolitan or nonmetropolitan area" as the geographic type.
- From the list of areas on the next page, select "Phoenix-Mesa-Glendale" under Arizona.
- The next page has a list of occupations; find and click on "electrical engineers 172071" and then, while holding the Ctrl key on your keyboard, find and click on "dental assistants 319091."
- Finally, select "May 2012" as the release date, "Annual median wage," and then, while holding the Ctrl key on your keyboard, select "Annual 75th percentile wage."

The customized table will shows that electrical engineers in the Phoenix area had an annual wage of $118,270 at the 75th percentile in May 2012. Dental assistants had a median annual wage of $34,760. The data suggest that you may be able to expect a salary increase when you relocate, although your spouse's wage should stay about the same. This information can help both of you make decisions in your relocation and jobseeking efforts.

Creating industry tables

If you're a college student majoring in accounting, you may want to research your earning prospects before you enter the labor force. Start with the data on the OES occupation profile for accountants and auditors.

The national estimates for this occupation show that the mean annual wage was $71,040 in May 2012. Although wages vary by industry and location, you should expect a lower starting salary in an entry-level position—something closer to the 10th percentile wage of $39,930.

In the industry section of the profile, you notice that in May 2012, accountants and auditors in the five top-paying industries had a wage that was higher than the national mean.

Retrieve data for the 10th percentile wage in the highest paying industries for accountants and auditors by clicking the "Create Customized Tables" link under "Industry profile for this occupation" and doing the following:

- To select a search type, choose "One occupation for multiple industries."
- On the next page, find "accountants and auditors 132011" in the occupations list.
- The next two pages allow you to choose the sectors and industries for which you would like to see data—including, for the broad search you're doing, an option to select "All sectors in this list," and then "All industries in this list."
- On the last page, choose "May 2012" as the release date, "Annual 10th percentile wage" for type of data, and "Excel" for the type of output.

You can sort the Excel file by the wage column, from largest to smallest, to identify which industries paid the highest wages for accountants and auditors at the 10th percentile in May 2012. From these data, you can target your job search to focus on positions more likely to offer above-average salaries for entry-level accountants.

For more information

The OES occupation profiles are one of many sources of OES data. For example, you may be interested in working in a particular industry but are willing to work in a variety of occupations within that industry. In that case, the OES industry tables (**www.bls.gov/oes/current/oessrci.htm**) are a good starting point. For each industry—such as construction, healthcare, or banking—the profile lists occupations in the field, employment, and average wages. The tables can be sorted so that they show which occupations are the largest and which are the highest paying.

OES occupational employment and wage data are also available as charts, maps, databases, and in a variety of publications. To find more, go to **www.bls.gov/oes**.

The *Occupational Outlook Handbook* (*OOH*) uses OES employment and wage data in profiles for hundreds of occupations. These profiles also include information about each occupation's duties, work environment, education or training requirements, job outlook, and more. Find the *OOH* online at **www.bls.gov/ooh**.

No trees were harmed in the making of the OOQ *online:* **www.bls.gov/ooq**

You're a *what*?

Online seller

Elka Torpey

What would you do if you knew you couldn't fail? When a friend asked Ann Drew Yu that question, it prompted her to open her imagination. Eventually, she decided to take a risk and start her own business: developing an inspirational product that she now sells online.

An English teacher turned stay-at-home mom, Ann designed a product—a box with cards and other tools—to help girls and women direct their lives in a positive way. Her original idea was so popular, Ann created a different version for classrooms.

Ann likes that online sales have allowed her to connect with people as far away as Australia. "Having an online business gives me the reach of the world," she says. "It gives me a platform to share what I think is a really useful and meaningful product."

As online shopping has grown, so too has the number of people who make money selling products online. Online sellers can sell just about anything. Some, like Ann, design or create the products themselves. Others sell new merchandise, antiques, or used items, like books or toys.

Starting an online business can be as simple as having something to sell and access to the Internet. But there are a lot of factors to consider if you're going to have a business that thrives.

One is to have confidence in your idea, especially early on. "You really have to believe in what you're doing, because it's a twisty and bumpy road at times," says Ann. "If I didn't really believe in what I'm doing, I'm sure I would have walked away by now."

