

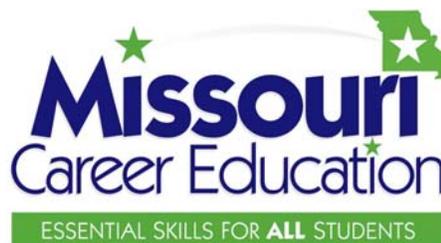
STATEWIDE VALIDATION

of
National Career Cluster Knowledge and Skills Statements
with
Suggestions to Better Prepare the Workforce of Tomorrow

*Responses Received from Online Survey of Missouri Business and Industry
Conducted November 20, 2006 through January 8, 2007*

16 Career Clusters

- *Agriculture, Food and Natural Resources*
- *Architecture and Construction*
- *Arts, Audio-Visual Technology, and Communication*
- *Business, Management and Administration*
- *Education and Training*
- *Finance*
- *Government and Public Administration*
- *Health*
- *Hospitality and Tourism*
- *Human Services*
- *Information Technology*
- *Law, Public Safety, Corrections and Security*
- *Manufacturing*
- *Marketing, Sales and Service*
- *Science, Technology, Engineering and Mathematics*
- *Transportation, Distribution and Logistics*



Department of Elementary and Secondary Education
Division of Career Education
Nancy J. Headrick, Assistant Commissioner
P.O. Box 480
Jefferson City, MO 65102-0480
(573) 751-3500

How essential are the following knowledge and skill statements to a foundation in a career or continuing education in Agriculture, Food and Natural Resources (AFNR)?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Achieve specific academic knowledge and skills required to pursue the full range of career and post-secondary education opportunities with AFNR.	45% (23)	49% (25)	4% (2)	2% (1)	0% (0)	1.63
Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information within AFNR.	71% (36)	25% (13)	4% (2)	0% (0)	0% (0)	1.33
Solve problems using critical thinking skills (e.g., analyze, synthesize and evaluate) independently and in teams.	82% (42)	14% (7)	4% (2)	0% (0)	0% (0)	1.22
Access suitable resources to identify public policies, issues and regulations impacting AFNR management.	35% (18)	51% (26)	14% (7)	0% (0)	0% (0)	1.78
Use information technology tools specific to AFNR to access, manage, integrates and create information.	30% (15)	56% (28)	12% (6)	2% (1)	0% (0)	1.86
Understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment.	53% (27)	37% (19)	8% (4)	2% (1)	0% (0)	1.59
Identify how key organizational systems affect organizational performance and the quality of products and services.	39% (20)	41% (21)	18% (9)	2% (1)	0% (0)	1.82
Total Respondents						51

How essential are the following knowledge and skill statements to a foundation in a career or continuing education in Agriculture, Food and Natural Resources (AFNR)?

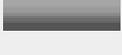
	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.	40% (19)	47% (22)	13% (6)	0% (0)	0% (0)	1.72
Identify health goals and safety procedures for AFNR occupations.	27% (13)	52% (25)	12% (6)	8% (4)	0% (0)	2.02
Demonstrate appropriate health and safety procedures for AFNR occupations.	30% (14)	51% (24)	17% (8)	2% (1)	0% (0)	1.91
Use leadership skills in collaborating with others to accomplish organizational goals and objectives.	56% (27)	33% (16)	10% (5)	0% (0)	0% (0)	1.54
Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.	44% (21)	46% (22)	10% (5)	0% (0)	0% (0)	1.67
Know and understand the importance of professional ethics and legal responsibilities.	63% (30)	29% (14)	8% (4)	0% (0)	0% (0)	1.46
Demonstrate workplace ethics specific to AFNR occupations.	54% (26)	31% (15)	12% (6)	0% (0)	2% (1)	1.57
Know and understand the importance of employability skills.	31% (15)	54% (26)	12% (6)	2% (1)	0% (0)	1.85
Explore, plan and effectively manage personal career options.	33% (15)	43% (20)	22% (10)	2% (1)	0% (0)	1.93
Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.	28% (13)	53% (25)	15% (7)	4% (2)	0% (0)	1.96

Use tools, equipment, machinery and technology to work in areas related to AFNR.	40% (19)	48% (23)	10% (5)	2% (1)	0% (0)	1.75
Envision emerging technology and globalization to project its influence on widespread markets.	32% (15)	49% (23)	17% (8)	0% (0)	2% (1)	1.85
Total Respondents						48

What other foundation skills and knowledge are essential for all careers in AFNR?

