CIMC CURRICULUM

SOIL, PLANT, & CROP SCIENCE

Embedded PASS Core Curriculum

❖ **Science----------Met majority of PASS requirements**
Will meet all PASS requirements when suggested supplements have been implemented.

CIMC CURRICULUM

SOIL, PLANT & CROP SCIENCE

TABLE OF CONTENTS

SOIL, PLANT, & CROP SCIENCE

SCIENCE

PHYSICAL SCIENCE

Oklahoma Vocational Curriculum:
Embedded PASS Skills

Soil, Plant & Crop Science: Science

CIMC Developed/
Recommended Curriculum: Soil, Plant, & Crop Science LAPS

PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area I.
Observing and Measuring

Content Skill Knowledge	Matching Curriculum Objectives
A. Identify similar or different characteristics in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
B. Select qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment.

	D-2:15 Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
C. Identify qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-4:3** Match categories of water erosion to their correct definitions. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.
D. Use the appropriate Systems International (SI) units (grams, meters, liters, and degrees Celsius) to measure objects, organisms, or events.	**B-1:11** Perform a soil profile examination. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill.

	D-5:4 Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.

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PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area II.
Classifying

Content Skill Knowledge	Matching Curriculum Objectives
A. Use observable properties to classify a set of objects, organisms, or events.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.

B. Identify the properties on which a given classification system is based.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.
C. Place an object, organism or event into a classification system.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on.

	D-4:3 Discuss the chemical classifications of pesticides.

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PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area III.
Experimenting

Content Skill Knowledge	Matching Curriculum Objectives
A. Arrange the steps of a scientific problem in logical order.	**D-4:1** List methods of controlling plant pests.
B. Identify the independent variables, dependent variables, and control in an experimental set-up.	**D-4:1** List methods of controlling plant pests.
C. Use mathematics to show relationships within a given set of observations.	**D-4:1** List methods of controlling plant pests. **D-5:19** Calculate the cost of establishing an improved pasture management program.
D. Identify a hypothesis for a given problem.	**D-4:1** List methods of controlling plant pests.

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PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area IV.
Interpreting

Content Skill Knowledge	Matching Curriculum Objectives
A. Select appropriate predictions based on previously observed patterns of evidence.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
B. Report data in an appropriate manner.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage.

	D-4:1 List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
C. Predict data points not included on a given graph.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
D. Interpret line, bar, and circle graphs.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
E. Identify data that support or reject stated hypothesis.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage.

	D-4:1 List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
F. Accept or reject hypothesis when given results of an investigation.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
G. Identify discrepancies between stated hypothesis and actual results.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
H. Select the most logical conclusion for given experimental data.	**B-1:2** List the uses of a soil survey report. **D-3:4** Discuss types of insect damage.

	D-4:1 List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

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Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area V.
Communicating

Content Skill Knowledge	Matching Curriculum Objectives
A. Prepare a written report describing the sequence, results, and interpretation of an investigation or event.	**C-1:12** Complete a land judging score card when given the characteristics of a field. **C-1:13** Judge a field and complete the score card. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.
B. Communicate and defend a scientific argument.	**B-3:16** Select from a list the benefits of a liming program. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes. **D-5:18** Survey a pasture to recommend improvement practices.
C. Identify or create an appropriate graph or chart from collected data, table, or written description.	**B-3:15** Complete a chart on the most desirable pH scale range for crops. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.

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Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area VI.
Modeling

Content Skill Knowledge	Matching Curriculum Objectives
A. Select a model, which explains a given set of observations.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to.

	C-1:10 Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
B. Select predictions based on models.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses.

	C-1:11 Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
C. Compare a given model to the real world.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	C-2:3 Choose the correct word or phrase to complete statements about subdivisions. **D-5:15** Write six steps for renovating pastureland.

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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area VII.
Safety in the Science Classroom

Content Skill Knowledge	Matching Curriculum Objectives
A. Recognize potential hazards within a science activity.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions.

	A-2:6 Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection. **A-2:11** List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

B. Practice safety procedures in all science activities.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions. **A-2:6** Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection.

