

Standards Correlations

Biological Applications in Agriculture (8086)

Task	SOL Correlations
Demonstrating Personal Qualities and Abilities	
Demonstrate creativity and innovation.	<p>English: 6.1, 6.3, 6.4, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 8.2, 8.4, 8.6, 8.7, 8.11, 8.12, 8.17, 8.18, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, AII.9, COM.1, COM.3, COM.4, COM.5, COM.8, DM.7, DM.1*, DM.10, DM.2*, DM.3*, PS.3*, PS.4*, PS.7*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>
Demonstrate critical thinking and problem solving.	<p>English: 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.5, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.10, 6.11, 7.2, 7.3, 7.8, 7.12, 7.13, 8.2, 8.4, 8.8, 8.9, 8.10, 8.11, A.8, A.9, G.1, G.13, G.14, AFDA.3, AFDA.5, AFDA.8, AII.9, AII.10, AII.11, COM.1, COM.3, COM.4, COM.5, COM.8, DM.4, DM.7, DM.1*, DM.2*, DM.3*, DM.9*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>

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Demonstrate initiative and self-direction.	English: 6.1, 6.4, 6.6, 6.7, 6.9, 7.1, 7.4, 7.6, 7.7, 7.9, 8.1, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate integrity.	English: 6.1, 7.1, 8.1, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate work ethic.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
Demonstrating Interpersonal Skills	
Demonstrate conflict-resolution skills.	English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.4, 8.6, 8.7, 8.9, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, VUS.1
Demonstrate listening and speaking skills.	English: 6.1, 6.2, 6.4, 6.6, 7.1, 7.2, 7.4, 7.6, 8.1, 8.2, 8.4, 8.6, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate respect for diversity.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, USII.9, VUS.1, VUS.13, WG.1, WHI.1, WHII.1
Demonstrate customer service skills.	English: 6.1, 6.4, 6.7, 7.1, 7.4, 7.7, 8.1, 8.4, 8.7, 9.1, 9.5, 9.6, 10.1, 10.5, 10.6, 11.1, 11.5, 11.6, 12.1, 12.5, 12.6 History and Social Science: CE.1, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Collaborate with team members	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1

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	History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrating Professional Competencies	
Demonstrate big-picture thinking.	English: 6.1, 6.4, 7.1, 7.4, 8.1, 8.4, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.4, CE.12, GOVT.1, GOVT.15, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate career- and life-management skills.	English: 6.1, 6.7, 7.1, 7.7, 8.1, 8.7, 9.1, 9.6, 10.1, 10.6, 11.1, 11.6, 12.1, 12.6 History and Social Science: CE.1, CE.4, CE.12, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 8.4
Demonstrate continuous learning and adaptability.	English: 6.1, 6.4, 6.7, 6.9, 7.1, 7.4, 7.7, 7.9, 8.1, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.3, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: BIO.1, CH.1, LS.1, PH.1, PH.4, PS.1
Manage time and resources.	English: 6.1, 6.2, 6.4, 6.7, 6.9, 7.1, 7.2, 7.4, 7.7, 7.9, 8.1, 8.2, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 8.4, 8.11, 8.12, 8.13, 8.14, 8.17, 8.18, A.4, A.5, A.8, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, COM.1, COM.3, COM.5, COM.8

Task	SOL Correlations
Demonstrate information-literacy skills.	<p>English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.9, 9.2, 9.5, 9.6, 9.8, 10.2, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> <p>Mathematics: 6.10, 6.11, 7.8, 7.9, 8.11, 8.12, A.8, A.9, AFDA.3, AFDA.4, AFDA.6, AFDA.7, AFDA.8, DM.8, PS.1*, PS.2*, PS.3*, PS.4*, PS.7*, PS.8*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1</p>
Demonstrate an understanding of information security.	<p>English: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.8, 8.9, 9.1, 9.2, 9.5, 9.6, 9.8, 10.1, 10.2, 10.5, 10.6, 10.8, 11.1, 11.2, 11.5, 11.6, 11.8, 12.1, 12.2, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> <p>Mathematics: COM.10</p>
Maintain working knowledge of current information-technology (IT) systems.	<p>English: 6.1, 6.3, 6.4, 6.6, 6.9, 7.1, 7.3, 7.4, 7.6, 7.9, 8.1, 8.3, 8.4, 8.6, 8.9</p> <p>History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> <p>Mathematics: 7.8, COM.1, COM.2, COM.7, COM.9, COM.10, COM.11, COM.16, COM.18, PS.17</p> <p>Science: BIO.1, CH.1, ES.1, PH.1</p>
Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.	<p>History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> <p>Mathematics: 6.10, 6.11, 7.9, 8.4, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AII.4, AII.7, AII.9, COM.1, COM.7, COM.10, COM.11, COM.12, COM.16</p> <p>Science: CH.1, ES.1, LS.1, PH.1, PS.1</p>
Apply mathematical skills to job-specific tasks.	<p>English: 6.4, 6.6, 6.7, 7.4, 7.6, 7.7, 8.4, 8.6, 8.7, 9.5, 9.6, 10.5, 10.6, 11.5, 11.6, 12.5, 12.6</p>

