ACT Insights in Education & Work

Career Readiness in the United States 2015

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Contents

Overview

This report—*Career Readiness in the United States 2015*—highlights the levels of career readiness for various subgroups of ACT WorkKeys® examinees in the United States and provides career readiness benchmarks for selected ACT WorkKeys cognitive skills by career cluster. Previous ACT WorkKeys reports, such as the *Condition of Work Readiness in the United States 2013*, presented skill readiness benchmarks at the occupational level, while others, such as the *A Better Measure of Skill Gaps* report, provided aggregate skill benchmarks by industry cluster.[1] In the *Condition of Work Readiness* and *A Better Measure* reports, job profile data from the ACT JobPro® database were used to determine skill readiness levels. Since 1993, ACT has conducted over 20,000 job analyses for occupations across a diverse array of industries and occupations.[2]

Career readiness is the academic skills and performance level of those skills required for readiness in jobs within a particular career cluster.

What Is Career Readiness?

In *Unpacking College and Career Readiness*, ACT defined "career readiness" as the skills and proficiency levels needed for specific career clusters.[3] At the same time, a more holistic approach to readiness throughout the education-to-work continuum was presented in *Beyond Academics: A Holistic Framework for Enhancing Education and Workplace Success*.[4] The latter report proposed a framework of broad construct domains that have a combined impact on education and work outcomes. Two of the construct domains, academic skills and cross-cutting capabilities within work contexts, are measured by the suite of ACT WorkKeys cognitive assessments. The ACT WorkKeys cognitive assessments measure the workplace skills critical to job success as well as the reasoning, critical thinking, and problem-solving techniques to solve work-related problems.

What Are Career Clusters?

Clustering industry or occupation data is a common strategy used by economic developers, workforce developers, and education/training providers to analyze and describe a national or regional economy in terms of employment and skills. Industry clusters are groups of similar and related businesses that share common markets, technologies, worker skill needs, and which can be linked by buyer-seller relationships.[5] Career clusters are groupings of occupations that are used by education/training providers to develop coursework, programs of study, and career navigation tools for students in both secondary and postsecondary education settings.[6]

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[1] *The Condition of Work Readiness in the United States 2013*. ACT, Inc. 2013; *A Better Measure of Skill Gaps*. ACT, Inc. 2011.

[2] ACT Job Profiling is used to establish career readiness standards. When a job profile or job analysis is conducted, it is essentially a local content validation study. Local content validation studies are recommended by the federal *Uniform Guidelines on Personnel Selection* for employers using cognitive assessments for selection purposes. Job profiling fits the definition of a local content validation study under the Uniform Guidelines. Content validation links the content of a test to observable factors such as job performance or observable work behavior (to demonstrate that the test is relevant to the job). Subject matter experts rate the importance of specific job tasks and assign ACT WorkKeys skill levels to each task that is needed to be successful on the job. An overall skill level is then computed for the specific ACT WorkKeys tests (e.g., Reading for Information, Applied Mathematics, Locating Information) that are relevant to the job. Content validation is the preferred method for using cognitive assessments for personnel selection under the *Uniform Guidelines* to prevent adverse impact in selection procedures. ACT JobPro is an established database of cognitive skills and skill levels required for over 20,000 jobs through 20 years of local content validation studies for specific jobs. The ACT JobPro database is the source of evidence for career and job readiness standards for ACT WorkKeys cognitive assessments.

[3] *Unpacking College and Career Readiness.* ACT, Inc. 2015. Work readiness is defined in this report as the attainment of the core or foundational level of the knowledge and skills normally required to enter a typical postsecondary workforce training program, regardless of occupation or career cluster. Job readiness is the level of job-specific skills within an occupation or career cluster.

[4] *Beyond Academics: A Holistic Framework for Enhancing Education and Workplace Success.* ACT, Inc. 2015.

[5] Porter, M.E. (1990). *The Competitive Advantage of Nations.* New York: The Free Press, pp. 1–857.

[6] Career Clusters have been used by the US Department of Education Office of Career, Technical, and Adult Education (formerly known as the Office of Vocational Adult Education) since 2001 as part of Perkins accountability requirements. More information about the history of Career Clusters can be found at www.careertech.org/career-clusters.

Career clusters are also used by workforce developers to understand the knowledge and skills of a national or local workforce and to bridge the gap between workforce and economic development when constructing a regional economic development strategy.

Using Career Clusters to Understand Skill Needs

Skills and skill levels needed for individual jobs can be aggregated by occupational title or, even more broadly, by clusters of similar occupations, i.e. career clusters. Aggregated skill benchmarks for success in a specific career cluster can provide a more complete picture of the factors that help individuals to be prepared for success in the workforce and throughout their career.

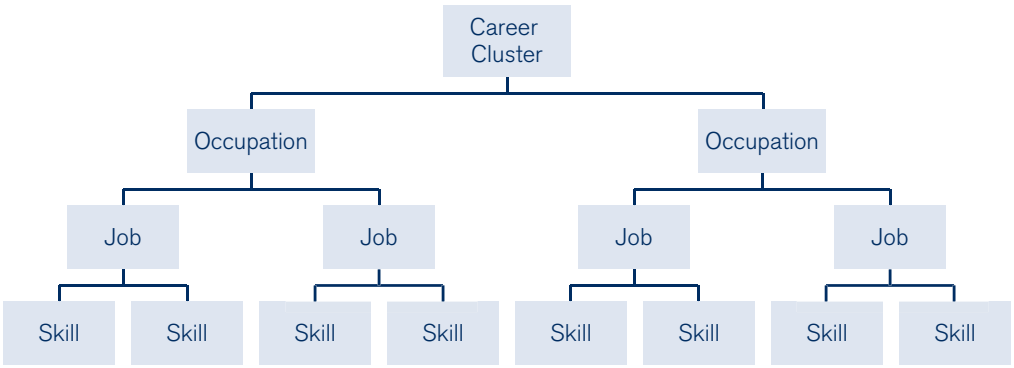

Figure 1. Aggregating Job Skills Data by Career Cluster

The skills and levels of proficiency needed can vary by career cluster and by level of educational attainment needed. Other constructs, such as behavioral skills, career navigation skills, and other cross-cutting capabilities are also needed for individual progression in a specific career cluster or occupation. The career readiness skills and performance benchmarks presented in this report can be used by education/training providers to develop curriculum and training programs for individuals seeking to acquire them as part of a career progression within a career cluster.

Measuring Career Readiness Skills in the United States

The following data represent ACT WorkKeys examinees in the United States from 2010–2014. Most examinee data are presented in aggregate form over the 2010–2014 time period. The purpose of aggregated data is to encourage a focus on trends, not year-to-year changes, which can represent normal—even expected—fluctuations in data. Studying trend lines—rather than data from a single year—offers more insight into what is happening in a region, state, or the nation.

Data are presented for three ACT WorkKeys cognitive assessments: Reading for Information, Applied Mathematics, and Locating Information. These three skills have been consistently identified as important for success in a broad range of jobs, making them "essential" foundational skills for career readiness.[7] Benchmarks for selected career clusters are provided for the three cognitive skills and are segmented by high, middle, and low educational groupings. The grouping of occupations by education level shows the different skill levels needed for success for the various entry and exit points within each career path.

Scores for each of the ACT WorkKeys cognitive assessments are independent of each other. Overall scores are reported in "levels," with a range from a low score of 3 to a high score of 7 for Applied Mathematics and Reading for Information, and from 3 to 6 for Locating Information. In each skill area, Level 3 is set at the perceived lowest level that employers value for their jobs. Individuals scoring below a Level 3 are considered not to have the necessary level of skill for any job that requires that skill area. Scores for individuals who do not achieve the minimum (Level 3) are reported as "0."