Another factor for business success is helping your product to stand out among the millions of other products online. Search engine optimization is one way that online sellers like Ann ensure that their website link appears at or near the top of the results when people search for a product. "You can have the most useful or beautiful product ever," Ann says, "but connecting it to the right people defines whether you have a business."

One of the easiest ways to start selling online is to set up an account with an established shopping website, which brings in customers and provides guidance on how to sell online, usually at some cost to the seller. A leading site recommends that you start out selling an item you already have, to get a feel for how the process works.

In addition to deciding what to sell, you should also consider how much to charge, who will buy it, and how to sell to those buyers: through your own website or an online shopping site. Other decisions, such as shipping options and whether to accept returns, are important, too.

And creating your own product also requires being able to make what you are going to sell. Before Ann could make her box a reality, for example, she needed to find a manufacturer that could produce it for her. A friend who worked in merchandising helped Ann find a company that would make the boxes.

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Online sellers do a variety of tasks. They photograph and write descriptions of the items they will sell and put the information online. They calculate total purchase amounts, taxes, and shipping costs; process payments; and send orders. And they interact with customers to answer questions or resolve problems.

Many online sellers spend a lot of time promoting their products, either online—through social media, email, newsletters, advertisements, or blogs—or in their communities. Ann, for example, gives workshops and speaks in schools.

The U.S. Bureau of Labor Statistics does not have earnings or employment data for online sellers. But earnings for online sellers, like those for any self-employed workers, depend on factors such as demand for their products and how much money the sellers take in after accounting for expenses.

Keeping products affordable and competitively priced, while still making a profit, is often difficult when selling online, because consumers can easily compare products and prices.

Even for successful sellers, earnings fluctuate—so it's important not to rely too heavily on potential earnings from an online business. "If we were relying on my income alone instead of my husband's," Ann says of her family's finances, "I would not have been able to quit my day job."

As self-employed workers, online sellers have other expenses, too. These often include health insurance and saving for retirement. Prospective sellers should also check to see if they need a seller's permit or if their state has other requirements for people who sell products online.

Frequently, online sellers work part time at their business, perhaps holding another job or, like Ann, raising a family. Work hours are often irregular, as sellers occasionally need to work additional or unusual hours to fill orders. But they have more control over their schedules than does someone who works a traditional, 9-to-5 job.

No formal education is required to become an online seller. Still, it's important to have good writing skills for crafting product descriptions and other web content, strong organizational and bookkeeping ability for keeping track of earnings and expenses, and resourcefulness for figuring out how to get products noticed.

Photo courtesy of Ann Drew Yu.

By selling her products online, Ann Drew Yu has the reach of the world from her own home.

Some level of technical skill for creating and managing an online presence is helpful, says Ann. Although other online sellers may work on search engine optimization and site design themselves, Ann hires people to do these tasks for her.

But technical ability and other skills aren't always enough to turn a good idea into a profitable venture. Success for most online sellers doesn't happen overnight: It takes a lot of hard work and a willingness to adapt as you go along.

"When you're an entrepreneur, you're not following a path," says Ann. "You're learning from what other people have done, sure, but you're making your own way."

OOChart

How long do workers stay with the same employer?

Every year, workers leave or change their employer. But how long do they stay before moving on? New data from the U.S. Bureau of Labor Statistics (BLS) show that wage and salary workers had been with their current employer for a median of 4.6 years in January 2012.