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	History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.5, 6.6, 6.12, 6.13, 6.14, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9, 7.11, 7.12, 7.13, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, A.1, A.3, A.4, A.5, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AFDA.8, AII.3, AII.7, AII.9, AII.10, COM.1, COM.7 Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1
Demonstrate professionalism.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate reading and writing skills.	English: 6.1, 6.6, 6.7, 7.1, 7.6, 7.7, 8.1, 8.6, 8.7, 9.1, 9.5, 9.6, 9.7, 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: 6.1, PH.1, PS.1
Demonstrate workplace safety.	English: 6.4, 7.4, 8.4, 9.5, 10.5, 11.5, 12.5 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
Examining All Aspects of an Industry	
Examine aspects of planning within an industry/organization.	History and Social Science: GOVT.16
Examine aspects of management within an industry/organization.	
Examine aspects of financial responsibility within an industry/organization.	
Examine technical and production skills required of workers within an	

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industry/organization.	
Examine principles of technology that underlie an industry/organization.	
Examine labor issues related to an industry/organization.	History and Social Science: GOVT.16
Examine community issues related to an industry/organization.	History and Social Science: GOVT.16
Examine health, safety, and environmental issues related to an industry/organization.	History and Social Science: GOVT.16
Addressing Elements of Student Life	
Identify the purposes and goals of the student organization.	
Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.	
Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.	
Identify Internet safety issues and procedures for complying with acceptable use standards.	
Exploring Work-Based Learning	
Identify the types of work-based learning (WBL) opportunities.	
Reflect on lessons learned during the WBL experience.	
Explore career opportunities related to the WBL experience.	

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Participate in a WBL experience, when appropriate.	
Exploring Leadership Opportunities through FFA	
Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 9.3, 9.5, 10.3, 10.5
Participate in an SAE.	English: 9.5, 9.8, 10.5, 10.8
Identify the benefits and responsibilities of FFA membership.	English: 9.5, 9.6, 9.7, 9.8, 10.5, 10.6, 10.7, 10.8
Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 9.5, 10.5 History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHII.8, WHII.10, WHII.11
Apply for an FFA degree and/or an agricultural proficiency award.	English: 9.5, 10.5
Understanding the Study of Living Things	
Describe the relationship between agriculture and biology.	English: 9.3, 9.5, 10.3, 10.5 History and Social Science: WHI.2, WHI.3, WHI.4, WHI.5, WHI.6, WHI.10, WHI.14, WHII.4 Science: BIO.3, BIO.5
Explain the key steps of the scientific method.	English: 9.5, 9.6, 9.7, 10.5, 10.6, 10.7 Science: BIO.1, CH.1, ES.2, PH.1
Develop experimental procedures to solve a problem or answer a question.	English: 9.1, 9.5, 10.1, 10.5 History and Social Science: WHII.4 Science: BIO.1, CH.1, ES.2, PH.1

Task	SOL Correlations
Demonstrate safe laboratory practices.	English: 9.8, 10.8 History and Social Science: GOVT.8 Science: CH.1
Describe the relationship between atoms and molecules.	English: 9.5, 10.5 Science: CH.2
Describe how organisms are identified and classified.	English: 9.5, 9.8, 10.5, 10.8 Science: BIO.4, BIO.6
Identify the role of federal, state, and local regulatory agencies in agriculture.	English: 9.5, 9.8, 10.5, 10.8 History and Social Science: GOVT.7, GOVT.8, GOVT.14, GOVT.15
Understanding Cell Structure and Functions	
Describe the cell as the building block of life.	English: 9.5, 10.5 History and Social Science: WHII.4 Science: BIO.3
Analyze the differences between plant and animal cells.	English: 9.5, 10.5 History and Social Science: WHII.4 Science: BIO.3
Compare prokaryotic and eukaryotic cells.	English: 9.5, 10.5 History and Social Science: WHII.4

Task	SOL Correlations
	Science: BIO.3
Analyze cell components.	History and Social Science: WHII.4 Science: BIO.3
Explain how cell structure and function are used to improve agricultural practices.	English: 9.5, 10.5 History and Social Science: WHII.4 Science: BIO.3
Explain the cell's surface area to volume ratio.	English: 9.5, 10.5 History and Social Science: WHII.4 Mathematics: G.13, G.14 Science: BIO.3
Explain the process of diffusion.	English: 9.5, 10.5 Science: BIO.3
Explain the process of osmosis.	English: 9.5, 10.5 Science: BIO.3
Explain the concept of homeostasis.	English: 9.5, 10.5 History and Social Science: WHII.4 Science: BIO.3
Explain the processes of mitosis and meiosis.	English: 9.5, 10.5

