



BEEF IT UP!

An Interdisciplinary Unit Plan for Grades 4-7 on the Beef Industry in British Columbia



INTERMEDIATE KIT

Subject Levels/Suggested Grades:

Science 4-7 | English Language Arts 4-7 | Social Studies 4-7 | Careers 4-7

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TEACHER BACKGROUND

The beef industry is important to British Columbia's economy and supports many family and community businesses. It is extremely diverse, including small hobby farms, diversified operations and large cattle ranches and feedlots. The BC ranching industry is continually finding new and innovative methods to manage the industry in an environmentally sustainable way. This series of lesson plans make the 'farm to fork' connection, supporting an understanding of the beef cattle ranching industry and its importance to British Columbians. Lesson plans may be used consecutively or as individual stand-alone lessons.

This kit includes activities based on the following structure:

Activity 1: The Life Cycle of Beef

Activity 2: Beef By-Products: Beyond the Beef!

Activity 3: Feed Your Food: What Do Cattle Eat?

Activity 4: Beef Sustainability: Fact vs. Myth?

Activity 5: Careers in the Beef Industry

Activity 6: Nutrient Recycling: The Carbon Cycle



ACTIVITY 1: The Life Cycle of Beef

Teacher Background

The journey of raising beef is unique and complex. Due in part to their changing nutritional needs throughout their lifetime, beef cattle often will change hands and ownership several times over the course of two to three years, as they move through their various life stages.

This lesson focuses on the basic needs of animals for survival (e.g. air, space, food, water, shelter), and demonstrates how a farmer helps cattle to meet these needs throughout its life cycle.

Materials:

- Teacher Handouts:
 - Activity 1 - The Life Cycle of Beef
- Student Handouts:
 - Activity 1 - The Life Cycle of Beef - KWL Sheet
 - Beef Life Cycle Handouts 1, 2, 3 (1 handout per group)
 - Beef Life Cycle Worksheet 1, 2, 3 (1 Copy per student)
- Projector
- Internet access

SCIENCE 4-7

Curricular Competencies

Questioning and Predicting

- Demonstrate curiosity about the natural world
- Observe objects and events in familiar contexts
- Identify questions about familiar objects and events that can be investigated scientifically
- Make observations in familiar or unfamiliar contexts

Planning and Conducting

- Make observations about living and non-living things in the local environment
- Observe, measure, and record data, using appropriate tools, including digital technologies

Processing and Analyzing Data & Information

- Experience and interpret the local environment

Content Connections

Grade 4

- sensing and responding: humans, other animals, plants
- biomes as large regions with similar environmental features

Grade 5

- basic structures and functions of body systems
- sensing and responding: humans, other animals, plants
- the nature of sustainable practices around BC's resources

Grade 6

- basic structures and functions of body systems
- effects of balanced and unbalanced forces in daily physical activities

Grade 7

- organisms have evolved over time: change in traits of populations over time
- survival needs: all organisms need space, food, water, and access to resources in order to survive

SCIENCE 4 - 7

Curricular Competencies

Processing and Analyzing Data & Information

- Demonstrate an openness to new ideas and consideration of alternatives
- Identify First Peoples perspectives and knowledge as sources of information

Content Connections

Grade 7

- natural selection: the natural process by which certain traits that have a greater fitness for their environment lead to a reproductive advantage; this process happens within a population over time because of genetic variation

ENGLISH LANGUAGE ARTS 4 - 7

Curricular Competencies

Using oral, written, visual, and digital texts, students are expected individually and collaboratively to be able to:

Comprehend and Connect (reading, listening, viewing)

- Access and integrate information and ideas from a variety of sources and from prior knowledge to build understanding
- Use a variety of comprehension strategies before, during, and after reading, listening, or viewing to deepen understanding of text
- Consider different purposes, audiences, and perspectives in exploring texts
- Apply a variety of thinking skills to gain meaning from texts
- Identify how differences in context, perspectives, and voice influence meaning in texts

Create and communicate (writing, speaking, representing)

- Exchange ideas and perspectives to build shared understanding
- Communicate in sentences and paragraphs, applying conventions of Canadian spelling, grammar, and punctuation
- Develop and apply expanding word knowledge

Content Connections

Grade 4 - 7

Strategies and processes

- reading strategies
- oral language strategies
- metacognitive strategies
- writing processes

Language features, structures, and conventions

- paragraph structure
- sentence structure and grammar conventions
- language varieties (*Grade 7)

PROCEDURE

Part 1

1. Hand each student a KWL chart and explain that this will be the tool they use to record their learning.
2. Starting in the “Know” column, have students fill out two points they know or think they know, about the Life Cycle of Beef Cattle.
3. Ask for volunteers to read out some of their points, or have the class participate in a gallery walk activity to view their peer’s responses. Students can add new facts learned to the “Learn” column and questions they still have to the “Wonder” column.
4. Display pictures from Teacher Handout at the front of the class and ask students to identify some similarities and differences between them. During this discussion, be sure to write down the following words under the appropriate heading: calf, cow, human, human child so that students have the opportunity to become familiar with this terminology.
5. Then, ask students what all of the animals in the pictures need to survive. When a student replies with one of the five elements of survival (food, water, shelter, space, air), ask which of the animals need that element. (The answer should be, “All of them!”)
6. Next, ask students if they think that these needs change over time? Discuss how human needs change (i.e. dependency when young, increasing independence as humans reach adulthood).
7. Discuss with students that there are several major stages in the Life Cycle of Beef, beginning with calves to when they are ready for the market.
8. Have students watch: <https://www.youtube.com/watch?v=jAGWK0yHOQQ&t=133s>, adding information to their KWL charts as they watch the video.

Part 2

1. Let students know that they are going to do a Jigsaw Activity.
2. Divide the class into groups of 3 and assign each group a part of the life cycle to investigate. These will be their “home group.” Using the Beef Life Cycle Handout for information, have students research and complete the corresponding “Beef Life Cycle Worksheet” for their assigned section. Tell them to ensure they know their assigned section well, as they will be responsible for teaching that section to their fellow classmates.
3. Reorganize groups of students into “expert groups” so that each new group has one person from each of the 3 previously assigned groups.
4. In the experts’ groups, have students take turns explaining and teaching their fellow classmates about the life cycle stage assigned to them. (Allow each student 2-3 minutes to explain their stage to other members of this expert group.)
5. Students then move back to their home groups, sharing the information they gathered from their peers. In their home group each student should ensure they have gathered all the information, and have completed each “Beef Life Cycle Worksheet”.
6. Have students return to their KWL charts from the beginning of the lesson. As an Exit Slip, have students fill in three new things they learned on their charts.

EXTENSION

- Go on a visit to the farm/ranch (A list of farms can be accessed here: <https://www.bcaitc.ca/farm-tours-field-trips>) or invite a producer to speak to the class about raising beef.

HUMAN MOTHER



HUMAN CHILD



Photos Courtesy of: Creative Commons

BABY CALF



ADULT COW



Photos Courtesy of: Canadian Cattleman's Association

TOPIC:

Name: _____ Date: _____

KNOW

K

**WANT TO
KNOW**

W

LEARNED

L

The Beef Life Cycle

Canadian beef is known for its world-class excellence, high quality and taste. In Canada and around the world, our beef is chosen by butchers, chefs and families. Once Canadian beef reaches your table, you know you will be fuelling your body with protein, iron, vitamin B12, zinc and other essential nutrients to live a healthy lifestyle.

Stage 1: Cows, Calves & Weaning

Raising beef begins with ranchers who have a herd of mother cows. “Cows” are adult females that have had a baby. These cows give birth to “calves”, which is the term used for newborn male or females. Cows usually give birth once a year, typically in the spring. When a calf is born, it weighs between 27-45 kg (60-100 lbs). In many parts of BC, once the grass begins to grow in the spring, the cows and their calves are turned out onto pastures to graze. The calves will also continue to feed off their mother’s milk until they are about 6-8 months old. At this age, the calves are big enough to eat only grass and hay, and they are ready for weaning. Weaning is done by separating the mother from the calf. This allows the mother cow to stop nursing her baby and keep more nutrition for the next calf that she will have the following spring. By this point, calves can weigh between 226-360 kg (500-800 lbs)! Smaller calves will move to a backgrounding operation, whereas heavier calves may go directly to a feedlot.