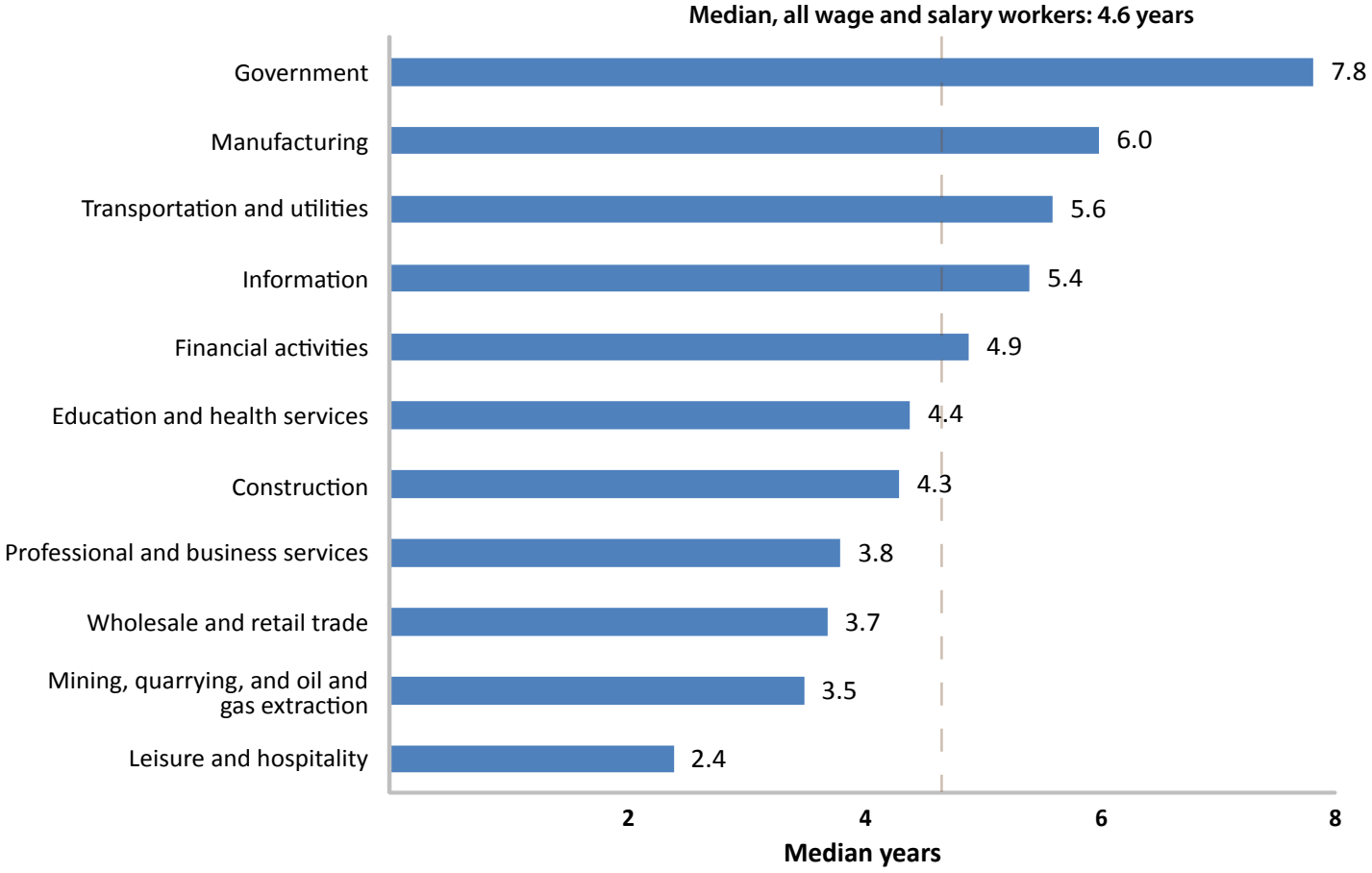
As the chart shows, employee tenure varied by industry. In government, for example, workers had been with the same employer for a median of 7.8 years, compared with 2.4 years for workers in the leisure and hospitality industry.

Employee tenure by industry depends on many factors, one of which is age. Younger workers have fewer years of tenure than older workers, who generally have been in the workforce longer. For example, data show that workers aged 25 to 34 had been with their current employer for about half as long as workers aged 45 to 50. Government workers as a group are usually older than leisure and hospitality workers, which helps, in part, to explain the difference in their median tenures.

Other factors that might affect tenure by industry are fluctuations in the numbers of new hires and separations.

These data come from a biennial supplement to the Current Population Survey (CPS). To learn more, see the BLS news release at **www.bls.gov/news.release/archives/tenure_09182012.htm** or visit the CPS website at **www.bls.gov/cps**.

