

Standards Correlations

Biotechnology Applications in Agriculture (8087)

| Task | SOL Correlations |
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| 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 |

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| 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 |
| Applying Biotechnology in Agriculture | |
| Implement safe laboratory and experimental procedures. | English: 11.5, 12.5 Science: CH.1 |
| Conduct an experiment or a research project in agriculture. | English: 11.8, 12.8 Mathematics: AFDA.8, AII.9, AII.11, PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10* Science: BIO.1, CH.1, PH.1 |
| Practice standard operating procedures (SOPs) related to the agricultural biotechnology lab. | English: 11.6, 11.7, 12.6, 12.7 Mathematics: AFDA.8, AII.9, AII.11, PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10* |
| Identify state and federal agencies relevant to one's chosen research field. | English: 11.5, 11.8, 12.5, 12.8 |

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| | History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15 |
| Research the emergence, evolution, and implications of bioethics associated with AFNR industries. | English: 11.8, 12.8 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Present views on a current bioethics issue in agriculture. | English: 11.1, 12.1 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Analyze a biotechnological innovation. | English: 11.5, 12.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 Science: PH.3, PH.4 |
| Simulate biotechnological innovation. | English: 11.1, 11.5, 12.1, 12.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 Science: PH.4 |
| Applying Biotechnology to Agricultural Species | |
| Analyze methods of plant breeding. | English: 11.5, 12.5 |
| Conduct an investigation that incorporates agricultural biotechnology. | English: 11.8, 12.8 |
| Demonstrate cloning methods used in plant science. | English: 11.8, 12.8 Science: BIO.5 |
| Produce a plant, using tissue culture. | English: 11.1, 11.6, 11.7, 12.1, 12.6, 12.7 |

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| | Mathematics: AFDA.8, AII.9, AII.11, PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10* |
| Analyze gene transfer. | English: 11.5, 12.5 |
| Recommend biological controls, based on a case study. | English: 11.5, 12.5 |
| Investigate animal reproductive technologies. | English: 11.5, 11.8, 12.5, 12.8 |
| Conduct an economic analysis of genetically engineered plants or animals vs. traditional crops and breeds. | English: 11.5, 12.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Examining Food Science | |
| Explore the use of biotechnology in food science. | English: 11.5, 12.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Conduct an experiment with enzyme(s) that are used in the food industry. | History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Preserve food. | |
| Applying Biotechnology in Environmental Science | |
| Investigate the use of bioremediation and bio restoration in environmental management. | English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 Science: BIO.8 |
| Demonstrate how phytoremediation is used in environmental management. | History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Assess air, soil, and water quality. | English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |

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| | Science: BIO.8 |
| Create a bioremediation plan. | English: 11.1, 11.5, 12.1, 12.5 History and Social Science: GOVT.7, GOVT.8, GOVT.12, GOVT.14, GOVT.15, VUS.14, WG.17, WHIL.14 |
| Investigating Bioinformatics and Genomics | |
| Explain gene mapping. | English: 11.5, 12.5 Science: BIO.5 |
| Investigate applications of genomics in AFNR. | English: 11.5, 11.8, 12.5, 12.8 Science: BIO.5 |
| Analyze genetic sequence data using bioinformatic tools. | English: 11.5, 12.5 Science: BIO.5 |