

MISSOURI GATEWAY-SKILLS



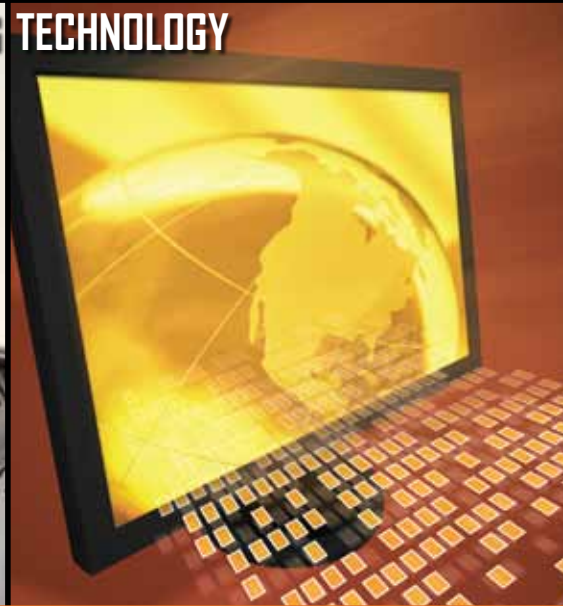
MATHEMATICS



SCIENCE



ENGINEERING



TECHNOLOGY

M I S S O U R I

Department of Economic Development

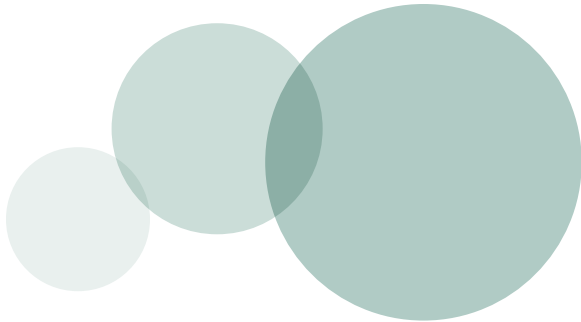


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KEY FINDINGS

In 2008, there were 34,026 science-intensive jobs (annual mean wage \$104,147*), 55,665 technology-intensive jobs (annual mean wage \$72,709), 60,539 engineering-intensive jobs (annual mean wage \$70,870), and 10,885 mathematics-intensive jobs (annual mean wage \$66,754) in Missouri, which all paid much higher salaries than the state average wage of \$38,849.

- ◆ By 2018, science-intensive jobs will increase by more than 11.1%, technology-intensive jobs will increase by 4%, engineering-intensive jobs will increase by more than 4.2%, and mathematics-intensive jobs will increase by 3.2%.
- ◆ Science-intensive occupations accounted for 1.2% of all employment statewide in 2008. Technology-intensive jobs accounted for 1.9% of the statewide employment, engineering-intensive jobs accounted for 2.1%, and mathematics-intensive jobs accounted for 0.4% of the 2008 state employment.
- ◆ In general, mean average wages per job for most Gateway Skill occupations were below the national averages for Gateway Skill occupations. However, this is expected as Missouri's average wage is also below the national average wage for 2008. Mathematics-intensive jobs had the most occupations either similar to or above the national average.
- ◆ The proportion of graduates obtaining post-secondary degrees (associate's, bachelor's, master's, and doctorates) in engineering, mathematics, computer science, and physical science has been increasing steadily since 1981. Though the proportion of graduates gaining advanced degrees is growing over time, the state is not keeping up with the rate of advanced degrees overall.
- ◆ Just 35% of Missouri's 8th graders were proficient or advanced in mathematics in 2009 and only 33% of Missouri 8th graders were proficient or advanced in science in 2005. Missouri students did score better in science assessments, above the national average and with more consistency, between 4th and 8th grade.

**The average wage of science-intensive occupations is unusually high due to the large number of skilled medical professionals within this skill area along with their high numbers of employment.*

OVERVIEW

At the turn of the millennium, it became evident to the nation that our economy was transitioning from an asset-based to an intangible asset-based system. In this new economy, copyrights, patents, branding, innovation, and knowledge are valued over more tangible assets such as stock or equipment. These intangible assets are critical for making a company viably competitive on a national and even international scale. Many of these assets are products of industry innovation, spearheaded by human talent. Human innovation can provide industry with technical knowledge, help create new scientific discoveries and applications, and develop new ways in which to commercialize and position new products.

As such, it has been argued that both state and national economic growth are directly tied to innovation. The development of new technologies, products, and services creates progress in virtually all aspects of daily life. This development is key to meet the upcoming challenges for Missouri such as rising health care costs for an aging population and the increased focus on new forms of energy. This accelerated rate of innovation will require more effective talent, especially in the areas of science, technology, engineering, and mathematics, also known as gateway skills.

In 2006, Missouri established a task force to investigate ways to increase student participation in gateway skills disciplines to better prepare Missourians for existing and future careers. Four strategic challenges have been identified that are central to improving gateway skills education in Missouri: Improve all students' performance from pre-kindergarten through graduate education, expand the pool of students motivated to pursuing science, technology, engineering, and mathematical occupations, expand the pool of Missouri's teachers who focus on these four gateway skills areas, and increase the public awareness of the importance of gateway skills industries and jobs in enhancing Missouri's competitiveness and innovation. This analysis focuses on the gateway skills occupations—four areas that have, in the past, been linked to occupations with job security, advancement, and higher wages.

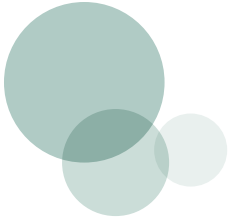
“Increased global competition, lackluster performance in mathematics and science education, and a lack of national focus on renewing its science and technology infrastructure have created a new economic and technological vulnerability as serious as any military or terrorist threat.”

Rising Above the Gathering Storm (2008), National Academy of Sciences

METHODS

Occupations were classified as science, technology, engineering, or mathematics intensive if the combined importance and level of mathematics, technology, or science skills needed to perform a particular job were two or more standard deviations above the mean skill level for all occupations. Skills refer to the developed capacities that facilitate learning and/or performance within occupations. Occupational skills data was taken from a national database called the Occupational Information Network (O*NET) to be used in the analysis. Certain occupations on O*Net are subdivided into several more detailed occupations, such as Fire Inspectors and Investigators (33-2021) being divided into Fire Inspectors (33-2021.01) and Fire Investigators (33-2021.02). The average of the importance (IM) for each occupation was calculated by totaling the IM scores for each of the new occupations and dividing by the number of new occupations that O*NET had created. This same process was used to create an average of the level (LV) for each occupation.

IM and LV scores were then summed and standardized. The scores were standardized based on a 13 point scale, which is the result of combining both the 5 point importance scale and the 7 point level scale. This inherently weights the level of a skill over the importance in the standardized score. This process generated a skills proficiency score that ranged from 0.0 (lowest skill proficiency) to 100.0 (highest skill proficiency).



$$\text{SKILL-PROFICIENCY occupations} = (((\text{SumIMLV}-1) / (13-1)) * 100)$$

Where:

- SumIMLV = AvgIM + AvgLV
 AvgIM = Average Skill Importance Score
 AvgLV = Average Skill Level (Frequency of Use) Score

The data for this analysis comes from three principal sources. Information on occupational skill requirements was taken from O*NET, maintained by the U.S. Department of Labor. Occupational wage data for Missouri was taken from Occupational Employment Statistics (OES), maintained by the Missouri Economic Research and Information Center (MERIC) and the U.S. Department of Labor. Occupational employment data for Missouri was taken from Employment Projections, maintained by the MERIC and the U.S. Department of Labor.

OCCUPATIONAL INFORMATION NETWORK (O*NET)

O*NET is a comprehensive database of worker attributes and job characteristics. The database contains information on knowledge, skills and ability requirements for 812 occupations. Although it is sometimes difficult to differentiate among knowledge, skill and ability in practice, they are distinct concepts in theory. Knowledge refers to information that has been acquired through formal education or training experiences. Skills refer to developed capacities that facilitate learning or performance. Abilities are defined as underlying characteristics of individuals, which are related to effective or superior performance in a job.

The knowledge and skills measures are used in this analysis. It is important to remember that knowledge and skills in this study do not measure an individual worker's knowledge and skills. Instead, the knowledge and skills are measures of the average level required by the performance of certain functions in that occupation.

OCCUPATIONAL EMPLOYMENT STATISTICS (OES)

The Occupational Employment Statistics (OES) program conducts a yearly mail survey designed to produce estimates of employment and wages for specific occupations. The OES program collects data on wage and salary workers in non-farm establishments in order to produce employment and wage estimates for over 700 occupations. Data from self-employed persons are not collected and are not included in the estimates. Estimates based on geographic areas are available at the national, state and metropolitan area levels. Occupational employment and wage estimates for over 400 industry classifications are also available. The MERIC conducts the OES survey for the State of Missouri. Each year more than 10,000 employers will be surveyed through random selection based on their industrial classification, size and geographic location. In addition to the statewide data, there are tabulations for each of the state's six metropolitan statistical areas and thirteen Local Workforce Investment Areas.

