Crosswalk Between: *Wisconsin's Model Academic Standards for Science* and
Wisconsin's Model Academic Standards for Agricultural Education
ANIMAL SCIENCE
FORT ATKINSON HIGH SCHOOL – FORT ATKINSON, WI
180 days (1 year)

Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

A. SCIENCE CONNECTIONS	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
A.12.1 Apply the underlying themes of science to develop defensible visions of the future	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Define genetic engineering 2. Define and explain the process of cloning 3. Understand the benefits of embryo transfer and artificial insemination 4. Summarize the reasons that aquaculture is a growing industry 5. Identify the types of aquatic animals produced in the United States
A.12.2 Show how conflicting assumptions about science themes lead to different opinions and decisions about evolution, health, population, longevity, education, and use of resources, and show how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Describe the economic importance of Animal Science 2. Explain the importance of the beef industry to the United State economy 3. Explain the importance of the poultry industry to the United States economy 4. Explain the importance of pets to the United States economy 5. Describe the role of animal products in the United States economy 6. Explain the reasons that some people object to modern animal agriculture 7. Defend the use of modern animal practices as related to animal health 8. Identify current issues in animal agriculture

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A.12.3 Give examples that show how partial systems, models, and explanations are used to give quick and reasonable solutions that are accurate enough for basic needs	A.12.2 Understand the variety, complexity, and size of the agricultural industry in the world B.12.1 Apply knowledge of technology to identify and solve problems D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products	1. Describe the role humans play in the development of Animal Science 2. Define genetic engineering 3. Define and explain the process of cloning 4. Understand the benefits of embryo transfer and artificial insemination 5. Identify current issues in animal agriculture
A.12.4 Construct arguments that show how conflicting models and explanations of events can start with similar evidence	E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the relationship of modern animal agriculture and the environment 2. Explain the production methods and environmental impact of livestock production
A.12.5 Show how the ideas and themes of science can be used to make real-life decisions about careers, work places, life-styles, and use of resources	B.12.5 Explore various career opportunities in the food, fiber, and natural resources industries using available forms of technology D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities F.12.4 Research a career in agricultural business marketing and management	1. Research and present a career in the animal science industry 2. List area Agribusinesses associated with animal Science
A.12.6 Identify and replace inaccurate personal models and explanations of science-related phenomena using evidence learned or discovered	D.12.5 Describe how biotechnology can enhance food and fiber production E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Define genetic engineering 2. Define and explain the process of cloning 3. Understand the benefits of embryo transfer and artificial insemination 4. Explain the relationship of modern animal agriculture and the environment 5. Explain the production methods and environmental impact of livestock production
A.12.7 Re-examine the evidence and reasoning that led to conclusions drawn from investigations, using the science themes	E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.4 Analyze practices used by farmers to reduce	1. Define genetic engineering 2. Define and explain the process of cloning 3. Understand the benefits of embryo transfer and artificial insemination

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	erosion and runoff to maintain soil fertility and productivity	4. Explain the relationship of modern animal agriculture and the environment 5. Explain the production methods and environmental impact of livestock production
B. NATURE OF SCIENCE	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
B.12.1 Show how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences	C.12.1 Demonstrate a working knowledge of leadership and leadership styles D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	1. Describe the role humans play in the development of Animal Science 2. Define genetic engineering 3. Define and explain the process of cloning 4. Understand the benefits of embryo transfer and artificial insemination 5. Identify current issues in animal agriculture 6. Defend the use of modern animal practices related to animal health 7. Explain why agriculturalists need to be sensitive to the concerns of consumers 8. Explain the importance of a safe food supply
B.12.2 Identify the cultural conditions that are usually present during great periods of discovery, scientific development, and invention	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production	1. Define genetic engineering 2. Define and explain the process of cloning 3. Understand the benefits of embryo transfer and artificial insemination 4. Identify current issues in animal agriculture 5. Defend the use of modern animal practices related to animal health 6. Explain why agriculturalists need to be sensitive to the concerns of consumers 7. Explain the importance of a safe food supply
B.12.3 Relate the major themes of science to human progress in understanding science and the world	D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.5 Analyze the impact and use of chemicals in the	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States

