

The *Colorado Reader* is a FREE cross curricular resource designed to reinforce Colorado Academic Standards using real-world, fact-based, unbiased agricultural and food content that is relatable to students.

Purpose:

Students will explore the concept of a food ecosystem - human society, animal agriculture, and plant agriculture all rely on each other and together to protect our environment.

Cross Curricular Connections and Colorado Academic Standards:

3rd Grade Science: Life Science

- Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change (3-LS4-4)

4th Grade Science: Life Science

- Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction (4-LS1-1)

5th Grade Science: Life Science

- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment (5-LS2-1)

3rd, 4th, and 5th Grade Reading, Writing, and Communicating: Reading for all Purposes

- Apply strategies to fluently read, comprehend, interpret, and analyze various types of informational texts.

How to use:

Pass out one copy of the *Colorado Reader* to each student. You could also send these items home with your students (or include in homework/enrichment packets) to complete at home on virtual learning days. Review the provided vocabulary with your students. Ask your students to read the *Colorado Reader*, completing the activities within the *Reader* as they go. Answers to the activities in the *Reader* are on the back, should you desire to collect and score responses. **An online assessment for student responses is also available. Link: <https://bit.ly/3mcxtsK>. An essay question has been added to the online assessment asking students to predict what would happen if they eliminated one factor of the food ecosystem.**

Vocabulary:

abiotic: relating to nonliving things in an environment

anaerobic digestion: a sequence of processes by which microorganisms break down biodegradable material in the absence of oxygen

biofuel: a fuel derived directly from living matter

biogas: a gas mixture produced during anaerobic digestion that contains methane and carbon dioxide; biogas can be burned as an energy source

biotic: relating to living things in an environment

byproduct: something that is made in addition to or that is leftover from the production of the desired good; can still be very useful in different ways

calorie: a unit of heat energy; the amount of heat required to raise the temperature of one gram of water one degree Celsius. It is used to indicate the amount of energy that foods will produce in the human body

climate: the weather of a particular region over a series of years

ecosystem: a biological community of living organisms interacting with nonliving parts of their environment

fossil fuels: a natural fuel, such as coal or gas, formed in the geological past from the remains of living organisms

grazing: to eat grass or other plants that are growing in a field, pasture, etc.

greenhouse effect: the trapping of the sun's warmth in a planet's lower atmosphere

greenhouse gas: a gas that contributes to the greenhouse effect by absorbing infrared radiation

methane: a colorless, odorless flammable gas which is the main constituent of natural gas

monogastric: an animal with a simple single-chambered stomach (one stomach)

nutrient: a substance that provides nourishment essential for growth and maintenance of life

renewable resource: natural resources that can be replaced naturally or by human efforts at a sustainable rate

rumen: the first stomach of a ruminant, which receives food or cud from the esophagus, partly digests it with the aid of bacteria, and passes it to the reticulum

ruminant: an animal that uses a series of stomach compartments and chew its cud in order to digest plant cellulose

shearing: cutting wool off of an animal

upcycle: reuse discarded material in such a way as to create a produce of higher quality or value than the original

weather: the state of the atmosphere in regard to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness

Support Videos:

A variety of student-appropriate videos for various grade levels are available to support the content of the *Colorado Reader*. Access the video playlist by searching for the Colorado Foundation for Agriculture on YouTube or using this link: <https://bit.ly/3ALUPJL>



Guide for How to Use the *Colorado Reader* With Your Students

The Food Ecosystem

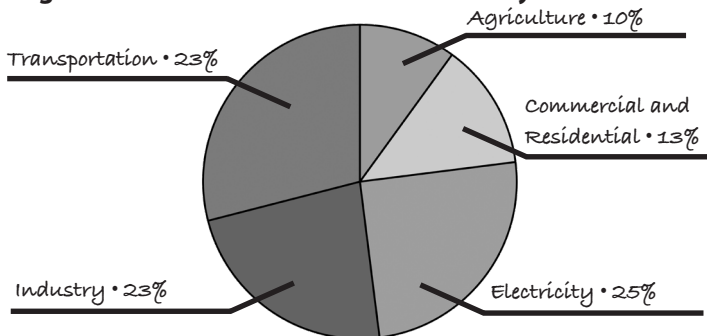
Enriching Activities

Got Guts?: Students will investigate the different digestive systems of livestock and learn how animals have unique nutritional needs based on these structures. Students will also discover the responsibilities of an animal nutritionist. (<https://agclassroom.org/matrix/lesson/292/>)

Farming for Energy: Students identify renewable and nonrenewable energy sources and investigate how farms can produce renewable energy. (<https://agclassroom.org/matrix/lesson/766/>)