Total Respondents	4
See comments sheet for detail	

Please select a career pathway:

		Response Percent	Response Total
Food Products and Processing Systems		16.7%	8
Plant Systems		12.5%	6
Animal Systems		31.3%	15
Power, Structural and Technical Systems		18.8%	9
Natural Resources Systems		4.2%	2
Environmental Service Systems		6.2%	3
Agribusiness Systems		10.4%	5
Total Respondents			48

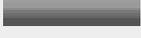
How essential are the following skills for the "Food Products and Processing Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Apply principles of food processing to the food industry.	68% (13)	26% (5)	0% (0)	0% (0)	5% (1)	1.28
Apply principles of food science to the food industry.	74% (14)	21% (4)	0% (0)	0% (0)	5% (1)	1.22
Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.	79% (15)	16% (3)	0% (0)	0% (0)	5% (1)	1.17
Identify processing, handling, and storage factors to show how they impact product quality and safety.	68% (13)	26% (5)	0% (0)	0% (0)	5% (1)	1.28
Total Respondents						19

What additional skills and knowledge are essential for careers in this pathway?

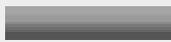
Total Respondents	0
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How would you characterize your relationship to the workforce in the career pathway of Food Products and Processing Systems? Answer as many as applicable.

		Response Percent	Response Total
I make hiring decisions		15.8%	3
I supervise people who are in this career field		15.8%	3
I work in this career field		21.1%	4
I have a friend or relative who works in this career field		21.1%	4
I have an interest in improving the quality of the workforce in this area		21.1%	4

I have an interest in attracting more people to this career field		15.8%	3
I have no professional connection with this career field		42.1%	8
Other (please specify)		5.3%	1
Total Respondents			19

Thank you for your responses. Please indicate what you would like to do next.

		Response Percent	Response Total
Continue to the final wrap-up questions of this survey		73.7%	14
Return to the Agriculture, Food and Natural Resources list to select another career pathway.		26.3%	5
Total Respondents			19

How essential are the following skills for the "Plant Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Apply principles of anatomy and physiology to produce and manage plants in both a domesticated and a natural	100% (7)	0% (0)	0% (0)	0% (0)	0% (0)	1.00
Address taxonomic or other classifications to explain basic plant anatomy and physiology.	57% (4)	14% (1)	29% (2)	0% (0)	0% (0)	1.71
Apply fundamentals of production and harvesting to produce plants.	86% (6)	14% (1)	0% (0)	0% (0)	0% (0)	1.14
Exercise elements of design to enhance an environment (e.g., floral, forest, landscape, farm).	71% (5)	29% (2)	0% (0)	0% (0)	0% (0)	1.29
Total Respondents						7

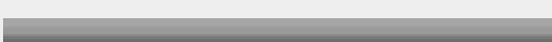
What other skills and knowledge are essential for this career pathway?

Total Respondents

3

(See comments sheet for detail)

How would you characterize your relationship to the workforce in the career pathway of Plant Systems? Answer as many as applicable.

		Response Percent	Response Total
I make hiring decisions		57.1%	4
I supervise people who are in this career field		57.1%	4
I work in this career field		85.7%	6
I have a friend or relative who works in this career field		85.7%	6
I have an interest in improving the quality of the workforce in this area		71.4%	5
I have an interest in attracting more people to this career field		85.7%	6
I have no professional connection with this career field		0%	0
Other (please specify)		0%	0
Total Respondents			7

Thank you for your responses. Please indicate what you would like to do next.

