

# Curriculum Report

**Teacher Name:** Lora Finch

**Course Title:** Zoology

## **Segments Covered:**

Animal Anatomy & Physiology,  
Animal Genetics & Reproduction,  
Domestic Animal Production,  
Animal Health & Nutrition,  
Career Readiness & Leadership

## **AFNRE Standards Covered:**

**Technical I.B.2 (Animal Anatomy & Physiology):** Apply principles of comparative anatomy and physiology to uses within various animal systems.,

**Technical I.F.1 (Animal Anatomy & Physiology):** Demonstrate safe animal handling and management techniques. ,

**Technical I.F.2 (Animal Anatomy & Physiology):** Implement procedures to ensure that animal products are safe.,

**Pathway I.B.1 (Animal Anatomy & Physiology):** Examine animal developmental stages.,

**Pathway I.C.1 (Animal Anatomy & Physiology):** Describe basic functions of animal cells, organs and systems.,

**Pathway I.C.2 (Animal Anatomy & Physiology):** Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.,

**Technical I.B.3 (Animal Genetics & Reproduction):** Select animals for specific purposes and maximum performance based on anatomy and physiology. ,

**Technical I.E.1 (Animal Genetics & Reproduction):** Evaluate the male and female reproductive systems in selecting animals.,

**Technical I.E.2 (Animal Genetics & Reproduction):** Evaluate animals for breeding readiness and soundness. ,

**Technical I.E.3 (Animal Genetics & Reproduction):** Apply scientific principles in the selection and breeding of animals. ,

**Technical I.A.1 (Domestic Animal Production):** Evaluate the development and implications of animal origin, domestication and distribution. ,

**Technical I.B.1 (Domestic Animal Production):** Classify animals according to hierarchical taxonomy and agriculture use. ,

**Technical I.G.1 (Domestic Animal Production):** Design animal housing, equipment and handling facilities for the major systems of animal production. ,

**Technical I.G.2 (Domestic Animal Production):** Comply with government regulations and safety standards for facilities used in animal production. ,

**Pathway I.A.1 (Domestic Animal Production):** Explain the variety and scope of managed animal systems in the United States and around the world including: livestock, poultry, aquaculture, companion animals, zoo animals, and exotic animals. ,

**Pathway I.A.2 (Domestic Animal Production):** Explain the historical development of animal systems around the world. ,

**Pathway I.A.3 (Domestic Animal Production):** Describe trends in the animal systems industry.,

**Pathway I.A.4 (Domestic Animal Production):** Recognize the historical, social, cultural and potential applications of biotechnology in the animal systems industry. ,

**Technical I.C.1 (Animal Health & Nutrition):** Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders. ,

**Technical I.C.2 (Animal Health & Nutrition):** Provide for the biosecurity of agricultural animals and production facilities. ,

**Technical I.D.1 (Animal Health & Nutrition):** Formulate feed rations to provide for the nutritional needs of animals. ,

**Technical I.D.2 (Animal Health & Nutrition):** Prescribe and administer animal feed additives and growth promotants in animal production. ,

**Pathway I.B.2 (Animal Health & Nutrition):** Assess whether the nutritional requirements of a given animal are being met by recording performance and comparing feed variations. ,

**Pathway I.B.3 (Animal Health & Nutrition):** Design a nutritional plan for a given animal with a clearly stated outcome. ,

**Career Cluster I.E.1 (Career Readiness & Leadership):** Locate and identify career opportunities that appeal to personal career goals. ,

**Career Cluster I.E.2 (Career Readiness & Leadership):** Match personal interest and aptitudes to selected careers. ,

**Career Cluster I.E.3 (Career Readiness & Leadership):** Provide examples and descriptions of various careers in each of the AFNR pathways. ,

**Career Ready Practice I.A.1 (Career Readiness & Leadership):** Act as a responsible and contributing citizen and employee. ,

**Career Ready Practice I.A.2 (Career Readiness & Leadership):** Apply appropriate academic and technical skills. ,

**Career Ready Practice I.A.3 (Career Readiness & Leadership):** Attend to personal health and financial well-being. ,

**Career Ready Practice I.A.4 (Career Readiness & Leadership):** Communicate clearly, effectively and with reason. ,

**Career Ready Practice I.A.6 (Career Readiness & Leadership):** Demonstrate creativity and innovation. ,

**Career Ready Practice I.A.7 (Career Readiness & Leadership):** Employ valid and reliable research strategies. ,

**Career Ready Practice I.A.8 (Career Readiness & Leadership):** Model integrity, ethical leadership and effective management. ,

**Career Ready Practice I.A.9 (Career Readiness & Leadership):** Plan education and career path aligned to personal goals. ,

**Career Ready Practice I.A.10 (Career Readiness & Leadership):** Use technology to enhance productivity. ,

**Career Ready Practice I.A.11 (Career Readiness & Leadership):** Utilize critical thinking to make sense of problems and persevere in solving them. ,

**Career Ready Practice I.A.12 (Career Readiness & Leadership):** Work productively in teams while using cultural/global competence.

