

Life Systems

Interacting Organisms



Including:
Looking Deeper
The Cell Construction Crew
Your Order's Up
Who's in Charge?
Around and Around We Go
Together We Stand
Adapt or Die
Sneaking Through
Sneaking Through - II
Where Does It Go From Here?
Owl Pellet P.A.
Some Good... Some bad - Microbes
Defend Yourself!
Mystery Sleuthing
Polluting Our Thoughts

An Integrated Unit for Grade 7/8

Written by:

The Curriculum Review Team 2005

Length of Unit: approximately: 16 hours

August 2005



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Unit Context

This Life Science Unit will set the stage for further and more in-depth studies into organisms. Children have a natural curiosity about their own bodies and their environment. Their curiosity can be nurtured through the study of life sciences. Looking at the relationships of living organisms to each other and to their environment will help students better understand and appreciate their role in the cycle of life. God has created a unique and mystifying world. Studying living things helps us to better appreciate ourselves and the world we live in. Living organisms develop features that help them cope with certain conditions in their environment. It is important that we understand the basic needs of all organisms in order to ensure their survival in today's world of pollution and environmental problems.

Students will work on a variety of Subtasks related to Life Systems; sometimes working together, and at times, due to the distinct nature of some aspects of the two topics, they will work in separate grade-specific groups. As with all combined grade units, assessment and/or evaluation is tied to grade-specific learning expectations, even when they are working together. The time allotment set out in specific subtasks should be flexible to ensure that students have enough time to achieve success.

Catholic Graduate Expectations have been included, specific to each subtask. Please refer to the Unit Wide Resources for references to aid in implementing these expectations.

Unit Summary

Students will continue to develop their knowledge of systems and living things. An understanding and appreciation of the diversity and interdependence of God's creations will be integral throughout the unit. Students will engage in several hands-on activities, research, and scientific investigations relating to organisms. They will develop a personal moral perspective on issues relating to themselves and their surrounding environment.

Students will be required to demonstrate knowledge of the basic structure and function of plant and animal cells. They will investigate the hierarchical units of living things, which will include working within the larger framework of ecosystems, as well as studying cells and organ systems within the human body.

Finally, they will be required to demonstrate the long-term effects of human activities and technological innovations on the sustainability of ecosystems and human body systems.

Culminating Task Assessment

The students will research and explore the problem of persistent pollutants and their harmful effects on both humans and ecosystems. The Grade 8 students will concentrate on the effects of chemical pollution on the human body and its organs and tissues, while the Grade 7 students will focus on the effects of chemical pollution on species within a food chain. Throughout the development of this task, the students will be encouraged to recognize "...that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it." (Witnesses to Faith)

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Links to Prior Knowledge

Prior knowledge for this unit will include a general understanding of the diversity of living things. Students should be able to classify systems as a way of organizing species within the animal kingdom, or a specific habitat. Use of a microscope to acquire firsthand experience in studying living things will also be required.

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Completion of Subtask 1 will allow the teacher to reflect upon the students' grasp of prior knowledge and provide further direction, if necessary, in order to develop the concepts necessary to complete the unit. As responsible Catholic citizens, the students will have also learned to respect the environment and use resources wisely.

* See expectations for Grades 4 to 6 (in unit list) to determine required prior knowledge.

Considerations

Notes to Teacher

Cross-curricular connections include Language: Reading, Writing, Oral & Visual Communication; Math: Measurement, Data Management; Drama: Role Playing; and Religious Education.

Teaching/Learning Strategies

- focus primarily on small group (co-operative learning, discussion, peer teaching) activities, teacher-directed lessons and an independent study relating to the Culminating Task. Specific instructional strategies are listed within each subtask.

Assessment

- will incorporate three types: formative (reflects a student's progress throughout a unit), diagnostic (information to help guide student), and summative (occurs at the end of each unit, which should be the student's best performance). Task-specific rubrics have been provided throughout the subtasks to aid in assessment. Provide the students with the appropriate rubric when the assignment is initially distributed. It is important that students have a clear understanding of what is expected from them prior to beginning the task. Modifications may be made as one finds it necessary.