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	production and processing of food and fiber	3. Tell how non-traditional animals are sold, processed, and marketed
B.12.4 Show how basic research and applied research contribute to new discoveries, inventions, and applications	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States 3. Define genetic engineering 4. Define and explain the process of cloning 5. Understand the benefits of embryo transfer and artificial insemination 6. Explain the relationship of modern animal agriculture and the environment 7. Explain production methods and the environmental impact of livestock production
B.12.5 Explain how science is based on assumptions about the natural world and themes that describe the natural world	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries E.12.3 Explain the impact of climate change on existing agricultural systems D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources	1. Explain reasons that some people object to modern animal agriculture 2. Defend the use of modern animal practices as related to animal health 3. Explain why agriculturalists need tobe sensitive to the concerns of consumers
C. SCIENCE INQUIRY	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations of phenomena; build hypotheses that might answer some of these questions; design possible investigations; and describe results that might emerge from such investigations	B.12.1 Apply knowledge of technology to identify and solve problems C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes	1. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 2. Prepare a presentation on horses 3. Present a research project on the livestock industry 4. Present a research project on the the dairy industry 5. Make cheddar cheese, ice cream, yogurt, and butter 6. Make sausage 7. Identify the signs of a healthy animal 8. Administer medication

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		9. Take animal vital signs 10. Perform basic animal health care 11. Incubate eggs 12. Raise rabbits 13. Care for fish 14. Care for dogs and cats 15. Evaluate animals based on pedigrees, performance data, type, confirmation, and use 16. Evaluate dairy cattle for type and production 17. Evaluate livestock animals' type and production 18. Calculate the production cost of raising market animals 19. Calculate the rate of gain and feed efficiency of broilers 20. Calculate the cost to produce broilers and eggs 21. Calculate the cost to have a pet

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C.12.2 Identify issues from an area of science study, write questions that could be investigated, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions	B.12.1 Apply knowledge of technology to identify and solve problems C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Define genetic engineering 2. Define and explain the process of cloning 3. Understand the benefits of embryo transfer and artificial insemination 4. Present a research project on the dairy industry 5. Present a research project on the livestock industry 6. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 7. Prepare a presentation on horses 8. Incubate eggs 9. Make cheddar cheese, ice cream, yogurt, and butter 10. Make sausage 11. Administer medication 12. Take animal vital signs 13. Perform basic animal health care 14. Raise rabbits 15. Care for fish 16. Care for dogs and cats 17. Evaluate dairy cattle for type and production 18. Evaluate livestock animal's type and production 19. Calculate the production cost of raising market animals 20. Calculate the cost to produce broilers and eggs 21. Calculate the rate of gain and feed efficiency of broilers 22. Calculate the cost to have a pet 23. Explain the production methods and evironmental impact of livestock production 24. Summarize the reasons that aquaculture is a growing industry 25. Identify the types of aquatic animals produced in the United States 26. Explain the relationship of modern animal agriculture and the environment

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		27. Explain the production methods and environmental impact of livestock production
C.12.3 Evaluate the data collected during an investigation, critique the data-collection procedures and results, and suggest ways to make any needed improvements	B.12.1 Apply knowledge of technology to identify and solve problems B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1. Define genetic engineering 2. Understand the benefits of artificial insemination and embryo transfer 3. Define and explain the process of cloning 4. Present a research project on the dairy industry 5. Present a research project on the livestock industry 6. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 7. Prepare a presentation on horses 8. Incubate eggs 9. Make cheddar cheese, ice cream, yogurt, and butter 10. Make sausage 11. Administer medication 12. Take animal vital signs 13. Perform basic animal health care 14. Raise rabbits 15. Care for fish 16. Care for dogs and cats 17. Evaluate dairy cattle for type and production 18. Evaluate livestock animal's type and production 19. Calculate the production cost of raising market animals 20. Calculate the cost to produce broilers and eggs 21. Calculate the rate of gain and feed efficiency of broilers 22. Calculate the cost to have a pet 23. Explain the production methods and evironmental impact of livestock production 24. Summarize the reasons that aquaculture is a growing industry 25. Identify the types of aquatic animals produced in the United States

