**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** |  |  |  |  |
| 1. Missouri Crops and Their Uses | R1.11-12.1  RST.11-12.7  RST.11-12.8  RST.11-12.9  SL.11-12.4  SL.11-12.6  WHST.11-12.1.a-b  WHST.11-12.1.e  SL.11-12.4  SL.11-12.6  RST.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. |  |
| 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. |  |
| 1. Careers in Crop Science | SL.11-12.6  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.11-12.9 |  | 1. Interview an individual in the crop science industry. 2. Research a career in the crop science industry. |  |
| 1. Government Influence and Current Trends | RST.11-12.1  WHST.11-12.1.a-e  WHST.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** |  |  |  |  |
| 1. Plant Physiology | WHST.11-12.10  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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.11-12.1  WHST.11-12.1.a-e  WHST.11-12.9  SL.11-12.4  SL.11-12.6  WHST.11-12.2.a-b  WHST.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** |  |  |  |  |
| 1. Soil Composition | SL.11-12.2  SL.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-e  WHST.11-12.2.a-e  WHST.11-12.7  SL.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.11-12.2  SL.11-12.6  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.11-12.2.e  N-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.11-12.4  SL.11-12.6  SL.11-12.1.c-d  SL.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.11-12.6  RST.11-12.1  WHST.11-12.11.a-e  WHST.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** |  |  |  |  |
| 1. Crop and Weed Identification | SL.11-12.4  SL.11-12.6  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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.11-12.4  SL.11-12.6  WHST.11-12.2.a-b  WHST.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-e  WHST.11-12.2.a-e  WHST.11-12.7  SL.11-12.2  SL.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** |  |  |  |  |
| 1. Protecting Ourselves and Others | WHST.11-12.6  SL.11-12.4  SL.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-d  SL.11-12.6  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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.11-12.4  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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-d  SL.11-12.6  WHST.11-12.6  N-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.11-12.4  SL.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.11-12.4  SL.11-12.6  N-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.1  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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  WHST.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.11-12.4  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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-d  SL.11-12.6  WHST.11-12.6  N-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.11-12.4  SL.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.11-12.4  SL.11-12.6  N-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.1  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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  WHST.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.11-12.4  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.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-d  SL.11-12.6  WHST.11-12.6  N-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.11-12.4  SL.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.11-12.4  SL.11-12.6  N-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.1  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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  WHST.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.11-12.1  WHST.11-12.a-e  WHST.11-12.9  SL.11-12.6 |  | 1. Complete a case study covering forage production.  2. Interview a local producer. |  |
| 1. Selecting a Forage | RST.11-12.4  RI.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  SL.11-12.4  SL.11-12.6  WHST.11-12.1.a-b  WHST.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.11-12.7  RST.11-12.7  RST.11-12.8  RST.11-12.9  WHST.11-12.4  WHST.11-12.7  WHST.11-12.9  SL.11-12.2  SL.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.11-12.4  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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-e  WHST.11-12.2.a-e  WHST.11-12.7  N-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.11-12.4  SL.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-1  WHST.11-12.1.a-e  WHST.11-12.2.a-e  WHST.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.11-12.4  SL.11-12.6  WHST.11-12.2.a-b  WHST.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-d  SL.11-12.6  WHST.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.11-12.4  SL.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.11-12.4  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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.1  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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  WHST.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-1  WHST.11-12.1.a-e  WHST.11-12.2.a-e  WHST.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.11-12.4  SL.11-12.6  WHST.11-12.2.a-b  WHST.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-d  SL.11-12.6  WHST.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.11-12.4  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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.1  SL.11-12.5  SL.11-12.6  WHST.11-12.2.a-b  WHST.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