	A-2:11 List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area VIII.
Inquiry

Content Skill Knowledge	Matching Curriculum Objectives
A. Formulate a testable hypothesis and design an appropriate experiment relating to the world.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
B. Design and conduct scientific investigations in which variables are identified and controlled.	**C-1:2** List factors that determine land capability class. **D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

C. Use a variety of technologies, such as hand tools, measuring instruments, and computers to collect, analyze, and display data.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
D. Inquiries should lead to the formation of explanations or models (physical, conceptual, and mathematical). In answering questions, students should engage in discussions (based on scientific knowledge, the use of logic, and evidence from the investigations) and arguments that encourage the revision of their explanations, leading to further inquiry.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	D-1:12 Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area IX.
Structure and Properties of Matter

Content Skill Knowledge	Matching Curriculum Objectives
A. Matter is made up of minute particles called atoms, and atoms are composed of even smaller components.	**B-1:1** Describe the components of a soil survey report.
B. An element is composed of a single type of atoms. When elements are listed in order according to the number of protons (called the atomic number), repeating patterns of physical and chemical properties identify families of elements with similar properties.	**See supplement booklet to meet this PASS requirement.**
C. Matter has characteristic properties, such as boiling points, melting points, solubility, and density, which distinguish pure substances and can be used to separate one substance from another.	**B-1:7** Match soil structures to their definitions.

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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area X.
Chemical Reactions

Content Skill Knowledge	Matching Curriculum Objectives
A. Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is converted.	**B-2:3** Label a soil pH scale.
B. The rate of chemical reactions is affected by the concentration and temperature of the reacting material.	**B-2:3** Label a soil pH scale.

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PASS Skills
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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area XI.
Motion and Forces

Content Skill Knowledge	Matching Curriculum Objectives
A. Objects change their motion only when a net force is applied. Laws of motion are used to determine the effects of forces on the motion of objects.	**B-4:1** Describe the effects of wind and water erosion. **B-4:2** Match degrees of erosion to their correct definitions. **C-1:4** Match rates of surface runoff to their correct definitions.
B. Gravitation is a universal force that each mass exerts on any other mass.	**B-4:1** Describe the effects of wind and water erosion. **B-4:2** Match degrees of erosion to their correct definitions.

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PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Physical Science

PASS Content Standard Area XII.
Interactions of Energy and Matter

Content Skill Knowledge	Matching Curriculum Objectives
A. All energy can be considered to be either kinetic energy, which is the energy of motion: potential energy, which depends on relative position: or energy contained by a field, such as electromagnetic waves.	**B-1:4** Describe the types of soil water.
B. Waves, including sounds and seismic waves, waves on water, and light waves, have energy and can transfer energy when they interact with matter.	**B-3:26** List factors, which determine whether or not irrigation is feasible. **B-4:3** Match categories of water erosion to their correct definitions.

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PASS Skills Sub-Core: Physical Science

PASS Content Standard Area XIII.
The Earth System

Content Skill Knowledge	Matching Curriculum Objectives
A. Geologic time can be estimated by observing rock sequences and using fossils to correlate the sequences at various locations.	**A-1:1** Define soil. **D-5:9** Match range sites to their descriptions.
B. The solid crust of the earth consist of separate plates that move very slowly pressing against one another in some places and pulling apart in other places.	**A-1:2** State reasons why soil is important. **D-5:9** Match range sites to their descriptions.

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PASS Content Standard Area XIV.
The Universe

Content Skill Knowledge	Matching Curriculum Objectives
A. The stars differ from each other in size, temperature, and age, but they appear to be made up of the same elements that are found on the earth.	**See supplement booklet to meet this PASS requirement.**
B. Stars condense by gravity out of clouds of molecules of the lightest elements until nuclear fusion of the light elements into heavier ones began to occur. Fusion released great amounts of energy over millions of years. Eventually, some stars exploded, producing clouds of heavy elements from which other stars and planets could later condense. The process of star formation and destruction continues.	**B-1:5** Select from a list the primary, secondary, and micronutrients found in soil.