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Stage 2: Stockers, Backgrounders & Feedlots

After weaning, cattle continue to grow by grazing on grass and pastures. This process is known as backgrounding. Backgrounders harvest hay and make silage for winter feeding. Silage grass or other green feed is compacted and stored in airtight plastic silo bags until it is fed to the cattle. Pastures provide forage for the other months. Between 9 and 11 months of age, when the cattle have reached the desired weight, the backgrounded cattle are typically placed in a feedlot (penned yard) where they are brought to a finished weight. Feedlots focus on efficient weight gain, nutrition and animal care. Cattle are provided a safe, low stress and healthy environment, and have plenty of room to move around in open air or indoor pens with access to food and water. Cattle will typically spend somewhere between 60 and 200 days at a feedlot eating a high-energy diet. Careful feeding and handling of cattle are essential to ensure a high quality beef for humans to eat.



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Stage 3: Auction, Breeding & Getting Ready for the Market

Once calves are ready to leave the ranch or farm, they are sold at livestock auction markets. This includes live, as well as online auctions. At these auctions, the cattle buyer bidding on the cattle may be hundreds or thousands of kilometers away from the auction site. Many of the female calves are kept on the farm to become mother cows and some of the male calves are kept to become breeding bulls. Breeding bulls are male cattle used to mate with females to produce calves.

Most cattle in Canada are “grass fed and grain finished.” This means they spent most of their life being raised on grass-based forage, then finished on grain (mostly barley or corn). Once cattle reach an optimal market weight (often upwards of 680 kg/1,500 lbs), they are ready for the market. Beef cattle are transported by truck to food safe facilities for quality grading and processing.



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ACTIVITY 2: Beef By-Products: Beyond the Beef!

Teacher Background

Cattle are some of the most efficient animals in the barnyard. In fact, 85% of grazing land for cattle isn't suitable for raising crops, so using it for raising cattle is its best application. When combined with the marvelous use of cattle by-products in real world settings, it's easy to see why cattle are such valuable livestock.

This lesson focuses on the many products that are derived from beef cattle beyond just meat and meat products. Students will identify products they use every day that contain beef product and see that animal agriculture is an important part of their everyday lives.

Materials:

- Computers/tablets
- Internet access
- Student handout:
 - Beef By Products: Beyond the Beef!

SCIENCE 4-7

Curricular Competencies	Content Connections
Questioning and Predicting <ul style="list-style-type: none">• Demonstrate curiosity about the natural world• Observe objects and events in familiar contexts• Identify questions about familiar objects and events that can be investigated scientifically• Make observations in familiar or unfamiliar contexts	Grade 4 <ul style="list-style-type: none">• sensing and responding: humans, other animals, plants• biomes as large regions with similar environmental features
Planning and Conducting <ul style="list-style-type: none">• Make observations about living and non-living things in the local environment• Observe, measure, and record data, using appropriate tools, including digital technologies	Grade 5 <ul style="list-style-type: none">• basic structures and functions of body systems• sensing and responding: humans, other animals, plants• the nature of sustainable practices around BC's resources
Processing and Analyzing Data & Information <ul style="list-style-type: none">• Experience and interpret the local environment	Grade 6 <ul style="list-style-type: none">• basic structures and functions of body systems• effects of balanced and unbalanced forces in daily physical activities
	Grade 7 <ul style="list-style-type: none">• organisms have evolved over time: change in traits of populations over time• survival needs: all organisms need space, food, water, and access to resources in order to survive

SCIENCE 4 - 7

Curricular Competencies

Processing and Analyzing Data & Information

- Demonstrate an openness to new ideas and consideration of alternatives
- Identify First Peoples perspectives and knowledge as sources of information

Content Connections

Grade 7

- natural selection: the natural process by which certain traits that have a greater fitness for their environment lead to a reproductive advantage; this process happens within a population over time because of genetic variation

PROCEDURE

1. Brainstorm with students what products they think come from beef cattle.
2. Ask: How many of these items are part of your everyday lives?
3. Read aloud or have students volunteer to read the article, Fun Facts: Products We Get From Beef Cattle: <https://beef2live.com/story-fun-facts-products-beef-cattle-0-104636>. Have students read just 1-2 paragraphs to increase engagement and active participation.
4. Ask students if they were surprised by any of the by-products they heard about.
5. Next have students watch the video together as a class: <https://www.youtube.com/watch?v=IGwoOihpBOY>. Share Canadian statistics from Teacher Information after students have watched the video.
6. Using the article information and the video, have students complete the “Beef By Products: Beyond the Beef” Worksheet listing the products that come from beef cattle.

TEACHER INFORMATION

Canadian Statistics:

- Animals fats are also being used to make biojet fuel in Canada.
- There are 60,000 beef farms and feedlots in Canada.
- Canada produces approximately 1.55 million tonnes of beef per year.

Beef By-Products: Beyond the Beef!

What do beef cattle have to do with me anyway?

Virtually the entire beef animal (99%) is used for something, but only 60% of it is used as meat. The rest of the beef is used to provide products we use daily. Using the information you've learned, see how many things you can find in your home and environment that come from a beef animal. List products in the four squares below.

<p>Beef By-Products Used in Factories</p> <p>rubber wallpaper dye</p>	<p>Beef By-Products Used In My Home (non-edible)</p> <p>crayons glue string candles perfume</p>
<p>Beef By-Products Used in Food Products</p> <p>gelatin medicine vitamins cream</p>	<p>Other Surprising Beef By-Products</p> <p>felt photo film paint</p>

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<p>Beef By-Products Used in Food Products</p>	<p>Other Surprising Beef By-Products</p>

ACTIVITY 3: Feed Your Food: What Do Cattle Eat?

Teacher Background

Ruminants are herbivorous mammals that are able to acquire nutrients from plant-based food by fermenting it in a specialized stomach prior to digestion, principally through microbial actions.

This lesson explores beef feed and the importance of certain ingredients in livestock diets. In addition, students will learn and discuss why it's important to feed animals a balanced and nutritious diet and how the job of an animal nutritionist is key to doing so.

Materials:

- Student Handout:
 - Feed Your Food: What Do Cattle Eat?
- Internet access
- iPads or projector
- 4 paper plates
- Samples of the following (which can be sourced from a local farm/ranch supply store)
 - rolled oats
 - corn
 - wheat
 - grass
- Blank Index Cards (to create questions/answers for game)
- Game Material Pages (Game Spinner, Game Board)
- Split Pins
- Paper Clips
- 1x1 paper squares for game pawns
- Cardboard
- Chocolates (optional for game prize)

SCIENCE 4-7

Curricular Competencies

Questioning and Predicting

- Demonstrate curiosity about the natural world
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Planning and Conducting

- Make observations about living and non-living things in the local environment

Content Connections

Grade 4

- sensing and responding: humans, other animals, plants
- biomes as large regions with similar environmental features

Grade 5

- basic structures and functions of body systems
- sensing and responding: humans, other animals, plants
- the nature of sustainable practices around BC's resources

SCIENCE 4 - 7

Curricular Competencies

Planning and Conducting

- Observe, measure, and record data, using appropriate tools, including digital technologies

Processing and Analyzing Data & Information

- Experience and interpret the local environment
- Demonstrate an openness to new ideas and consideration of alternatives
- Identify First Peoples perspectives and knowledge as sources of information

Content Connections

Grade 6

- basic structures and functions of body systems
- effects of balanced and unbalanced forces in daily physical activities

Grade 7

- organisms have evolved over time: change in traits of populations over time
- survival needs: all organisms need space, food, water, and access to resources in order to survive
- natural selection: the natural process by which certain traits that have a greater fitness for their environment lead to a reproductive advantage; this process happens within a population over time because of genetic variation

ENGLISH LANGUAGE ARTS 4 - 7

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Using oral, written, visual, and digital texts, students are expected individually and collaboratively to be able to:

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- Consider different purposes, audiences, and perspectives in exploring texts
- Apply a variety of thinking skills to gain meaning from texts
- Identify how differences in context, perspectives, and voice influence meaning in texts

Create and communicate (writing, speaking, representing)

- Exchange ideas and perspectives to build shared understanding
- Communicate in sentences and paragraphs, applying conventions of Canadian spelling, grammar, and punctuation
- Develop and apply expanding word knowledge

Content Connections

Grade 4 - 7

Strategies and processes

- reading strategies
- oral language strategies
- metacognitive strategies
- writing processes

Language features, structures, and conventions

- paragraph structure
- sentence structure and grammar conventions
- language varieties (*Grade 7)

PROCEDURE

Part 1

1. Place 4 plates at the front of the classroom with the following items on each plate:
 - sample of rolled oats
 - sample of corn (can use popping corn kernels or corn chips if cannot source from farm/ranch supply store).
 - samples of wheat (can use kernels or wheat in another form, such as crackers, if cannot source from farm/ranch supply store).
 - sample of grass
2. Ask students to line up behind the item that they like to eat the most. Ask students to discuss their choices around their selections with someone who has chosen a different item that they have.
3. It is likely that no one chose grass. At this point, introduce the topic of ruminants by telling students that cows are called “ruminants.” Tell students that ruminants typically have a stomach with four compartments. They are known for chewing cud, which is food that has been regurgitated from the first compartment to be chewed again. Unlike cattle (and other animals like sheep, goats and deer), humans are not ruminants and thus cannot break down grass and other coarse vegetation. For more information see: <https://www.bcaitc.ca/resources/ruminant-animals-beef-and-dairy-cattle>
4. Have students watch the video, Occupation Profile for Animal Scientists: <https://www.careeronestop.org/toolkit/careers/occupations/Occupation-profile.aspx?keyword=Animal%20Scientists&onetcode=19101100&location=US>
5. Have students read, Student handout: “Feed Your Food: What Do Cattle Eat? Ask students to create questions and answer cards on the index cards, using the information from the article provided. How many teeth do cows have? (32), How many kilograms of food do cows eat per day? (50), etc.

Part 2

1. Students will then move into groups of 4-5 and compile all their questions together.
2. In their groups, give each student a 1x1 piece of paper. On the paper have students each draw and colour one thing that a beef cow consumes, to create their own game pawn to move on the game board.
3. Students can create their spinners (1 per group) by following the instructions on the “Make Your own Spinner” handout.
4. Play the game! The game board simulates the pattern of a real bovine digestive system. The object of the game is to be the first game pawn to reach the end of the cow’s digestive system.
 - a. All players place their game pawns on start.
 - b. The youngest player starts by spinning the spinner. After spinning, they draw a card. If they answer the question correctly then they can move their game pawn forward that number of spaces. If they answer incorrectly, their game pawn remains stationary.
 - c. When finished with the card, always put it on the bottom of the stack.
 - d. The first player to land in the dung heap wins the game.
 - e. Optional: Award students with chocolates as “cow patties” for prizes.

EXTENSION

- For a more comprehensive view of the beef production story, have students also explore the Grow BC Map and read about cattle ranching and feedlot finishing here at: <https://www.bcaitc.ca/grow-bc-commodities>
- Check out the nutritional info about beef and try some of the delicious recipes from <https://canadabeef.ca/>

Feed Your Food: What Do Cattle Eat?

Cattle are herbivores meaning they do not eat meat. Cows have 32 teeth and 4 stomach compartments which all help these animals to digest food. They use their teeth to eat around 23 kilograms of food each day! Cattle have a very diverse diet and can eat a variety of feeds that provide them with different nutrients. For example, cows eat grasses, corn stalks, grains, and hay. Cows also drink a lot of water. They drink up to 133 litres of water every day. This results in an average adult cow can weighing between 180-725 kilograms! Below is a list of some common cattle feed and descriptions.

Roughages

Roughages are thick, indigestible ingredients that improve digestion. In the human diet, foods like fruits, vegetables and whole grains provide the roughage we need to stay healthy. In the beef cattle diet, common roughages include hay, silage and grass. Silage is a crop (like grass or other greens) that has been preserved in a tight container, called a silo or a silage pit. The majority of the food that cattle eat comes from this type of feed. Roughages are mainly fillers in the cattle's diet. They are high in fiber but relatively low in energy.

Grains

Grains are high in energy and protein but low in fiber. Common grains fed to cattle are corn, wheat, barley and oats. Cattle require a significant amount of roughage in their diet along with the grain they consume. Cattle are fed more grain to help "finish them off" so they can go to market. Feeding grain also helps to produce a high-quality, marbled product.

Oilseeds

Oilseeds are very important in the cattle's diet. They perform many functions such as providing energy, proteins and some fiber to the cattle's diet. Some examples of oilseeds are soybeans and canola meal which may be added to a cattle's food for nutrition.

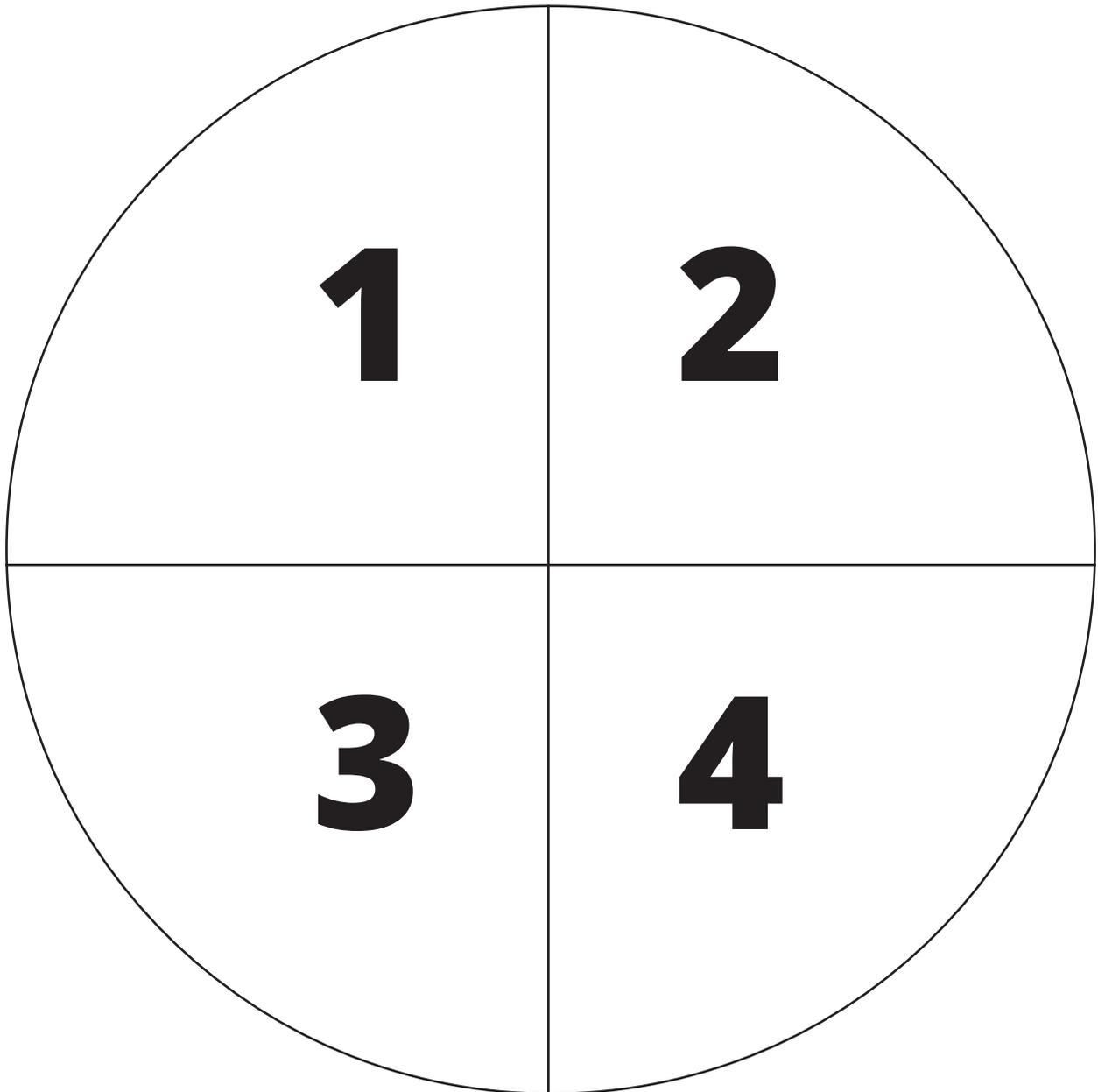
Co-products

Many co-products used for cattle food are leftover ingredients from food production for humans. Some common co-products fed to cattle include grains waste used in distillation (making alcohol), sweet corn cannery waste, bakery waste, and apple pomace. Apple pomace is the solid that remains after pressing apples for apple cider, apple juice or making apple sauce.