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		26. Explain the relationship of modern animal agriculture and the environment 27. Explain the production methods and environmental impact of livestock production
C.12.4 During investigations, choose the best data-collection procedures and materials, use them competently, and calculate the degree of precision of the resulting data	B.12.1 Apply knowledge of technology to identify and solve problems B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1. Define genetic engineering 2. Understand the benefits of artificial insemination and embryo transfer 3. Define and explain the process of cloning 4. Present a research project on the dairy industry 5. Present a research project on the livestock industry 6. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 7. Prepare a presentation on horses 8. Incubate eggs 9. Make cheddar cheese, ice cream, yogurt, and butter 10. Make sausage 11. Administer medication 12. Take animal vital signs 13. Perform basic animal health care 14. Raise rabbits 15. Care for fish 16. Care for dogs and cats 17. Evaluate dairy cattle for type and production 18. Evaluate livestock animal's type and production 19. Calculate the production cost of raising market animals 20. Calculate the cost to produce broilers and eggs 21. Calculate the rate of gain and feed efficiency of broilers 22. Calculate the cost to have a pet 23. Explain the production methods and evironmental impact of livestock production 24. Summarize the reasons that aquaculture is a growing industry

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		25. Identify the types of aquatic animals produced in the United States 26. Explain the relationship of modern animal agriculture and the environment 27. Explain the production methods and environmental impact of livestock production
C.12.5 Use the explanations and models found in earth and space, life and environmental, and physical sciences to develop likely explanations for the results of their investigations	B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1. Define genetic engineering 2. Understand the benefits of artificial insemination and embryo transfer 3. Define and explain the process of cloning 4. Present a research project on the dairy industry 5. Present a research project on the livestock industry 6. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 7. Prepare a presentation on horses 8. Incubate eggs 9. Make cheddar cheese, ice cream, yogurt, and butter 10. Make sausage 11. Administer medication 12. Take animal vital signs 13. Perform basic animal health care 14. Raise rabbits 15. Care for fish 16. Care for dogs and cats 17. Evaluate dairy cattle for type and production 18. Evaluate livestock animal's type and production 19. Calculate the production cost of raising market animals 20. Calculate the cost to produce broilers and eggs 21. Calculate the rate of gain and feed efficiency of broilers 22. Calculate the cost to have a pet 23. Explain the production methods and evironmental impact of livestock production

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		24. Summarize the reasons that aquaculture is a growing industry 25. Identify the types of aquatic animals produced in the United States 26. Explain the relationship of modern animal agriculture and the environment 27. Explain the production methods and environmental impact of livestock production
C.12.6 Present the results of investigations to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand	B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1. Present a research project on the dairy industry 2. Present a research project on the livestock industry 3. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 4. Prepare a presentation on horses 5. Incubate eggs 6. Make cheddar cheese, ice cream, yogurt, and butter 7. Make sausage 8. Administer medication 9. Take animal vital signs 10. Perform basic animal health care 11. Raise rabbits 12. Care for fish 13. Care for dogs and cats 14. Evaluate dairy cattle for type and production 15. Evaluate livestock animal's type and production 16. Calculate the production cost of raising market animals 17. Calculate the cost to produce broilers and eggs 18. Calculate the rate of gain and feed efficiency of broilers 19. Calculate the cost to have a pet 20. Explain the production methods and evironmental impact of livestock production 21. Summarize the reasons that aquaculture is a growing industry

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		22. Identify the types of aquatic animals produced in the United States 23. Explain the relationship of modern animal agriculture and the environment 24. Explain the production methods and environmental impact of livestock production
C.12.7 Evaluate articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design	B.12.1 Apply knowledge of technology to identify and solve problems B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1. Present a research project on the dairy industry 2. Present a research project on the livestock industry 3. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 4. Prepare a presentation on horses 5. Incubate eggs 6. Make cheddar cheese, ice cream, yogurt, and butter 7. Make sausage 8. Administer medication 9. Take animal vital signs 10. Perform basic animal health care 11. Raise rabbits 12. Care for fish 13. Care for dogs and cats 14. Evaluate dairy cattle for type and production 15. Evaluate livestock animal's type and production 16. Calculate the production cost of raising market animals 17. Calculate the cost to produce broilers and eggs 18. Calculate the rate of gain and feed efficiency of broilers 19. Calculate the cost to have a pet 20. Explain the production methods and evironmental impact of livestock production 21. Summarize the reasons that aquaculture is a growing industry 22. Identify the types of aquatic animals produced in the United States