Adaptations

The activities in this unit are designed to be as open-minded as possible to allow for many learning styles and abilities. Teachers will want to choose small-group members carefully to ensure that all students' needs are met. Individual modifications to the unit should be considered by the classroom teacher.

Some suggested modifications are to:

- recognize effort as well as full task completion;
- provide immediate feedback;
- clarify expectations at the beginning of each lesson and perhaps provide sample responses for some students;
- repeat important information (concepts and ideas) or allow students to repeat and rephrase;
- use pictures and diagrams whenever possible;
- encourage students to question for clarification and additional information before beginning work;
- vary resources with regard to reading level, amount of visual information, use of oral, written, and visual data;
- modify the assignment in terms of time, quantity of work assigned, and nature of the assignment;
- stress quality rather than quantity;
- provide opportunities for strengths to be used (e.g., artistic abilities could be used to good advantage in groups);
- team students with varying abilities;
- help students keep lesson notes consistent and organized;
- adjust reading level of student material or tape recorded text;
- teach note-taking and organizational skills;
- provide research material at their reading level, or with relevant information highlighted;
- use reading partners;
- assign enrichment tasks;



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- vary assessment strategies.

Special Education Accommodations

- provide an encouraging and supportive classroom environment.
- refer to individual IEPs and accommodation logs of exceptional learners to make meaningful adaptations for these students through consultation with the school's Special Education and ESL teachers.
- provide students with instructional models which illustrate basic concepts.
- encourage heterogeneous grouping of students where at least one student in each group is a strong reader
- set up group work to meet the needs of all members. Pair students with physical needs, learning and/or developmental challenges and explain expectations of those students to the group.

Considerations for Unit Planning

- It is suggested that the study of ecosystems involve some direct experience with communities within the local environment. Consider incorporating this outing around Subtasks 5, 6, or 7. Suggested field trips may include conservation areas, local ponds, woods, beaches, etc.
- Each Subtask will take approximately 60 minutes to complete, the unit is designed to last eight weeks:
- Order videos for Subtask 6 (Human Body Systems) ahead of time;
- Obtain a class set of Science textbooks for research purposes.
- Order class set of Owl Pellets (one pellet/two2 students) prior to beginning unit to allow four weeks for delivery. Most science supply houses will be able to provide these.



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1 Looking Deeper

Both Grade 7 and 8 students will be asked to classify the items found in their surrounding environments, focusing on the distinction between living and nonliving elements. Chart paper will be used to further classify living things, particularly from the animal kingdom. During the introduction to the internal systems (cells - the basic unit of life), students will brainstorm a "What You Want To Learn About" list. This list may remain on display throughout the unit.

Catholic Graduate Expectations:

CGE 7i - respects the environment and uses resources wisely.

CGE 5e - respects the rights, responsibilities and contributions of self and others.

2 The Cell Construction Crew

Many students have trouble visualizing cells as three-dimensional units. The purpose of this activity is to provide students with a hands-on activity which will enhance their understanding of the 3-D characteristics of cells while reinforcing their knowledge of plant and animal cell structure.

Catholic Graduate Expectations:

CGE 2e - uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology, and information systems to enhance the quality of life.

3 Your Order's Up

The students will appreciate that all organisms, plant and animal, have cells as their fundamental unit of organization. The progression of life from cell, to tissue, to organ, to organ systems, to organism (individual) will be explored and extended to population, community, biome, and biosphere. An understanding of these concepts will lead to the introduction of the culminating task.

Catholic Graduate Expectations:

CGE 3e - adopts a holistic approach to life by integrating learning from various subject areas and experience.

4 Who's in Charge?

The Grade 8 students will further investigate the cell, focusing on the organelles and their functions. They will complete an activity to reinforce this new information.

The Grade 7 students will further investigate the components of an ecosystem, focusing on biotic and abiotic elements.

Catholic Graduate Expectations:

CGE 3f - examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio- economic and ecological) for the development of a just and compassionate society.

CGE 5a - works effectively as an interdependent team member.



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5 Around and Around We Go

This lesson will be introduced to both grades through an activity that demonstrates the interdependence of living organisms. Following the activity, the students will focus on food chains and webs.