In addition to the three cognitive skills presented in this report, career readiness may include other cognitive skills, personality characteristics, and attitudes that are essential for success in a career cluster or occupation. While the career readiness standards currently presented include only cognitive skills, it is also important to measure and define the personality characteristics important to success in a job or career. The "life skills" framework presented in *Unpacking College and Career Readiness* supports this more holistic view of career readiness. The attitudes and behavioral characteristics measured by the ACT WorkKeys Talent Assessment affect an individual's ability to perform successfully in an occupation or career pathway.[8]

Ultimately, without the necessary knowledge for an occupation or career path (usually gained through academic degrees, occupational certificates, and workforce certifications), most individuals would not be considered fully qualified to enter a job or able to successfully perform job duties. Professional standards for certification and licensure, programs of study in education, and training programs vary significantly by career path, occupation, educational institution, and state, and are outside the scope of this report.

[7] Analysis of the ACT JobPro database has found that, of the nine ACT WorkKeys cognitive skill areas, Reading for Information, Locating Information, and Applied Mathematics are most often determined via the job profiling process to be important for job and task performance.

[8] For more information about the ACT WorkKeys Talent Assessment, visit www.act.org/workkeys/assess/talent/.

All Examinees

From 2010 to 2014, there were 3,423,827 examinees who took ACT WorkKeys Reading for Information, 3,426,838 who took Applied Mathematics, and 2,942,361 who took Locating Information.

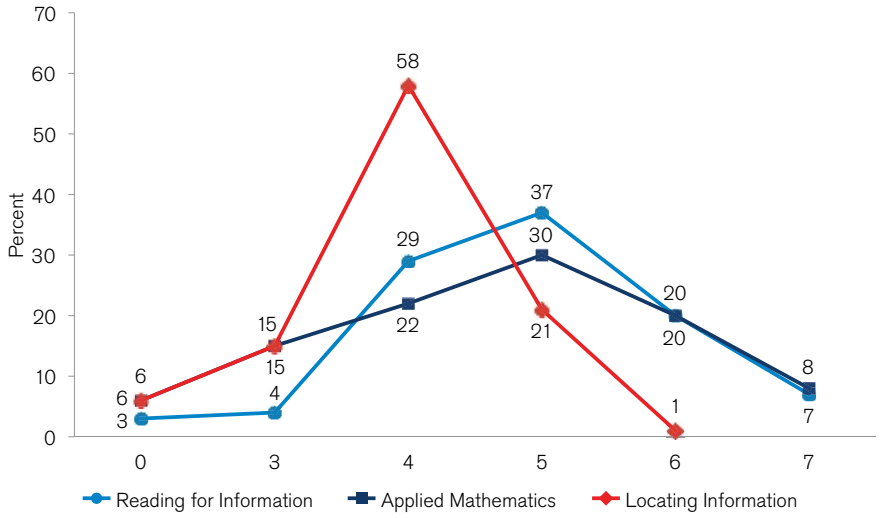

Figure 1. Percent of All ACT WorkKeys Examinees Meeting Career Readiness Skill Levels 2010–2014

Note: In this report, totals may not sum to 100% due to rounding.

Proportionally, fewer examinees achieved the highest skill level for Locating Information (1%) compared to Reading for Information (7%) and Applied Mathematics (8%).

Three ACT WorkKeys cognitive assessments—Reading for Information, Locating Information, and Applied Mathematics—form the basis of the ACT National Career Readiness Certificate™ (ACT NCRC®). The ACT NCRC certifies essential foundational skills that have been consistently identified as important for success in a broad range of jobs.[9]

An ACT NCRC level is determined by the lowest score an individual achieves on Applied Mathematics, Reading for Information, and Locating Information. For example, achieving minimum scores of Level 3 on the three assessments qualifies an individual for a Bronze ACT NCRC; minimum scores of Level 4 qualify for a Silver ACT NCRC; minimum scores of Level 5 qualify for a Gold ACT NCRC; and minimum scores of Level 6 qualify for a Platinum ACT NCRC. An individual who took all three assessments and failed to achieve a minimum score of Level 3 across each would be considered an ACT NCRC non-qualifier.

[9] For more information about the ACT National Career Readiness Certificate, visit www.act.org/products/workforce-act-national-career-readiness-certificate/.

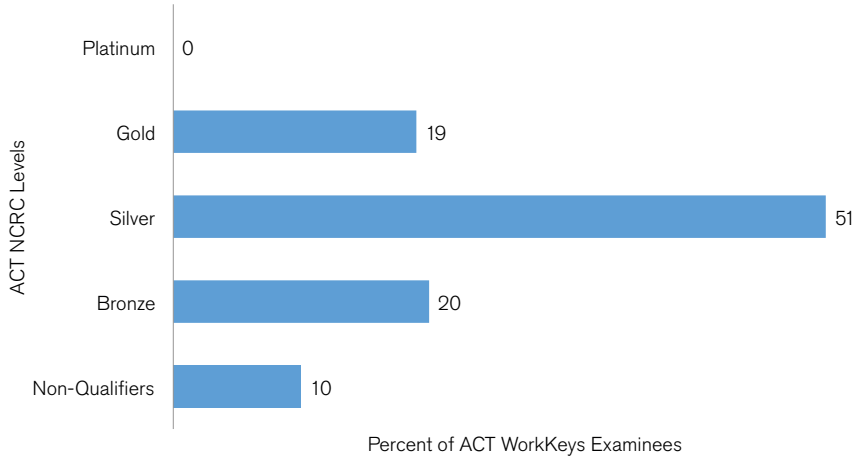

Figure 2. Percent of All ACT NCRC Qualifiers by NCRC Level 2010–2014

Note: Numbers may not sum to 100% due to rounding.

There were 2,770,212 examinees who took all three ACT NCRC ACT WorkKeys assessments between 2010 and 2014.

Of these examinees, 70% (n = 1,950,945) qualified for the ACT NCRC at a Silver level or higher; 10% (n = 263,305) did not qualify for the ACT NCRC. Less than 1% (n = 13,279) of examinees qualified for a Platinum level ACT NCRC.

Examinees by Education Group

Segmenting examinees by their highest level of education provides additional insight about trends in work readiness skills. ACT WorkKeys examinees were grouped by low, middle, and high education.[10] Low education examinees are those that do not have formal training beyond high school; middle education examinees are those that complete at least one but less than four years of formal training beyond high school; and high education examinees are those that complete four years or higher of formal training beyond high school.

[10] Educational level achieved was determined via self-reported data that is included in the user registration section of the ACT WorkKeys assessment process.

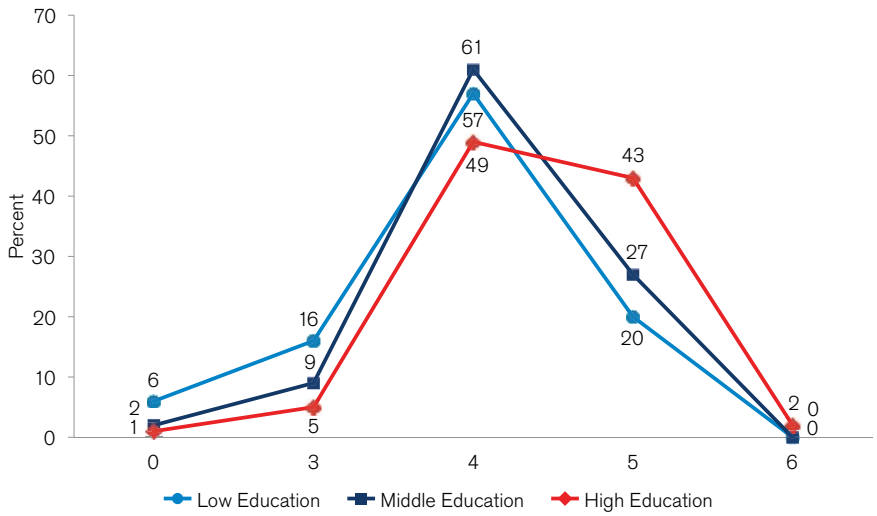

Figure 3. Percent of ACT WorkKeys Examinees by Locating Information Skill Levels and Education Group 2010–2014

For examinees who took the three ACT NCRC ACT WorkKeys assessments between 2010 and 2014, the level of work readiness skills consistently increased with level of education.

The largest difference in skill levels between education groups was for Locating Information Level 5 and Reading for Information Level 7 (there was a 23% and 24% difference between low and high education examinees, respectively).

Of the three types of work readiness skills, Locating Information had the lowest share of examinees scoring at the highest skill level for all three education groups.

