

## Lesson C5–1

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# Identifying Differences Between Plants and Animals

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**Unit C.** Basic Principles of Agricultural/Horticultural Science

**Problem Area 5.** Identifying Basic Principles in Animal Science

**Lesson 1.** Identifying Differences Between Plants and Animals

### **New Mexico Content Standard:**

**Pathway Strand:** Animal Systems

**Standard: I:** Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

**Benchmark: I-A:** Use classification systems to explain basic functions of animal anatomy and physiology.

**Performance Standard:** 1. Describe functional difference in animal structures and body systems. 2. Classify animals according to anatomy and physiology.

**Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

1. Explain the meaning of an organism and list its characteristics.
2. Define plant and animal.
3. Name and describe the life processes of living organisms.
4. List the similarities of plants and animals.
5. List and explain differences in the life processes of plants and animals.

**List of Resources.** The following resources may be useful in teaching this lesson:

**Recommended Resources.** One of the following resources should be selected to accompany the lesson:

Lee, Jasper S. and Diana L. Turner. *AgriScience*, Third Edition. Danville, Illinois: Interstate Publishers, Inc., 2003. (Textbook, Chapters 5 and 7)

**Other Resources.** The following resources will be useful to students and teachers:

Cooper, Elmer L. *Agriscience Fundamentals and Applications*, 2<sup>nd</sup> Edition. Albany, New York: Delmar Publishers, 1997.

Lee, Jasper S. and Diana L. Turner. Activity Manual — *AgriScience*, Third Edition. Danville, Illinois: Interstate Publishers, Inc., 2003.

Starr, Cecie and Taggart, Ralph. *Biology*, 7<sup>th</sup> Edition. Belmont, California: Wadsworth Publishing Company, 1995.

Towle, Albert. *Modern Biology*. Austin, Texas: Holt, Rinehart and Winston, Inc., 1993.

## List of Equipment, Tools, Supplies, and Facilities

Writing surface  
Overhead projector  
Transparencies from attached masters  
Copies of student lab sheets  
Specimens of animals and plants to observe

**Terms.** The following terms are presented in this lesson (shown in bold italics):

Animal  
Cell  
Circulation  
Food  
Growth  
Life process  
Locomotion  
Organism  
Plant

Protoplasm  
Repair  
Reproduction  
Respiration  
Secretion  
Sensation

**Interest Approach.** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here:

*Form students into small groups of three or four. Have each group select a chairperson and a recorder. The role of the chairperson is to direct the group through its work. The role of the recorder is to write down a summary of group discussion. Assign each group the duty of listing examples of two common plants and animals in the local area. Have students list the most important characteristics of each plant and animal, combine them, and then list the characteristics of plants and animals which are similar and those which are different. Have oral reports from each group. Develop a list of similarities and differences on the writing surface as the reports are provided by the groups.*

## Summary of Content and Teaching Strategies

**Objective 1:** Explain the meaning of an organism and list its characteristics.

**Anticipated Problem:** What is an organism? What are the characteristics of organisms?

- I. An **organism** is a living thing that varies in size and shape. It is a structural unit that carries out chemical and life processes. When the life processes stop, they die. All organisms are unique, though they share many similarities.
  - A. Organisms have a number of characteristics that classify them as living or nonliving condition.
    1. Organisms are unique and made of cells. A **cell** is a unit or building block with a definite structure and function. The number of cells in an organism varies from one to millions, depending on the size of the organism. Cells have membranes and substances that carry out chemical activities needed for life processes. The cells of organisms contain protoplasm. **Protoplasm** is a liquid-like material inside a cell that contains various suspended solid materials that carry out chemical processes needed for living.
    2. Organisms need energy to carry out life processes. Energy for plants and animals comes from food.
    3. Organisms have a life span. (This is covered in lesson plan C5–5.)
    4. Organisms grow and reproduce. **Growth** is the process of an organism increasing in size by adding cells. **Reproduction** is the process of similar organisms giving rise to

new individuals of the same kind. (These topics are covered in more detail in Lessons C5–3 and C5–5)

5. Organisms respond to their environment. The environment may promote growth and life processes or it may prevent growth or cause death.
- B. Organisms carry out life processes. A **life process** is a function that is essential for an organism to remain in the living condition and produce new members of the species. This varies among plants, animals, and other organisms. These are the distinguishing characteristics between plants and animals.

*Have students read appropriate sections in the suggested chapters in the recommended textbook as home work or in supervised study prior to covering this lesson. Involve student input in outlining the content of the objective on the writing surface or use TM: C5–1A. As always, students should keep notes on the important content, which will help master the objectives for the class. Observe notes on a regular basis.*

## **Objective 2:** Define plant and animal.

**Anticipated Problem:** What is a plant? What is an animal?

- II. Plants and animals have both similarities and differences.
  - A. A **plant** is an organism that uses nutrients to make the food needed for life processes. The nutrients are taken in as a liquid. Structural characteristics and functions allow plants to use the nutrients in making food in the appropriate environment. Plants are in the Kingdom Plantae. Some 350,000 species of plants have been identified on Earth.
  - B. An **animal** is an organism that acquires food from other sources and has other qualities that distinguish it from plants and organisms in other kingdoms. Animals are members of the Kingdom Animalia. Scientists have identified nearly a million different species of animals.