SOIL, PLANT, & CROP SCIENCE

SCIENCE

BIOLOGY

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PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Biology

PASS Content Standard Area I.
Observing and Measuring

Content Skill Knowledge	Matching Curriculum Objectives
A. Identify similar or different characteristics in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
B. Select qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment.

	D-2:15 Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
C. Identify qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-4:3** Match categories of water erosion to their correct definitions. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.
D. Use the appropriate Systems International (SI) units (grams, meters, liters, and degrees Celsius) to measure objects, organisms, or events.	**B-1:11** Perform a soil profile examination. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill.

	D-5:4 Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area II.
Classifying

Content Skill Knowledge	**Matching Curriculum Objectives**
A. Use observable properties to classify a set of objects, organisms, or events.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.

B. Identify the properties on which a given classification system is based.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.
C. Place an object, organism or event into a classification system.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on.

	D-4:3 Discuss the chemical classifications of pesticides.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area III.
Experimenting

Content Skill Knowledge	Matching Curriculum Objectives
A. Arrange the steps of a scientific problem in logical order.	**D-4:1** List methods of controlling plant pests.
B. Identify the independent variables, dependent variables, and control in an experimental set-up.	**D-4:1** List methods of controlling plant pests.
C. Use mathematics to show relationships within a given set of observations.	**D-4:1** List methods of controlling plant pests. **D-5:19** Calculate the cost of establishing an improved pasture management program.
D. Identify a hypothesis for a given problem.	**D-4:1** List methods of controlling plant pests.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area IV.
Interpreting

Content Skill Knowledge	Matching Curriculum Objectives
A. Select appropriate predictions based on previously observed patterns of evidence.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
B. Report data in an appropriate manner.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

C. Predict data points not included on a given graph.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
D. Interpret line, bar, and circle graphs.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
E. Identify data that support or reject stated hypothesis.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
F. Accept or reject hypothesis when given results of an investigation.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

G. Identify discrepancies between stated hypothesis and actual results.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
H. Select the most logical conclusion for given experimental data.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area V.
Communicating

Content Skill Knowledge	Matching Curriculum Objectives
A. Prepare a written report describing the sequence, results, and interpretation of an investigation or event.	**C-1:12** Complete a land judging score card when given the characteristics of a field. **C-1:13** Judge a field and complete the score card. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.
B. Communicate and defend a scientific argument.	**B-3:16** Select from a list the benefits of a liming program. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes. **D-5:18** Survey a pasture to recommend improvement practices.
C. Identify or create an appropriate graph or chart from collected data, table, or written description.	**B-3:15** Complete a chart on the most desirable pH scale range for crops. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area VI.
Modeling

Content Skill Knowledge	Matching Curriculum Objectives
A. Select a model, which explains a given set of observations.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to.

	C-1:10 Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
B. Select predictions based on models.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses.

	C-1:11 Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
C. Compare a given model to the real world.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	C-2:3 Choose the correct word or phrase to complete statements about subdivisions. **D-5:15** Write six steps for renovating pastureland.

Oklahoma Vocational Curriculum:
Embedded PASS Skills

Soil, Plant, & Crop Science: Science

CIMC Developed/
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Core Curriculum Area: Science

PASS Skills Sub-Core: Biology

PASS Content Standard Area VII.
Safety in the Science Classroom

Content Skill Knowledge	Matching Curriculum Objectives
A. Recognize potential hazards within a science activity.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions.

	A-2:6 Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection. **A-2:11** List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

B. Practice safety procedures in all science activities.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions. **A-2:6** Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection.