OCCUPATIONAL EMPLOYMENT PROJECTIONS

Occupational employment projections are developed using data from Missouri's occupational employment and wage survey along with unemployment insurance information provided by the State of Missouri and the U.S. Bureau of Labor Statistics. OES and Quarterly Census of Employment and Wages (QCEW) data are the basis for the occupational data used in the projections. The data collected reflect the Standard Occupational Classification (SOC). Many occupations are not identified separately in the SOC and are included in aggregate categories. Employment may not be sufficient to warrant the development of occupational projections in every occupation in each state, or the data may be confidential. The U.S. Employment and Training Administration provides funding for the employment projections program.



SCIENCE-INTENSIVE OCCUPATIONS SUMMARY

According to 2008 estimates, there were 34,026 science-intensive jobs in Missouri earning an annual mean wage of \$104,147 per job, which is much higher than the state average wage of \$38,849. The projected number of science-intensive jobs for 2018 is expected to increase by more than 11.1% to a total of 37,802 jobs. The average level of educational attainment for individuals employed in science-intensive occupation in 2008 required at least a bachelor's degree or higher. In addition, workers in science-intensive occupations accounted for 1.2% of all employment statewide.

Most science-intensive jobs were in Education & Health Services, Self-Employed Workers, Government, and Professional & Business Services. The projected net change of science-intensive occupations from 2008-2018 is over 3,745 jobs.

Science-Intensive Occupations <i>Employment by Industry for Missouri</i>			
Industry	2008 Employment	2018 Employment	Net Change
Education and Health Services	21,650	24,658	3,008
Manufacturing	7,840	7,710	-130
Professional and Business Services	4,595	5,318	723
Government	2,942	3,082	140
Self-Employed and Unpaid Family Workers, Primary Job	1,171	1,138	-33
Trade, Transportation, and Utilities	334	349	15
Construction	178	194	16
Other Services (Except Government)	60	64	4
Financial Activities	58	61	3
Natural Resources and Mining	32	31	-1
Information	20	20	0
Missouri Total	38,880	42,625	3,745

*Estimated annual average employment and wages for 2008.
Source: Analysis of Occupational Employment Statistics and O*Net by MERIC*

In Missouri, science-intensive occupations with the highest employment base were Health Specialties Teachers (6,351 jobs at \$105,867), Family and General Practitioners (4,427 jobs at \$150,983), Mechanical Engineers (3,366 jobs at \$73,205), Dentists (1,977 jobs at \$166,832), and Medical Scientists, except Epidemiologist (2,020 jobs at \$67,086).

Occupations with the largest percentage of national mean wages were Soil and Plant Scientists (106.7% of national mean wages), Podiatrists (106.5% of national mean wages), Dentists (106.4% of national mean wages), Anesthesiologists (104.0%), and Internists (103.8%).

From 2008 to 2018, science-intensive occupations with the largest projected percent increases in employment with at least a net change of 10 are:

- ◆ Biomedical Engineers (94 jobs at 62% change)
- ◆ Biochemists and Biophysicists (126 jobs at 45% change)
- ◆ Medical Scientists, except Epidemiologists (633 jobs at 31% change)
- ◆ Veterinarians (330 jobs at 26% change)
- ◆ Biological Technicians (254 jobs at 17% change)

Using data from O*Net, skill proficiency scores were calculated by averaging the importance (IM) and level (LV) scores for each six-digit SOC occupation. IM and LV scores were then summed and standardized. The scores were standardized based on a 13-point scale, which is the result of combining both the 5-point importance scale and the 7-point level scale. The process generated a skills proficiency score that ranged from 0.0 (low skill proficiency) to 100.00 (high skill proficiency).

Skills refer to the developed capacities that facilitate learning and/or performance within occupations. Occupations with the highest science skills proficiency were Atmospheric, Earth, Marine, and Sciences Teachers (score of 86.00), Physicists (score of 84.75), Chemistry Teachers (score of 83.75), Materials Scientists (score of 83.67), and Biological Sciences Teachers (score of 83.08).

Science-Intensive Occupations <i>Employment and Wages in Missouri</i>					
Occupation Title	Employment 2008	Employment 2018	Entry Wage	Average Wage	Expert Wage
Health Specialties Teachers, Postsecondary	6,351	7,082	\$47,536	\$105,867	\$135,033
Family & General Practitioners	4,427	4,903	\$66,825	\$150,983	\$193,061
Mechanical Engineers	3,366	3,288	\$52,163	\$73,205	\$83,725
Medical Scientists, Except Epidemiologists	2,020	2,653	\$46,958	\$67,086	\$77,150
Dentists, General	1,977	2,079	\$81,234	\$166,832	\$209,631
Biological Technicians	1,486	1,740	\$22,599	\$36,503	\$43,456
Chemists	1,395	1,375	\$39,690	\$64,593	\$77,045
Veterinarians	1,272	1,602	\$45,224	\$71,112	\$84,056
Nursing Instructors & Teachers, Postsecondary	1,105	1,221	\$42,270	\$57,580	\$65,236
Biological Science Teachers, Postsecondary	1,056	1,176	\$39,008	\$69,369	\$84,550
Aerospace Engineers	ND	ND	ND	ND	ND
Engineering Teachers, Postsecondary	857	956	\$49,693	\$85,018	\$102,680
Surgeons	780	897	ND	\$219,547	ND
Natural Sciences Managers	641	682	\$64,294	\$105,453	\$126,033
Internists, General	630	725	\$117,320	\$190,973	\$227,800
Chemical Engineers	575	558	\$50,148	\$90,459	\$110,614
Anesthesiologists	570	657	ND	\$220,123	ND
Obstetricians & Gynecologists	564	647	ND	\$196,270	ND
Zoologists & Wildlife Biologists	416	422	\$33,165	\$48,281	\$55,839
Pediatricians, General	386	447	\$104,331	\$150,286	\$173,264

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018.
Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC
ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics*

Science-Intensive Occupations						
MO Percent of US Wages & Projected Employment Growth						
Occupation	Employment 2008	Employment 2018	Total Growth Openings 2008-2018*	MO Average Wage	U.S. Average Wage	MO % of U.S. Average Wage
Health Specialties Teachers, Postsecondary	6,351	7,082	731	\$105,867	\$103,340	102.45%
Family & General Practitioners	4,427	4,903	476	\$150,983	\$168,550	89.58%
Mechanical Engineers	3,366	3,288	0	\$73,205	\$80,580	90.85%
Medical Scientists, Except Epidemiologists	2,020	2,653	633	\$67,086	\$84,760	79.15%
Dentists, General	1,977	2,079	102	\$166,832	\$156,850	106.36%
Biological Technicians	1,486	1,740	254	\$36,503	\$41,140	88.73%
Chemists	1,395	1,375	0	\$64,593	\$72,740	88.80%
Veterinarians	1,272	1,602	330	\$71,112	\$90,110	78.92%
Nursing Instructors & Teachers, Postsecondary	1,105	1,221	116	\$57,580	\$65,240	88.26%
Biological Science Teachers, Postsecondary	1,056	1,176	120	\$69,369	\$87,220	79.53%
Aerospace Engineers	ND	ND	48	ND	ND	93.06%
Engineering Teachers, Postsecondary	857	956	99	\$85,018	\$92,970	91.45%
Surgeons	780	897	117	\$219,547	\$219,770	99.90%
Natural Sciences Managers	641	682	41	\$105,453	\$127,000	83.03%
Internists, General	630	725	95	\$190,973	\$183,990	103.80%
Chemical Engineers	575	558	0	\$90,459	\$91,670	98.68%
Anesthesiologists	570	657	87	\$220,123	\$211,750	103.95%
Obstetricians & Gynecologists	564	647	83	\$196,270	\$204,470	95.99%
Zoologists & Wildlife Biologists	416	422	6	\$48,281	\$60,670	79.58%
Pediatricians, General	386	447	61	\$150,286	\$161,410	93.11%

Estimated annual average employment and wages for 2008. Projected annual average employment for 2018. Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC. ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics. *Growth Openings are defined as openings created by occupational creation or expansion