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		23. Explain the relationship of modern animal agriculture and the environment 24. Explain the production methods and environmental impact of livestock production
D. PHYSICAL SCIENCE	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
Structures of Atoms and Matter		
D.12.1 Describe atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States 3. Explain the relationship of modern animal agriculture and the environment 4. Explain the production methods and environmental impact of livestock production
D.12.2 Explain the forces that hold the atom together and illustrate how nuclear interactions change the atom	No significant match found	
D.12.3 Explain exchanges of energy in chemical interactions and exchange of mass and energy in atomic/nuclear reactions	E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the relationship of modern animal agriculture and the environment 2. Explain the production methods and environmental impact of livestock production

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Chemical Reactions		
D.12.4 Explain how substances, both simple and complex, interact with one another to produce new substances	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States 3. Explain the relationship of modern animal agriculture and the environment 4. Explain the production methods and environmental impact of livestock production
D.12.5 Identify patterns in chemical and physical properties and use them to predict likely chemical and physical changes and interactions	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States 3. Explain the importance of a safe food supply 4. Explain why agriculturalists need to be sensitive to the concerns of consumers
D.12.6 Through investigations, identify the types of chemical interactions, including endothermic, exothermic, oxidation, photosynthesis, and acid/base reactions	D.12.5 Describe how biotechnology can enhance food and fiber production E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers
Motions and Forces		
D.12.7 Qualitatively and quantitatively analyze changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically	No significant match found	
D.12.8 Understand the forces of gravitation, the electromagnetic force, and the intermolecular force, and explain their impact on the universal system	No significant match found	
D.12.9 Describe models of light, heat, and sound and	D.12.5 Describe how biotechnology can enhance food and	1. Explain the importance of a safe food supply

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through investigations describe similarities and differences in the way these energy forms behave	fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
Conservation of Energy and the Increase in Disorder		
D.12.10 Using the science themes, illustrate the law of conservation of energy during chemical and nuclear reactions	No significant match found	
Interactions of Matter and Energy		
D.12.11 Using the science themes, explain common occurrences in the physical world	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
D.12.12 Using the science themes and knowledge of chemical, physical, atomic and nuclear interactions, explain changes in materials, living things, the earth's features, and	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers

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stars	within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States
E. EARTH AND SPACE SCIENCE	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will::***	
Energy in the Earth System		
E.12.1 Using the science themes, distinguish between internal energies (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show how these sources of energy have an impact on those systems	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world. E 12.3 Explain the impact of climate change on existing agricultural systems	
Geochemical Cycles		
E.12.2 Analyze the geochemical and physical cycles of the earth and use them to describe movements of matter	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world E 12.3 Explain the impact of climate change on existing agricultural systems	
The Origin and Evolution of the Earth System		
E.12.3: Using the science themes, describe theories of the origins and evolution of the universe and solar system, including the earth system as a part of the solar system, and relate these theories and their implications to geologic time on earth	E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems. E.12.4 Anaylze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	1. Explain the relationship of modern animal agriculture and the environment 2. Explain the production methods and environmental impact of livestock production
E.12.4 Analyze the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain the consequences to the environment	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production.	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry

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	D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact. E.12.2 Analyze benefits, costs, and consequences of land use E.12.4 Anaylze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment.	4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
The Origin and Evolution of the Universe		
E.12.5 Using the science themes, understand that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin	No significant match	
F. LIFE AND ENVIRONMENTAL SCIENCE	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
The Cell		
F.12.1 Evaluate the normal structures and the general and special functions of cells in single-celled and multiple-celled organisms	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact.	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production

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F.12.2 Understand how cells differentiate and how cells are regulated	D.12.5 Describe how biotechnology can enhance food and fiber production. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Explain the relationship of modern animal agriculture and the environment 4. Explain the production methods and environmental impact of livestock production
The Molecular Basis of Heredity		
F.12.3 Explain current scientific ideas and information about the molecular and genetic basis of heredity	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
F.12.4 State the relationships between functions of the cell and functions of the organism as related to genetics and heredity	D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
Biological Evolution		

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F.12.5 Understand the theory of evolution, natural selection, and biological classification	D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources.	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States
F.12.6 Using concepts of evolution and heredity, account for changes in species and the diversity of species, including the influence of these changes on science, e.g., breeding of plants or animals	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
The Interdependence of Organisms		
F.12.7 Investigate how organisms both cooperate and compete in ecosystems	E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the relationship of modern animal agriculture and the environment 2. Explain the production methods and environmental impact of livestock production