		Response Percent	Response Total
Continue to the final wrap-up questions of this survey		71.4%	5
Return to the Agriculture, Food and Natural Resources list to select another pathway.		28.6%	2
Total Respondents			7
(skipped this question)			46

How essential are the following skills for the "Animal Systems" career pathway?

	Very important	Important	Slightly Important	Not Important	No opinion	Response Average
Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.	53% (9)	29% (5)	18% (3)	0% (0)	0% (0)	1.65
Recognize animal behaviors to facilitate working with animals safely.	35% (6)	59% (10)	6% (1)	0% (0)	0% (0)	1.71
Provide proper nutrition to maintain animal performance.	67% (10)	20% (3)	13% (2)	0% (0)	0% (0)	1.47
Know the factors that influence an animal's reproductive cycle to explain species response.	47% (8)	35% (6)	18% (3)	0% (0)	0% (0)	1.71
Identify environmental factors that affect an animal's performance.	53% (9)	41% (7)	6% (1)	0% (0)	0% (0)	1.53
Total Respondents						17

What other skills and knowledge are essential for this career pathway?

Total Respondents	4
(See comments sheet for detail)	

How would you characterize your relationship to the workforce in the career pathway of Animal Systems? Answer as many as applicable.

		Response Percent	Response Total
I make hiring decisions		17.6%	3
I work in this career field		70.6%	12
I supervise people who are in this career field		23.5%	4
I have an interest in improving the quality of the workforce in this area		64.7%	11
I have an interest in attracting more people to this career field		58.8%	10
I have no professional connection with this career field		0%	0
I have a friend or relative who works in this career field		29.4%	5
No response		5.9%	1
Total Respondents			17

Thank you for your responses. Please indicate what you would like to do next.

		Response Percent	Response Total
Continue to the final wrap-up questions of this survey		88.2%	15
Return to the Agriculture, Food and Natural Resources list to select another pathway.		11.8%	2
Total Respondents			17

How essential are the following skills for the "Power, Structural and Technical Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.	78% (7)	22% (2)	0% (0)	0% (0)	0% (0)	1.22
Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.	100% (9)	0% (0)	0% (0)	0% (0)	0% (0)	1.00
Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.	78% (7)	22% (2)	0% (0)	0% (0)	0% (0)	1.22
Exercise basic skills in blueprint and design development to create sketches, drawings and plans.	44% (4)	44% (4)	11% (1)	0% (0)	0% (0)	1.67
Read and relate structural plans to specifications and building codes.	67% (6)	11% (1)	22% (2)	0% (0)	0% (0)	1.56
Examine structural requirements to estimate project costs.	44% (4)	33% (3)	22% (2)	0% (0)	0% (0)	1.78
Develop skills required to use construction/fabrication equipment and tools.	33% (3)	67% (6)	0% (0)	0% (0)	0% (0)	1.67
Plan, implement, manage, and/or provide support services to facility design and construction; equipment design, manufacture, repair, and service; and agricultural technology.	56% (5)	33% (3)	11% (1)	0% (0)	0% (0)	1.56
Use the variety of tools available in computer systems to accomplish fast, accurate production in the workplace.	56% (5)	33% (3)	11% (1)	0% (0)	0% (0)	1.56

Use available power sources to plan and apply control systems.	56% (5)	44% (4)	0% (0)	0% (0)	0% (0)	1.44
Explain geospatial technology to demonstrate its applications.	11% (1)	56% (5)	22% (2)	0% (0)	11% (1)	2.13
Total Respondents						9

What other skills and knowledge are essential for this career pathway?

Total Respondents	0
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How would you characterize your relationship to the workforce in the career pathway of Power, Structural and Technical Systems? Answer as many as applicable.

		Response Percent	Response Total
I make hiring decisions		22.2%	2
I supervise people who are in this career field		44.4%	4
I work in this career field		33.3%	3
I have a friend or relative who works in this career field		22.2%	2
I have an interest in improving the quality of the workforce in this area		55.6%	5
I have an interest in attracting more people to this career field		55.6%	5
I have no professional connection with this career field		33.3%	3
Other (please specify)		0%	0
Total Respondents			9

Thank you for your responses. Please indicate what you would like to do next.