Science-Intensive Occupations								
Skills Proficiency								
Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Atmospheric, Earth, Marine, & Space Sciences Teachers, Postsecondary	84.7	73.0	80.7	74.8	78.0	86.0	82.1	81.9
Physicists	85.3	69.4	77.4	68.1	84.9	84.8	83.9	81.0
Chemistry Teachers, Postsecondary	82.1	67.0	75.3	76.0	76.1	83.8	76.7	77.7
Materials Scientists	79.5	72.5	66.8	65.3	77.8	83.7	81.3	74.8
Biological Science Teachers, Postsecondary	83.8	73.3	77.8	79.6	60.5	83.1	78.8	77.9
Engineering Teachers, Postsecondary	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Medical Scientists, Except Epidemiologists	88.5	83.3	81.0	71.4	62.8	81.8	78.7	79.8
Health Specialties Teachers, Postsecondary	85.8	72.2	81.6	78.4	55.3	80.8	81.3	77.1
Forestry & Conservation Science Teachers, Postsecondary	83.5	74.4	82.1	76.3	71.8	80.2	81.0	80.3
Biochemists and Biophysicists	81.9	71.0	76.6	63.7	58.9	80.1	68.8	76.7
Chemical Engineers	75.3	71.4	65.3	63.4	73.2	79.1	72.5	73.2
Obstetricians & Gynecologists	86.1	82.3	66.7	76.5	53.8	78.8	82.6	81.7
Physics Teachers, Postsecondary	79.1	68.8	72.6	75.3	77.6	78.7	78.2	74.8
Agricultural Sciences Teachers, Postsecondary	83.0	72.3	80.2	74.2	65.1	78.5	75.8	76.8
Agricultural Engineers	77.8	68.8	74.3	67.0	81.3	78.1	72.9	74.3
Soil & Plant Scientists	79.5	65.8	76.3	65.3	65.8	77.5	73.3	73.1
Environmental Science Teachers, Postsecondary	85.9	73.7	83.4	77.0	71.3	77.2	83.1	81.0
Hydrologists	77.3	65.8	72.6	67.0	75.3	77.1	72.3	72.0
Anesthesiologists	86.7	79.5	67.5	69.2	61.5	76.7	83.7	78.3
Podiatrists	83.9	86.3	66.3	73.5	53.9	76.4	78.6	76.9

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale. Source: Analysis of O*Net by MERIC



TECHNOLOGY-INTENSIVE OCCUPATIONS SUMMARY

According to 2008 estimates, there were 55,665 technology-intensive jobs in Missouri earning an annual mean wage of \$72,709 per job, which is much higher than the state average wage of \$38,849. The projected number of technology-intensive jobs for 2018 is expected to increase by more than 4% to a total of 57,877 jobs. The average level of educational attainment for individuals employed in technology-intensive occupations in 2008 was a bachelor's degree or higher. In addition, workers in technology-intensive occupations accounted for 1.9% of all employment statewide.

Technology-Intensive Occupations

Employment by Industry for Missouri

Industry	2008 Employment	2018 Employment	Net Change
Professional and Business Services	25,295	26,348	1,053
Information	14,740	15,708	968
Manufacturing	12,844	12,220	-624
Government	7,660	7,708	48
Education and Health Services	3,491	4,066	575
Trade, Transportation, and Utilities	3,186	3,067	-119
Financial Activities	3,005	3,200	195
Self-Employed and Unpaid Family Workers, Primary Job	2,349	2,651	302
Other Services (Except Government)	620	614	-6
Construction	610	624	14
Natural Resources and Mining	10	10	0
Missouri Total	73,810	76,216	2,406

Estimated annual average employment and wages for 2008.

*Source: Analysis of Occupational Employment Statistics and O*Net by MERIC*

Most technology-intensive jobs were in Professional & Business Services, Information, Manufacturing, and Government. The projected net change of technology-intensive occupations from 2008-2018 is more than 2,400 jobs.

In Missouri, technology-intensive occupations with the highest employment base were Computer Systems Analyst (10,610 jobs at \$72,018), Computer Programmers (9,651 jobs at \$66,946), Computer Applications Software Engineers (8,885 jobs at \$76,059), Network Systems and Data Communications Analysts (5,213 jobs at \$74,788), and Computer Systems Software Engineers (4,715 jobs at \$78,884).

Occupations with the largest percentage of national mean wages were Computer Hardware Engineers (115.1%), Orthotists and Prosthetists (105.1%), Mechanical Drafters (99.5%), Chemical Engineers (98.7%), and Network Systems and Data Communications Analysts (97.7%).

From 2008 to 2018, technology-intensive occupations with the largest projected percent increases in employment with at least a net change of 10 are:

- ◆ Biomedical Engineers (94 jobs at 62% change)
- ◆ Network Systems and Data Communications Analysts (1,573 jobs at 30% change)
- ◆ Computer Software Engineers, Systems Software (634 jobs at 14% change)
- ◆ Computer Software Engineers, Applications (1,158 jobs at 13% change)
- ◆ Engineering Teachers, Postsecondary (99 jobs at 12% change)

Technology-Intensive Occupations Employment and Wages in Missouri					
Occupation Title	Employment 2008	Employment 2018	Entry Wage	Average Wage	Expert Wage
Computer Systems Analysts	10,610	11,084	\$50,693	\$72,018	\$82,680
Computer Programmers	9,651	7,887	\$42,413	\$66,946	\$79,212
Computer Software Engineers, Applications	8,885	10,043	\$50,600	\$76,059	\$88,788
Network Systems & Data Communications Analysts	5,213	6,786	\$46,454	\$74,788	\$88,955
Computer Software Engineers, Systems Software	4,715	5,358	\$56,419	\$78,384	\$89,366
Computer Specialists, All Other	4,030	4,337	\$50,786	\$74,506	\$86,366
Electronics Engineers, Except Computer	2,498	2,417	\$57,415	\$79,901	\$91,143
Electrical Engineers	2,446	2,312	\$56,334	\$79,155	\$90,566
Mechanical Drafters	1,082	951	\$33,956	\$49,547	\$57,343
Multi-Media Artists & Animators	916	929	\$28,121	\$46,846	\$56,208
Aerospace Engineers	ND	ND	ND	ND	ND
Engineering Teachers, Postsecondary	857	956	\$49,693	\$85,018	\$102,680
Sales Engineers	720	704	\$44,166	\$71,658	\$85,403
Chemical Engineers	575	558	\$50,148	\$90,459	\$110,614
Respiratory Therapy Technicians	ND	ND	\$26,752	ND	\$39,906
Computer & Information Scientists, Research	455	462	ND	ND	ND
Computer Hardware Engineers	286	282	\$60,210	\$116,734	\$144,996
Electronic Equipment Installers & Repairers, Motor Vehicles	242	224	\$19,443	\$28,501	\$33,030
Radio Mechanics	189	165	\$32,983	\$40,790	\$44,694
Biomedical Engineers	151	245	\$41,957	\$67,177	\$79,787

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018.
Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC
ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics*

O*Net technology skills refer to the developed capacities that facilitate learning and/or performance within technological occupations. Occupations with the highest technology skills proficiency were Computer Applications Software Engineers (score of 78.25), Computer Systems Software Engineers (score of 74.33), Agricultural Engineers (score of 72.58), Aerospace Engineering and Operations Technicians (score of 71.92), and Orthotists and Prosthetists (score of 71.83).

Technology-Intensive Occupations

MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2008	Employment 2018	Total Growth Openings 2008-2018*	MO Average Wage	U.S. Average Wage	MO % of U.S. Average Wage
Computer Systems Analysts	10,610	11,084	474	\$72,018	\$80,430	89.54%
Computer Programmers	9,651	7,887	0	\$66,946	\$74,690	89.63%
Computer Software Engineers, Applications	8,885	10,043	1,158	\$76,059	\$90,170	84.35%
Network Systems & Data Communications Analysts	5,213	6,786	1,573	\$74,788	\$76,560	97.69%
Computer Software Engineers, Systems Software	4,715	5,358	643	\$78,384	\$96,620	81.13%
Computer Specialists, All Other	4,030	4,337	307	\$74,506	\$78,010	95.51%
Electronics Engineers, Except Computer	2,498	2,417	0	\$79,901	\$91,540	87.29%
Electrical Engineers	2,446	2,312	0	\$79,155	\$86,250	91.77%
Mechanical Drafters	1,082	951	0	\$49,547	\$49,790	99.51%
Multi-Media Artists & Animators	916	929	13	\$46,846	\$62,810	74.58%
Aerospace Engineers	ND	ND	48	ND	ND	93.06%
Engineering Teachers, Postsecondary	857	956	99	\$85,018	\$92,970	91.45%
Sales Engineers	720	704	0	\$71,658	\$90,540	79.15%
Chemical Engineers	575	558	0	\$90,459	\$91,670	98.68%
Respiratory Therapy Technicians	ND	ND	0	ND	ND	77.76%
Computer & Information Scientists, Research	455	462	7	\$77,221	\$105,370	73.29%
Computer Hardware Engineers	286	282	0	\$116,734	\$101,410	115.11%
Electronic Equipment Installers & Repairers, Motor Vehicles	242	224	0	\$28,501	\$29,880	95.38%
Radio Mechanics	189	165	0	\$40,790	\$42,250	96.54%
Biomedical Engineers	151	245	94	\$67,177	\$82,550	81.38%

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018. Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC. ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics. *Growth Openings are defined as openings created by occupational creation or expansion*