Catholic Graduate Expectations:

CGE 7d - promotes the sacredness of life.

CGE 3b - creates, adapts, evaluates new ideas in light of the common good.

6 Together We Stand

To keep a human body or an ecosystem healthy, the components must work together as a system. The students will examine the relationship between the structures and the functions of cells in plants and animals. Viewing videos on the human body's organ systems will further enhance the concepts taught.

Catholic Graduate Expectations:

CGE 3f - examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio-economic and ecological) for the development of a just and compassionate society.

7 Adapt or Die

The students will understand that living organisms can adapt to their surroundings. In order to survive living things must be able to adapt. Adaptation is a gradual, but continuous process from one generation of a species to the next. The Grade 7 students will examine adaptations within ecosystems, while the Grade 8 students will examine adaptations within the human species.

Catholic Graduate Expectations:

CGE 7a - acts morally and legally as a person formed in Catholic traditions.

CGE 7d - promotes the sacredness of life.

CGE 2b - reads, understands and uses written materials effectively

8 Sneaking Through

Both Grade 7 and 8 students will investigate how fluids enter and exit cells (diffusion and osmosis). They will gain an understanding of the different types of membranes that make these processes possible.

9 Sneaking Through - II

Continuation of Subtask 8. Students will take their conclusions and apply the knowledge gained to a Venn Diagram.

10 Where Does It Go From Here?

Our bodies' organ systems work together as a single unit for a common purpose: to stay alive. In our bodies there are many systems that take on specialized tasks. For example, our digestive system is responsible for extracting essential nutrients from the foods we eat. The class will look at the respiratory, circulatory, digestive, and excretory systems within humans. This will lend itself to the next lesson focusing on the unique digestive system of an owl.

Catholic Graduate Expectations:

CGE 4a - demonstrates a confident and positive sense of self and respect for the dignity and welfare of others.



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11 Owl Pellet P.A.

Owl pellets are masses of undigested food that are regurgitated by these birds, containing the bones of their prey, as well as any fur, feathers, claws, and teeth. A part of the owl's digestive system presses these parts together to form a pellet. Scientists learn many things about the owls and their habitats by examining their pellets. The students will dissect their own owl pellets, compare their findings to an Owl Pellet Bone Chart (provided), and draw conclusions from their results.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

12 Some Good... Some bad - Microbes

Both Grade 7 and 8 students will explore the harmful and beneficial effects of microbes on the human body. They will have the opportunity to observe these effects firsthand, through the Dishcloth Experiment. Many microbes play a role detrimental to human health, while at the same time they play an integral role in the ecosystem.

13 Defend Yourself!

This task is a continuation to the previous lesson on Microbes. The Grade 7 students have investigated food chains, webs, and biological pyramids. The students will use this past knowledge to recognize the effects of pesticides/toxic chemicals in a food web. In the Grade 8 component, students will focus on the functions of specialized cells, white blood cells, in the defence against invaders. Defence against infection is described at the cellular level.

Catholic Graduate Expectations:

CGE 7a - acts morally and legally as a person formed in Catholic traditions.

CGE 7i - respects the environment and uses resources wisely.

14 Mystery Sleuthing

Grade 7 and 8 students are required to investigate, research, and solve an ecological or environmental mystery. In place of a murderer or villain, the culprit is something that has disturbed the ecological balance. Students will be required to apply their understanding of habitats and the interrelationship of plants and animals within a habitat to a real situation.

Catholic Graduate Expectations:

CGE 7d - promotes the sacredness of life.

CGE 5a - works effectively as an interdependent team member.

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.



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15 Polluting Our Thoughts

The students will research and explore the problem of persistent pollutants and their harmful effects on both humans and ecosystems. The Grade 8 students will concentrate on the effects of chemical pollution on the human body and its organs and tissues, while the Grade 7 students will focus on the effects of chemical pollution on species within a food chain. Throughout the development of this task, the students will be encouraged to recognize "...that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it." (Witnesses to Faith)

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**

~ 60 mins

Description

Both Grade 7 and 8 students will be asked to classify the items found in their surrounding environments, focusing on the distinction between living and nonliving elements. Chart paper will be used to further classify living things, particularly from the animal kingdom. During the introduction to the internal systems (cells - the basic unit of life), students will brainstorm a "What You Want To Learn About" list. This list may remain on display throughout the unit.

