**Advanced Crop Science**

Instructional Framework

An instructional framework provides educators with a list of benchmark statements aligned to Common Core and national content area standards for a given course or program. The Missouri Advanced Crop Science Instructional Framework lists a sequence of content, organized into distinct units of instruction. Sample activities and potential Common Core related enhancements are provided.

|  | **Common Core Standards** | **National Standards (AFNR)** | **Activities** | **Enhancements** |
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| 1. **Overview**
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| 1. Missouri Crops and Their Uses
 | R1.11-12.1RST.11-12.7RST.11-12.8RST.11-12.9SL.11-12.4SL.11-12.6WHST.11-12.1.a-bWHST.11-12.1.eSL.11-12.4SL.11-12.6RST.11-12.4 |  | 1. Research the different crops grown in Missouri and present them orally to the class.
2. Challenge students to develop a new food product from the crops grown in Missouri and create a poster presentation.
3. Create flash cards of the different crops grown in Missouri.
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| 1. The Importance of Crops
 | S-ID.1 |  | 1. Research and conduct a scavenger hunt for current events and create a graph of comparing numbers of bushels of crops grown in Missouri.
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| 1. Careers in Crop Science
 | SL.11-12.6RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Interview an individual in the crop science industry.
2. Research a career in the crop science industry.
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| 1. Government Influence and Current Trends
 | RST.11-12.1WHST.11-12.1.a-eWHST.11-12.9 |  | 1. Complete a case study covering the governmental influence on the crop science industry.2. Complete a case study covering the current trends in the crop science industry.  |  |
| 1. **Plant Biology**
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| 1. Plant Physiology
 | WHST.11-12.10RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Germinate seeds of monocot and dicot plants. Record daily observations in a journal. 2. Plant different varieties of seeds within a species and complete a research report with your findings.  |  |
| 1. Plant Growth and Nutrient Needs
 | RST.11-12.1WHST.11-12.1.a-eWHST.11-12.9SL.11-12.4SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Complete a case study on recent findings in regards to nutrients valuable for plant growth. 2. Interview a soil scientist. Present your findings to the class. |  |
| 1. **Soil Fertility and Management**
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| 1. Soil Composition
 | SL.11-12.2SL.11-12.6 |  | 1. Provide four soil samples for the students to judge. Have them analyze the soil particles of each sample.  |  |
| 1. Soil Types and Limitations
 | WHST.11-12.1.a-eWHST.11-12.2.a-eWHST.11-12.7SL.11-12.6 |  | 1. Have the students use soil sample books to determine the soil in a particular area. Have them prepare written reasons why they feel the selected area would have good or poorly draining soils. 2. Have students interview a land owner which has recently completed conservation practices on their land.  |  |
| 1. Soil Testing
 | SL.11-12.2SL.11-12.6RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Organize a soils judging career development event team with students in the class. 2. Have students complete a research report which is analyzing results from soil sampling.  |  |
| 1. Fertilizing Soils
 | SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.eN-Q.1 |  | 1. Create a media presentation explaining fertilizer application methods. 2. Calculate fertilizer needs and application rates of selected fields. |  |
| 1. Soil Management Practices
 | SL.11-12.4SL.11-12.6SL.11-12.1.c-dSL.11-12.6 |  | 1. Prepare a poster presentation explaining the different tillage practices.2. Prepare a poster presentation explaining the different planting methods. 3. Conduct a debate on conventional- versus conservation-tilled soils.  |  |
| 1. Soil Conservation Practices
 | SL.11-12.6RST.11-12.1WHST.11-12.11.a-eWHST.11-12.9 |  | 1. Have students conduct interviews with individuals who practice soil conservation.2. Analyze case studies over the different soil conservation practices. |  |
| 1. **Identifying and Selecting Crops and Seeds**
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| 1. Crop and Weed Identification
 | SL.11-12.4SL.11-12.6RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Create a poster presentation over legumes, forbs, or woody plants. 2. Prepare a research report over the weeds in their area. |  |
| 1. Crop Selection
 | SL.11-12.4SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Conduct an interview with a seed salesperson and prepare a presentation for the class. |  |
| 1. Crop Seed Selection
 | WHST.11-12.1.a-eWHST.11-12.2.a-eWHST.11-12.7SL.11-12.2SL.11-12.6 |  | 1. Have students research various seed companies and prepare written reasons for seed selected.2. Develop seed judging activities for the students. |  |
| 1. **Safety, Environment, and Legal Issues**