		Response Percent	Response Total
Continue to the final wrap-up questions of this survey		88.9%	8
Return to the Agriculture, Food and Natural Resources list to select another pathway.		11.1%	1
Total Respondents			9

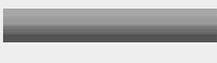
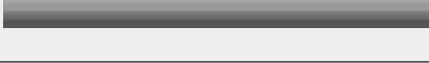
How essential are the following skills for the "Natural Resources Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Recognize importance of resource and human interrelations to conduct management activities in natural habitats.	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	1.00
Use effective venues to communicate natural phenomena to the public.	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	1.33
Apply scientific principles to natural resource management activities.	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	1.33
Employ knowledge of natural resource industries to describe production practices and processing procedures.	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	1.33
Practice responsible conduct to protect natural resources.	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	1.00
Total Respondents						3

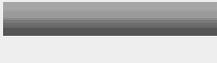
What other skills and knowledge are essential for this career pathway?

Total Respondents	0
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How would you characterize your relationship to the workforce in the career pathway of Natural Resources Systems? Answer as many as applicable.

		Response Percent	Response Total
I make hiring decisions		0%	0
I supervise people who are in this career field		33.3%	1
I work in this career field		0%	0
I have a friend or relative who works in this career field		66.7%	2
I have an interest in improving the quality of the workforce in this area		33.3%	1
I have an interest in attracting more people to this career field		66.7%	2
I have no professional connection with this career field		33.3%	1
Other (please specify)		0%	0
Total Respondents			3

Thank you for your responses. Please indicate what you would like to do next.

		Response Percent	Response Total
Continue to the final wrap-up questions of this survey		66.7%	2
Return to the Agriculture, Food and Natural Resources list to select another pathway.		33.3%	1
Total Respondents			3

How essential are the following skills for the "Environmental Service Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Use analysis procedures to plan and evaluate environmental service impacts.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Identify public policies and regulations impacting environmental services to determine their effect on facility operation.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Apply scientific principles to environmental services.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Operate environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management, and energy) to manage a facility environment.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Use tools, equipment, machinery and technology to accomplish tasks in environmental services.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Total Respondents						0

What other skills and knowledge are essential for this career pathway?

Total Respondents						0
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How essential are the following skills for the "Agribusiness Systems" career pathway?

	Very Important	Important	Slightly Important	Not Important	No opinion	Response Average
Practice good record keeping to accomplish AFNR business objectives.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Apply generally accepted accounting principles and skills to manage budget, credit, and optimal application of AFNR business assets.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Employ AFNR industry concepts and practices to manage inventory.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Utilize technology to accomplish AFNR business objectives.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Use sales and marketing principles to accomplish an AFNR business objective.	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0.00
Total Respondents						0

What other skills and knowledge are essential for this career pathway?

Total Respondents						0

In which state do you live?			
		Response Percent	Response Total
Missouri		100%	44
Other (please specify)		0%	0
Total Respondents			44

Please indicate the professional area in which you work:			
		Response Percent	Response Total
Business/Industry		43.2%	19
State Agency		9.1%	4
Federal Agency		0%	0
Association/Chamber		11.4%	5
Secondary Education		18.2%	8
Postsecondary Education		2.3%	1
Other (please specify)		15.9%	7
Total Respondents			44

Years of work experience:			
		Response Percent	Response Total
Student		0%	0
0-1		2.3%	1
2-5		4.5%	2
6-10		2.3%	1
11-20		34.1%	15
21-30		38.6%	17
31+		18.2%	8

Total Respondents	44

What other comments would you like to add related to career education in Missouri?

Total Respondents	4
(See Comments page)	

Would you be willing to participate in future surveys like this related to Missouri Career Education and workforce development?