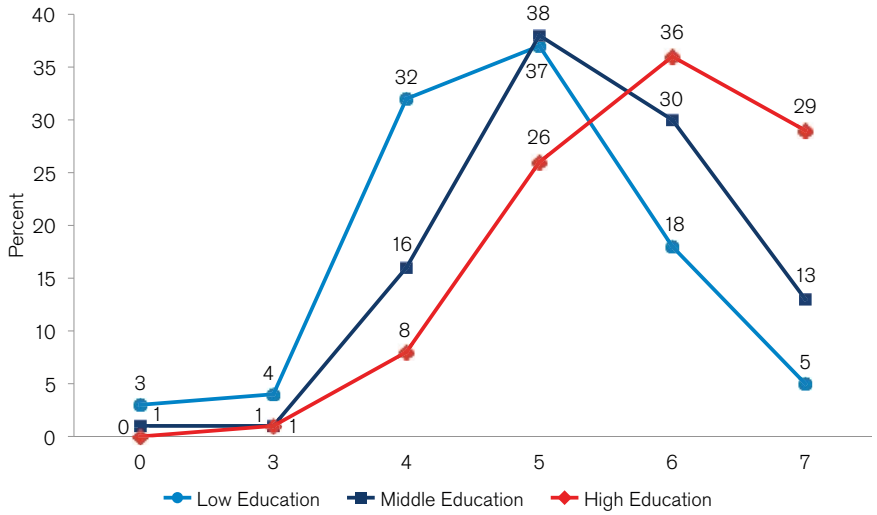

Figure 4. Percent of ACT WorkKeys Examinees by Reading for Information Skill Levels and Education Group 2010–2014

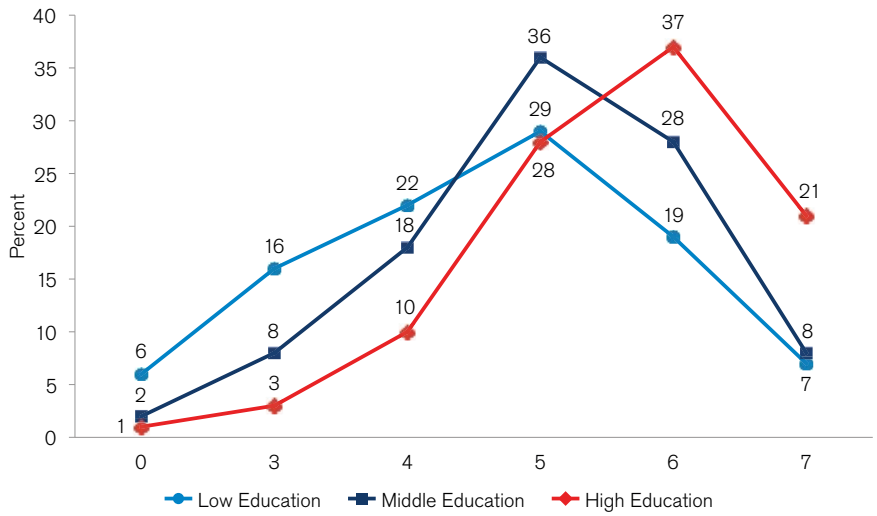

Figure 5. Percent of ACT WorkKeys Examinees by Applied Mathematics Skill Levels and Education Group 2010–2014

For examinees who took the three ACT NCRC ACT WorkKeys assessments between 2010 and 2014, ACT NCRC levels consistently increased with level of education. Individuals with a lower level of education were less likely to qualify for the ACT NCRC, compared to examinees with a middle or high level of education. For examinees in the low education group, 10% (n = 229,774) did not qualify for a certificate due to scoring below Level 3 on at least one of the three ACT NCRC ACT WorkKeys assessments.

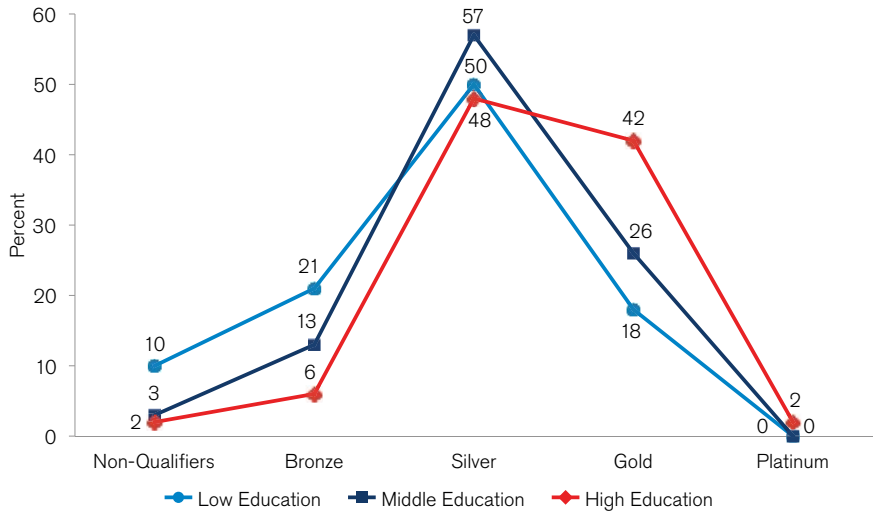

Figure 6. Percent of ACT NCRC Qualifiers by ACT NCRC Level and Education Level 2010–2014

Examinees with a high level of education (92%) were more likely to qualify for the ACT NCRC at the Silver level or higher, compared to individuals with a low (68%) or middle (83%) level of education.

US High School Examinees

More than 1.7 million high school examinees took one of the three foundational ACT WorkKeys assessments between 2010 and 2014.

Similar to the overall population, a smaller share of high school examinees scored at the highest skill level for Locating Information compared to the other two skill areas.

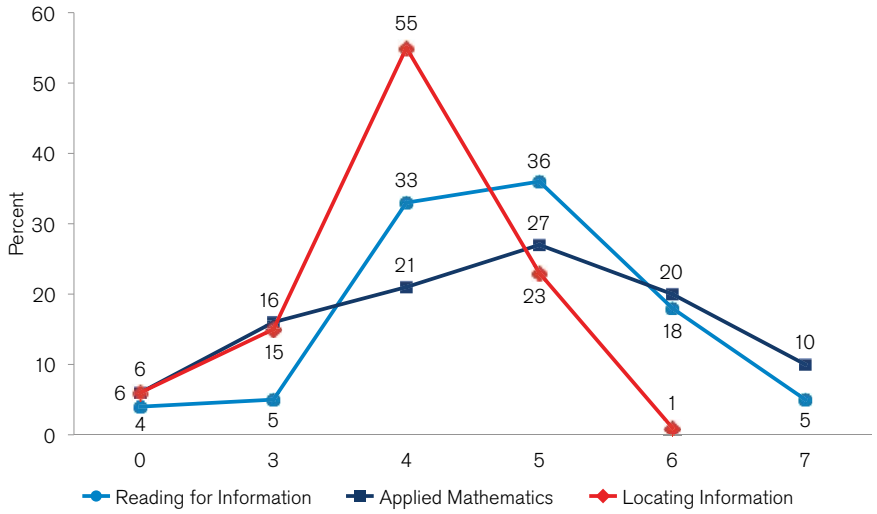

Figure 7. Percent of ACT WorkKeys High School Examinees Meeting Career Readiness Skill Levels 2010–2014

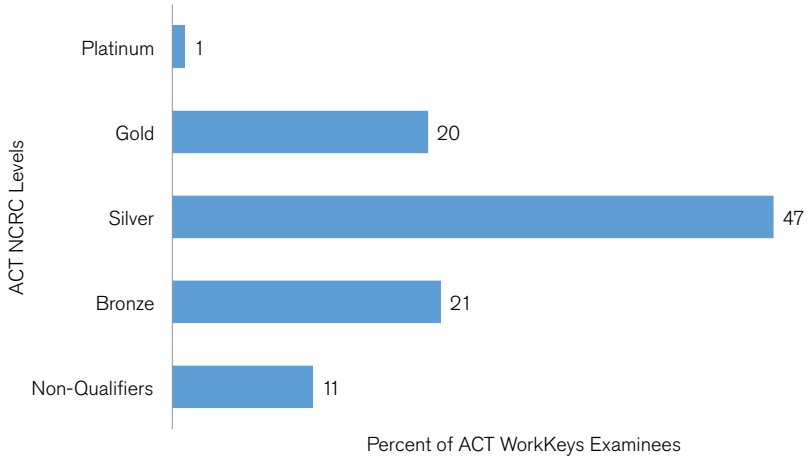

Figure 8. Percent of High School ACT NCRC Qualifiers by ACT NCRC Level 2010–2014

Of the high school ACT NCRC-eligible examinees between 2010 and 2014, only 11% (n = 136,364) did not qualify for a certificate, while 68% (n = 857,715) scored at a Silver level or higher.