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	Science: BIO.5
Understanding Basic Genetics	
Explain Mendelian principles of inheritance.	English: 9.5, 10.5 Science: BIO.5
Analyze a Punnett square.	English: 9.5, 10.5 Mathematics: PS.11*, PS.12* Science: BIO.5
Describe the structures and components of DNA molecules.	English: 9.5, 10.5 Science: BIO.5
Describe the function and replication of nucleic acids.	English: 9.5, 10.5 Science: BIO.5
Discuss the process of DNA transfer.	English: 9.1, 10.1 Science: BIO.5
Explain how genetic principles are used in animal and plant breeding.	English: 9.5, 10.5 Science: BIO.5
Explain how hybrid plants and animals are developed.	English: 9.5, 10.5 Science: BIO.5
Describe how genetic modification is used in animal and plant breeding programs.	English: 9.5, 10.5

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Identify how technology is used in the selection of breeding animals and plants.	English: 9.5, 10.5
Explain the role of genetic mutations in animal and plant breeding.	English: 9.5, 10.5 Science: BIO.5
Explaining Principles of Genetic Engineering	
Explain the principles of genetic engineering.	English: 9.5, 10.5 Science: BIO.5
Describe how genetic engineering is used in agriculture.	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Compare genetic engineering and genetic modification in agriculture, food, and natural resources (AFNR).	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Identify emerging trends in genetic engineering.	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14 Science: BIO.5
Analyze ethical issues related to genetic engineering.	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14 Science: BIO.5
Summarize the laws affecting genetically altered organisms.	English: 9.5, 10.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHII.14

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Explain safety procedures and policies related to genetic engineering and the laboratory.	English: 9.5, 9.8, 10.5, 10.8 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Understanding Basic Plant Structures, Functions, and Nutrition	
Explain the life-sustaining processes by which all plants grow and develop.	English: 9.5, 10.5 Science: BIO.2
Describe factors that affect plant growth.	English: 9.5, 10.5 Science: BIO.2
Describe the movement of minerals, water, and nutrients in plants.	English: 9.5, 10.5 Science: BIO.2
Describe the methods plants use to store food.	English: 9.5, 10.5
Explain how plants protect themselves from diseases, insects, and predators.	English: 9.5, 10.5
Compare the primary methods of asexual reproduction.	English: 9.5, 10.5
Explain the advantages and disadvantages of soilless plant production.	English: 9.5, 10.5
Understanding Fundamentals of Animal Nutrition	
Describe the anatomy and physiology of domestic animals.	English: 9.5, 10.5 Science: BIO.4
Explain the four major classes of macromolecules.	English: 9.5, 10.5 Science: BIO.2
Explain nutrition requirements for animals.	English: 9.5, 10.5

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Calculate the amount of feed needed based on energy requirements.	History and Social Science: GOVT.7, GOVT.8, GOVT.14, GOVT.15 Mathematics: A.1, A.4
Describe the roles of non-nutritive factors in feed.	English: 9.5, 10.5
Identify toxic substances that can harm animals.	English: 9.5, 10.5
Calculate the feed conversion ratio (FCR).	Mathematics: A.1, A.4
Understanding Principles of Animal Health	
Evaluate overall health or homeostasis for a domestic animal species.	English: 9.5, 10.5
Define terms associated with disease conditions.	English: 9.3, 9.5, 10.3, 10.5 Science: BIO.4
Define terms associated with severity of disease or condition.	English: 9.3, 9.5, 10.3, 10.5
Compare treatment methods.	English: 9.5, 10.5
Explain disease resistance.	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Outline best management practices (BMP) for preventing disease outbreaks in a domestic animal species.	English: 9.6, 9.7, 10.6, 10.7 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Understanding Principles of Water and Soil Quality	
Define terms related to water quality management.	English: 9.3, 9.5, 10.3, 10.5
Explain factors that affect dissolved oxygen concentrations in water.	English: 9.5, 10.5
Explain how turbidity affects water quality.	English: 9.5, 10.5

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Identify BMP for water management.	English: 9.5, 9.8, 10.5, 10.8
Explain how water quality affects aquatic life.	English: 9.5, 10.5
Conduct a water analysis.	English: 9.6, 9.7, 10.6, 10.7 Mathematics: A.8, A.9, AFDA.8, PS.1*, PS.2*, PS.3*, PS.4*
Analyze key issues related to water quality and agriculture.	English: 9.5, 10.5 History and Social Science: GOVT.12, VUS.14, WG.17, WHII.14
Identify the components of a soil profile used in nutrient management.	English: 9.5, 10.5 Science: ES.8
Identify the particles that make up the structure of soil.	English: 9.5, 10.5 Science: ES.8
Explain the purpose of testing soil fertility.	English: 9.5, 10.5
Conduct a soil test.	English: 9.1, 9.5, 10.1, 10.5