	A-2:11 List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

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Soil, Plant, & Crop Science: Science

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Core Curriculum Area: Science

PASS Skills Sub-Core: Biology

PASS Content Standard Area VIII.
Inquiry

Content Skill Knowledge	Matching Curriculum Objectives
A. Formulate a testable hypothesis and design an appropriate experiment relating to the world.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
B. Design and conduct scientific investigations in which variables are identified and controlled.	**C-1:2** List factors that determine land capability class. **D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

C. Use a variety of technologies, such as hand tools, measuring instruments, and computers to collect, analyze, and display data.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
D. Inquiries should lead to the formation of explanations or models (physical, conceptual, and mathematical). In answering questions, students should engage in discussions (based on scientific knowledge, the use of logic, and evidence from the investigations) and arguments that encourage the revision of their explanations, leading to further inquiry.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	D-1:12 Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area IX.
The Cell

Content Skill Knowledge	Matching Curriculum Objectives
A. Cells are the fundamental unit of life, comprised of a variety of structures that perform functions, such as transport information and synthesis of molecules.	**D-1:9** Define genetic engineering.
B. Cells function according to the information contained in DNA.	**D-1:9** Define genetic engineering.
C. Cells can differentiate and may develop into complex multi-cellular organisms.	**D-1:7** Label parts of a legume, grain, and tuber. **D-3:11** Match causes of infectious plant diseases to their correct descriptions.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area X.
The Molecular Basis of Heredity

Content Skill Knowledge	Matching Curriculum Objectives
A. In all organisms, the instructions for specifying the characteristics of the organism are carried in DNA, and changes in DNA (mutations) occur spontaneously at low rates.	**D-1:8** Describe methods of crop improvement. **D-1:9** Define genetic engineering. **D-1:10** Define cloning.
B. A sorting and recombination of genes in production results in a great variety of possible gene combinations from the offspring of any two parents.	**D-1:8** Describe methods of crop improvement. **D-1:9** Define genetic engineering. **D-1:10** Define cloning.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area XI.
Biological Diversity

Content Skill Knowledge	Matching Curriculum Objectives
A. Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.	**D-1:11** Describe uses of defoliants and growth inhibitors. **D-3:11** Match causes of infectious plant diseases to their correct descriptions.
B. Diversity of species is developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology, that enhance survival and reproductive success in a particular environment.	**D-1:1** Arrange in order the stages in the life cycle of plants. **D-1:2** Explain transpiration. **D-1:11** Describe uses of defoliants and growth inhibitors.

C. Extension occurs when the environment changes and the adaptive characteristics of a species are insufficient to its survival.	**D-1:11** Describe uses of defoliants and growth inhibitors.

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PASS Content Standard Area XII.
The Interdependence of Organisms

Content Skill Knowledge	Matching Curriculum Objectives
A. Matter on the earth cycles among the living and nonliving components of the biosphere.	**A-1:3** List the factors responsible for soil formation. **D-2:8** Describe methods of planting. **D-3:7** State ways weeds hinder crop production. **D-3:9** Discuss bird and wildlife damage. **D-4:4** Explain the principles of integrated pest management. **D-5:5** Match native grasses to their degree of palatability.

B. Energy flows through ecosystems in one direction.	**D-2:8** Describe methods of planting. **D-3:7** State ways weeds hinder crop production. **D-3:9** Discuss bird and wildlife damage. **D-4:4** Explain the principles of integrated pest management.
C. Organisms both cooperate and compete in ecosystems.	**A-1:6** Identify environmental issues affecting plant agriculture. **D-2:8** Describe methods of planting. **D-3:2** Explain how pests affect plant and crop growth. **D-3:7** State ways weeds hinder crop production. **D-3:9** Discuss bird and wildlife damage. **D-4:4** Explain the principles of integrated pest management. **D-6:1** Explain the importance of harvesting efficiently.

D. Living organisms have the capacity to produce populations of infinite size, but environments and resources limit population size.	**A-1:7** Describe the relationship between livestock and crop production. **D-2:8** Describe methods of planting. **D-3:7** State ways weeds hinder crop production. **D-3:9** Discuss bird and wildlife damage. **D-4:4** Explain the principles of integrated pest management. **D-5:5** Match native grasses to their degree of palatability. **D-6:1** Explain the importance of harvesting efficiently.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area XIII.
Matter, Energy, and Organization in Living Systems

Content Skill Knowledge	Matching Curriculum Objectives
A. The complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain the organism.	**A-1:3** List the factors responsible for soil formation. **D-1:1** Arrange in order the stages in the life cycle of plants. **D-1:2** Explain transpiration. **D-2:5** Identify characteristics of common plants. **D-3:3** Label the stages in the life cycle of common insects.