Technology-Intensive Occupations

Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Computer Software Engineers, Systems Software	64.1	57.5	58.6	72.3	56.3	78.3	78.3	77.4
Agricultural Engineers	68.8	74.3	67.0	81.3	78.1	74.3	72.9	74.3
Aerospace Engineering & Operations Technicians	73.3	70.3	67.6	71.3	64.6	72.6	74.3	73.8
Computer Software Engineers, Applications	67.1	61.3	64.8	58.3	47.7	71.9	81.0	75.8
Orthotists & Prosthetists	70.8	63.1	70.5	49.2	53.9	71.8	73.5	70.8
Electrical Engineers	71.0	59.6	58.3	64.6	63.2	70.8	73.7	70.8
Biomedical Engineers	67.2	65.3	68.6	70.6	71.6	70.3	64.8	69.6
Chemical Engineers	71.4	65.3	63.4	73.2	79.1	69.9	72.5	73.2
Sales Engineers	77.6	71.6	68.3	75.5	68.8	68.2	73.3	72.0
Sound Engineering Technicians	66.9	41.5	62.4	36.9	26.6	67.9	63.8	67.8
Fashion Designers	63.5	61.8	70.0	69.5	41.1	67.6	74.5	76.3
Network Systems & Data Communications Analysts	65.8	56.5	57.8	46.1	32.4	65.5	67.1	67.8
Nuclear Engineers	72.5	72.3	65.4	73.7	62.3	65.2	73.2	68.0
Engineering Teachers, Postsecondary	73.6	79.4	77.6	83.6	82.8	64.7	85.2	83.9
Mechanical Drafters	64.8	55.3	57.0	67.6	42.6	64.2	60.0	54.7
Materials Scientists	72.5	66.8	65.3	77.8	83.7	63.8	81.3	74.8
Aerospace Engineers	74.8	74.4	72.8	64.0	73.2	63.6	82.1	77.3
Computer & Information Scientists, Research	73.4	73.9	69.0	71.3	68.2	63.3	79.8	86.3
Computer Programmers	62.3	50.7	52.5	52.8	24.5	63.1	77.7	72.3
Electronics Engineers, Except Computer	68.8	67.2	63.3	71.3	63.6	63.1	69.2	73.0

*Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale. Source: Analysis of O*Net by MERIC*



ENGINEERING-INTENSIVE OCCUPATIONS SUMMARY

According to 2008 estimates, there were 60,539 engineering-intensive jobs in Missouri earning an annual mean wage of \$70,870, which is much higher than the state average wage of \$38,849. The projected number of engineering-intensive jobs for 2018 is expected to increase by more than 4.2% to a total of 63,076 jobs. The average level of educational attainment for individuals employed in engineering-intensive occupations in 2008 was a bachelor's degree. In addition, workers in engineering-intensive occupations accounted for 2.1% of all employment statewide.

Most engineering-intensive jobs were in Manufacturing, Professional and Business Services, Construction, and Government. The projected net change of engineering-intensive occupations from 2008-2018 is over 2,800 jobs.

Engineering-Intensive Occupations <i>Employment by Industry for Missouri</i>			
Industry	2008 Employment	2018 Employment	Net Change
Manufacturing	27,304	26,822	-482
Professional and Business Services	17,210	18,995	1,785
Construction	13,880	14,128	248
Government	13,674	13,952	278
Information	8,414	8,954	540
Trade, Transportation, and Utilities	4,638	4,628	-10
Education and Health Services	2,089	2,418	329
Self-Employed and Unpaid Family Workers, Primary Job	922	965	43
Financial Activities	902	1,015	113
Natural Resources and Mining	601	619	18
Other Services (Except Government)	138	144	6
Missouri Total	89,772	92,640	2,868

*Estimated annual average employment and wages for 2008.
Source: Analysis of Occupational Employment Statistics and O*Net by MERIC*

In Missouri, engineering-intensive occupations with the highest employment base were Operating Engineers and Other Construction Equipment Operators (9,014 jobs at \$46,571), Computer Applications Software Engineers (8,885 jobs at \$76,059), Civil Engineers (5,738 jobs at \$75,812), Computer Systems Software Engineers (4,715 jobs at \$78,384), and Industrial Engineers (3,412 jobs at \$71,352).

Occupations with the largest percentage of national mean wages were Rail Yard Engineers, Dinkey Operators, and Hostlers (116% of national mean wages), Computer Hardware Engineers (115% of national mean wages), Operating Engineers and Other Construction Equipment Operators (105% of national mean wages), Materials Engineers (102% of national mean wages), and Environmental Engineering Technicians (101% of national mean wages).

From 2008 to 2018, engineering-intensive occupations with the largest projected percent increases in employment with at least a net change of 10 are:

- ◆ Biomedical Engineers (94 jobs at 62% change)
- ◆ Materials Engineers (52 jobs at 14% change)
- ◆ Computer Software Engineers, Systems Software (634 jobs at 13% change)
- ◆ Computer Software Engineers, Applications (99 jobs at 12% change)
- ◆ Engineering Teachers, Higher Education (99 jobs at 12% change)

Engineering-Intensive Occupations Employment and Wages in Missouri

Occupation Title	Employment 2008	Employment 2018	Entry Wage	Average Wage	Expert Wage
Operating Engineers & Other Construction Equipment Operators	9,014	9,090	\$30,391	\$46,571	\$54,662
Computer Software Engineers, Applications	8,885	10,043	\$50,600	\$76,059	\$88,788
Civil Engineers	5,738	6,139	\$51,181	\$75,812	\$88,128
Computer Software Engineers, Systems Software	4,715	5,358	\$56,419	\$78,384	\$89,366
Industrial Engineers	3,412	3,677	\$51,599	\$71,352	\$81,229
Mechanical Engineers	3,366	3,288	\$52,163	\$73,205	\$83,725
Engineers, All Other	3,154	3,157	\$58,420	\$83,481	\$96,012
Electronics Engineers, Except Computer	2,498	2,417	\$57,415	\$79,901	\$91,143
Electrical Engineers	2,446	2,312	\$56,334	\$79,155	\$90,566
Engineering Managers	2,336	2,291	\$77,065	\$104,884	\$118,794
Civil Engineering Technicians	2,301	2,393	\$29,420	\$42,658	\$49,276
Electrical & Electronic Engineering Technicians	1,714	1,632	\$35,422	\$53,452	\$62,467
Environmental Engineers	1,150	1,225	\$49,609	\$71,924	\$83,082
Locomotive Engineers	ND	ND	ND	ND	ND
Airline Pilots, Copilots, & Flight Engineers	ND	ND	ND	ND	ND
Industrial Engineering Technicians	926	914	\$28,963	\$42,684	\$49,545
Aerospace Engineers	ND	ND	ND	ND	ND
Engineering Teachers, Postsecondary	857	956	\$49,693	\$85,018	\$102,680
Engineering Technicians, Except Drafters, All Other	824	857	\$35,119	\$56,231	\$66,788
Sales Engineers	720	704	\$44,166	\$71,658	\$85,403

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018.
Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC
ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics*

There was no specific O*Net skill that was expressly for occupations within Engineering, however many of the skills necessary for those occupations were highlighted within O*Net's scores. The top 20 engineering occupations scored the highest skills proficiencies within critical thinking, reading comprehension and active listening.

Engineering-Intensive Occupations

MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2008	Employment 2018	Total Growth Openings 2008-2018*	MO Average Wage	U.S. Average Wage	MO % of U.S. Average Wage
Operating Engineers & Other Const. Equipment Operators	9,014	9,090	76	\$46,571	\$44,180	105.41%
Computer Software Engineers, Applications	8,885	10,043	1,158	\$76,059	\$90,170	84.35%
Civil Engineers	5,738	6,139	401	\$75,812	\$81,180	93.39%
Computer Software Engineers, Systems Software	4,715	5,358	643	\$78,384	\$96,620	81.13%
Industrial Engineers	3,412	3,677	265	\$71,352	\$77,090	92.56%
Mechanical Engineers	3,366	3,288	0	\$73,205	\$80,580	90.85%
Engineers, All Other	3,154	3,157	3	\$83,481	\$90,600	92.14%
Electronics Engineers, Except Computer	2,498	2,417	0	\$79,901	\$91,540	87.29%
Electrical Engineers	2,446	2,312	0	\$79,155	\$86,250	91.77%
Engineering Managers	2,336	2,291	0	\$104,884	\$122,810	85.40%
Civil Engineering Technicians	2,301	2,393	92	\$42,658	\$47,420	89.96%
Electrical & Electronic Engineering Technicians	1,714	1,632	0	\$53,452	\$55,410	96.47%
Environmental Engineers	1,150	1,225	75	\$71,924	\$80,750	89.07%
Locomotive Engineers	ND	ND	90	ND	ND	102.70%
Airline Pilots, Copilots, & Flight Engineers	ND	ND	0	ND	ND	110.42%
Industrial Engineering Technicians	926	914	0	\$42,684	\$49,030	87.06%
Aerospace Engineers	ND	ND	48	ND	ND	93.06%
Engineering Teachers, Postsecondary	857	956	99	\$85,018	\$92,970	91.45%
Engineering Technicians, Except Drafters, All Other	824	857	33	\$56,231	\$58,330	96.40%
Sales Engineers	720	704	0	\$71,658	\$90,540	79.15%

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018. Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC. ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics. *Growth Openings are defined as openings created by occupational creation or expansion*