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F.12.8 Using the science themes, infer changes in ecosystems prompted by the introduction of new species, environmental conditions, chemicals, and air, water, or earth pollution	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers 3. Summarize the reasons that aquaculture is a growing industry 4. Identify the types of aquatic animals produced in the United States 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production
Matter, Energy, and Organization in Living Systems		
F.12.9 Using the science themes, investigate energy systems (related to food chains) to show how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism	D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products E.12.3 Explain the impact of climate change on existing agricultural systems	
F.12.10 Understand the impact of energy on organisms in living systems	No significant match found	
F.12.11 Investigate how the complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain an organism	D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world	

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	D.12.5 Describe how biotechnology can enhance food and fiber production. E.12.3 Explain the impact of climate change on existing agricultural systems	
The Behavior of Organisms		
F.12.12 Trace how the sensory and nervous systems of various organisms react to the internal and external environment and transmit survival or learning stimuli to cause changes in behavior or responses	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production E.12.3 Explain the impact of climate change on existing agricultural systems	1. Explain the importance of a safe food supply 2. Explain why agriculturalists need to be sensitive to the concerns of consumers
G. SCIENCE APPLICATIONS	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will:***	
G.12.1 Identify personal interests in science and technology; account for implications that these interests might have for future education, and options to be considered	D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities B.12.5 Explore various career opportunities in the food, fiber, and natural resources industries using available forms of technology B.12.6 Access information identifying the postsecondary education programs, both in and outside of Wisconsin, leading to careers in the food, fiber, and natural F.12.4 Research a career in agricultural business marketing and management	1. Identify the major areas of beef production in the United States 2. Identify the major areas of swine production in the United States 3. Identify the major areas of sheep production in the United States 4. Explain the production methods and environmental impact of livestock production 5. Identify the major areas of broiler and egg production in the United States 6. Define vertical integration
G.12.2 Design, build, evaluate, and revise models and explanations related to the earth and space, life and environmental, and physical sciences	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce soil erosion and runoff to maintain soil fertility and productivity	1. Explain the production methods and environmental impact of livestock production

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G.12.3 Analyze the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the community	A.12.2 Understand the variety, complexity, and size of the agricultural industry in the world A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber B.12.1 Apply knowledge of technology to identify and solve problems B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Describe the economic importance of Animal Science 2. Identify the major areas of dairy production in the United States 3. Identify the major areas of beef production in the United States 4. Identify the major areas of swine production in the United States 5. Identify the major areas of sheep production in the United States 6. Identify the major areas of broiler and egg production in the United States 7. Understand the importance of modern animal agriculture 8. Understand the importance of horses throughout the history of the United States 9. Discuss the importance of the horse industry 10. Describe the role of animal products in the United States economy 11. Understand the different products derived from animals 12. Explain the importance of a safe food supply 13. Summarize the reasons that aquaculture is a growing industry 14. Identify the types of aquatic animals produced in the United States 15. Explain the relationship of modern animal agriculture and the environment 16. Explain the production methods and environmental impact of livestock production
G.12.4 Show how a major scientific or technological change has had an impact on work, leisure, or the home	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.6 Understand the impact emerging technologies	1. Prepare a 5-minute presentation on a current issue dealing with animal agriculture 2. Define and explain the process of cloning 3. Understand the benefits of artificial insemination

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	within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources	and embryo transfer 4. Summarize the reasons that aquaculture is a growing industry 5. Identify the types of aquatic animals produced in the United States
G.12.5 Choose a specific problem in our society, identify alternative scientific or technological solutions to that problem and argue its merits	B.12.1 Apply knowledge of technology to identify and solve problems	
H. SCIENCE IN SOCIAL AND PERSONAL PERSPECTIVES	**Agricultural Education Standards**	**Crosswalk of Local School Curriculum**
Performance Standards	**Performance Standards**	
By the end of Grade 12 students will:	***By the end of Grade 12 students will::***	
H.12.1 Using the science themes and knowledge of the earth and space, life and environmental, and physical sciences, analyze the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region	A.12.1 Identify how political policies and issues shape and influence food and fiber systems A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries cite examples of conflicts between environmentalists and producers of food and fiber E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1. Identify current issues in animal agriculture 2. Defend the use of modern animal practices related to animal health 3. Explain why agriculturalists need to be sensitive to the concerns of consumers 4. Explain the relationship of modern animal agriculture and the environment 5. Explain the production methods and environmental impact of livestock production 6. Explain the reasons that some people object to modern animal agriculture 7. Explain how people have influenced the development of domesticated animals