		Response Percent	Response Total
Yes		43.2%	19
Maybe		38.6%	17
No		18.2%	8
Total Respondents			44

Would you be willing to serve on a local or state advisory council for the betterment of career education and workforce preparation in Missouri?

		Response Percent	Response Total
Yes		20.5%	9
Maybe		29.5%	13
No		50%	22
Total Respondents			44

If you indicated "yes" or "maybe" to either of the two questions above, please provide DESE your contact information (include name, company, address, telephone number, and e-mail address). This information will be used solely for the purposes described.

Total Respondents	17
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Through which channel did you receive this survey?

		Response Percent	Response Total
Trade association or professional society		44.2%	19
Chamber of Commerce or industry group		2.3%	1
Business colleague		2.3%	1
e-mail from Department of Elementary and Secondary Education		25.6%	11
Educator		14%	6
Website link		2.3%	1
Word-of-mouth		2.3%	1
Other (please specify)		7%	3
Total Respondents			43

Was this survey easy to use?

		Response Percent	Response Total
Yes		81.4%	35
No		0%	0
Somewhat		11.6%	5
Comments		7%	3
Total Respondents			43

COMMENTS FOR AGRICULTURE:**FOUNDATION Knowledge and Skills:**

What other foundation skills and knowledge are essential for all careers in AFNR?	
1.	Communication - written and oral
2.	Learn how to study and learn. The future will require continuous education!
3.	Advanced computer training and business development
4.	observation skills-the ability to observe, pay attention to details, and analyze problems and form solutions as a result of observations. Have had employees in the past who were immune to outside stimuli of all kinds. Always to the detriment of my business, and often at risk to the employee's health and safety.

PATHWAY Knowledge and Skills:**FOOD PRODUCTS and PROCESSING SYSTEMS**

What additional skills and knowledge are essential for careers in this pathway?	
Total Respondents	
0	

PLANT SYSTEMS

What other skills and knowledge are essential for this career pathway?	
1.	Identify environmental issues connected to plant production practices.
2.	Need good knowledge of plant diseases, visual identification of chemical and elemental stress on plants, and entomology ID of major midwest pests.
3.	Again, observation skills and the ability to concentrate on the task at hand

ANIMAL SYSTEMS

What other skills and knowledge are essential for this career pathway?	
1.	Identify environmental issues associated with animal production.
2.	Marketing of the finished product - mature animals.
3.	Depending on type of occupation, but the ability to develop, share and implement ideas with others will be of key importance in any animal system pathway career. Some will require more specific animal husbandry knowledge, such as the ones listed above in this survey.
4.	Understanding of genetics.

POWER, STRUCTURAL and TECHNICAL SYSTEMS

What other skills and knowledge are essential for this career pathway?	
Total Respondents	
0	

NATURAL RESOURCES SYSTEMS

What other skills and knowledge are essential for this career pathway?	
Total Respondents	
0	

ENVIRONMENTAL SERVICE SYSTEMS

What other skills and knowledge are essential for this career pathway?	
Total Respondents	0

AGRIBUSINESS SYSTEMS

What other skills and knowledge are essential for this career pathway?	
Total Respondents	0

OTHER COMMENTS:

What other comments would you like to add related to career education in Missouri?	
1.	In the above survey, when I selected the Agribusiness pathway, it kept sending me to food science.
2.	I was an MU Ag grad from NW MO. I feel MU needs to focus on the major crops and biotechnology in the state. It was nice to know about alterative crops (Meyers) but more focus should have been on the comments I inserted earlier. MO can show the midwest how to grow top yielding commodities(139 bu beans).
3.	Access to proper training and opportunities to learn about potential career pathways in our education system are critical to recruiting, training and hiring the best potential employees for careers in agriculture fields.
4.	Agriculture in general, and of course I am more familiar with animal agriculture in Missouri, represents a dynamic area for career options. The traditional labor positions are still available, but with increasing application of technology to production systems as well as processing, there are more and better careers available for educated folks than ever before.