Engineering-Intensive Occupations

Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Engineering Teachers, Postsecondary	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Agricultural Engineers	77.8	68.8	74.3	67.0	81.3	78.1	72.9	74.3
Marine Engineers & Naval Architects	66.8	68.4	66.3	62.8	76.3	68.2	68.3	66.6
Sales Engineers	78.0	77.6	71.6	68.3	75.5	68.8	73.3	72.0
Mechanical Engineers	73.4	68.6	66.3	64.8	74.8	73.1	70.6	66.3
Petroleum Engineers	75.6	71.6	67.4	64.6	74.5	66.0	71.9	72.2
Nuclear Engineers	70.4	72.5	72.3	65.4	73.7	62.3	73.2	68.0
Chemical Engineers	75.3	71.4	65.3	63.4	73.2	79.1	72.5	73.2
Computer Software Engineers, Systems Software	74.6	64.1	57.5	58.6	72.3	56.3	78.3	77.4
Electronics Engineers, Except Computer	78.1	68.8	67.2	63.3	71.3	63.6	69.2	73.0
Aerospace Engineering & Operations Technicians	76.9	73.3	70.3	67.6	71.3	64.6	74.3	73.8
Mining & Geological Engineers, Including Mining Safety Engineers	67.4	67.8	64.6	64.7	71.0	60.6	64.0	66.3
Biomedical Engineers	76.7	67.2	65.3	68.6	70.6	71.6	64.8	69.6
Civil Engineering Technicians	63.3	58.3	55.1	57.5	67.8	40.3	60.5	61.5
Health & Safety Engineers, Except Mining Safety Engineers & Inspectors	75.1	68.8	69.3	67.7	64.9	63.4	69.0	69.1
Electrical Engineers	75.1	71.0	59.6	58.3	64.6	63.2	73.7	70.8
Aerospace Engineers	78.4	74.8	74.4	72.8	64.0	73.2	82.1	77.3
Materials Engineers	77.5	66.7	64.2	60.2	62.0	71.5	65.6	64.3
Industrial Engineers	65.8	64.8	59.6	58.2	61.8	37.6	62.3	62.3
Mechanical Engineering Technicians	66.1	62.3	58.8	52.9	61.3	43.7	54.0	62.3

*Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale. Source: Analysis of O*Net by MERIC*

MATHEMATICS-INTENSIVE OCCUPATIONS SUMMARY

According to 2008 estimates, there were 10,885 mathematics-intensive jobs in Missouri earning an annual mean wage of \$66,734 per job, which is much higher than the state average wage of \$38,849. The projected number of mathematical-intensive jobs for 2018 is expected to increase by more than 3.2% to a total of 11,237 jobs. The average level of educational attainment for individuals employed in mathematical-intensive occupations in 2008 was a bachelor's degree or higher. In addition, workers in mathematics-intensive occupations accounted for 0.4% of all employment statewide.

Most mathematics-intensive jobs were in Manufacturing, Construction, Education and Health Services, and Professional and Business Services. The projected net change of mathematics-intensive occupations from 2008 to 2018 is over 250 jobs.

Mathematics-Intensive Occupations

Employment by Industry for Missouri

Industry	2008 Employment	2018 Employment	Net Change
Manufacturing	4,662	4,388	-274
Construction	4,034	4,098	64
Education and Health Services	2,898	3,229	331
Professional and Business Services	1,762	1,861	99
Government	652	668	16
Information	580	580	0
Trade, Transportation, and Utilities	449	458	9
Financial Activities	441	473	32
Self-Employed and Unpaid Family Workers, Primary Job	345	335	-10
Natural Resources and Mining	26	14	-12
Missouri Total	15,849	16,104	255

Estimated annual average employment and wages for 2008.

*Source: Analysis of Occupational Employment Statistics and O*Net by MERIC*

In Missouri, mathematics-intensive occupation with the highest employment base were Mechanical Engineers (3,366 jobs at \$73,205), Drywall and Ceiling Tile Installers (2,091 jobs at \$46,139), Mathematical Science Teachers (1,066 jobs at \$58,541), Engineering Teachers (857 at \$85,018), and Operations Research Analysts (787 jobs at \$70,033).

Occupations with the largest percentage of national mean wages were Drywall and Ceiling Tile Installers (112% of national mean wages), Agricultural Engineers (97% of national mean wages), Physicists (94% of national mean wages), Operations Research Analysts (93% of national mean wages), and Engineering Teachers (91% of national mean wages).

From 2008 to 2018, mathematics-intensive occupations with the largest percent increases in employment with at least a net change of 10 are:

- ◆ Actuaries (38 jobs at 13% change)
- ◆ Engineering Teachers, Postsecondary (99 jobs at 12% change)
- ◆ Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary (19 jobs at 12% change)
- ◆ Chemistry Teachers, Postsecondary (43 jobs at 11% change)
- ◆ Physics Teachers, Postsecondary (37 jobs at 11% change)

O*Net mathematical skills refer to the developed capacities that facilitate learning and/or performance within mathematical occupations. Occupations with the highest mathematical skills proficiency were Mathematicians (score of 89.83), Operation Research Analysts (score of 86.17), Physicists (score of 84.92), Mathematical Science Teachers (score of 84.58), and Engineering Teachers (score of 83.58).

Mathematics-Intensive Occupations <i>Employment and Wages in Missouri</i>					
Occupation Title	Employment 2008	Employment 2018	Entry Wage	Average Wage	Expert Wage
Mechanical Engineers	3,366	3,288	\$52,163	\$73,205	\$83,725
Drywall & Ceiling Tile Installers	2,091	2,107	\$29,805	\$46,139	\$54,306
Mathematical Science Teachers, Postsecondary	1,066	1,185	\$35,802	\$58,541	\$69,911
Engineering Teachers, Postsecondary	857	956	\$49,693	\$85,018	\$102,680
Operations Research Analysts	787	846	\$47,701	\$70,033	\$81,199
Sales Engineers	720	704	\$44,166	\$71,658	\$85,403
Statisticians	432	446	\$39,210	\$65,096	\$78,039
Chemistry Teachers, Postsecondary	376	419	\$41,196	\$59,960	\$69,342
Physics Teachers, Postsecondary	327	364	\$37,896	\$60,676	\$72,066
Actuaries	302	340	\$47,753	\$86,492	\$105,862
Atmospheric, Earth, Marine, & Space Sciences Teachers, Postsecondary	165	184	\$42,256	\$68,513	\$81,642
Materials Scientists	108	104	\$47,184	\$71,114	\$83,079
Physicists	87	91	\$67,131	\$104,951	\$123,861
Hydrologists	ND	ND	\$48,943	\$70,361	\$81,070
Petroleum Engineers	55	47	\$72,553	\$87,547	\$95,044
Agricultural Engineers	37	42	\$56,800	\$72,373	\$80,159
Mathematicians	28	34	\$64,234	\$81,514	\$90,154
Marine Engineers & Naval Architects	ND	ND	ND	ND	ND

*Estimated annual average employment and wages for 2008. Projected annual average employment for 2018.
Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC
ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics*

Mathematics-Intensive Occupations

MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2008	Employment 2018	Total Growth Openings 2008-2018*	MO Average Wage	U.S. Average Wage	MO % of U.S. Average Wage
Mechanical Engineers	3,366	3,288	0	\$73,205	\$80,580	90.85%
Drywall & Ceiling Tile Installers	2,091	2,107	16	\$46,139	\$41,080	112.31%
Mathematical Science Teachers, Postsecondary	1,066	1,185	119	\$58,541	\$70,550	82.98%
Engineering Teachers, Postsecondary	857	956	99	\$85,018	\$92,970	91.45%
Operations Research Analysts	787	846	59	\$70,033	\$75,370	92.92%
Sales Engineers	720	704	0	\$71,658	\$90,540	79.15%
Statisticians	432	446	14	\$65,096	\$75,220	86.54%
Chemistry Teachers, Postsecondary	376	419	43	\$59,960	\$77,350	77.52%
Physics Teachers, Postsecondary	327	364	37	\$60,676	\$83,320	72.82%
Actuaries	302	340	38	\$86,492	\$97,450	88.76%
Atmospheric, Earth, Marine, & Space Sciences Teachers, Postsecondary	165	184	19	\$68,513	\$83,320	82.23%
Materials Scientists	108	104	0	\$71,114	\$82,350	86.36%
Physicists	87	91	4	\$104,951	\$111,250	94.34%
Hydrologists	ND	ND	1	\$70,361	\$76,760	91.66%
Petroleum Engineers	55	47	0	\$87,547	\$119,960	72.98%
Agricultural Engineers	37	42	5	\$72,373	\$74,640	96.96%
Mathematicians	28	34	6	\$81,514	\$93,920	86.79%
Marine Engineers & Naval Architects	ND	ND	0	ND	ND	176.99%

Estimated annual average employment and wages for 2008. Projected annual average employment for 2018. Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC. ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics. *Growth Openings are defined as openings created by occupational creation or expansion