Examinees by Race/Ethnicity

Of the 2,441,270 examinees who took Locating Information and provided race/ethnicity data between 2010 and 2014, 58% (n = 1,427,486) were White. Compared to other ethnic groups, White examinees were more likely to score at Level 4 or higher on Locating Information (87%).

Table 1. Percent of ACT WorkKeys Examinees Meeting Work Readiness Skill Levels by Race/Ethnicity—Locating Information (2010–2014)

	Level Score				
Race/Ethnicity	0	3	4	5	6
African American	10%	24%	59%	8%	0%
American Indian	8%	19%	59%	14%	0%
Asian	7%	15%	50%	26%	2%
Hispanic	8%	19%	59%	14%	0%
Pacific Islander	10%	20%	56%	14%	0%
White	3%	10%	58%	28%	1%
Two or More Races	4%	13%	60%	23%	1%
Prefer Not to Respond	7%	15%	57%	20%	1%

An estimated 2,822,517 examinees took Applied Mathematics and provided race/ethnicity data between 2010 and 2014. White (88%) and Asian (84%) examinees had the highest share of scores at Level 4 or higher on Applied Mathematics.

Between 2010 and 2014, the two largest race/ethnic groups of Reading for Information examinees were White (57%, n = 1,626,558) and African American (22%, n = 605,453).

Table 2. Percent of ACT WorkKeys Examinees Meeting Work Readiness Skill Levels by Race/Ethnicity—Applied Mathematics (2010–2014)

	Level Score					
Race/Ethnicity	0	3	4	5	6	7
African American	12%	27%	29%	24%	7%	1%
American Indian	7%	20%	27%	28%	15%	3%
Asian	5%	11%	16%	25%	24%	19%
Hispanic	7%	20%	25%	29%	15%	4%
Pacific Islander	9%	19%	24%	27%	16%	5%
White	3%	9%	18%	33%	27%	10%
Two or More Races	4%	14%	22%	31%	21%	8%
Prefer Not to Repond	6%	15%	22%	30%	20%	7%

Table 3. Percent of ACT WorkKeys Examinees Meeting Work Readiness Skill Levels by Race/Ethnicity—Reading for Information (2010–2014)

	Level Score					
Race/Ethnicity	0	3	4	5	6	7
African American	4%	6%	41%	36%	11%	2%
American Indian	4%	5%	38%	36%	13%	3%
Asian	4%	5%	28%	32%	22%	9%
Hispanic	5%	6%	38%	34%	14%	3%
Pacific Islander	4%	6%	38%	34%	14%	4%
White	2%	2%	23%	38%	25%	10%
Two or More Races	2%	3%	29%	39%	21%	7%
Prefer Not to Respond	3%	4%	29%	36%	20%	8%

Compared to other ethnic groups, White examinees and individuals who identified as Two or More Races were more likely to score at Level 4 or higher on Reading for Information (96%).

Table 4. ACT NCRC Qualifier—Race/Ethnicity (2010–2014)

	Level Score				
Race/Ethnicity	Non-Qualifiers	Bronze	Silver	Gold	Platinum
African American	17%	32%	45%	6%	0%
American Indian	13%	25%	49%	12%	0%
Asian	10%	18%	46%	24%	1%
Hispanic	12%	25%	50%	12%	0%
Pacific Islander	15%	25%	47%	12%	0%
White	5%	14%	54%	25%	1%
Two or More Races	7%	19%	53%	20%	0%
Prefer Not to Repond	11%	20%	50%	18%	1%

Career Readiness Skill Benchmarks for Career Clusters

Applying a similar methodology used in both *A Better Measure of Skill Gaps* and *Condition of Work Readiness in the United States 2013* reports, occupational profiles in the ACT JobPro database are used to determine career readiness skill benchmarks for career clusters in the United States.[11]

The ACT JobPro database contains foundational skills data for over 1,000 occupations, aggregated from more than 20,000 job analyses of occupations across a diverse array of industries. Career Readiness skill levels are presented for three ACT WorkKeys cognitive skills—Reading for Information, Applied Mathematics, and Locating Information for career clusters. The purpose is to provide individuals with a snapshot of the skill requirements for different career paths that require varying levels of education and training.

Career clusters were developed using a combination of clusters from both O*NET and the National Career Clusters Framework.[12] Occupations within each career cluster were grouped into low, middle, and high education groupings based on the US Bureau of Labor Statistics Most Significant Source of Education/Training.[13] Employment data are from the US Bureau of Labor Statistics Occupation Employment Projections 2002–2012.[14]

A skill benchmark for each of the three education groupings for each career cluster was then created by establishing the level at the 85th percentile for each education grouping. This represents the skill levels required for entry into 85% of those occupations. A skill benchmark for each grouping shows the skill demand for the majority of occupations within a career cluster.

A gap analysis was conducted to compare examinees by education group for career clusters requiring similar levels of education for entry into employment.

"Skills gap" was defined as a gap between the skills needed for a career cluster requiring a given level of education versus the skills possessed by workers with a comparable level of education. Caution must be used in interpreting skills gaps from aggregate data. Trends in group differences in skills gaps can provide additional information to education and workforce stakeholders. Ultimately, career readiness benchmarks are intended to be used to assist individuals in comparing their skill levels against what is needed for a career path.[15]

Table 5. Education Groups for Career Clusters

Education Group	Typical Level of Education/Experience Required
High Education	Doctoral or Professional Degree Master's Degree Bachelor's Degree
Middle Education	Associate's Degree Postsecondary Non-Degree Award
Low Education	Some College, No Degree High School Diploma or Equivalent Less than High School

[11] The job profiles in ACT JobPro follow the O*Net taxonomy of occupational codes and can be aggregated for various types of analysis. An occupational profile is the aggregate of job profiles within the same occupational code. Analysis in this report was aggregated to Standard Occupational Codes (SOC) in order to tie in information about projected occupational trends in growth over the long-term. A job readiness benchmark, or skill level required for a given occupation, is the median skill level set for all job profiles with the same O*Net or SOC code. A median skill score for three ACT WorkKeys skills (Reading for Information, Locating Information, and Applied Mathematics) was created for each SOC code.

[12] For more information about O*Net, visit www.onetonline.org/. Additional information regarding the National Career Clusters Framework can be found at www.careertech.org/career-clusters.

[13] US Bureau of Labor Statistics, Employment Projections—Measures of Education and Training. www.bls.gov/emp/ep_education_training_system.htm.

[14] US Bureau of Labor Statistics, 2012–2022 Occupational Projections. www.bls.gov/emp/.

[15] A full listing of ACT occupational profiles can be found at: www.act.org/workkeys/analysis/occup.html.

The Agriculture Career Cluster

Occupations in the agriculture career cluster constituted 8% of total occupational employment in the United States in 2012. Agriculture careers are projected to grow more than 10% from 2012–2022 with more than 4 million openings due to growth and replacement.