### **NGSS Alignment:**

**HS-LS1-1.** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. (AFNRE Standard Linked: Pathway I.C.1),

**HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. (AFNRE Standards Linked: Technical I.B.2; Pathway I.C.2; Technical II.A.2; Technical II.A.3; Pathway II.B.1; Pathway II.B.2; Pathway II.B.3),

**HS-LS1-3.** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. (AFNRE Standards Linked: Pathway I.B.2; Pathway II.B.3; Pathway II.A.1; Pathway II.A.2; Technical II.B.1),

**HS-LS1-4.** Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. (AFNRE Standards Linked: Technical I.E.1; Technical.E.3),

**HS-LS1-7.** Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. (AFNRE Standards Linked: Pathway I.B.2; Technical I.D.1),

**HS-LS2-3.** Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. (AFNRE Standards Linked: Pathway I.C.1; Technical II.A.2; Pathway II.B.1; Technical II.A.3; Pathway II.B.3; Pathway II.C.2; Technical III.A.2; Career Cluster I.F.1; Career Cluster I.F.2),

**HS-LS2-8.** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. (AFNRE Standards Linked: Technical I.B.3; Technical I.E.2),

**HS-LS3-1.** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. (AFNRE Standards Linked: Technical I.E.3; Technical II.A.2; Pathway I.C.1),

**HS-LS3-2.** Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. (AFNRE Standards Linked: Technical I.E.3; Technical I.B.3; Pathway I.A.4; Pathway II.C.6; Career Cluster I.A.6; Career Cluster I.A.7),

**HS-LS3-3.** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. (AFNRE Standards Linked: Technical I.E.3; Technical I.A.3; Technical II.C.2; Pathway II.C.3; Pathway II.C.1) ,

**HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. (AFNRE Standards Linked: Pathway I.C.2; Technical I.A.1; Technical I.B.1; Pathway I.A.2; Technical II.A.1; Pathway II.B.2; Pathway II.C.6; Career Cluster I.A.6; Career Cluster I.A.7),

**HS-LS4-2.** Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. (AFNRE Standards Linked: Technical III.A.2; Pathway II.C.6; Career Cluster I.A.6; Pathway I.C.2; Technical I.A.1; Technical I.B.1; Pathway I.A.2; Technical II.A.1; Pathway II.B.2; Career Cluster I.A.7) ,

**HS-LS4-4.** Construct an explanation based on evidence for how natural selection leads to adaptation of populations. (AFNRE Standards Linked: Technical I.A.1; Pathway I.A.2; Pathway I.A.4; Technical II.B.1; Career Cluster I.D.2; Career Cluster I.F.1),

**HS-ESS2-7.** Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. (AFNRE Standards Linked: Technical I.A.1; Pathway I.A.2)

### Teaching Ideas:

#### AFNRE Standard: Pathway I.A.2

**NGSS Link: HS-LS4-1** (a) Chicken embryo development lab - Andrea Mayack; (b) Class discussion of species and cultivars of horticultural plants; (c) Video: Islands and Evolution - Discover Education

**NGSS Link: HS-LS4-2** (a) Oh Deer - Project Wild (Carrie Preston); (b) Turkey Trouble - Project Wild (Tate Forbush); (c) Discussion topics related to genetic modification

**NGSS Link: HS-LS4-4** (a) Discussion idea: plants that act as perennials in higher climate zones and annuals in lower climate zones; (b) Discussion idea: water quality affects populations of species; (c) Video: Standard Deviants: Evolutionary Biology

**NGSS Link: HS-ESS2-7** (a) Students create the management practices for a specific animal and geographic location; (b) World Food Prize; (c) Research on the origins of breeds of animal species. ,

#### AFNRE Standard: Pathway I.A.3

**NGSS Link: HS-LS3-3** (a) Probability Lab using Coins Cards and Dice - Tate Forbush; (b) EPD Discussion: how some traits are more hereditary - Ally Harwell,

#### AFNRE Standard: Pathway I.A.4

**NGSS Link: HS-LS3-2** (a) Discussion idea: GMO technology and pesticide resistance

**NGSS Link: HS-LS4-4** (a) Discussion idea: plants that act as perennials in higher climate zones and annuals in lower climate zones; (b) Discussion idea: water quality affects populations of species; (c) Video: Standard Deviants: Evolutionary Biology,

#### AFNRE Standard: Pathway I.B.2

**NGSS Link: HS-LS1-3** (a) Agriscience Fair; (b) poultry contest; (c) rabbit contest

**NGSS Link: HS-LS1-7** (a) lab on general respiration using jumping jacks and testing CO<sub>2</sub> in body (using Methylene Blue) (Cassie Forbush); (b) Project Wild -- carrying capacity of ecosystems (Jessi Spry); (c)

protein amounts in hay vs grain vs grasses etc.; (d) use tags from various feeds and determine which animals could eat what based on what's inside (Jessi Spry),

**AFNRE Standard: Pathway I.C.1**

**NGSS Link: HS-LS1-1** (a) create 3-D models/drawings of different systems; (b) create a lesson on a body system and teach the rest of the class