Mathematics-Intensive Occupations

Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Mathematicians	84.3	64.2	72.5	62.7	89.8	71.9	83.9	81.2
Operations Research Analysts	79.2	72.2	69.5	66.3	86.2	68.1	79.8	74.7
Physicists	85.3	69.4	77.4	68.1	84.9	84.8	83.9	81.0
Mathematical Science Teachers, Postsecondary	72.8	68.6	63.3	73.9	84.6	49.2	76.7	69.7
Engineering Teachers, Postsecondary	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Actuaries	71.1	70.9	60.4	62.8	83.6	40.8	73.6	78.3
Agricultural Engineers	77.8	68.8	74.3	67.0	81.3	78.1	72.9	74.3
Atmospheric, Earth, Marine, & Space Sciences Teachers, Postsecondary	84.7	73.0	80.7	74.8	78.0	86.0	82.1	81.9
Materials Scientists	79.5	72.5	66.8	65.3	77.8	83.7	81.3	74.8
Physics Teachers, Postsecondary	79.1	68.8	72.6	75.3	77.6	78.7	78.2	74.8
Marine Engineers & Naval Architects	66.8	68.4	66.3	62.8	76.3	68.2	68.3	66.6
Chemistry Teachers, Postsecondary	82.1	67.0	75.3	76.0	76.1	83.8	76.7	77.7
Drywall & Ceiling Tile Installers	58.6	60.3	52.3	58.4	75.8	49.5	65.1	53.4
Sales Engineers	78.0	77.6	71.6	68.3	75.5	68.8	73.3	72.0
Hydrologists	77.3	65.8	72.6	67.0	75.3	77.1	72.3	72.0
Statisticians	72.6	69.2	73.9	68.6	74.9	66.7	73.7	78.0
Mechanical Engineers	73.4	68.6	66.3	64.8	74.8	73.1	70.6	66.3
Petroleum Engineers	75.6	71.6	67.4	64.6	74.5	66.0	71.9	72.2

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale. Source: Analysis of O*Net by MERIC

GATEWAY SKILLS EDUCATION SUMMARY

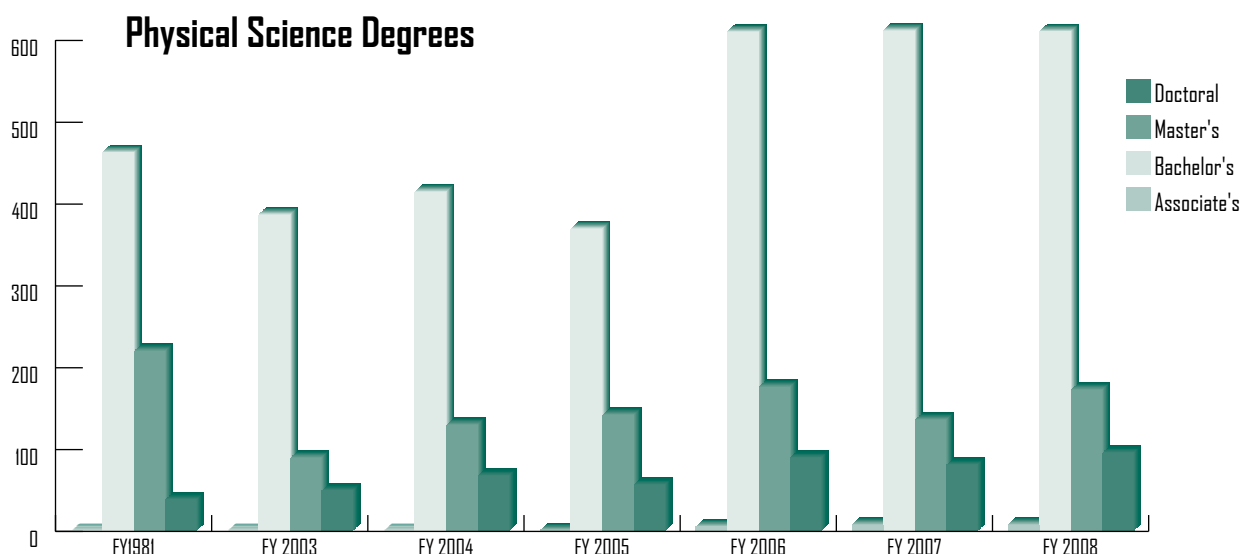
PHYSICAL SCIENCE

In the 2008-2009 school year, a total of 888 post-secondary degrees in physical science were conferred in Missouri, of which 68.8% were bachelor's degrees, 19.5% were master's degrees, and 10.8% were doctoral degrees. Although the number of bachelor's degrees in physical science has significantly increased since the Fall of 1981, the number of physical science degrees as a percentage of all bachelor's degrees has decreased during that time period. This indicates that while more graduates are obtaining bachelor's degrees in physical science in Missouri, proportionally the degree is falling behind in growth.

Physical Science							
Degrees Conferred by Higher Education Institutions in Missouri							
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Associate's- Number	0	0	0	1	6	8	8
Associate's- % of All Degrees	0.00%	0.00%	0.00%	0.01%	0.06%	0.08%	0.08%
Bachelor's- Number	463	387	415	370	610	612	611
Bachelor's- % of All Degrees	2.19%	1.23%	1.30%	1.14%	1.73%	1.71%	1.68%
Master's- Number	220	90	130	142	176	136	173
Master's- % of All Degrees	3.01%	0.60%	0.83%	0.86%	1.08%	0.81%	1.03%
Doctoral- Number	39	50	68	57	90	81	96
Doctoral- % of All Degrees	7.10%	6.26%	8.22%	6.45%	9.59%	7.89%	9.16%

Source: Analysis of Missouri Department of Higher Education data by MERIC

Since the Fall of 1981, the number of master's degrees in physical science has fluctuated, and the number of physical science degrees as a percentage of all master's degrees has decreased closer to 1% growth. However, the number and percent of doctoral degrees in physical science has increased since Fall of 1981. This indicates that overall Missouri is producing more graduates with advanced degrees in physical science.



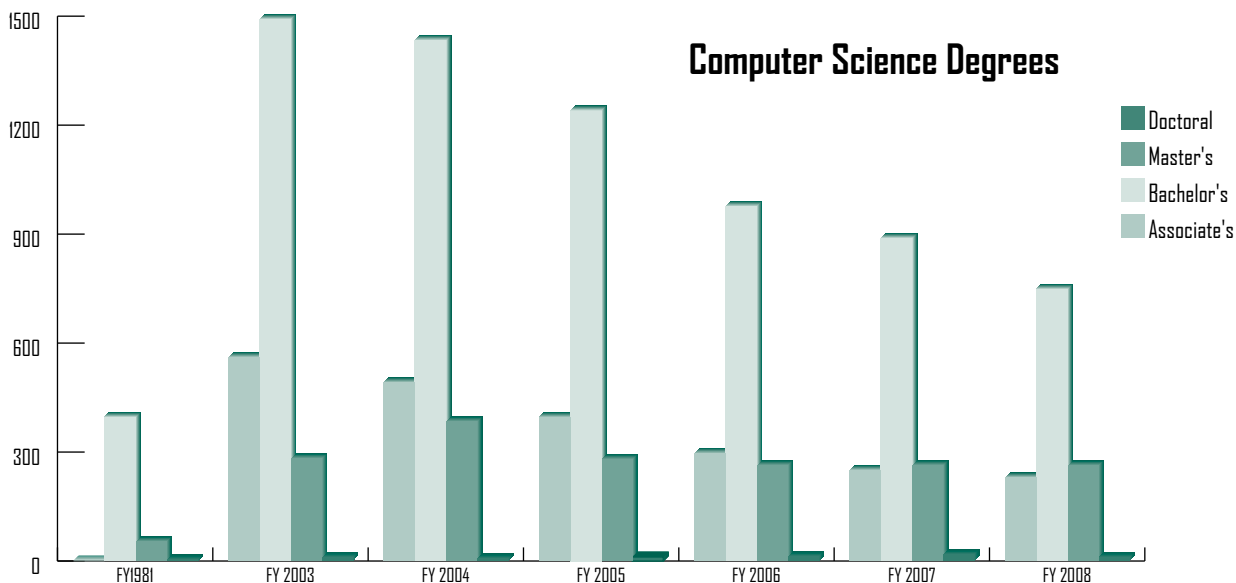
COMPUTER SCIENCE

In the 2008-2009 school year, a total of 1,250 post-secondary degrees in computer science were conferred in Missouri, of which 59.8% were bachelor's degrees, 21.0% were master's degrees, and 0.9% were doctoral degrees. The number of bachelor's degrees in computer science has varied increasingly since the Fall of 1981, as has the number of computer science degrees as a percentage of all bachelor's degrees during that time period. This indicates that overall more graduates are obtaining bachelor's degrees in computer science in Missouri, but the ratio of degrees conferred has returned to 1981 standings.