*Ask students to provide definitions of plant and animal. Efforts to do so will likely result in students naming similarities and differences in plants and animals. Develop two lists on the writing surface using the items that they name. List definitions on the writing surface or use TM: C5–1B.*

## **Objective 3:** Name and describe the life processes of living organisms.

**Anticipated Problem:** What are the life processes of living organisms? How are these processes carried out?

- III. All living organisms carry out life processes in different ways. Life processes are the characteristics of organisms.
  - A. Living organisms carry out eight life processes, they are as follows:
    1. Getting and using food—**Food** is the material that provides nourishment for a living organism. Some organisms require food in a ready-to-use form. Other organisms can manufacture food from nutrients.

2. Movement—Movement refers to internal processes as well as locomotion. **Locomotion** is the ability for an organism to move itself from one place to another. Movement involves a complex system of responding to stimuli.
  3. **Circulation** is the movement of necessary materials throughout an organism. Animals have circulatory systems that move blood while plants have vascular systems that move water and nutrients and manufactured food.
  4. **Respiration** is the process by which the cells of an organism receive oxygen so that the energy in food or digested food can be released. Respiratory structures vary among species.
  5. Growth and repair—Growth processes occur from the beginning to the end of life. Growth is increasing in size. Growth occurs when cells become larger or multiply or specialize into organs and tissues. (Note: Lesson C5–2 includes more information on cell specialization). In mature organisms, most growth is the process of repairing tissues. **Repair** occurs when parts of an organism wear out or are damaged and are replaced by growing new cells.
  6. **Secretion** is the production of substances by an organism that it needs for the living condition to occur. Secretions are often important in how an organism carries out other life processes, such as saliva is important in good ingestion in some animals.
  7. **Sensation** is the awareness of an organism to its environment and the responses it makes to it. Organisms respond to stimuli received through their senses. Animals have higher developed systems for sensation in five areas: vision, hearing, touch, smell, and taste. Plants are responsive to light and deficiencies or conditions in its environment.
  8. Reproduction processes vary but all sexual reproduction involves the union of a male and female sex cell regardless of the species involved. Some organisms reproduce asexually, such as plants that send out runners or bulbs that divide.
- B. Seven of the processes are essential for an organism to remain in the living condition. Reproduction is not essential for an organism to live but is required for new members of a species to be produced. Disruption of any of the eight processes results in organisms failing to live and reproduce.

*Have students read the appropriate sections in the textbook (chapter 5). Use student input to develop a list of the eight life processes on the writing surface. If preferred, use TM: C5–1C and present the list of life processes. Ask students to explain the life processes. Some comparison of these processes in plants and animals should be encouraged.*

**Objective 4:** List the similarities of plants and animals.

**Anticipated Problem:** What are the similarities of plants and animals?

- IV. All living organisms share similar needs and functions. These can be used as the basis for listing similarities of plants and animals.
  - A. Plants and animals are similar or alike in several ways.

1. Both have life cycles.
  2. Both carry out processes to remain in the living condition.
  3. Both are made of cells.
  4. Both must have food.
- B. Animals depend on plants to manufacture food which enters the food chain. Animals eat plants. Upon death, the animals decompose to provide nutrients for plants.
- C. Plants use the nutrients from the decaying remains of animals and other plants. Nutrients in manure is also used by plants for growth.

*Have students read the appropriate section in the textbook on plant and animal similarities (chapter 7). Ask students to name ways plants and animals are similar. Develop a list on the writing surface or use items suggested by students in objective 2. Use the writing surface or TM: C5–1D to summarize the four major areas of similarity.*

**Objective 5:** List and explain differences in the life processes of plants and animals.

**Anticipated Problem:** What are the differences in the life processes of plants and animals?

V. Plants and animals differ in important ways.

A. The major differences are:

1. Plants take up nutrients in water and make their own food. Animals ingest (eat) food and cannot make food.
2. Animals are capable of locomotion (moving about). Plants cannot move about on their own.
3. Both plants and animals have cells but the structure varies in one important way: Plant cells have cell walls. A membrane is located inside the wall. Animal cells do not have walls. Walls provide rigidity that keep plants standing and retaining their shape. Animals have soft membranes and have skeletons to give body shape.
4. Photosynthesis and respiration both occur in plants. Animals only have respiration. Plants take in carbon dioxide and release oxygen during photosynthesis. Both animals and plants take in oxygen and release carbon dioxide during respiration.

*Have students read the appropriate sections in the textbook (chapters 5 and 7). Ask students to name differences in plants and animals. Develop a list of differences on the writing surface. Have students observe specimens of plants and animals to identify differences in the specimens, such as a corn plant, dog, chicken, and petunia. Use LS: C5–1A or outline the observation activity on the writing surface. Use TM: C5–1E or the writing surface to summarize the differences in plants and animals.*

**Review/Summary.** Use the objectives for the lesson to guide the review and summary. Have students explain the content that goes with each objective. Observe student performance in terms of level of mastery of the objectives. Reteach any objectives where mastery appears deficient.