B. As matter and energy flow through different levels of organizations of living systems—cells , organs, organisms, and communities—and between living systems and the physical environment, chemical elements are recombined in different ways by different structures. Each recombination results in storage, use, and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.	**A-1:2** State reasons why soil is important. **D-2:5** Identify characteristics of common plants. **D-3:3** Label the stages in the life cycle of common insects.

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PASS Skills Sub-Core: Biology

PASS Content Standard Area XIV.
The Behavior of Organisms

Content Skill Knowledge	Matching Curriculum Objectives
A. Organisms have behavioral responses to internal changes and to external stimuli.	**A-1:4** Describe how plants use soil. **D-2:7** List factors affecting seeding ratings.
B. Broad patterns of behavior exhibited by animals have adapted to ensure reproductive success.	**A-1:4** Describe how plants use soil.

SOIL, PLANT, & CROP SCIENCE

SCIENCE

CHEMISTRY

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PASS Content Standard Area I.
Observing and Measuring

Content Skill Knowledge	Matching Curriculum Objectives
A. Identify similar or different characteristics in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
B. Select qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-1:6** Describe the soil textures. **D-2:14** Calibrate planting equipment.

	D-2:15 Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices. **D-6:7** Survey harvesting methods for two crops in your region.
C. Identify qualitative (descriptive) or quantitative (numerical) observations in a given set of objects, organisms, or events.	**B-4:3** Match categories of water erosion to their correct definitions. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill. **D-5:4** Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.
D. Use the appropriate Systems International (SI) units (grams, meters, liters, and degrees Celsius) to measure objects, organisms, or events.	**B-1:11** Perform a soil profile examination. **D-2:14** Calibrate planting equipment. **D-2:15** Calibrate a grain drill.

	D-5:4 Define animal unit. **D-5:18** Survey a pasture to recommend improvement practices.

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PASS Content Standard Area II.
Classifying

Content Skill Knowledge	Matching Curriculum Objectives
A. Use observable properties to classify a set of objects, organisms, or events.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.

B. Identify the properties on which a given classification system is based.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on. **D-4:3** Discuss the chemical classifications of pesticides.
C. Place an object, organism or event into a classification system.	**A-1:9** Use the binomial system of plan classification. **D-1:6** Discuss types of plants based upon their agronomic classification. **D-2:4** Identify common crop seeds. **D-3:8** Identify common weeds. **D-4:2** Name categories of pesticides and the pests they are used on.

	D-4:3 Discuss the chemical classifications of pesticides.

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PASS Skills Sub-Core: Chemistry

PASS Content Standard Area III.
Experimenting

Content Skill Knowledge	Matching Curriculum Objectives
A. Arrange the steps of a scientific problem in logical order.	**B-2:6** List the steps for collecting a soil sample. **D-4:1** List methods of controlling plant pests.
B. Identify the independent variables, dependent variables, and control in an experimental set-up.	**B-2:6** List the steps for collecting a soil sample. **D-4:1** List methods of controlling plant pests.
C. Use mathematics to show relationships within a given set of observations.	**B-2:6** List the steps for collecting a soil sample. **D-4:1** List methods of controlling plant pests.

	D-5:19 Calculate the cost of establishing an improved pasture management program.
D. Identify a hypothesis for a given problem.	**B-2:6** List the steps for collecting a soil sample. **D-4:1** List methods of controlling plant pests.

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PASS Skills Sub-Core: Chemistry

PASS Content Standard Area IV.
Interpreting

Content Skill Knowledge	Matching Curriculum Objectives
A. Select appropriate predictions based on previously observed patterns of evidence.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
B. Report data in an appropriate manner.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

C. Predict data points not included on a given graph.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
D. Interpret line, bar, and circle graphs.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
E. Identify data that support or reject stated hypothesis.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
F. Accept or reject hypothesis when given results of an investigation.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

G. Identify discrepancies between stated hypothesis and actual results.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.
H. Select the most logical conclusion for given experimental data.	**D-3:4** Discuss types of insect damage. **D-4:1** List methods of controlling plant pests. **D-5:18** Survey a pasture to recommend improvement practices.