Computer Science							
Degrees Conferred by Higher Education Institutions in Missouri							
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Associate's- Number	0	561	491	396	296	250	229
Associate's- % of All Degrees	0.00%	6.17%	5.11%	3.92%	2.90%	2.39%	2.15%
Bachelor's- Number	396	1,491	1,433	1,239	976	888	748
Bachelor's- % of All Degrees	1.87%	4.75%	4.50%	3.81%	2.77%	2.48%	2.06%
Master's- Number	53	281	383	280	264	264	262
Master's- % of All Degrees	0.73%	1.88%	2.46%	1.70%	1.61%	1.58%	1.55%
Doctoral- Number	3	11	6	11	13	19	11
Doctoral- % of All Degrees	0.55%	1.38%	0.73%	1.24%	1.39%	1.85%	1.05%

Source: Analysis of Missouri Department of Higher Education data by MERIC

Since the Fall of 1981, the number of master's degrees in computer science has significantly increased, and the number of computer science degrees as a percentage of all master's degrees has likewise increased. In addition, the number and percent of doctoral degrees in computer science had increased until 2007, with a slight drop this past year. Despite this, Missouri is producing still more graduates with advanced degrees in computer science.



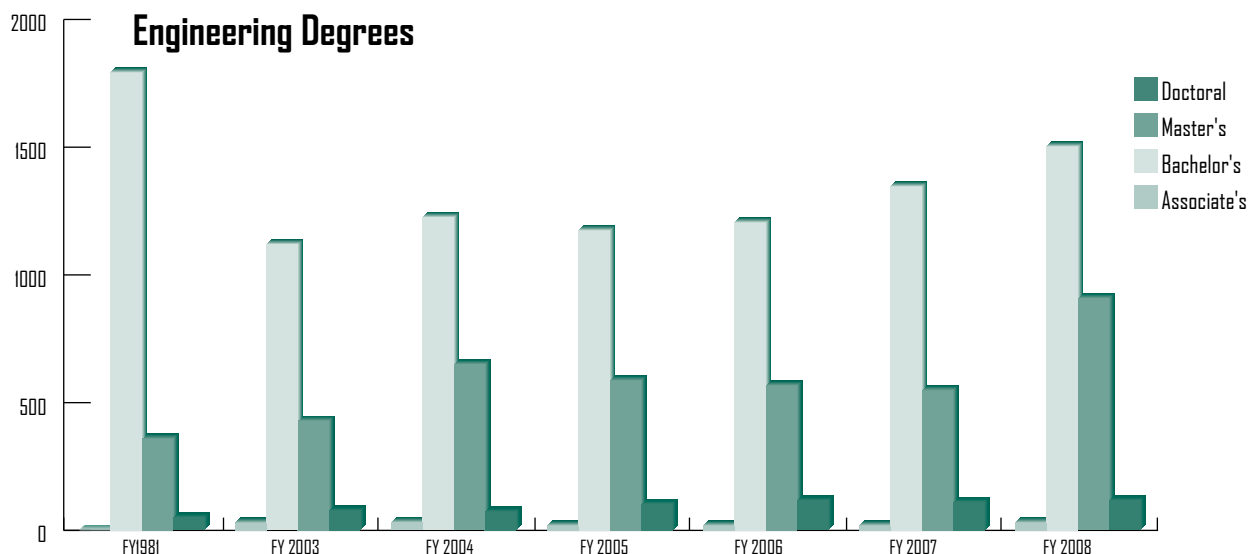
ENGINEERING

Throughout the 2008-2009 school year, a total of 2,556 post-secondary degrees in engineering were conferred in Missouri, of which 58.7% were bachelor's degrees, 35.5% were master's degrees, and 4.6% were doctoral degrees. The total number of bachelor's degrees in engineering has decreased since the Fall of 1981, as well as the percentage of all bachelor's degrees. However, the number of degrees conferred is showing positive growth since 2005. This indicates that proportionally fewer graduates are obtaining bachelor's degrees in engineering in Missouri.

Engineering							
Degrees Conferred by Higher Education Institutions in Missouri							
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Associate's- Number	0	28	31	17	17	18	30
Associate's- % of All Degrees	0.00%	0.31%	0.32%	0.17%	0.17%	0.17%	0.28%
Bachelor's- Number	1,791	1,119	1,225	1,173	1,203	1,345	1,501
Bachelor's- % of All Degrees	8.47%	3.56%	3.84%	3.61%	3.41%	3.75%	4.13%
Master's- Number	357	427	649	586	566	547	908
Master's- % of All Degrees	4.88%	2.86%	4.17%	3.56%	3.46%	3.27%	5.38%
Doctoral- Number	50	76	73	102	117	110	117
Doctoral- % of All Degrees	9.11%	9.51%	8.83%	11.54%	12.47%	10.71%	11.16%

Source: Analysis of Missouri Department of Higher Education data by MERIC

Since the Fall of 1981, the number of master's degrees in engineering has significantly increased, while the number of engineering master's degrees as a percentage of all master's degrees had decreased until this past year. The number and percent of doctoral degrees in engineering have increased since the Fall of 1981. Percentage wise, Missouri is producing fewer graduates with bachelor's degrees in engineering since 1981 while producing more master's and doctoral degrees.



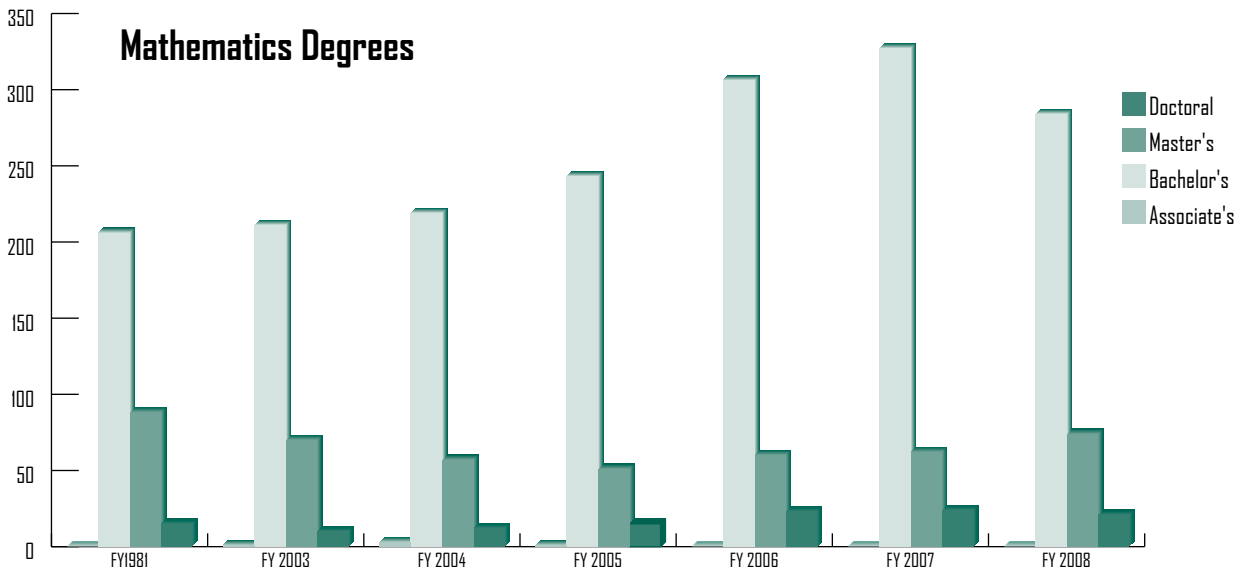
MATHEMATICS

In the 2008-2009 school year, a total of 379 post-secondary degrees in mathematics were conferred in Missouri, of which 74.9% of mathematics degrees were bachelor's, 19.5% were master's degrees, and 5.5% were doctoral degrees. The total number of bachelor's degrees in mathematics has increased since the Fall of 1981, while mathematics degrees as a percent of all bachelor's degrees has decreased. This indicates that while Missouri is producing more graduates with degrees in mathematics over time, the state is not keeping up with the rate of advanced degrees overall.

Mathematics							
<i>Degrees Conferred by Higher Education Institutions in Missouri</i>							
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Associate's- Number	0	1	3	1	0	0	0
Associate's- % of All Degrees	0.00%	0.02%	0.03%	0.01%	0.00%	0.00%	0.00%
Bachelor's- Number	206	211	219	243	306	327	284
Bachelor's- % of All Degrees	0.97%	0.67%	0.69%	0.75%	0.87%	0.91%	0.78%
Master's- Number	88	70	57	51	60	62	74
Master's- % of All Degrees	1.20%	0.47%	0.37%	0.31%	0.37%	0.37%	0.44%
Doctoral- Number	15	10	12	15	23	24	21
Doctoral- % of All Degrees	2.73%	1.25%	1.45%	1.70%	2.45%	2.34%	2.00%

Source: Analysis of Missouri Department of Higher Education data by MERIC

Since the Fall of 1981, the total number of master's degrees in mathematics has decreased, while the number of doctoral degrees in mathematics has increased slightly. However, the number of mathematics doctoral degrees as a percentage of degrees has decreased since 1981.