**NGSS Link: HS-LS2-3** (a) Make pickles or sauerkraut; (b) Counting Owl pellets; (c) Ruminant investigation - stomachs; (d) Plants in different amounts of light; (e) CASE Activity 5.2.5 Refueling Plants or Activity 5.2.4 Sugar from the Sun: Where Did They Come From?; (f) Lesson NOAA Ocean Explorer

**NGSS Link: HS-LS3-1** (a) Punnett Square Labs - NAAE Community of practice (ICEV); (b) Critter Lab - Rebel Smith & Carrie Preston,

**AFNRE Standard: Pathway I.C.2**

**NGSS Link: HS-LS1-2** (a) create 3-D models/drawings of different systems; (b) create a lesson on a body system and teach the rest of the class

**NGSS Link: HS-LS4-1** (a) Chicken embryo development lab - Andrea Mayack; (b) Class discussion of species and cultivars of horticultural plants; (c) Video: Islands and Evolution - Discover Education

**NGSS Link: HS-LS4-2** (a) Oh Deer - Project Wild (Carrie Preston); (b) Turkey Trouble - Project Wild (Tate Forbush); (c) Discussion topics related to genetic modification,

**AFNRE Standard: Technical I.A.1**

**NGSS Link: HS-LS4-1** (a) Chicken embryo development lab - Andrea Mayack; (b) Class discussion of species and cultivars of horticultural plants; (c) Video: Islands and Evolution - Discover Education

**NGSS Link: HS-LS4-2** (a) Oh Deer - Project Wild (Carrie Preston); (b) Turkey Trouble - Project Wild (Tate Forbush); (c) Discussion topics related to genetic modification

**NGSS Link: HS-LS4-4** (a) Discussion idea: plants that act as perennials in higher climate zones and annuals in lower climate zones; (b) Discussion idea: water quality affects populations of species; (c) Video: Standard Deviants: Evolutionary Biology

**NGSS Link: HS-ESS2-7** (a) Students create the management practices for a specific animal and geographic location; (b) World Food Prize,

**AFNRE Standard: Technical I.B.1**

**NGSS Link: HS-LS4-1** (a) Chicken embryo development lab - Andrea Mayack; (b) Class discussion of species and cultivars of horticultural plants; (c) Video: Islands and Evolution - Discover Education

**NGSS Link: HS-LS4-2** (a) Oh Deer - Project Wild (Carrie Preston); (b) Turkey Trouble - Project Wild (Tate Forbush); (c) Discussion topics related to genetic modification,

**AFNRE Standard: Technical I.B.2**

**NGSS Link: HS-LS1-2** (a) create 3-D models/drawings of different systems; (b) create a lesson on a body system and teach the rest of the class,

**AFNRE Standard: Technical I.B.3**

**NGSS Link: HS-LS2-8** (a) The animal dating game; (b) Adaptations lab (finch lab/Darwin); (c) Oh Behave! Animal behaviors lab; (d) Meat rabbit contest; (e) Broiler contest

**NGSS Link: HS-LS3-2** (a) Discussion ideas: GMO technology and pesticide resistance,

**AFNRE Standard: Technical I.D.1**

**NGSS Link: HS-LS1-7** (a) lab on general respiration using jumping jacks and testing CO<sub>2</sub> in body (using Methylene Blue) (Casie Forbush); (b) Project Wild -- carrying capacity of ecosystems (Jessi Spry); (c) protein amounts in hay vs grain vs grasses etc.; (d) use tags from various feeds and determine which animals could eat what based on what's inside (Jessi Spry),

**AFNRE Standard: Technical I.E.1**

**NGSS Link: HS-LS1-4** (a) create mitosis stages with oreos and sprinkles (Casie Forbush) or sugar cookies and icing (Jessi Spry); (b) how to read an EPD; (c) evolution conversations -- survival of the fittest etc.; (d) polled vs horned cattle; (e) broiler contest - cell differentiation (stages in broiler chicks in their first

few days of development in an egg, or candle eggs),

**AFNRE Standard: Technical I.E.2**

**NGSS Link: HS-LS2-8** (a) The animal dating game; (b) Adaptations lab (finch lab/Darwin); (c) Oh Behave! Animal behaviors lab; (d) Meat rabbit contest; (e) Broiler contest,

**AFNRE Standard: Technical I.E.3**

**NGSS Link: HS-LS1-4** (a) create mitosis stages with oreos and sprinkles (Casie Forbush) or sugar cookies and icing (Jessi Spry); (b) how to read an EPD; (c) evolution conversations -- survival of the fittest etc.; (d) polled vs horned cattle; (e) broiler contest - cell differentiation (stages in broiler chicks in their first few days of development in an egg, or candle eggs)

**NGSS Link: HS-LS3-1** (a) Punnett Square Labs - NAAE Community of practice (ICEV); (b) Critter Lab - Rebel Smith & Carrie Preston

**NGSS Link: HS-LS3-2** (a) Discussion ideas: GMO technology and pesticide resistance

**NGSS Link: HS-LS3-3** (a) Probability Lab using Coins Cards and Dice - Tate Forbush; (b) EPD Discussion: how some traits are more hereditary - Ally Harwell