Make your own Spinner

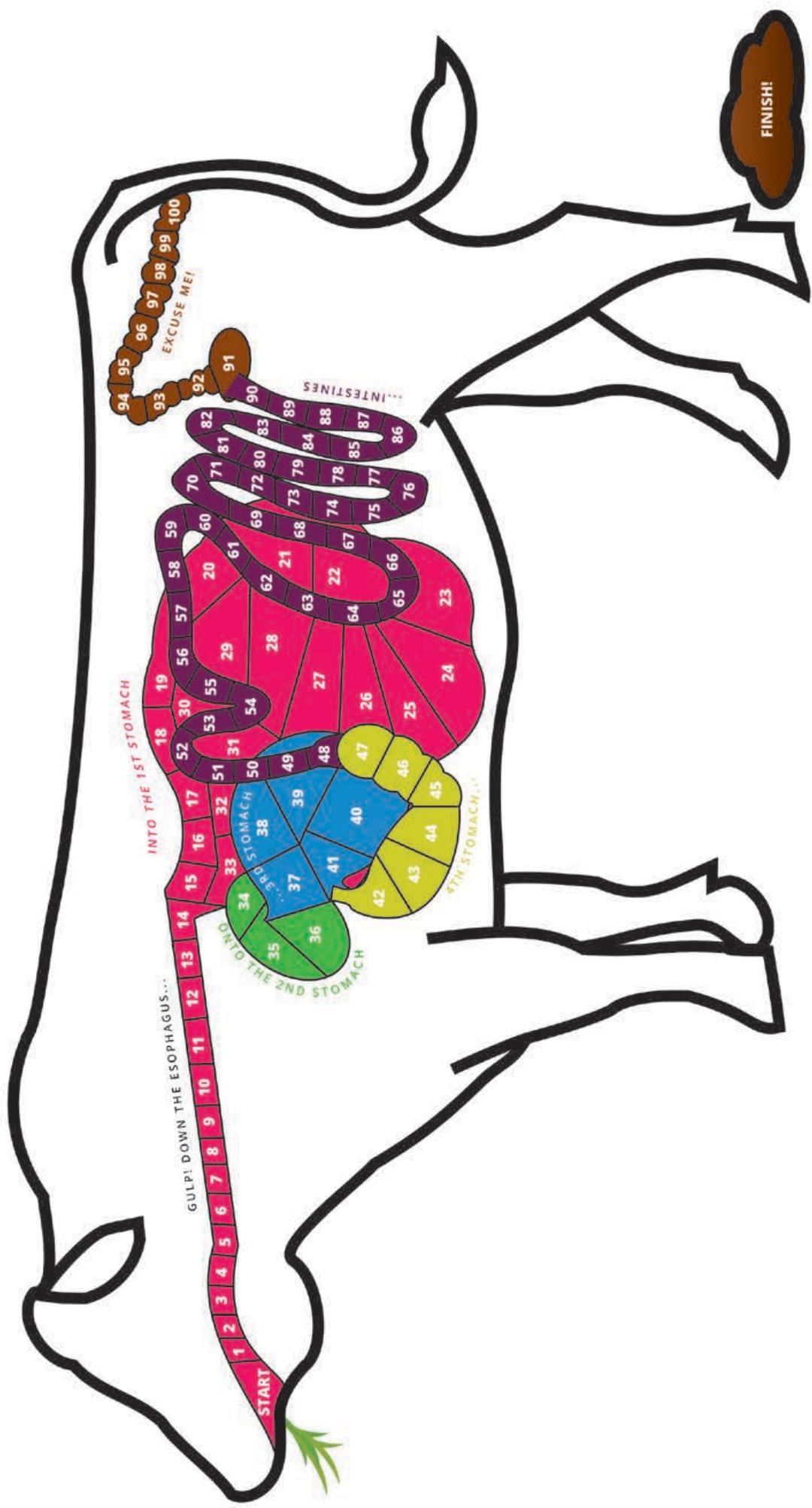
This is one of the easiest and most effective ways to make a home-made spinner! Cut out the round template below and paste it on cardboard to strengthen it. Make a hole in the centre of the spinner. Take a split pin and insert it through the narrowest loop of a paper clip. Then push the split pin through the hole in the spinner.

Make sure not to push it through completely – ensure there is a small gap to allow the paper clip to spin freely. Turn the spinner over and open the two feet of the split pin to secure it.



MOOOOVING THROUGH

A COW'S DIGESTIVE SYSTEM GAME



ACTIVITY 4: Beef Sustainability: Fact vs. Myth?

Teacher Background

In Canada, Canadians can enjoy beef as a part of a nutritious diet. Red meat production, however, has recently been negatively singled out as being bad for the environment. In this lesson students will explore the myths around beef production and create an advertising campaign promoting this protein-rich, nutritional food product that is an important industry in British Columbia.

Materials:

- Teacher Handout:
 - Beyond Meat Ad
- Student Handouts:
 - Beef Sustainability: Fact Vs. Myth
 - Creating a Myth Busting Ad About Beef
- Tablets/computers
- Internet access

SCIENCE 4-7

Curricular Competencies	Content Connections
Questioning and Predicting <ul style="list-style-type: none">• Demonstrate curiosity about the natural world• Observe objects and events in familiar contexts• Identify questions about familiar objects and events that can be investigated scientifically• Make observations in familiar or unfamiliar contexts	Grade 4 <ul style="list-style-type: none">• sensing and responding: humans, other animals, plants• biomes as large regions with similar environmental features
Planning and Conducting <ul style="list-style-type: none">• Make observations about living and non-living things in the local environment• Observe, measure, and record data, using appropriate tools, including digital technologies	Grade 5 <ul style="list-style-type: none">• basic structures and functions of body systems• sensing and responding: humans, other animals, plants• the nature of sustainable practices around BC's resources
Processing and Analyzing Data & Information <ul style="list-style-type: none">• Experience and interpret the local environment• Demonstrate an openness to new ideas and consideration of alternatives	Grade 6 <ul style="list-style-type: none">• basic structures and functions of body systems• effects of balanced and unbalanced forces in daily physical activities
	Grade 7 <ul style="list-style-type: none">• organisms have evolved over time: change in traits of populations over time• survival needs: all organisms need space, food, water, and access to resources in order to survive

SCIENCE 4 - 7

Curricular Competencies

Processing and Analyzing Data & Information

- Identify First Peoples perspectives and knowledge as sources of information

Content Connections

Grade 7

- natural selection: the natural process by which certain traits that have a greater fitness for their environment lead to a reproductive advantage; this process happens within a population over time because of genetic variation

SOCIAL STUDIES 4 - 7

Curricular Competencies

- Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions
- Construct arguments defending the significance of individuals/ groups, places, events, or developments (significance)
- Ask questions, corroborate inferences, and draw conclusions about the content and origins of different sources (evidence)
- Sequence objects, images, or events, and determine continuities and changes between different time periods or places (continuity and change)
- Differentiate between intended and unintended consequences of events, decisions, or developments, and speculate about alternative outcomes (cause and consequence)
- Construct narratives that capture the attitudes, values, and worldviews commonly held by people at different times or places (perspective)
- Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place (ethical judgment)