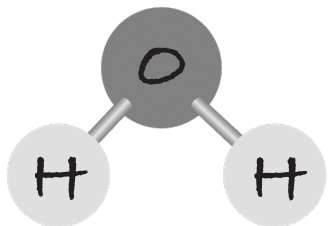
Where Does it Come From? Students will explore the connection between geography, climate, and the type of agriculture in an area by reading background information and census data about the agricultural commodities beef, potatoes, apples, wheat, corn, and milk. (<https://agclassroom.org/matrix/lesson/385/>)

Page 2: U.S. Greenhouse Gas Emissions by Sector

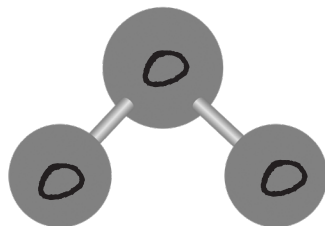


Page 2: What are the greenhouse gases?

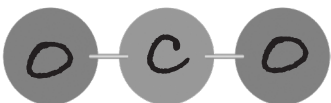
WATER VAPOR – H₂O



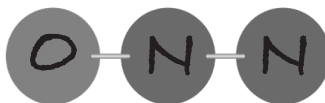
OZONE - O₃



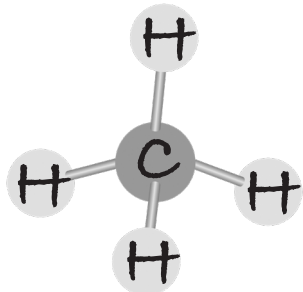
CARBON DIOXIDE – CO₂



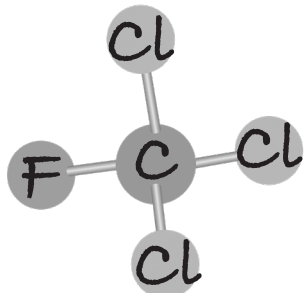
NITRUS OXIDE - N₂O



METHANE - CH₄



CHLOROFLUOROCARBONS - CFCs (1 C; 3 Cl; 1 F)



Climate Change Phenomena: Bananas in Our Breadbasket?

Students will explore the carbon cycle and evaluate associated phenomena of climate as they discover the impact climate change could have on the farms that produce our food. (<https://agclassroom.org/matrix/lesson/703/>)

Carbon Hoofprints: Cows and Climate Change: Students will explore the carbon cycle and evaluate the carbon footprint of cattle. Using critical thinking skills, students will use the Claim, Evidence, and Reasoning model to determine the effect of cows' methane production on the environment and investigate the extent cattle contribute to climate change. (<https://agclassroom.org/matrix/lesson/766/>)

Additional Lessons for K-12 Instruction: There are a wide variety of additional FREE ready-to-use lesson plans, companion resources, kits, maps/infographics, and movies/videos for K-12 instruction about climate, cattle, pigs, and sheep and wool. These are available by searching for those key words on the Agricultural Literacy Curriculum Matrix available at AgClassroom.org or simply use this link: <https://bit.ly/3tGghwP>

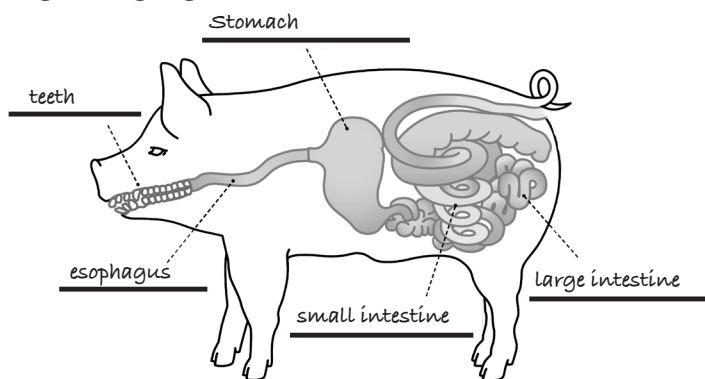
Request a Guest Speaker: Our team of experts are ready and on stand-by to help you make core curriculum connections using agriculture. To request a guest speaker, simply email Info@GrowingYourFuture.com

Page 3: Cow Digestive Tract

Answer 1: teeth
Answer 2: esophagus
Answer 3: rumen
Answer 4: reticulum

Answer 5: omasum
Answer 6: abomasum
Answer 7: small intestine
Answer 8: large intestine

Page 5: Pig Digestive Tract



Page 7: True or False?

- | | | |
|----------|-----------|-----------|
| 1. True | 9. True | 17. True |
| 2. True | 10. True | 18. True |
| 3. True | 11. True | 19. False |
| 4. False | 12. True | 20. True |
| 5. True | 13. True | 21. True |
| 6. False | 14. True | 22. True |
| 7. False | 15. False | |
| 8. True | 16. True | |