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| 1. Protecting Ourselves and Others
 | WHST.11-12.6SL.11-12.4SL.11-12.6 |  | 1. Have students create an online social media presentation about safety around the farm. 2. Create a poster about safety and present to an elementary class. |  |
| 1. Protecting the environment
 | SL.11-12.1.c-dSL.11-12.6RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Conduct a debate on the biggest problem or danger of crop production activities. 2. Have students research the different conservation practices supported by the Natural Resource and Conservation Services. |  |
| 1. Knowing the law
 | N-Q.1 |  | 1. Calculate legal land descriptions.  |  |
| 1. **Corn and Grain Sorghum Production**
 |  |  |  |  |
| 1. Planning the Crop
 | RST.11-12.4RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Create flash cards of nutrient deficiencies.2. Conduct an experiment and write a research report on the effects of light or temperature on plants.  |  |
| 1. Selecting a Variety
 | RST.11-12.4 |  | 1. Create flash cards of nutrient deficiencies. |  |
| 1. Selecting a Tillage and Planting Method
 | SL.11-12.1.c-dSL.11-12.6WHST.11-12.6N-Q.1 |  | 1. Conduct a debate on the different tillage methods.2. Create an online database for the state to compare planting and harvest dates.3. Calculate corn populations and costs of planting. |  |
| 1. Selecting a Pest Control Program
 | RST.11-12.4SL.11-12.6 |  | 1. Create flash cards of common pests. 2. Interview crop scouts on common pests in the area.  |  |
| 1. Scouting and Maintaining the Crops
 | RST.11-12.4SL.11-12.6N-Q.1 |  | 1. Create flash cards of common weeds. 2. Interview crop scouts on common pests in the area.3. Calculate the costs of replanting lost crops.  |  |
| 1. Harvesting the Crop
 | N-Q.1SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Calculate the proper harvest times.2. Calculate harvest losses.3. Create a media presentation of the different harvest methods.  |  |
| 1. Marketing the Crop
 | N-Q.1WHST.11-12.10 |  | 1. Using a specified commodity play the futures market.2. Set up an imaginary farm and fill out a journal along the way.  |  |
| 1. Figuring Crop Costs
 | N-Q.1 |  | 1. Calculate variable and fixed costs and net returns.  |  |
| 1. **Soybean Production**
 |  |  |  |  |
| 1. Planning the Crop
 | RST.11-12.4RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Create flash cards of nutrient deficiencies.2. Conduct an experiment and write a research report on the effects of light or temperature on plants.  |  |
| 1. Selecting a Variety
 | RST.11-12.4 |  | 1. Create flash cards of nutrient deficiencies. |  |
| 1. Selecting a Tillage and Planting Method
 | SL.11-12.1.c-dSL.11-12.6WHST.11-12.6N-Q.1 |  | 1. Conduct a debate on the different tillage methods.2. Create an online database for the state to compare planting and harvest dates.3. Calculate corn populations and costs of planting. |  |
| 1. Selecting a Weed Control Program
 | RST.11-12.4SL.11-12.6 |  | 1. Create flash cards of common weeds. 2. Interview crop scouts on common pests in the area.  |  |
| 1. Scouting and Maintaining the Crops
 | RST.11-12.4SL.11-12.6N-Q.1 |  | 1. Create flash cards of common weeds. 2. Interview crop scouts on common pests in the area.3. Calculate the costs of replanting lost crops.  |  |
| 1. Harvesting the Crop
 | N-Q.1SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Calculate the proper harvest times.2. Calculate harvest losses.3. Create a media presentation of the different harvest methods.  |  |
| 1. Marketing the Crop
 | N-Q.1WHST.11-12.10 |  | 1. Using a specified commodity play the futures market.2. Set up an imaginary farm and fill out a journal along the way.  |  |
| 1. Figuring Crop Costs
 | N-Q.1 |  | 1. Calculate variable and fixed costs and net returns.  |  |
| 1. **Wheat and Small Grain Production**
 |  |  |  |  |
| 1. Planning the Crop
 | RST.11-12.4RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9 |  | 1. Create flash cards of nutrient deficiencies.2. Conduct an experiment and write a research report on the effects of light or temperature on plants. |  |
| 1. Selection of Variety
 | RST.11-12.4 |  | 1. Create flash cards of nutrient deficiencies. |  |
| 1. Selecting a Tillage and Planting Method
 | SL.11-12.1.c-dSL.11-12.6WHST.11-12.6N-Q.1 |  | 1. Conduct a debate on the different tillage methods.2. Create an online database for the state to compare planting and harvest dates.3. Calculate corn populations and costs of planting. |  |
| 1. Pest Control Program
 | RST.11-12.4SL.11-12.6 |  | 1. Create flash cards of common pests. 2. Interview crop scouts on common pests in the area.  |  |
| 1. Scouting and Maintaining the Crop
 | RST.11-12.4SL.11-12.6N-Q.1 |  | 1. Create flash cards of common weeds. 2. Interview crop scouts on common pests in the area.3. Calculate the costs of replanting lost crops.  |  |
| 1. Harvesting the Crop
 | N-Q.1SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Calculate the proper harvest times.2. Calculate harvest losses.3. Create a media presentation of the different harvest methods.  |  |
| 1. Marketing the Crop
 | N-Q.1WHST.11-12.10 |  | 1. Using a specified commodity play the futures market.2. Set up an imaginary farm and fill out a journal along the way.  |  |