**Application.** Students can apply the content of this lesson as they learn about and work with plants and animals.

**Evaluation.** Observe student performance and participation throughout the lesson as one means of assessing student learning. Observation of student performance in future learning will provide information on the extent to which the objectives have been achieved. A written test can also be used. A sample test is attached.

## **Answers to Sample Test:**

### **Part One: Matching**

1=i, 2=a, 3=j, 4=b, 5=d, 6=h, 7=g, 8=c, 9=e, 10=f

### **Part Two: Completion**

1=plant, 2=animal, 3=Reproduction, and 4=nutrients

### **Part Three: Short Answer**

1. The answer should list four similarities as summarized on TM: C5-1D.
2. The answer should list four differences as summarized on TM: C5-1E.

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# Test

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## Lesson C5–1: Identifying Differences Between Plants and Animals

### Part One: Matching

*Instructions.* Match the term with the correct response. Write the letter of the term by the definition.

- |                 |                |
|-----------------|----------------|
| a. life process | f. circulation |
| b. growth       | g. repair      |
| c. organism     | h. locomotion  |
| d. food         | i. secretion   |
| e. respiration  | j. sensation   |

- \_\_\_\_\_ 1. Production of substances by an organism to promote life processes.
- \_\_\_\_\_ 2. A function that is vital for an organism to remain in the living condition and produce young.
- \_\_\_\_\_ 3. Awareness of an organism to its environment and the responses it makes to it.
- \_\_\_\_\_ 4. Increase in size of an organism.
- \_\_\_\_\_ 5. The material that provides nourishment for an organism.
- \_\_\_\_\_ 6. The ability of some organisms to move about.
- \_\_\_\_\_ 7. The process of an organism producing new cells when old cells die or are injured.
- \_\_\_\_\_ 8. A living thing that carries out life processes.
- \_\_\_\_\_ 9. The process by which the cells of an organism receive oxygen so that the energy in food can be released.
- \_\_\_\_\_ 10. The movement of substances throughout an organism.

### Part Two: Completion

*Instructions.* Provide the word or words to complete the following statements.

1. A \_\_\_\_\_ is an organism that uses nutrients to make food for the conduct of needed life processes.
2. An \_\_\_\_\_ is an organism that ingests food and is usually capable of locomotion.



# Characteristics of Organisms

**Organism—a living thing; structural unit that carries out chemical processes to remain in the living condition; a member of one of the five Kingdoms**

## Characteristics:

- **organisms are unique**
- **organisms need energy**
- **organisms have a life span**
- **organisms grow and reproduce**
- **organisms respond to their environment**

# **Definition of Plant and Animal**

**Plant—an organism that uses nutrients to make food needed for life processes; a member of the Kingdom Plantae**

**Animal—an organism that acquires food from other sources; a member of the Kingdom Animalia**

# Life Processes

**Life process—a function essential for an organism to remain in the living condition**

**Seven required to live:**

- **get and use food**
- **movement**
- **circulation**
- **respiration**
- **growth and repair**
- **secretion**
- **sensation**

**One required to continue species:**

- **reproduction**

# **Similarities of Plants and Animals**

- 1. Both have life cycles.**
- 2. Both carry out life processes.**
- 3. Both are made of cells.**
- 4. Both must have food.**

# **Differences of Plants and Animals**

- 1. Plants make food; animals ingest food.**
- 2. Animals are capable of locomotion; plants cannot move about.**
- 3. Plant cells have membranes and walls; animal cells have membranes and no walls.**
- 4. Photosynthesis and respiration both occur in plants; animals only carry out respiration.**

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# Lab Sheet

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## Comparison of Plants and Animals

**Purpose:**

The purpose of this activity is to compare plant and animal specimens.

**Supplies/Equipment:**

You will need a specimen plant and a specimen animal to observe.

**Safety:**

Depending on the conditions in which the observations are made, no safety hazards may be present. Assess the situation and, if needed, use the appropriate PPE.

**Procedure:**

Locate a plant and animal specimen conveniently within a few feet to make observation easy and accurate.

- \_\_\_\_\_ Step 1. Identify the species of the plant and animal you are observing. Write the species name here:  
Plant Species \_\_\_\_\_ Animal Species \_\_\_\_\_
- \_\_\_\_\_ Step 2. Observe the life processes listed below of the two organisms and record your observations. Write what you observe for the plant and animal specimen. Describe evidence of the processes or how the organism will carry out the processes. Note: In some cases, it may be difficult or impossible to observe the processes. In that case, use reference materials to prepare your findings.

### Food

Plant Specimen \_\_\_\_\_

Animal Specimen \_\_\_\_\_

### **Movement**

Plant Specimen \_\_\_\_\_

Animal Specimen \_\_\_\_\_

### **Respiration**

Plant Specimen \_\_\_\_\_

Animal Specimen \_\_\_\_\_

### **Secretion**

Plant Specimen \_\_\_\_\_

Animal Specimen \_\_\_\_\_

\_\_\_\_\_ Step 3. Write an overall assessment of these and other life processes on the back of this sheet for the plant and animal specimens.