Catholic Graduate Expectations:

CGE 7i - respects the environment and uses resources wisely.

CGE 5e - respects the rights, responsibilities and contributions of self and others.

Expectations

- 7s4 – identify living (biotic) and non-living (abiotic) elements in an ecosystem;
- 6s6 – identify and describe the characteristics of vertebrates, and use these characteristics to classify vertebrates as mammals, birds, amphibians, reptiles, and fish (the five main classes);
- 8e47 • listen attentively to organize and classify information and to clarify thinking;
- 4s1 • demonstrate an understanding of the concepts of habitat and community, and identify the factors that could affect habitats and communities of plants and animals;
- 4s3 • describe ways in which humans can change habitats and the effects of these changes on the plants and animals within the habitats.
- 4s9 – classify plants and animals that they have observed in local habitats according to similarities and differences (e.g., in shape, location).

Groupings

- Students Working As A Whole Class
- Students Working In Small Groups
- Students Working Individually

Teaching / Learning Strategies

- Computer Assisted Learning
- Brainstorming
- Classifying
- Collaborative/cooperative Learning
- Discussion
- Independent Study

Assessment

Diagnostic Assessment:

* See subtask expectations Grades 4 to 6 to determine required prior knowledge.

Look for the following when applying your anecdotal assessment:

- ability of the students to classify;
- ability to distinguish between living and non-living elements;
- understanding of vertebrates and invertebrates (demonstrated on students' chart paper).

Use a personalized classroom checklist for recording your observations of the student's knowledge.

Assessment Strategies

- Observation
- Questions And Answers (oral)
- Classroom Presentation

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~ 60 mins

Assessment Recording DevicesAnecdotal Record
Checklist**Teaching / Learning****Full Class Activity (Grades 7 and 8)**

1) Ask the students to classify the living and non-living things you would be able to find in the following places: a house, an aquarium, a forest.

2) Ask the students to define the criteria that they used to differentiate between living and non-living things? Can you create an orderly system for classifying all of the animals in the world?

3) At this point, show pictures of vertebrates and invertebrates and have the students classify the pictures into:

- a) the five main classes of vertebrates (mammals, birds, amphibians, reptiles, fish); and
- b) the four main classes of invertebrates (sponges, worms, molluscs, arthropods).

In small groups, have the students put their answers onto chart paper, which they can then display in the classroom.

4) Next, ask the students if they ever wonder what is below the surface of an animal's exterior. Create a list of the information they know. Ask students if we can assume that animals with different characteristics on the outside will also look different on the inside. Have students discuss all possibilities.

5) Select a diagram of an animal cell from the Unit Wide Resources list. Have the students identify the parts of the animal cell. Allow the students to seek assistance from classroom resources (textbook, encyclopedia, computer programs, etc.).

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources**Photographs/Pictures**

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Notes to Teacher

- 1) Collect chart paper and markers prior to the lesson.
- 2) Gather pictures of vertebrates and invertebrates from available resources (Internet, magazines, text, posters).
- 3) Have classroom texts and computer resources available for students to use.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

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~ 60 mins

Description

Many students have trouble visualizing cells as three-dimensional units. The purpose of this activity is to provide students with a hands-on activity which will enhance their understanding of the 3-D characteristics of cells while reinforcing their knowledge of plant and animal cell structure.

Catholic Graduate Expectations:

CGE 2e - uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology, and information systems to enhance the quality of life.

Expectations

- 8s6 A – identify organelles in cells through observation (e.g., vacuole, nucleus, chloroplast) and explain their functions;
- 8s18 – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);
- 7s15 – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as biosphere, biome, ecosystem, species);
- 8s1 A • demonstrate an understanding of the basic structure and function of plant and animal cells, and describe the hierarchical organization of cells in plants and animals;
- 8s7 A – describe, using their observations, differences in structure between plant and animal cells;
- 8s20 A – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a simulation illustrating movement of water and nutrients between cells and through various organs and systems).