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PASS Skills Sub-Core: Chemistry

PASS Content Standard Area V.
Communicating

Content Skill Knowledge	Matching Curriculum Objectives
A. Prepare a written report describing the sequence, results, and interpretation of an investigation or event.	**C-1:12** Complete a land judging score card when given the characteristics of a field. **C-1:13** Judge a field and complete the score card. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.
B. Communicate and defend a scientific argument.	**B-3:16** Select from a list the benefits of a liming program. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes. **D-5:18** Survey a pasture to recommend improvement practices.
C. Identify or create an appropriate graph or chart from collected data, table, or written description.	**B-3:15** Complete a chart on the most desirable pH scale range for crops. **D-5:6** Complete a chart listing characteristics of native grasses. **D-5:12** Complete a chart of important forage grasses. **D-5:13** Complete a chart of important forage legumes.

	D-5:18 Survey a pasture to recommend improvement practices.

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PASS Skills Sub-Core: Chemistry

PASS Content Standard Area VI.
Modeling

Content Skill Knowledge	Matching Curriculum Objectives
A. Select a model, which explains a given set of observations.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to.

	C-1:10 Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
B. Select predictions based on models.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses.

	C-1:11 Match factors that affect land capability class to the correct land treatments applied to each. **D-5:15** Write six steps for renovating pastureland.
C. Compare a given model to the real world.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	C-2:3 Choose the correct word or phrase to complete statements about subdivisions. **D-5:15** Write six steps for renovating pastureland.

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Core Curriculum Area: Science

PASS Skills Sub-Core: Chemistry

PASS Content Standard Area VII.
Safety in the Science Classroom

Content Skill Knowledge	Matching Curriculum Objectives
A. Recognize potential hazards within a science activity.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions.

	A-2:6 Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection. **A-2:11** List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

B. Practice safety procedures in all science activities.	**A-2:1** Describe the purpose of a Material Safety data Sheet. **A-2:2** Define acute and chronic toxicity. **A-2:3** Define oral, dermal, and inhalation toxicity. **A-2:4** List symptoms of pesticide poisoning. **A-2:5** Choose the word or phrase to complete statements about chemical safety precautions. **A-2:6** Complete statements about the importance of protective clothing and equipment. **A-2:7** Select from a list true statements concerning chemical storage. **A-2:8** Choose correct methods of hazardous waste disposal. **A-2:9** Discuss labeling of hazardous materials. **A-2:10** Choose the word or phrase to complete statements about chemical use and groundwater protection.

	A-2:11 List hand tool safety precautions and procedures. **A-2:12** List power tool safety precautions and procedures. **A-2:13** Complete statements concerning safety around large equipment. **A-2:14** Pass a chemical safety test with a score of 100%. **A-2:15** Interpret an MSDS.

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PASS Content Standard Area VIII.
Inquiry

Content Skill Knowledge	Matching Curriculum Objectives
A. Formulate a testable hypothesis and design an appropriate experiment relating to the world.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
B. Design and conduct scientific investigations in which variables are identified and controlled.	**C-1:2** List factors that determine land capability class. **D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

C. Use a variety of technologies, such as hand tools, measuring instruments, and computers to collect, analyze, and display data.	**D-1:12** Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.
D. Inquiries should lead to the formation of explanations or models (physical, conceptual, and mathematical). In answering questions, students should engage in discussions (based on scientific knowledge, the use of logic, and evidence from the investigations) and arguments that encourage the revision of their explanations, leading to further inquiry.	**C-1:5** Match land capability classes to their correct definitions. **C-1:6** Complete a chart on correct suitable uses of land capability classes. **C-1:7** Complete a chart on the best land capability class possible for certain soil factors. **C-1:8** List recommended land treatments applied to land capability classes. **C-1:9** Match types of vegetative practices to the correct land capability classes each is applied to. **C-1:10** Match types of mechanical treatments to their correct uses. **C-1:11** Match factors that affect land capability class to the correct land treatments applied to each.