Table 6. Profiled ACT WorkKeys Skills for Selected Occupations in the Agriculture Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	37-3011.00	Landscaping and Groundskeeping Workers	1,124,900	1,264,000	422,700	3	3	4
	39-2021.00	Nonfarm Animal Caretakers	190,600	219,800	52,100	4	3	4
	37-1012.00	First-Line Supervisors of Landscaping and Groundskeeping Workers	207,300	233,600	49,900	5	5	5
	53-7081.00	Refuse and Recyclable Material Collectors	133,200	154,900	49,300	3	3	4
	51-8031.00	Water and Wastewater Treatment Plant and System Operators	111,000	119,600	47,500	4	4	4
Middle	19-4031.00	Chemical Technicians	63,600	69,500	21,600	5	5	4
	19-4091.00	Environmental Science and Protection Technicians, Including Health	32,800	38,900	19,000	5	5	5
	17-3029.00	Engineering Technicians, Except Drafters, All Other	67,700	68,300	14,600	5	5	4
	17-3027.00	Mechanical Engineering Technicians	47,500	49,700	12,100	5	4	5
	19-4011.01	Agricultural Technicians	25,900	26,700	10,100	7	5	6
High	27-1024.00	Graphic Designers	259,500	276,900	86,000	4	4	4
	29-9011.00	Occupational Health and Safety Specialists	62,900	67,100	21,300	4	5	4
	25-1042.00	Biological Science Teachers, Postsecondary	61,400	73,400	21,200	4	4	3
	19-1021.00	Biochemists and Biophysicists	29,200	34,600	13,700	6	7	5
	19-4093.00	Forest and Conservation Technicians	12,900	13,700	5,800	3	4	4

Career Readiness Benchmarks for Agriculture Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Locating Information and Reading for Information skills needed for the Agriculture career cluster. Additionally, all three education groups in the Agriculture career cluster require at least Level 5 for Applied Mathematics.

Table 7. Agriculture Career Cluster—Career Readiness Benchmarks

	Applied Mathematics	Reading for Information	Locating Information
Education Group	(Range: 3–7)	(Range: 3–7)	(Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	5	4	4
Middle Education Occupations	5	5	5
High Education Occupations	5	6	4

Source: ACT Job Profiles, January 2004–December 2013

Agriculture Career Readiness of US ACT WorkKeys Examinees

Table 8. Examinee Gap Analysis for Agriculture Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group	Applied Mathematics	Reading for Information	Locating Information
(Examinees and Occupations)	(Range: 3–7)	(Range: 3–7)	(Range: 3–6)
Low Education	55%	92%	77%
Middle Education	72%	81%	27%
High Education	86%	65%	94%

Less than a third (27%) of examinees with a middle level of educational attainment met or exceeded the Locating Information skill benchmarks for the middle education Agriculture career cluster.

The Architecture and Construction Career Cluster

Occupations in the Architecture and Construction career cluster constituted 6% of total occupational employment in the United States in 2012. Architecture and Construction careers are projected to grow more than 18% from 2012–2022 with more than 3 million openings due to growth and replacement.

Table 9. Profiled ACT WorkKeys Skills for Selected Occupations in the Architecture and Construction Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	47-2061.00	Construction Laborers	1,071,100	1,331,000	489,100	4	4	4
	47-2111.00	Electricians	583,500	698,200	224,600	5	5	5
	47-1011.00	First-Line Supervisors of Construction Trades and Extraction Workers	545,500	673,800	187,100	4	5	4
	47-2073.00	Operating Engineers and Other Construction Equipment Operators	351,200	417,600	144,400	3	4	4
	47-2152.01	Pipe Fitters and Steamfitters	386,900	469,200	130,500	4	3	4
Middle	49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	267,600	323,500	123,700	4	4	4
	49-2022.00	Telecommunications Equipment Installers and Repairers, Except Line Installers	217,200	225,700	38,200	4	4	4
	17-3011.01	Architectural Drafters	87,900	88,500	12,400	7	6	5
	17-3029.00	Engineering Technicians, Except Drafters, All Other	67,700	68,300	14,600	5	5	4
	17-3012.01	Electronic Drafters	29,600	32,500	6,800	5	5	5
High	11-9021.00	Construction Managers	485,000	563,200	154,600	4	6	4
	13-1051.00	Cost Estimators	202,200	255,200	118,000	6	5	5
	11-9041.00	Architectural and Engineering Managers	193,800	206,900	60,600	7	7	5
	17-1022.00	Surveyors	42,400	46,800	13,400	6	5	5
	17-2111.01	Industrial Safety and Health Engineers	24,100	26,700	9,700	4	4	4

Career Readiness Benchmarks for Architecture and Construction Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Locating Information and Reading for Information skills needed for Architecture and Construction careers. Additionally, all three education groups in the Architecture career cluster require at least Level 5 for Applied Mathematics.

Table 10. Architecture and Construction Career Cluster—Career Readiness Benchmarks

	Applied Mathematics	Reading for Information	Locating Information
Education Group	(Range: 3–7)	(Range: 3–7)	(Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	5	4	4
Middle Education Occupations	5	5	5
High Education Occupations	6	6	5

Source: ACT Job Profiles, January 2004–December 2013

Architecture and Construction Career Readiness of US ACT WorkKeys Examinees

Table 11. Examinee Gap Analysis for Architecture and Construction Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group	Applied Mathematics	Reading for Information	Locating Information
(Examinees and Occupations)	(Range: 3–7)	(Range: 3–7)	(Range: 3–6)
Low Education	55%	92%	77%
Middle Education	72%	81%	27%
High Education	58%	65%	45%

Less than half (45%) of examinees with a high level of educational attainment and less than a third (27%) of those with a middle level of educational attainment met or exceeded the Locating Information skill benchmarks for the high and middle education groups in the Architecture and Construction career cluster.

The Arts, Audio Video Technology, and Communications Career Cluster

Occupations in the Arts, Audio Video Technology, and Communications career cluster constituted 2% of total occupational employment in the United States in 2012. Arts, Audio Video Technology, and Communications careers are projected to grow more than 5% from 2012–2022 with more than 800,000 openings due to growth and replacement.

Table 12. Profiled ACT WorkKeys Skills for Selected Occupations in the Arts, Audio Video Technology, and Communications Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	39-3091.00	Amusement and Recreation Attendants	267,100	297,500	164,200	3	4	4
	39-7011.00	Tour Guides and Escorts	41,400	44,800	23,400	3	5	4
	27-4021.00	Photographers	136,300	142,200	20,300	4	4	4
	39-3093.00	Locker Room, Coatroom, and Dressing Room Attendants	19,600	21,600	11,900	3	3	4
	41-2012.00	Gaming Change Persons and Booth Cashiers	22,300	22,300	9,700	4	3	3
Middle	49-2022.00	Telecommunications Equipment Installers and Repairers, Except Line Installers	217,200	225,700	38,200	4	4	4
	27-4011.00	Audio and Video Equipment Technicians	67,700	76,900	21,500	NA	5	3
	49-2097.00	Electronic Home Entertainment Equipment Installers and Repairers	31,300	31,600	11,400	3	4	4
	27-4012.00	Broadcast Technicians	36,700	37,900	7,800	3	5	4
	43-9031.00	Desktop Publishers	16,400	15,500	3,000	NA	5	3
High	27-1024.00	Graphic Designers	259,500	276,900	86,000	4	4	4
	25-1199.00	Postsecondary Teachers, All Other	248,000	280,200	69,500	5	5	5
	27-3031.00	Public Relations Specialists	229,100	256,500	58,800	4	5	4
	27-3042.00	Technical Writers	49,500	56,900	22,600	5	5	5
	27-1021.00	Commercial and Industrial Designers	39,200	40,900	12,100	5	5	5

Career Readiness Benchmarks for Arts, Audio Video Technology, and Communications Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Locating Information and Applied Mathematics skills needed for Arts, Audio Video Technology, and Communications careers. Additionally, all three education groups in the Arts career cluster require at least Level 5 for Reading for Information.

Table 13. Arts, Audio Video Technology, and Communications Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	5	4
Middle Education Occupations	4	5	4
High Education Occupations	5	5	5

Source: ACT Job Profiles, January 2004–December 2013

Communications Career Readiness of US ACT WorkKeys Examinees

Table 14. Examinee Gap Analysis—Arts, Audio Video Technology, and Communications Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	60%	77%
Middle Education	90%	81%	88%
High Education	86%	91%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for the high education groups in the Arts career cluster.

The Business Management and Administration Career Cluster

Occupations in the Business Management and Administration career cluster constituted 19% of total occupational employment in the United States in 2012. Business Management and Administration careers are projected to grow more than 9% from 2012–2022 with more than 8 million openings due to growth and replacement.