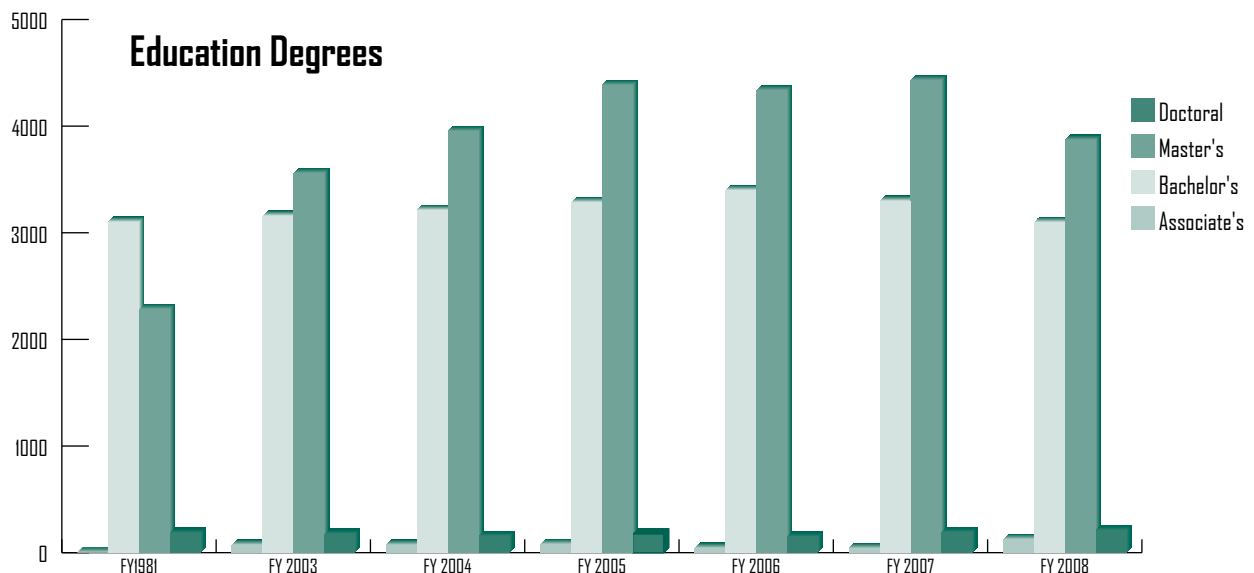
EDUCATION

Throughout the 2008-2009 school year, a total of 7,301 post-secondary degrees in education were conferred in Missouri, of which 42.4% were bachelor's degrees, 53.0% were master's degrees, and 2.9% were doctoral degrees. The number of bachelor's degrees in education had increased since the Fall of 1981 until this most recent year, while education degrees as a percent of all bachelor's degrees has decreased steadily over the time period. This indicates that proportionally fewer graduates are obtaining bachelor's degrees in education.

Education							
Degrees Conferred by Higher Education Institutions in Missouri							
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
Associate's- Number	0	75	74	77	45	39	124
Associate's- % of All Degrees	0.00%	0.82%	0.77%	0.76%	0.44%	0.37%	1.17%
Bachelor's- Number	3,101	3,159	3,211	3,283	3,395	3,298	3,095
Bachelor's- % of All Degrees	14.67%	10.06%	10.08%	10.10%	9.62%	9.20%	8.51%
Master's- Number	2,283	3,558	3,951	4,384	4,335	4,429	3,872
Master's- % of All Degrees	31.23%	23.79%	25.36%	26.65%	26.50%	26.44%	22.95%
Doctoral- Number	185	176	155	175	150	190	210
Doctoral- % of All Degrees	33.70%	22.03%	18.74%	19.80%	15.99%	18.50%	20.04%

Source: Analysis of Missouri Department of Higher Education data by MERIC

Since the Fall of 1981, the total number of master's degrees in education has significantly increased, while the number of doctoral degrees in education has also risen slightly. However, the number of education doctoral degrees as a percentage of all doctoral degrees has significantly decreased since the Fall of 1981. This indicates that, while Missouri is producing more graduates with advanced degrees in education over time, the state is not keeping up with the rate of advanced degrees overall.

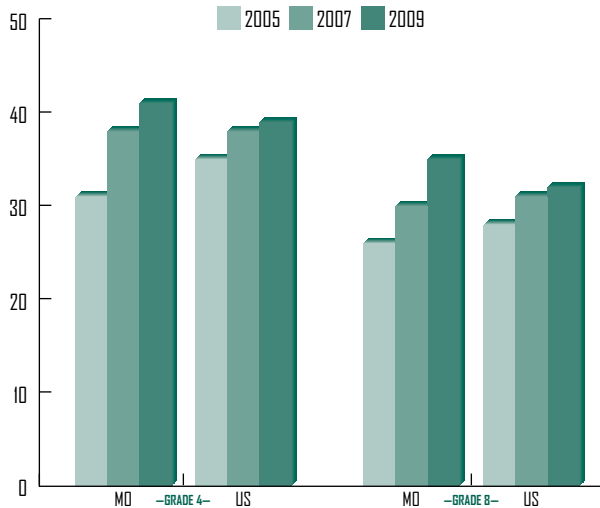


MISSOURI'S NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Missouri has been in-line with the national average for students in both 4th and 8th grades in scoring at or above proficient in math with the National Assessment of Educational Progress (NAEP) in 2009. However, the math scores for students scoring at or above proficient have declined as they transition from Grade 4 to Grade 8. In science, Missouri students scored above the national average and have a more consistent transition between 4th and 8th grade with the most recent NAEP testing in 2007.

National Assessment of Educational Progress (NAEP)

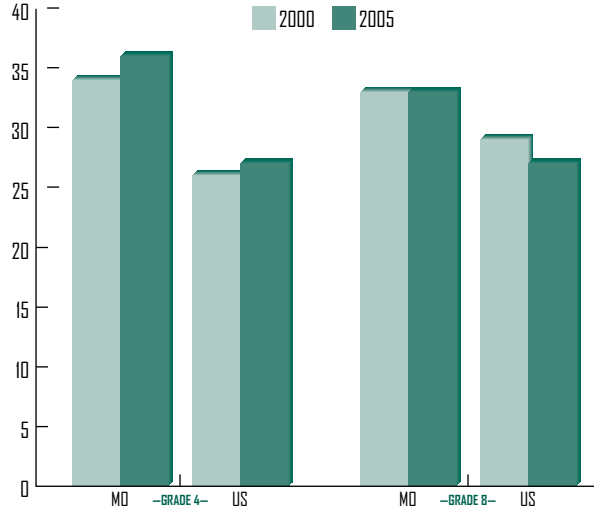
Percent At or Above Proficient in Math



Source: National Assessment of Educational Progress 2009

National Assessment of Educational Progress (NAEP)

Percent At or Above Proficient in Science

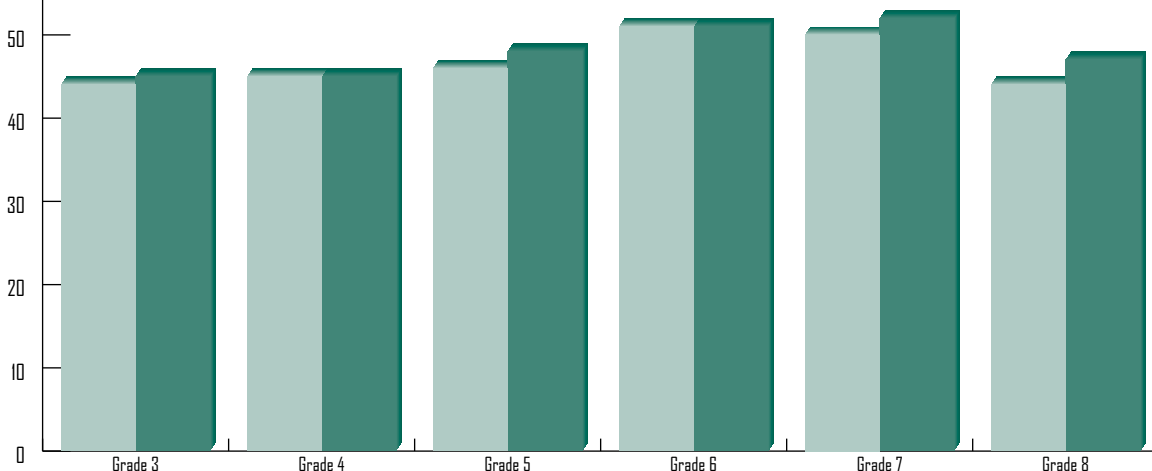


Source: National Assessment of Educational Progress 2007

The percentage of Missouri students scoring at proficient and advanced levels on the Missouri Assessment Program (MAP) in math seems to hold steady from Grades 3 through 7 before experiencing declines upon reaching Grades 8. However, between 2008 and 2009, all of the tested grades have increased their proficient or advanced scoring percentages, except for Grade 4 and 6 which remained constant.

Math Scores—Missouri Assessment Program (MAP)

Percent of Students Scoring Proficient or Advanced, All Students Grades 3-8



Source: Missouri Department of Elementary and Secondary Education



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Department of Economic Development