	D-1:12 Calculate the percent of germination to determine the rate of application. **D-2:6** Choose an appropriate site for a specified crop.

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PASS Content Standard Area IX.
Structures and Properties of Matter

Content Skill Knowledge	Matching Curriculum Objectives
A. Matter is made of atoms and atoms are composed of even smaller components.	**A-1:8** Describe no-agricultural uses of plants.
B. Atoms interact with one another by transferring or sharing outer electrons that are farthest from the nucleus.	**B-2:2** Name the major items for which soils are tested. **B-3:11** Explain the Haber process of manufacturing nitrogen fertilizers.
C. An element is composed of a single type of atom. When elements are listed in order according to the number of protons, repeating patterns of physical and chemical properties identify families of elements with similar properties. This is the basis for the Periodic Table.	**B-2:3** Label a soil pH scale.

D. A compound is formed when two or more kinds of atoms bind together chemically. Each compound has unique chemical and physical properties.	**A-1:1** Define soil.
E. Solids, liquids, and gases differ in the energy that binds them together.	**B-1:4** Describe the types of soil water. **B-1:5** Select from a list the primary, secondary, and micronutrients found in soil. **C-1:3** Match degrees of permeability to their correct soil characteristics.

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Recommended Curriculum: Soil, Plant, & Crop Science LAPS

PASS Skills
Core Curriculum Area: Science

PASS Skills Sub-Core: Chemistry

PASS Content Standard Area X.
Chemical Reactions

Content Skill Knowledge	Matching Curriculum Objectives
A. Chemical reactions occur all around us. These reactions may release or consume energy but the total energy of the system remains constant.	**D-1:3** State the formula for respiration. **D-1:4** Explain the process of respiration. **D-1:5** State the formula for photosynthesis.
B. A large number of important reactions involve the transfer of either electrons (oxidation/reduction) or hydrogen ions (acid/base reactions).	**See supplement booklet to meet this PASS requirement.**
C. Reaction rates depend on the concentration and temperature of the reactants. Catalysts accelerate chemical reactions.	**See supplement booklet to meet this PASS requirement.**

SOIL, PLANT, & CROP SCIENCE

SCIENCE

SUMMARY

SUMMARY
PASS Skills in this particular analysis of Vocational Curriculum

Curriculum: Soil, Plant, & Crop Science LAPS

PASS: Science—Physical Science

PASS Summary and Strengths

The core curriculum area met the majority of PASS standard requirements. Of the fourteen PASS content standards fourteen were addressed. Of the forty-four content skills within the PASS content standards forty-two were addressed.

PASS Standards/Skills Not Addressed

AREA IX—Structures and Properties of Matter

B. An element is composed of a single type of atoms. When elements are listed in order according to the number of protons (called the atomic number), repeating patterns of physical and chemical properties identify families of elements with similar properties.

AREA XIV—The Universe

A. The stars differ from each other in size, temperature, and age, but they appear to be made up of the same elements that are found on the earth.

SUMMARY
PASS Skills in this particular analysis of Vocational Curriculum

Curriculum: Soil, Plant, & Crop Science LAPS

PASS: Science—Biology

PASS Summary and Strengths

The core curriculum area met all of the PASS standard requirements. Of the fourteen PASS content standards fourteen were addressed. Of the forty-seven content skills within the PASS content standards forty-seven were addressed.

PASS Standards/Skills Not Addressed

SUMMARY
PASS Skills in this particular analysis of Vocational Curriculum

Curriculum: Soil, Plant, & Crop Science LAPS

PASS: Science—Chemistry

PASS Summary and Strengths

The core curriculum area met the majority of PASS standard requirements. Of the ten PASS content standards ten were addressed. Of the thirty-nine content skills within the PASS content standards thirty-seven were addressed.

PASS Standards/Skills Not Addressed

AREA X—Chemical Reactions

B. A large number of important reactions involve the transfer of either electrons (oxidation/reduction) or hydrogen ions (acid/base reactions).