Median years of tenure with current employer for employed wage and salary workers, aged 16 years and over, by selected industry, January 2012



Source: U.S. Bureau of Labor Statistics, Current Population Survey


Get your gears turning.
Read the OOQ online at:
www.bls.gov/ooq

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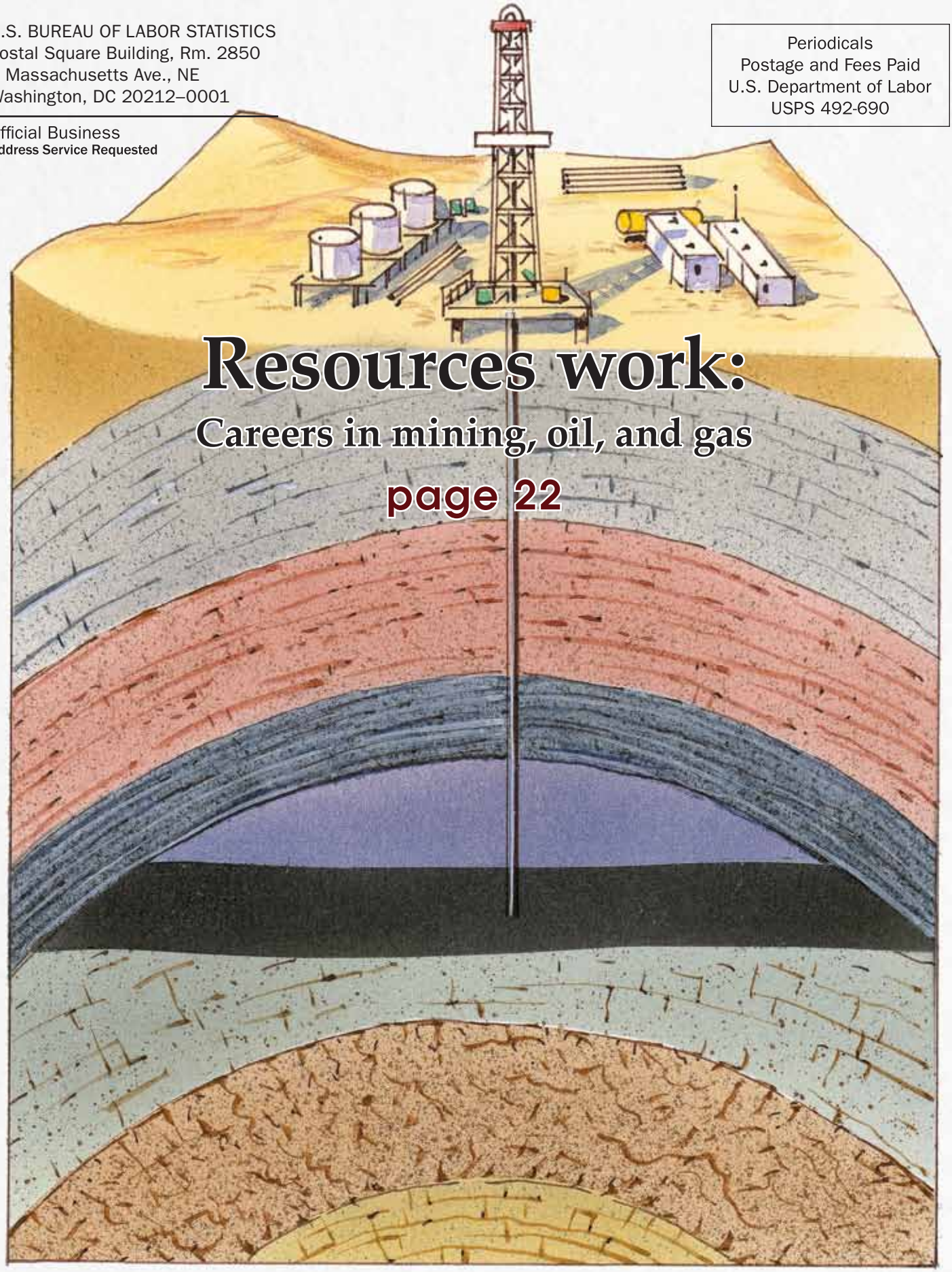

Resources work:

Careers in mining, oil, and gas

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