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H.12.2 Evaluate proposed policy recommendations (local, state, and/or national) in science and technology for validity, evidence, reasoning, and implications, both short and long term	A.12.1 Identify how political policies and issues shape and influence food and fiber systems B.12.1 Apply knowledge of technology to identify and solve problems C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries E.12.2 Analyze benefits, costs, and consequences of land use F.12.1 Describe how the production, distribution, and marketing of food and fiber is part of a complex economic system	1. Explain the production methods and environmental impact of livestock production 2. Incubate eggs 3. Make cheddar cheese, ice cream, yogurt, and butter 4. Make sausage 5. Administer medication 6. Take animal vital signs 7. Perform basic animal health care 8. Raise rabbits 9. Care for fish 10. Care for dogs and cats 11. Evaluate dairy cattle for type and production 12. Evaluate livestock animal's type and production 13. Calculate the production cost of raising market Animals 14. Calculate the cost to produce broilers and eggs 15. Calculate the rate of gain and feed efficiency of Broilers 16. Calculate the cost to have a pet 17. Explain the reasons that some people object to modern animal agriculture 18. Explain how people have influenced the development of domesticated animals 19. Defend the use of modern animal practices related to animal health 20. Explain why agriculturalists need to be sensitive to the concerns of consumers
H.12.3 Show how policy decisions in science depend on many factors, including social values, ethics, beliefs, and time-frames, and considerations of science and technology	A.12.1 Identify how political policies and issues shape and influence food and fiber systems B.12.1 Apply knowledge of technology to identify and solve problems D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries E.12.2 Analyze benefits, costs, and consequences of land	1. Explain the reasons that some people object to modern animal agriculture 2. Explain how people have influenced the development of domesticated animals 3. Defend the use of modern animal practices related to animal health 4. Explain why agriculturalists need to be sensitive to

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	use E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment F.12.1 Describe how the production, distribution, and marketing of food and fiber is part of a complex economic system	the concerns of consumers 5. Explain the relationship of modern animal agriculture and the environment 6. Explain the production methods and environmental impact of livestock production 7. Tell how milk is sold, processed, and marketed 8. Describe the economic importance of Animal Science 9. Explain the importance of the beef industry to the United State economy 10. Explain the importance of the poultry industry to the United States economy 11. Explain the importance of pets to the United States economy 12. Describe the role of animal products in the United States economy
H.12.4 Advocate a solution or combination of solutions to a problem in science or technology	B.12.1 Apply knowledge of technology to identify and solve problems D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources	1. Summarize the reasons that aquaculture is a growing industry 2. Identify the types of aquatic animals produced in the United States
H.12.5 Investigate how current plans or proposals concerning resource management, scientific knowledge, or technological development will have an impact on the environment, ecology, and quality of life in a community or region	A.12.1 Identify how political policies and issues shape and influence food and fiber systems A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber B.12.1 Apply knowledge of technology to identify and solve problems D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.6 Understand the impact emerging technologies	1. Explain the reasons that some people object to modern animal agriculture 2. Explain how people have influenced the development of domesticated animals 3. Defend the use of modern animal practices related to animal health 4. Explain why agriculturalists need to be sensitive to the concerns of consumers 5. Summarize the reasons that aquaculture is a growing

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	within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.2 Analyze benefits, costs, and consequences of land use E 12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	industry 6. Identify the types of aquatic animals produced in the United States 7. Explain the production methods and environmental impact of livestock production
H.12.6 Evaluate data and sources of information when using scientific information to make decisions.	B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries	1. Explain the reasons that some people object to modern animal agriculture 2. Explain how people have influenced the development of domesticated animals 3. Defend the use of modern animal practices related to animal health 4. Explain why agriculturalists need to be sensitive to the concerns of consumers
H.12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning.	B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries	1. Explain the reasons that some people object to modern animal agriculture 2. Explain how people have influenced the development of domesticated animals 3. Defend the use of modern animal practices related to animal health 4. Explain why agriculturalists need to be sensitive to the concerns of consumers

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