Table 15. Profiled ACT WorkKeys Skills for Selected Occupations in the Business Management Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	43-4051.00	Customer Service Representatives	2,362,800	2,661,400	941,600	4	4	4
	43-9061.00	Office Clerks, General	2,983,500	3,167,600	810,900	4	4	4
	43-6014.00	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,324,400	2,632,300	587,600	3	4	4
	43-1011.00	First-Line Supervisors of Office and Administrative Support Workers	1,418,100	1,589,600	508,000	4	4	4
	43-4171.00	Receptionists and Information Clerks	1,006,700	1,142,600	406,900	4	4	4
Middle	51-1011.00	First-Line Supervisors of Production and Operating Workers	594,700	584,200	83,700	4	4	4
High	11-1021.00	General and Operations Managers	1,972,700	2,216,800	613,100	5	5	5
	13-2011.01	Accountants	1,275,400	1,442,200	544,200	5	5	5
	13-1111.00	Management Analysts	718,700	852,500	245,200	4	5	4
	11-9021.00	Construction Managers	485,000	563,200	154,600	4	6	4
	11-3031.00	Financial Managers	532,100	579,200	146,900	6	6	5

Career Readiness Benchmarks for Business Management and Administration Careers

The aggregated ACT WorkKeys skills benchmarks indicate that for the high education group, Level 5 is the lowest level of Locating Information, Applied Mathematics, and Reading for Information skills needed for Business Management and Administration careers.

Table 16. Business Management and Administration Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	4	4
Middle Education Occupations	NA	NA	NA
High Education Occupations	5	5	5

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education group in order to calculate a benchmark.

Business Management and Administration Career Readiness of US ACT WorkKeys Examinees

Table 17. Examinee Gap Analysis—Business Management and Administration Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	92%	77%
Middle Education	NA	NA	NA
High Education	86%	91%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for the high education group in the Business career cluster.

The Education and Training Career Cluster

Occupations in the education and training career cluster constituted 14% of total occupational employment in the United States in 2012. Education and training careers are projected to grow more than 11% from 2012–2022 with more than 6 million openings due to growth and replacement.

Table 18. Profiled ACT WorkKeys Skills for Selected Occupations in the Education and Training Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	43-9061.00	Office Clerks, General	2,983,500	3,167,600	810,900	4	4	4
	37-2011.00	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,324,000	2,604,000	717,300	3	3	3
	43-6014.00	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,324,400	2,632,300	587,600	3	4	4
	39-9011.00	Childcare Workers	1,312,700	1,496,800	570,000	3	4	4
	25-9041.00	Teacher Assistants	1,223,400	1,328,500	382,600	4	4	4
Middle	25-2011.00	Preschool Teachers, Except Special Education	438,200	514,600	199,400	3	4	3
	25-4031.00	Library Technicians	106,200	115,200	66,300	4	4	4
	19-4099.01	Quality Control Analysts	63,900	70,400	31,600	4	4	4
	27-4011.00	Audio and Video Equipment Technicians	67,700	76,900	21,500	NA	5	3
	19-4011.01	Agricultural Technicians	25,900	26,700	10,100	7	5	6
High	25-3099.00	Teachers and Instructors, All Other	981,600	1,057,500	243,500	4	4	4
	21-1021.00	Child, Family, and School Social Workers	285,700	328,800	103,600	4	4	4
	21-1012.00	Educational, Guidance, School, and Vocational Counselors	262,300	293,500	87,000	4	4	4
	11-3011.00	Administrative Services Managers	280,800	315,000	79,900	5	5	4
	13-1151.00	Training and Development Specialists	228,800	264,200	77,200	4	5	4

Career Readiness Benchmarks for Education and Training Careers

The aggregated ACT WorkKeys skills benchmarks indicate that for the high education group, Level 5 is the lowest level of Locating Information, Applied Mathematics, and Reading for Information skills needed for Education and Training careers.

Table 19. Education and Training Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	4	4
Middle Education Occupations	NA	NA	NA
High Education Occupations	5	5	5

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education grouping in order to calculate a benchmark.

Education and Training Career Readiness of US ACT WorkKeys Examinees

Table 20. Examinee Gap Analysis—Education and Training Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	92%	77%
Middle Education	NA	NA	NA
High Education	86%	91%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for the high education group in Education and Training career cluster.

The Finance Career Cluster

Occupations in the Finance career cluster constituted 10% of total occupational employment in the United States in 2012. Finance careers are projected to grow more than 11% from 2012–2022 with more than 4 million openings due to growth and replacement.

Table 21. Profiled ACT WorkKeys Skills for Selected Occupations in the Finance Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	43-4051.00	Customer Service Representatives	2,362,800	2,661,400	941,600	4	4	4
	43-1011.00	First-Line Supervisors of Office and Administrative Support Workers	1,418,100	1,589,600	508,000	4	4	4
	41-4012.00	Sales Representatives, Wholesale and Manufacturing	1,480,700	1,612,800	420,700	5	5	5
	43-3071.00	Tellers	545,300	551,000	259,800	3	4	4
	43-3011.00	Bill and Account Collectors	397,400	455,600	170,000	3	4	4
High	13-1111.00	Management Analysts	718,700	852,500	245,200	4	5	4
	15-1121.00	Computer Systems Analysts	520,600	648,400	209,600	4	4	4
	13-1161.00	Market Research Analysts and Marketing Specialists	415,700	547,200	188,500	4	4	4
	11-3031.00	Financial Managers	532,100	579,200	146,900	6	6	5
	41-3031.01	Sales Agents, Securities and Commodities	354,600	394,300	122,600	5	5	4

Career Readiness Benchmarks for Finance Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across the low and high education groups, Level 5 is the lowest level of Locating Information skills needed for Finance careers.

Table 22. Finance Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	5	5
Middle Education Occupations	NA	NA	NA
High Education Occupations	5	6	5

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education grouping in order to calculate a benchmark

Finance Career Readiness of US ACT WorkKeys Examinees

Table 23. Examinee Gap Analysis—Finance Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	60%	20%
Middle Education	NA	NA	NA
High Education	86%	65%	45%

Less than half (45%) of examinees with a high level of educational attainment and less than one quarter (20%) of those with a low level of educational attainment met or exceeded the Locating Information skill benchmarks for the high and low education groups in the Finance career cluster.

The Government and Public Administration Career Cluster

Occupations in the Government and Public Administration career cluster constituted 15% of total occupational employment in the United States in 2012. Government and Public Administration careers are projected to grow more than 9% from 2012–2022 with more than 6 million openings due to growth and replacement.

Table 24. Profiled ACT WorkKeys Skills for Selected Occupations in the Government and Public Administration Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	49-9071.00	Maintenance and Repair Workers, General	1,325,100	1,450,300	379,700	4	4	4
	11-9199.00	Managers, All Other	898,200	950,800	249,100	3	4	4
	33-3051.01	Police Patrol Officers	653,800	692,700	243,900	3	4	4
	13-1199.00	Business Operations Specialists, All Other	991,800	1,065,200	209,400	4	5	4
	21-1093.00	Social and Human Service Assistants	372,700	453,900	178,700	4	5	4
Middle	29-2041.00	Emergency Medical Technicians and Paramedics	239,100	294,400	120,600	3	5	4
	33-2011.00	Firefighters	307,000	327,300	104,000	4	4	4
	23-2011.00	Paralegals and Legal Assistants	277,000	323,300	91,200	3	5	4
	25-4031.00	Library Technicians	106,200	115,200	66,300	4	4	4
	49-3011.00	Aircraft Mechanics and Service Technicians	121,700	124,700	35,600	5	5	5
High	11-1021.00	General and Operations Managers	1,972,700	2,216,800	613,100	5	5	5
	13-1111.00	Management Analysts	718,700	852,500	245,200	4	5	4
	23-1011.00	Lawyers	759,800	834,700	196,500	5	7	6
	13-1071.00	Human Resources Specialists	418,000	451,100	109,500	3	4	4
	21-1021.00	Child, Family, and School Social Workers	285,700	328,800	103,600	4	4	4

Career Readiness Benchmarks for Government and Public Administration Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Locating Information and Applied Mathematics skills needed for Government and Public Administration careers. Additionally, all three education groups in the Government career cluster require at least Level 5 for Reading for Information.