Content Connections

Grade 4 - 5

- valuable natural resources has played a key role in changing the land, people, and communities of Canada

Grade 6 - 7

- economic policies and resource management, including effects on indigenous peoples
- globalization and economic interdependence
- international co-operation and responses to global issues
- regional and international conflict
- origins, core beliefs, narratives, practices, and influences of religions, including at least one indigenous to the Americas
- scientific, philosophical, and technological developments
- media technologies and coverage of current events

PROCEDURE

1. Ask students if they have heard of any meat substitutes and if they've tried them. Ask what they liked/did not like about them.
2. Explain to students that there have been a number of plant-based proteins developed, however that currently they represent less than 1% market share while real beef represents more than 99% market share.¹
3. Show students the ad from Teacher Handout- Beyond Meat Ad.
4. Ask students to share their thoughts about the ad with a partner. Do they believe it? Why or why not? Would this ad motivate them to stop eating meat? Why or why not?
5. Show the video: <https://youtu.be/JDSoZBmdudg>
6. Handout the sheet, "Sustainability: Fact Vs. Myth" ² and provide each student an with a way to access the Internet. Note that this info sheet includes American facts. The task is to search Canadian facts to use in creating their ad.
7. Put students in groups of two and let them know that they will be creating an ad campaign to debunk the beef industry myths. Handout "Creating a Myth Busting Ad About Beef" and ask students to consider the following things when creating their ad:
 - Target Audience - who will they create the ad for (parents, children, shoppers consumers?)
 - Factual Research / Evidence - Where will they get their information from?
 - Images - What types of pictures would best reflect the point they are trying to make?
 - Words - Which words will be most appealing to a reader; how many words should you use on an ad?
8. Have students review the following websites to gather information for their advertisement.
 - <https://thinkbeef.ca/>
 - <https://canadabeef.ca/>
 - <https://www.beefitswhatsfordinner.com/raising-beef>
 - <https://beeffortheplanet.ca/>
 - <https://grsbeef.org/>
 - <https://www.crsbcertified.ca/>
 - <https://www.beeffortheplanet.ca>
 - <https://www.raisingcdnbeef.ca>
 - AITC Canada Guardians of the Grasslands
9. Provide students with time to share their advertisements with others in the class.

EXTENSION

- Check out nutritional info about beef and try some of the delicious recipes from <https://canadabeef.ca/>

Source:

1. <https://www.beefitswhatsfordinner.com/newsroom/addressing-myths>
2. https://www.beefitswhatsfordinner.com/Media/BIWFD/Docs/beef-sustainability-factvsmyth_010319-03.pdf

BEYOND BURGER™

BEEF BURGER

¼ LB US BEEF BURGER



VS



99% LESS WATER



93% LESS LAND



90% FEWER GHGE



46% LESS ENERGY

source: <https://www.beyondmeat.com/whats-new/go-beyond-this-earth-day>



BEEF SUSTAINABILITY: FACT VS. MYTH

	FACT	MYTH
	<ul style="list-style-type: none">Beef production, including the production of animal feed, is responsible for only 3.7% of greenhouse gas emissions in the United States.	<ul style="list-style-type: none">Cattle are one of the leading sources of greenhouse gas emissions.
	<ul style="list-style-type: none">Cattle only consume 2.6 lbs. of grain per pound of beef, which is similar to pork and poultry, and nearly 90% of grain-finished cattle feed is inedible by humans.	<ul style="list-style-type: none">Cattle consume 9 pounds of grain or more per pound of beef and compete with people for food.
	<ul style="list-style-type: none">Corn going to feed beef cattle represents only 10% of harvested corn grain in the United States, or 8 million acres.	<ul style="list-style-type: none">We grow 100 million acres of corn just to feed cattle.
	<ul style="list-style-type: none">It only takes 308 gallons of water to produce a pound of boneless beef, and water use by beef is around 5% of U.S. water withdrawals. Plus, this water is recycled.	<ul style="list-style-type: none">It takes up to 24,000 gallons of water to produce a pound of boneless beef and beef is major drain on water resources.

CA Rotz, S Asem-Hiablie, S Place, G Thoma., 2018. Environmental footprints of beef cattle production in the United States. Agricultural Systems. Advance online publication. doi.org/10.1016/j.agsy.2018.11.005.



Funded by Beef Farmers and Ranchers

Name: _____ Date: _____

CREATING A MYTH BUSTING AD ABOUT BEEF

Use this worksheet to organize your idea for your ad.

Part 1: ADVERTISEMENT BIG IDEAS

What medium will you use for your ad? Print? Video? Social Media?	Who is the target audience? (Age, gender, personality traits?)	What is your commercial trying to persuade people to believe?
What visual images will you use?	What ways will you convey this message? (call for action?)	 

Part 2: ADVERTISEMENT DETAILS

Product Name:	Headline:	Special Features:
Persuasive words/Phrases:	Sense of Urgency:	Why It's Better than Opposing Campaign Ad:

ACTIVITY 5: Careers in the Beef Industry

Teacher Background

There is a myriad of career opportunities available in the agriculture and agri-food sector area. In fact, 1 in 8 jobs in Canada are somehow involved in agriculture and range from everything from veterinarian to grocery store clerk. The production of beef involves many different people, as it moves from the farm to table. In this lesson students will explore the many career opportunities offered by the beef industry and how each one contributes to the process of beef production in BC.

Materials:

- Whiteboard / Chart paper
- Tablets/computers
- Internet access
- Student Handouts:
 - What's Your Something?
 - Careers in the Beef Cattle Industry

CAREERS 4 - 7

Curricular Competencies

Students are expected to be able to do the following:

- Identify and appreciate their personal attributes, skills, interests, and accomplishments and their growth over time
- Recognize the need for others who can support their learning and personal growth
- Set realistic short- and longer-term learning goals, define a path, and monitor progress
- Make connections between effective work habits and success
- Demonstrate safe behaviours in a variety of environments
- Question self and others about the role of technology in the changing workplace
- Appreciate the influence of peer relationships, family, and community on personal choices and goals

Content Connections

Grade 4 - 7

Personal Development

- goal-setting strategies
- self-assessment
- project management
- leadership
- problem-solving and decision-making strategies

Connections to Community

- local and global needs and opportunities
- cultural and social awareness
- global citizenship
- volunteer opportunities

Life and Career Plan

- factors affecting types of jobs in the community
- technology in learning and working
- role of mentors, family, community, school, and personal network in decision making

ENGLISH LANGUAGE ARTS 4 - 7

Curricular Competencies

Using oral, written, visual, and digital texts, students are expected individually and collaboratively to be able to:

Comprehend and Connect (reading, listening, viewing)

- Access and integrate information and ideas from a variety of sources and from prior knowledge to build understanding
- Use a variety of comprehension strategies before, during, and after reading, listening, or viewing to deepen understanding of text
- Consider different purposes, audiences, and perspectives in exploring texts
- Apply a variety of thinking skills to gain meaning from texts
- Identify how differences in context, perspectives, and voice influence meaning in texts

Create and communicate (writing, speaking, representing)

- Exchange ideas and perspectives to build shared understanding
- Communicate in sentences and paragraphs, applying conventions of Canadian spelling, grammar, and punctuation
- Develop and apply expanding word knowledge

Content Connections

Grade 4 - 7

Strategies and processes

- reading strategies
- oral language strategies
- metacognitive strategies
- writing processes

Language features, structures, and conventions

- paragraph structure
- sentence structure and grammar conventions
- language varieties (*Grade 7)

PROCEDURE

1. Create a T-chart on the board and let students know they will be discussing careers in the beef industry. Tell students that one side of the chart will focus on careers directly related to the animal itself. The other side will focus on careers that help market/sell beef to consumers. Ask students to share their ideas with the class and write their responses onto the white board.
2. As a class, complete a list of careers related to the beef industry being sure to include:
 - **Grain Farmer:** grows hay and grain to feed cattle
 - **Veterinarian:** helps care for and treat sick cattle
 - **Animal Nutritionist:** helps formulate balanced rations for cattle
 - **Animal Scientist:** studies animal genetics or the way animals reproduce to improve the efficiency of cattle production
 - **Agricultural Worker / Ranch Hand:** feeds, waters and cares for the animals on a regular basis; move cattle between the barn and pasture as necessary
 - **Feedlot Manager:** oversees daily operations of feed yards providing knowledge and support for herd nutrition, marketing, and environmental conditions for livestock in feedlots
 - **Butchers / Meat Packers:** harvests animals, and divides their carcasses into sections; package meat for shipment.