| 1. Figuring Crop Costs
 | N-Q.1 |  | 1. Calculate variable and fixed costs and net returns.  |  |
| 1. **Forage Production**
 |  |  |  |  |
| 1. Planning the Crop
 | RST.11-12.1WHST.11-12.a-eWHST.11-12.9SL.11-12.6 |  | 1. Complete a case study covering forage production. 2. Interview a local producer. |  |
| 1. Selecting a Forage
 | RST.11-12.4RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9SL.11-12.4SL.11-12.6WHST.11-12.1.a-bWHST.11-12.1.e |  | 1. Create flash cards of the different types of forages. 2. Research and report on forage grown in the area.  |  |
| 1. Selecting a Tillage and Planting Method
 | RI.11-12.7RST.11-12.7RST.11-12.8RST.11-12.9WHST.11-12.4WHST.11-12.7WHST.11-12.9SL.11-12.2SL.11-12.6 |  | 1. Research the different types of equipment to plant a forage stand. 2. Examine soil sample of well and non-well established forage stands.  |  |
| 1. Scouting and Maintaining the Crop
 | RST.11-12.4SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Create flash cards of the different types of pests. 2. Create a PowerPoint presentation of the different methods to control pests.  |  |
| 1. Selecting a Grazing System
 | WHST.11-12.1.a-eWHST.11-12.2.a-eWHST.11-12.7N-Q.1 |  | 1. Provide written reasons why you would choose the different grazing systems. 2. Practice calculating Carrying capacity and “cow-days.” |  |
| 1. Harvesting for Seed
 | SL.11-12.4SL.11-12.6 |  | 1. Create a poster of five different forage crops used for their seeds and present to the class.  |  |
| 1. Harvesting for Feed
 | WHST.11-12.10 |  | 1. Record in a journal the analysis of several hay samples.  |  |
| 1. Marketing the Crop and Figuring Crop Costs
 | N-Q.1 |  | 1. Calculate crop costs. |  |
| 1. **Cotton Production**
 |  |  |  |  |
| 1. Planning the Crop
 | N.Q-1WHST.11-12.1.a-eWHST.11-12.2.a-eWHST.11-12.7 |  | 1. Calculate and chart rain fall over a period of time. 2. Conduct and analyze soil samples. Provide written results.  |  |
| 1. Selecting the Variety
 | SL.11-12.4SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Have students research various seed companies and prepare written reasons.2. Develop seed judging activities for the students. |  |
| 1. Tilling and Planting the Crop
 | SL.11-12.1.c-dSL.11-12.6WHST.11-12.6 |  | 1. Conduct a debate on the different tillage methods.2. Create an online database for the state to compare planting and harvest dates. |  |
| 1. Selecting a Weed Control Program
 | RST.11-12.4SL.11-12.6 |  | 1. Create flash cards of common weeds. 2. Interview crop scouts on common pests in the area. |  |
| 1. Scouting and Maintaining the Crop
 | RST.11-12.4SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Create flash cards of the different types of pests. 2. Create a PowerPoint presentation of the different methods to control pests. |  |
| 1. Harvesting the Crop
 | N-Q.1SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Calculate the proper harvest times.2. Calculate harvest losses.3. Create a media presentation of the different harvest methods.  |  |
| 1. Marketing the Crop
 | N-Q.1WHST.11-12.10 |  | 1. Using a specified commodity play the futures market.2. Set up an imaginary farm and fill out a journal along the way |  |
| 1. Figuring Crop Costs
 | N-Q.1 |  | 1. Calculate variable and fixed costs and net returns. |  |
| 1. **Rice Production**
 |  |  |  |  |
| 1. Planning the Crop
 | N.Q-1WHST.11-12.1.a-eWHST.11-12.2.a-eWHST.11-12.7 |  | 1. Calculate and chart rain fall over a period of time. 2. Conduct and analyze soil samples. Provide written results.  |  |
| 1. Selecting a Variety
 | SL.11-12.4SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Have students research various seed companies and prepare written reasons.2. Develop seed judging activities for the students. |  |
| 1. Tilling and Planting the Crop
 | SL.11-12.1.c-dSL.11-12.6WHST.11-12.6 |  | 1. Conduct a debate on the different tillage methods.2. Create an online database for the state to compare planting and harvest dates. |  |
| 1. Scouting and Maintaining the Crop
 | RST.11-12.4SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Create flash cards of the different types of pests. 2. Create a PowerPoint presentation of the different methods to control pests. |  |
| 1. Harvesting the Crop
 | N-Q.1SL.11-12.5SL.11-12.6WHST.11-12.2.a-bWHST.11-12.2.e |  | 1. Calculate the proper harvest times.2. Calculate harvest losses.3. Create a media presentation of the different harvest methods.  |  |
| 1. Marketing the Crop
 | N-Q.1 |  | 1. Calculate variable and fixed costs and net returns. |  |

**Codes for Common Core Mathematics are:**

* N = Number and Quantity
* A = Algebra
* F = Functions
* G = Geometry
* S = Statistics and Probability

**Codes for Common Core English Language Arts and Literacy are:**

* RL = Reading for Literature
* RI = Reading for Informational Text
* RST = Reading for Literacy in Science and Technical Subjects
* RH = Reading for Literacy in History/Social Studies
* W = Writing
* WHST = Writing for Literacy in History/Social Studies, Science, and Technical Subjects
* SL = Speaking and Listening
* L = Language