Table 25. Government and Public Administration Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	5	4
Middle Education Occupations	5	5	4
High Education Occupations	5	6	5

Source: ACT Job Profiles, January 2004–December 2013

Government and Public Administration Career Readiness of US ACT WorkKeys Examinees

Table 26. Examinee Gap Analysis—Government and Public Administration Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	60%	77%
Middle Education	72%	81%	88%
High Education	86%	65%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for the high education group in the Government career cluster.

The Health Care Career Cluster

Occupations in the Health Care career cluster constituted 9% of total occupational employment in the United States in 2012. Health Care careers are projected to grow more than 21% from 2012–2022 with more than 5 million openings due to growth and replacement.

Table 27. Profiled ACT WorkKeys Skills for Selected Occupations in the Health Care Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	31-1011.00	Home Health Aides	875,100	1,299,300	590,700	3	4	4
	43-1011.00	First-Line Supervisors of Office and Administrative Support Workers	1,418,100	1,589,600	508,000	4	4	4
	43-4171.00	Receptionists and Information Clerks	1,006,700	1,142,600	406,900	4	4	4
	43-6013.00	Medical Secretaries	525,600	714,900	252,500	4	4	4
	21-1093.00	Social and Human Service Assistants	372,700	453,900	178,700	4	5	4
Middle	31-1014.00	Nursing Assistants	1,479,800	1,792,000	593,600	3	4	4
	29-2061.00	Licensed Practical and Licensed Vocational Nurses	738,400	921,300	363,100	4	5	4
	31-9092.00	Medical Assistants	560,800	723,700	269,900	4	5	4
	31-9091.00	Dental Assistants	303,200	377,600	137,200	3	5	4
	29-2041.00	Emergency Medical Technicians and Paramedics	239,100	294,400	120,600	3	5	4
High	11-9111.00	Medical and Health Services Managers	315,500	388,800	149,900	4	5	4
	11-3011.00	Administrative Services Managers	280,800	315,000	79,900	5	5	4
	29-2011.00	Medical and Clinical Laboratory Technologists	164,300	187,100	65,800	5	5	5
	25-1072.00	Nursing Instructors and Teachers, Postsecondary	67,800	91,800	34,200	6	6	5
	29-1031.00	Dietitians and Nutritionists	67,400	81,600	22,300	5	5	5

Career Readiness Benchmarks for Health Care Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Locating Information and Applied Mathematics skills needed for the Health Care career cluster. Additionally, all three education groups in the Health Care career cluster require at least Level 5 for Reading for Information.

Table 28. Health Care Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	5	4
Middle Education Occupations	5	5	5
High Education Occupations	5	5	5

Source: ACT Job Profiles, January 2004–December 2013

Health Care Career Readiness of US ACT WorkKeys Examinees

Table 29. Examinee Gap Analysis for Health Care Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	60%	77%
Middle Education	72%	81%	27%
High Education	86%	91%	45%

Less than a third (27%) of examinees with a middle level of educational attainment met or exceeded the Locating Information skill benchmarks for careers that required a similar level of education in the Health Care career cluster.

The Hospitality and Tourism Career Cluster

Occupations in the Hospitality and Tourism career cluster constituted 15% of total occupational employment in the United States in 2012. Hospitality and Tourism careers are projected to grow more than 10% from 2012–2022 with more than 8 million openings due to growth and replacement.

Table 30. Profiled ACT WorkKeys Skills for Selected Occupations in the Hospitality and Tourism Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	35-3021.00	Combined Food Preparation and Serving Workers, Including Fast Food	2,969,300	3,391,200	1,555,700	3	3	3
	35-3031.00	Waiters and Waitresses	2,362,200	2,494,000	1,268,300	4	3	3
	39-9011.00	Childcare Workers	1,312,700	1,496,800	570,000	3	4	4
	37-2012.00	Maids and Housekeeping Cleaners	1,434,600	1,618,000	467,700	3	3	3
	41-1011.00	First-Line Supervisors of Retail Sales Workers	1,603,300	1,674,200	419,800	5	4	4
Middle	25-2011.00	Preschool Teachers, Except Special Education	438,200	514,600	199,400	3	4	3
	35-2013.00	Cooks, Private Household	7,000	6,900	1,400	3	3	4
	39-4011.00	Embalmers	5,100	4,400	1,100	5	7	4
	39-5012.00	Hairdressers, Hairstylists, and Cosmetologists	611,200	688,700	220,600	4	3	4
High	11-2022.00	Sales Managers	359,300	389,000	106,900	5	6	5
	21-1021.00	Child, Family, and School Social Workers	285,700	328,800	103,600	4	4	4
	11-1011.00	Chief Executives	330,500	347,900	87,800	5	6	5
	21-1022.00	Healthcare Social Workers	146,200	185,500	70,200	5	4	5
	11-2021.00	Marketing Managers	180,500	203,400	61,700	7	6	5

Career Readiness Benchmarks for Hospitality and Tourism Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, for the low education group, Level 4 is the lowest level of Locating Information, Applied Mathematics, and Reading for Information skills needed for Hospitality and Tourism careers.

Table 31. Hospitality and Tourism Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	4	4
Middle Education Occupations	NA	NA	NA
High Education Occupations	5	6	5

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education grouping in order to calculate a benchmark.

Hospitality and Tourism Career Readiness of US ACT WorkKeys Examinees

Table 32. Examinee Gap Analysis—Hospitality and Tourism Career Cluster

Percent of All Examinees that Meet or Exceed Median Skill Level Requirements

Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	77%	92%	77%
Middle Education	NA	NA	NA
High Education	86%	65%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for the high education group in the Hospitality and Tourism career cluster.

The Marketing, Sales, and Service Career Cluster

Occupations in the Marketing, Sales, and Service career cluster constituted 12% of total occupational employment in the United States in 2012. Marketing, Sales, and Service careers are projected to grow more than 7% from 2012–2022 with more than 6 million openings due to growth and replacement.

Table 33. Profiled ACT WorkKeys Skills for Selected Occupations in the Marketing, Sales, and Service Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	41-2031.00	Retail Salespersons	4,447,000	4,881,700	1,955,700	3	4	4
	41-2011.00	Cashiers	3,338,900	3,425,400	1,530,000	3	3	3
	43-5081.00	Stock Clerks and Order Fillers	1,807,200	1,801,200	546,000	3	4	3
	41-4012.00	Sales Representatives, Wholesale and Manufacturing	1,480,700	1,612,800	420,700	5	5	5
	41-1011.00	First-Line Supervisors of Retail Sales Workers	1,603,300	1,674,200	419,800	5	4	4
High	41-4011.00	Sales Representatives, Technical and Scientific Products	382,300	419,500	111,800	5	4	4
	11-2022.00	Sales Managers	359,300	389,000	106,900	5	5	6
	11-2021.00	Marketing Managers	180,500	203,400	61,700	7	5	6
	13-1121.00	Meeting, Convention, and Event Planners	94,200	125,400	44,200	4	5	5
	25-1011.00	Business Teachers, Postsecondary	103,400	118,500	30,700	4	4	4

Career Readiness Benchmarks for Marketing, Sales, and Service Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across the low and high education groups, Level 5 is the lowest level of Locating Information, Applied Mathematics, and Reading for Information skills needed for Marketing careers.

Table 34. Marketing, Sales, and Service Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	5	5	5
Middle Education Occupations	NA	NA	NA
High Education Occupations	6	5	6

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education grouping in order to calculate a benchmark.

Marketing, Sales, and Service Career Readiness of US ACT WorkKeys Examinees

Table 35. Examinee Gap Analysis—Marketing, Sales, and Service Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	55%	60%	20%
Middle Education	NA	NA	NA
High Education	58%	91%	2%

Almost none (2%) of examinees with a high level of educational attainment and less than one quarter (20%) of those with a low level of educational attainment met or exceeded the Locating Information skill benchmarks for the high and low education groups in the Marketing career cluster.