- **Farm Reporters or Broadcasters:** reports on cattle markets and provides important information to the industry
 - **Auctioneers or Livestock Market Managers:** assists farmers in selling cattle
 - **Cattle Buyers:** buys cattle for processing facilities
 - **Marketing Manager:** analyzes industry trends and creates strategies to sell the products
 - **Truck Driver:** transports cattle to processing facilities then to stores
 - **Store Owner:** sells beef raised on ranches
3. Share “What’s Your Something?” sheets with students and have them review it to see if there are careers that they may still be able to add to the chart on the whiteboard.
 4. Draw a table with three rows and two columns (as shown below) on the whiteboard and explain to students that they will be completing a career exploration activity.

Career Name / Description:	Drawing:
Training & Education:	Work Environment:
Career Opportunities & Outlook	Why I want to be a...

5. Use Careers in the Beef Industry - Example, and fill out the whiteboard chart using the profile of an Animal Nutritionist.
6. Have students choose at least 1 career from the class generated list. Then have them complete the “Careers in the Beef Industry” handout after researching online using the following sites:
 - <https://aitc-canada.ca/en-ca/learn-about-agriculture/agriculture-careers>
 - <https://www.bcaitc.ca/resources/careers-agriculture>
 - <https://www.agcareers.com/career-profiles/cp-results.cfm>
8. Have students present their information to the class in a visual format of their choosing (e.g poster, PowerPoint, Prezi)

EXTENSION

- Have students dress as they would if they worked in their chosen career (farmer, scientist, veterinarian, etc.). Invite parents or students from other classes to visit and ask questions about their occupations.
- Invite a cattle rancher to share their story about beef production in BC.
- Play thinkAg Career Case Game (AITC-C) <https://www.bcaitc.ca/resources/career-case-game>

WHAT'S YOUR SOMETHING

What is your future career path? You have to do **SOMETHING** to earn a living, but what will it be? Here are some examples of careers in agriculture and food... Is there **SOMETHING** that interests you?



The agri-food sector employs over **2.2 MILLION** Canadians (1 in 8 jobs*) — and most of them are off the farm!

Minimum Education Required
 HIGH SCHOOL DIPLOMA
 COLLEGE DIPLOMA
 CERTIFICATE / LICENSE
 UNIVERSITY DEGREE



START SOMETHING

Do you dream of being your own boss? The agri-food sector has many opportunities to start your own business.

- ENTREPRENEUR



SELL SOMETHING

Are you good at convincing people to buy things? A career in business and sales could be calling.

- SALES REPRESENTATIVES – FOOD, SEED, FEED, FUEL
- EXPORT SALES MANAGER
- MARKETING SPECIALIST



CONSTRUCT SOMETHING

Are you the DIY type, always building something? Consider a job designing robotic equipment, or constructing agricultural buildings.

- CARPENTER / LABOURER
- ASSEMBLY TECHNICIAN
- WELDER
- ELECTRICAL ENGINEER



GROW SOMETHING

Is your thumb green? What would agriculture be without seed, soil and plants? There are a variety of careers available in the field of Plant Science.

- HORTICULTURALIST
- LANDSCAPE DESIGNER
- PLANT SCIENTIST / FIELD AGRONOMIST
- GREENHOUSE MANAGER



RAISE SOMETHING

Do you love animals? You can run your own business, work on a farm, or maybe be employed by an animal nutrition company.

- FARM WORKER
- FEEDLOT MANAGER
- FOOD ANIMAL VETERINARIAN
- HERD NUTRITIONIST



CREATE SOMETHING

The agriculture and food sector is about developing and creating things for people to eat, drink, wear, and use. Are you creative enough to transform ingredients or ideas into a finished product?

- GRAPHIC DESIGNER
- FOOD STYLIST
- WINEMAKER
- FOOD TECHNOLOGIST



PROTECT SOMETHING

Is the environment always on your mind? Put your passion for the planet to work in an Environmental Science or Natural Resources career.

- ENVIRONMENTAL PROTECTION TECHNICIAN
- NUTRIENT MANAGEMENT SPECIALIST
- CLIMATE CHANGE ANALYST



IMPROVE SOMETHING

Are you crazy about Science? Research and Development is a big focus in agri-food. You could be the scientist who makes the next big discovery.

- RESEARCH & DEVELOPMENT TECHNICIAN
- ANIMAL BIOTECHNOLOGIST
- NUTRITIONIST / DIETITIAN
- RESEARCH STATION MANAGER



PROGRAM SOMETHING

Do you live to code? Agri-food is BIG on technology, so program yourself a spot in the future of feeding the world.

- INFORMATION TECHNOLOGY SOFTWARE DEVELOPER
- AUTOMATION TECHNICIAN
- PRECISION AGRICULTURE SPECIALIST



OPERATE/FIX SOMETHING

What drives your gears? If the answer is machines, a career in Ag Mechanics could be for you. Machines of all types need to be built, maintained and operated.

- SERVICE TECHNICIAN
- DRONE OPERATOR
- ELECTRONIC TECHNICIAN
- HEAVY EQUIPMENT OPERATOR



EVALUATE/CALCULATE SOMETHING

Are numbers your thing? Agri-food is big business, which means big money. That translates into loads of jobs working in finance.

- ACCOUNTANT
- AG FINANCIAL SERVICE REPRESENTATIVE
- AUDITOR
- ECONOMIST



COMMUNICATE SOMETHING

Do you have a way with words? Agriculture Communications is a world of continuous action needing people to tell a story and spread the news.

- AGRICULTURE BROADCASTER
- AGRICULTURE JOURNALIST
- COMMUNICATIONS SPECIALIST
- SOCIAL MEDIA STRATEGIST



CONSULT ABOUT SOMETHING

Do you like to think about problems and find the best solutions? There are many jobs in Agriculture Business which focus on helping people to make educated decisions.

- AGRICULTURAL LAWYER
- PUBLIC RELATIONS SPECIALIST
- AGRONOMIST
- CROP ADVISOR



MANAGE SOMETHING

Do you enjoy planning, assigning tasks and making sure everything gets done? Agriculture businesses of all different types need managers to make sure their operations run smoothly.

- OFFICE MANAGER
- OCCUPATIONAL HEALTH & SAFETY MANAGER
- BRAND MANAGER
- HUMAN RESOURCE MANAGER

EXPLORE MORE AGRICULTURE AND FOOD CAREERS AT WWW.AITC-CANADA.CA

Job titles are retrieved from AgCareers.com and Government of Saskatchewan Think Ag program.

Growing Forward 2 



thinkAG 

CAREERS IN THE BEEF INDUSTRY

<p>Career Name:</p> <p>ANIMAL NUTRITIONIST</p> <p>Description:</p> <p>An animal nutritionist helps formulate balanced rations for cattle.</p>	<p>Drawing:</p>  <p>Photo from: Creative Commons</p>
<p>Training & Education: <i>What Education is needed? How long will you attend school?</i></p> <p>To become a animal nutritionist you must have:</p> <ul style="list-style-type: none">• A Bachelor of Science degree is usually required for entry-level animal nutritionists.• Many nutritionists may hold degrees in a variety of areas ranging from animal science to biology to biochemistry.	<p>Work Environment: <i>Where do you work? Who do you work with? What do you wear?</i></p> <p>Animal nutritionists can work in a variety of environments such as farms, corporate research, development facilities, pharmaceutical companies, pet or livestock feed companies, federal government offices, laboratories, zoos, and wildlife rehabilitation centres. Depending on where they work, their dress code will vary.</p>
<p>Career Opportunities & Outlook: <i>What is the salary? What are the growth opportunities?</i></p> <p>Animal nutritionist salaries can vary widely based on years of experience, the level of education and the specific nature of their work, but the average annual salary ranges from \$70,000-\$80,000</p>	<p>The reason I am interested in learning about this career is...</p> <p>I have always wanted to become a animal nutritionist. I also enjoy working with animals and I think making sure they get the right nutrition is very important for the animal as well as for the humans that eat it.</p>

CAREERS IN THE BEEF INDUSTRY

The term “agricultural careers” brings to mind for many an image of a farmer in overalls maneuvering a tractor through a field of wheat, or a ranch hand throwing feed to the animals. There are many options on the agricultural career ladder, however, from farm laborers to animal scientists to marketing managers. In order for food to be produced, agricultural experts in many different occupations will always be necessary. In this lesson you will explore careers related to the Beef Industry.