C. Reaction rates depend on the concentration and temperature of the reactants. Catalysts accelerate chemical reactions.

SOIL, PLANT, & CROP SCIENCE

ADDENDUM

ADDENDUM

PASS Skills Analysis of Vocational Curriculum
Soil, Plant, & Crop Science

PASS Requirements—Supplement Suggestions

Science—Physical Science	***Area IX—Structures and Properties of Matter***
	B. Use the periodic table to identify nutrients (elements) necessary in soil. Compare fertilizers and contents to prices and how they can be different: Using unit B-3 Soil, Plant, & Crop Science, Fertilizers & Irrigation.
	Area XIV—The Universe
	A. Compare nutrients and recomposition of soil to moon, stars, etc. to show its consistency: Using unit B-2 objective 5.
Science—Biology	***Met all PASS Standard Requirements***
Science—Chemistry	***Area X—Chemical Reactions***
	B. Discuss process (chemical change) in wet, dry and gas fertilizers and how they are made: Using unit B-3, Fertilizers.
	C. Discuss mixing fertilizers and safety (reactions to heat and other chemicals): Using unit B-3, Fertilizers and videos through the chemical companies.

NOTE: supplement information to meet PASS requirements using assignment sheets, job sheets, etc.

SOIL, PLANT, & CROP SCIENCE

SUPPLEMENT SAMPLE

ASSIGNMENT SHEET	*INVESTIGATING THE ELEMENTS IN FERTILIZERS*	**PASS-1**

Name _____Score_____

OBJECTIVE

Investigate the physical structure and properties of the nutrients in soil and fertilizers.

PASS Information

Core: Science
Sub-Core: Physical Science
Standard: Area IX — Structures and Properties of Matter
B — An element is composed of a single type of atom. When elements are listed in order according to the number of protons (called the *atomic number*), repeating patterns of physical and chemical properties identify families of elements with similar properties.

INTRODUCTION

You are going to investigate the atomic structures of the elements that are present in soil nutrients and fertilizers.

Remember, there are 2 kinds of atomic structures in soil nutrients and fertilizers:

- An *element* is a substance that contains only one kind of atom.
- A *molecule* contains 2 or more different kinds of atoms.

For this assignment, you will need a chart called a *periodic table.* This chart shows all the elements, grouped into related families based on their *atomic number* (the number of protons they contain).

INSTRUCTIONS

1. The primary, secondary, and micro plant nutrients are all elements. Look up each of these plant nutrients on the periodic table. Write down each nutrient's chemical symbol, its atomic number, and the names of other elements in the same family.

TABLE 1 Primary Plant Nutrients

Nutrient/ Element	Symbol	Atomic Number	Other Elements in Family
Nitrogen			
Phosphorus			
Potassium			

TABLE 2 Secondary Plant Nutrients

Nutrient/ Element	Symbol	Atomic Number	Other Elements in Family
Calcium			
Magnesium			
Sulfur			

TABLE 3 Micronutrients

Nutrient/ Element	Symbol	Atomic Number	Other Elements in Family
Boron			
Iron			
Manganese			
Zinc			
Copper			
Chlorine			
Molybdenum			

2. Fertilizers contain the 3 primary plant nutrients: nitrogen, phosphorus, and potassium. The phosphorus and the potassium atoms are often combined with atoms of a well-known gas to form molecules of chemical compounds. Review the information in Unit B-3 and the periodic table, then answer the following questions.

   a. What is the name of the gas with which the phosphorus and potassium atoms are often combined in fertilizers?

   _____

   b. What is the chemical symbol for this gas? _____

   c. What other elements belong to the same family as this gas? _____

   d. Write the name and molecular formula of the chemical compound that is created when phosphorus is combined with this gas:

   _____

   _____

   _____

   e. Write the name and molecular formula of the chemical compound that is created when potassium is combined with this gas:

   _____

   _____

   _____

3. Compare the prices of several types of fertilizers with different NPK ratios. Which elements seem to make fertilizer more expensive? Can you suggest any reasons for this?

   _____

   _____

   _____