The Manufacturing Career Cluster

Occupations in the Manufacturing career cluster constituted 15% of total occupational employment in the United States in 2012. Manufacturing careers are projected to grow more than 9% from 2012–2022 with more than 6 million openings due to growth and replacement.

Table 36. Profiled ACT WorkKeys Skills for Selected Occupations in the Manufacturing Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	53-7062.00	Laborers and Freight, Stock, and Material Movers, Hand	2,197,300	2,439,200	922,500	3	3	4
	41-4012.00	Sales Representatives, Wholesale and Manufacturing	1,480,700	1,612,800	420,700	5	5	5
	49-9071.00	Maintenance and Repair Workers, General	1,325,100	1,450,300	379,700	4	4	4
	49-3023.02	Automotive Specialty Technicians	701,100	761,500	237,600	4	4	4
	53-7064.00	Packers and Packagers, Hand	666,900	707,000	215,000	3	3	4
Middle	49-3011.00	Aircraft Mechanics and Service Technicians	121,700	124,700	35,600	5	5	5
	17-3023.01	Electronics Engineering Technicians	146,500	146,500	30,400	5	5	4
	49-9062.00	Medical Equipment Repairers	42,300	55,100	24,600	3	3	4
	19-4031.00	Chemical Technicians	63,600	69,500	21,600	5	5	4
	19-4091.00	Environmental Science and Protection Technicians, Including Health	32,800	38,900	19,000	5	5	5
High	11-1021.00	General and Operations Managers	1,972,700	2,216,800	613,100	5	5	5
	15-1133.00	Software Developers, Systems Software	405,000	487,800	134,700	4	5	4
	17-2141.00	Mechanical Engineers	258,100	269,700	99,700	4	4	5
	27-1024.00	Graphic Designers	259,500	276,900	86,000	4	4	4
	17-2112.00	Industrial Engineers	223,300	233,400	75,400	5	5	5

Career Readiness Benchmarks for Manufacturing Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across education groups, Level 4 is the lowest level of Applied Mathematics, Locating Information, and Reading for Information skills needed for jobs in the Manufacturing career cluster.

Table 37. Manufacturing Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	4	4	4
Middle Education Occupations	5	5	5
High Education Occupations	6	6	5

Source: ACT Job Profiles, January 2004–December 2013

Manufacturing Career Readiness of US ACT WorkKeys Examinees

Table 38. Examinee Gap Analysis for Manufacturing Career Cluster

	Percent of All Examinees that Meet or Exceed Median Skill Level Requirements		
Education Group	Applied Mathematics	Reading for Information	Locating Information
(Examinees and Occupations)	(Range: 3–7)	(Range: 3–7)	(Range: 3–6)
Low Education	77%	92%	77%
Middle Education	72%	81%	27%
High Education	58%	65%	45%

Less than half (45%) of examinees with a high level of educational attainment and less than a third (27%) of those with a middle level of education met or exceeded the Locating Information skill benchmarks for jobs that required similar levels of education in the Manufacturing career cluster.

The STEM (Science, Technology, Engineering, and Math) Career Cluster

Occupations in the STEM career cluster constituted 3% of total occupational employment in the United States in 2012. STEM careers are projected to grow more than 13% from 2012–2022 with more than 1 million openings due to growth and replacement.

Table 39. Profiled ACT WorkKeys Skills for Selected Occupations in the STEM Career Cluster

Education Group	O*NET Code	Occupation Title	US Employment 2012	US Projected Employment 2022	Job Openings, 2012–2022	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low	15-1151.00	Computer User Support Specialists	547,700	658,500	196,900	5	5	4
	17-3031.01	Surveying Technicians	54,000	61,300	17,000	5	4	4
Middle	19-4099.01	Quality Control Analysts	63,900	70,400	31,600	4	4	4
	17-3023.01	Electronics Engineering Technicians	146,500	146,500	30,400	5	5	4
	19-4031.00	Chemical Technicians	63,600	69,500	21,600	5	5	4
	17-3029.00	Engineering Technicians, Except Drafters, All Other	67,700	68,300	14,600	5	5	4
	17-3011.01	Architectural Drafters	87,900	88,500	12,400	7	6	5
High	13-1161.00	Market Research Analysts and Marketing Specialists	415,700	547,200	188,500	4	4	4
	15-1131.00	Computer Programmers	343,700	372,100	118,100	5	5	5
	13-1051.00	Cost Estimators	202,200	255,200	118,000	6	5	5
	17-2141.00	Mechanical Engineers	258,100	269,700	99,700	4	4	5
	17-2112.00	Industrial Engineers	223,300	233,400	75,400	5	5	5

Career Readiness Benchmarks for STEM Careers

The aggregated ACT WorkKeys skills benchmarks indicate that, across the middle and high education groups, Level 5 is the lowest level of Applied Mathematics, Locating Information, and Reading for Information skills needed for jobs in the STEM career cluster.

Table 40. STEM Career Cluster—Career Readiness Benchmarks

Education Group	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
SKILL LEVEL REQUIRED FOR 85% OF OCCUPATIONS			
Low Education Occupations	NA	NA	NA
Middle Education Occupations	5	5	5
High Education Occupations	6	5	5

Source: ACT Job Profiles, January 2004–December 2013

Note: NA = insufficient number of job profiles or occupations within an education grouping in order to calculate a benchmark.

STEM Career Readiness of US ACT WorkKeys Examinees

Table 41. Examinee Gap Analysis for STEM Career Cluster

Education Group (Examinees and Occupations)	Applied Mathematics (Range: 3–7)	Reading for Information (Range: 3–7)	Locating Information (Range: 3–6)
Low Education	NA	NA	NA
Middle Education	72%	81%	27%
High Education	58%	91%	45%

Less than half (45%) of examinees with a high level of educational attainment met or exceeded the Locating Information skill benchmarks for jobs that required a high level of education in the STEM career cluster.

Policies and Practices to Increase Readiness

Implementing Career Readiness Standards

Education and workforce stakeholders should integrate career readiness skills into curriculum to ensure that individuals have the types and levels of skills needed for a reasonable chance of success in gaining a job and progressing within that career. Using career readiness standards as a target can help shape curriculum to better reflect the skills required for jobs in demand. ACT has developed ACT WorkKeys Targets for Instruction, which help educators and trainers develop curricula and instructional strategies for the ACT WorkKeys skills areas.[16] ACT WorkKeys Targets are available for each ACT WorkKeys cognitive skill area and include skill-building strategies, sample work-based tasks and problems for each level, guidelines for obtaining and using workplace materials, and a detailed description of each ACT WorkKeys skill area and level.

Creating Communities of Work and Career Readiness

Although career readiness standards are designed to match an individual's skills with those needed to succeed in a career pathway, the data underlying the standards can be used in aggregate form for community, regional, and statewide work readiness efforts. To that end, ACT is leading a national effort to certify ACT Work Ready Communities and provide a community-based framework that links workforce development to education and aligns with the economic development needs of communities, regions, and states.[17] The initiative is designed to:

- help business and industry identify the foundational skills they need for a productive workforce,
- allow policymakers to consistently measure skills gaps in a timely manner at the national, state, and local levels, and
- provide economic developers with data to market the quality of their workforce.

Implementing Policies and Practices for Data-Driven Decision Making

States have made progress in developing longitudinal data systems—this must continue. The primary goal of these systems has been to ensure that individuals throughout the education and workplace continuum are prepared for their next successful transition in life. To achieve this goal, states must implement systems that allow educators and workforce professionals to monitor academic and economic performance outcomes. In addition, it is crucial to support research that investigates best practices in education and training interventions that improve individual outcomes.

[16] For more information about the ACT WorkKeys Targets for Instruction, visit www.act.org/workkeys/sktrain/targets.html.
[17] For more information about ACT Work Ready Communities, visit www.workreadycommunities.org/.

ACT is an independent, nonprofit organization that provides assessment, research, information, and program management services in the broad areas of education and workforce development. Each year, we serve millions of people in high schools, colleges, professional associations, businesses, and government agencies, nationally and internationally. Though designed to meet a wide array of needs, all ACT programs and services have one guiding purpose—helping people achieve education and workplace success.

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