<p>Career Name:</p> <p>Description:</p>	<p>Drawing:</p>
<p>Training & Education: <i>What Education is needed? How long will you attend school?</i></p>	<p>Work Environment: <i>Where do you work? Who do you work with? What do you wear?</i></p>
<p>Career Opportunities & Outlook: <i>What is the salary? What are the growth opportunities?</i></p>	<p>The reason I am interested in learning about this career is...</p>

ACTIVITY 6: Nutrient Recycling: The Carbon Cycle

Teacher Background

All living things are made of carbon. Carbon is also a part of the ocean, air, and even rocks. In this lesson, students will learn about how the carbon cycle is a way for nature to recycle and store this important element. In addition, they will investigate the important role that farms and ranches play in this natural and essential process.

Materials:

- Student Handouts:
 - The Carbon Cycle Overview
 - The Carbon Cycle Crossword

SCIENCE 4-7

Curricular Competencies	Content Connections
Questioning and Predicting <ul style="list-style-type: none">• Demonstrate curiosity about the natural world• Observe objects and events in familiar contexts• Identify questions about familiar objects and events that can be investigated scientifically• Make observations in familiar or unfamiliar contexts	Grade 4 <ul style="list-style-type: none">• sensing and responding: humans, other animals, plants• biomes as large regions with similar environmental features• energy has various forms and is conserved• Matter has mass, takes up space, and can change phase.• the law of conservation of energy — energy cannot be created or destroyed but can be changed
Planning and Conducting <ul style="list-style-type: none">• Make observations about living and non-living things in the local environment• Observe, measure, and record data, using appropriate tools, including digital technologies	Grade 5 <ul style="list-style-type: none">• the rock cycle• local types of earth materials• First Peoples concepts of interconnectedness in the environment• the nature of sustainable practices around BC's resources• First Peoples knowledge of sustainable practices
Processing and Analyzing Data & Information <ul style="list-style-type: none">• Experience and interpret the local environment• Demonstrate an openness to new ideas and consideration of alternatives• Identify First Peoples perspectives and knowledge as sources of information	Grade 6 <ul style="list-style-type: none">• basic structures and functions of body systems• effects of balanced and unbalanced forces in daily physical activities
	Grade 7 <ul style="list-style-type: none">• Earth and its climate have changed over geological time• organisms have evolved over time: change in traits of populations over time• survival needs: all organisms need space, food, water, and access to resources in order to survive• natural selection: the natural process by which certain traits that have a greater fitness for their environment lead to a reproductive advantage; this process happens within a population over time because of genetic variation• elements and compounds are pure substances• chemical changes

PROCEDURE

1. Let students know that they will be discussing the Carbon Cycle and how matter moves from land (geosphere) to animals (biosphere) to the air (atmosphere).
2. Have students watch the following video: https://www.youtube.com/watch?v=xFE9o-c_pKg
3. Read aloud and discuss "The Carbon Cycle Overview" handout.
4. Write the key terms on the board and provide students with definitions.
 - a. Carbon Cycle - a way for nature to recycle and store this important element.
 - b. Photosynthesis - process where plants take in light energy, water and carbon dioxide and produce oxygen and sugar (food).
 - c. Respiration - process where animals and plants take in oxygen and food and produce carbon dioxide and water.
5. Using the information and the video, have students complete "The Carbon Cycle Crossword" individually or with a partner.

How Does Raising Cattle Affect the Carbon Cycle?

Cattle that graze on pastures are an important part of the grassland ecosystem and nutrient recycling. The grasslands, where the cattle live and feed, store the element carbon in soil and plants. Grazing cattle eat these plants and the carbon changes forms in the animal's body into new substances. Cattle then produce several substances that are released back into the environment, such as carbon dioxide when they breathe, methane gas as they digest food, and other carbon substances that are released in their manure.

As with any food production system, there is an environmental impact associated with beef production, however, BC ranchers use, and continue to develop, new environmentally sustainable practices. Ranchers partner with the environment and do what they can to protect the health of their animal – this means protecting water sources and working towards the maintenance of a sustainable agriculture ecosystem. Modern production allows ranchers to get more beef from fewer animals which maximizes resources like land and water while still providing humans with the essential nutrients and taste of beef.

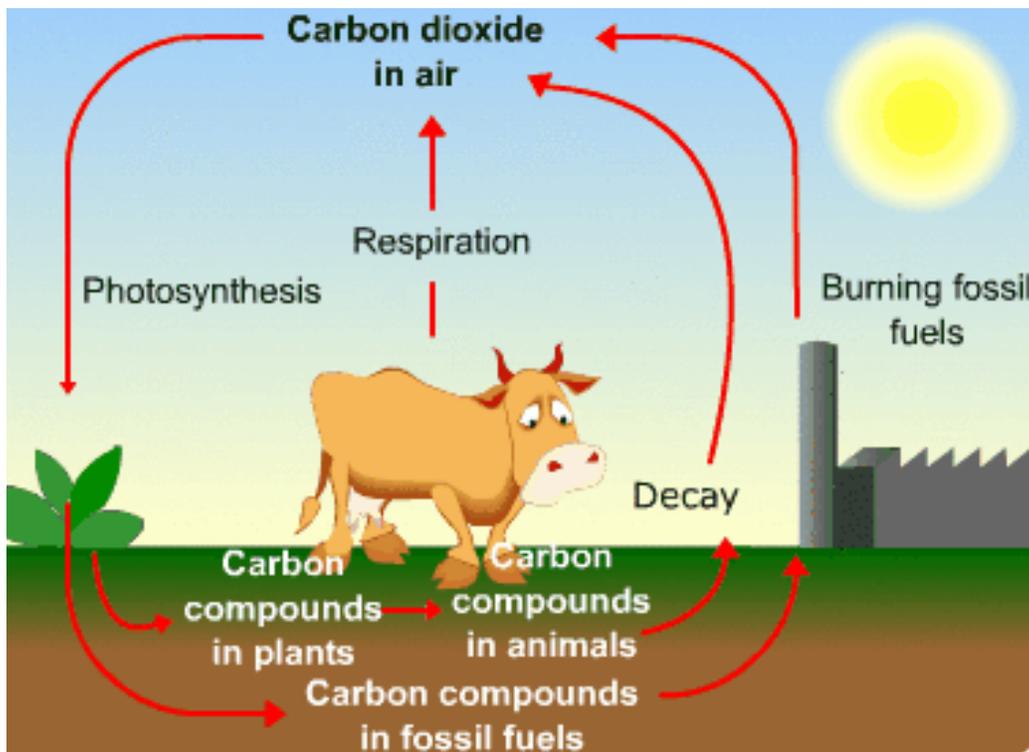
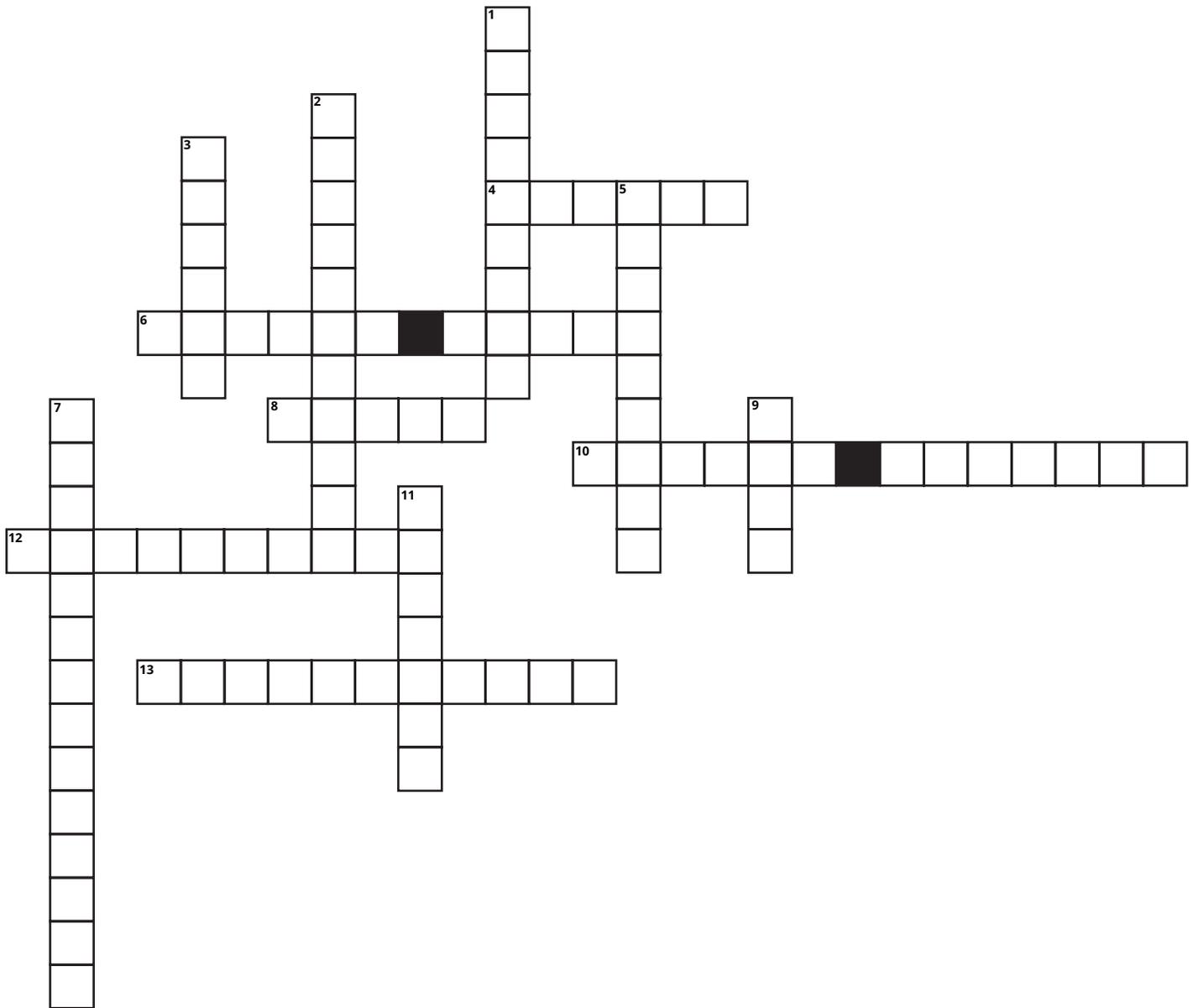


Image from: <https://www.sciencefacts.net/carbon-cycle.html>

THE CARBON CYCLE CROSSWORD



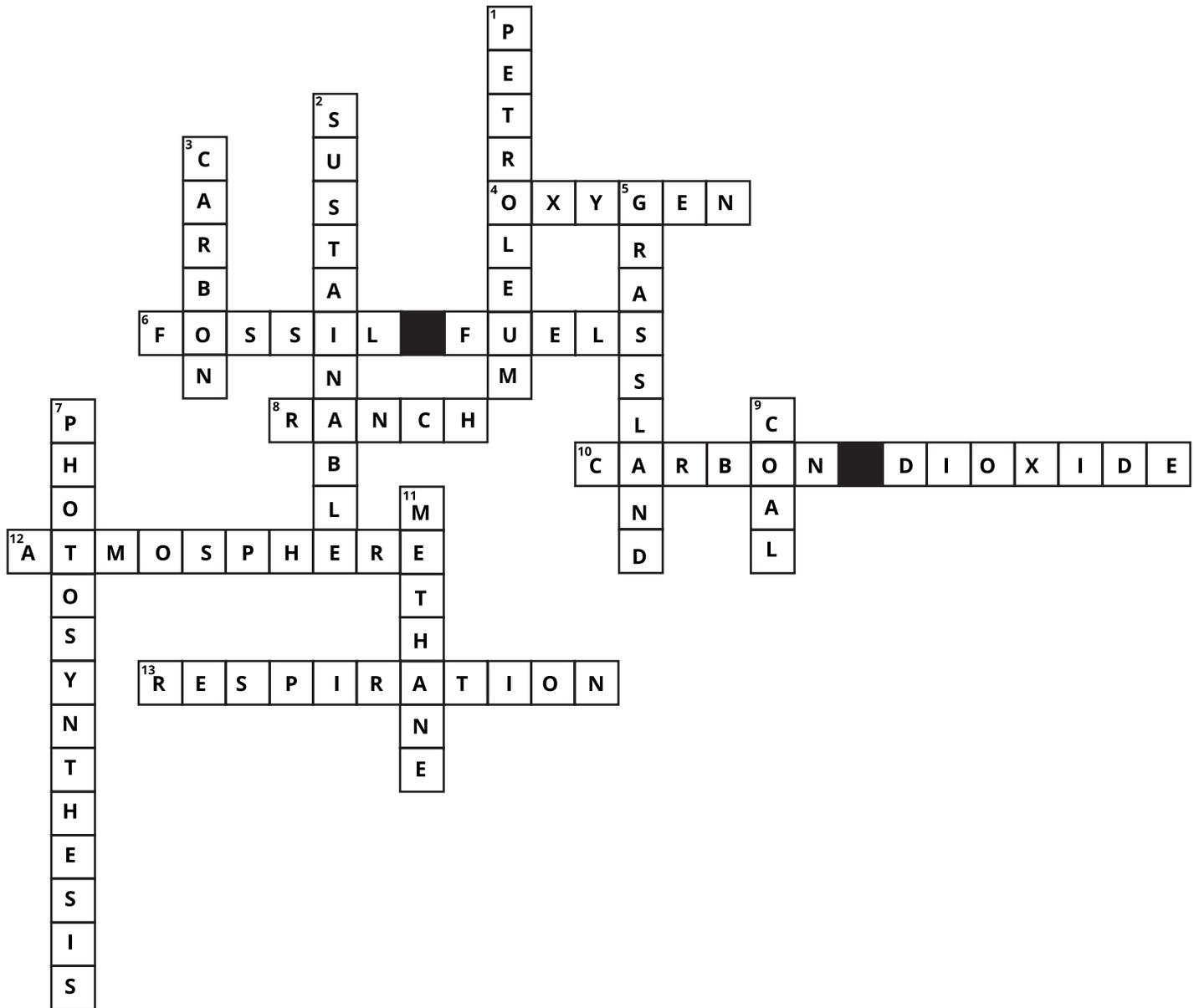
DOWN CLUES

1. A type of fossil fuel.
2. Able to be maintained over time because methods used do not hurt the environment.
3. This element is found in all living things.
5. The type of environment (biome) where cattle graze
7. The process in which plants make their own food.
9. A fossil fuel sometimes used to heat homes.
11. Cows produce this gas as they digest food.

ACROSS CLUES

4. Carbon dioxide is a substance made of a carbon atom and two _____ atoms.
6. When burned, these provide energy and release carbon dioxide into the atmosphere.
8. A large farm where animals are kept.
10. The gas produced when humans breathe.
12. When fossil fuels are burned, carbon is released into the _____.
13. Animals breathe using a process called _____.

THE CARBON CYCLE CROSSWORD



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