Groupings

- Students Working In Small Groups
- Students Working Individually

Teaching / Learning Strategies

- Advance Organizer
- Collaborative/cooperative Learning
- Homework
- Model Making

Assessment

- a) Rubric is provided for assessing the final product of the cell construction.
**note: CGE 5a and 5e are assessed within this rubric
- b) You may choose to formally assess the completed diagrams of the plant and animal cells that the students were assigned for homework. This will address expectations 8s7 and 8s20.
- c) There is also BLM 2.3 available to assess students group work skills.

Assessment Strategies

- Exhibition/demonstration
- Performance Task

Assessment Recording Devices

- Rubric

Teaching / Learning

- 1) Re-examine cell structures from last class. Based upon this acquired knowledge, students will construct three-dimensional cells.

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~ 60 mins

- 2) Divide the class into small groups. Gather all materials and have them laid out according to the number of student groups. Distribute materials and BLM 2.1 to each group.
- 3) Inform groups that they will be making two cells, plant and animal. When they finish, each cell will be approximately the size of a tennis ball. The first part of the class period will be spent making the cell structures themselves. Instruct students to wait before putting the cells together until you can explain the procedure. Have group leaders assign responsibility for each cell part to the group members.
- 4) Have the 'cell membrane' people cut the large piece of plastic wrap in half, and place each piece on the table.
- 5) Have the 'cytoplasm' people form two balls using the plain modelling clay. Lay one ball on each piece of plastic wrap and press each into a 'pancake' about 10 cm in diameter.
- 6) Instruct students to designate one pancake 'animal cell' and the other 'plant cell.'
- 7) Have members of each group find the supplies they need to represent their cell structures, then cut, form, fold, paste, etc., until their structure is simulated. Place finished structures in a pile in the centre of the appropriate pancake.
- 8) When all of the cell parts are completed and in place, have someone in each group gather up the pancake carefully, cupping it around its topping, and seal all the edges together to form a ball. Have the 'cell membrane' people wrap the plastic wrap around the cytoplasm and have the 'cell wall' people wrap the aluminum foil around the plant cell.
- 9) Depending upon time available, cells can be cut in half this class period, or the next.
- 10) Provide students with a diagram of both a plant and an animal cell, which requires them to label the parts of each. Classroom textbooks, computer resources, or other Board resources may be utilized by the students.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



2. 2 Cell Construction Rubric



2.1 3-D Cell Construction

2.1 3-D Cell Construction.cwk



2.3 Group Work Assessment

Teacher Group Evaluation.cwk

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~ 60 mins

Notes to Teacher

Gather materials required for the experiment. (Materials are listed in BLM 2.1.)

Ensure the student chosen as group leader is able to manage the group. Depending on the dynamics of your groups, some teacher assistance may be required to get the group organized.

Classroom textbooks, computer resources, or other Board resources may be utilized by the students for the take-home assignment.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

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Description

The students will appreciate that all organisms, plant and animal, have cells as their fundamental unit of organization. The progression of life from cell, to tissue, to organ, to organ systems, to organism (individual) will be explored and extended to population, community, biome, and biosphere. An understanding of these concepts will lead to the introduction of the culminating task.

Catholic Graduate Expectations:

CGE 3e - adopts a holistic approach to life by integrating learning from various subject areas and experience.

Expectations

- 8s8 A – describe the organization of cells into tissues, organs, and systems;
- 7s15 A – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as biosphere, biome, ecosystem, species);
- 8s18 A – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);
- 7s13 – formulate questions about and identify the needs of various living things in an ecosystem, and explore possible answers to these questions and ways of meeting these needs (e.g., research the population levels of a species over time and predict its future levels on the basis of past trends and present conditions; determine how the structure of specific plants helps them withstand high winds, live on the surface of water, or compete for sunlight);

Groupings

Students Working As A Whole Class
Students Working Individually

Teaching / Learning Strategies

Classifying
Concept Clarification
Direct Teaching
Homework

Assessment

Students will be required to hand in flow charts.
Use rubric provided (3.2) for assessment.

Assessment Strategies

Performance Task

Assessment Recording Devices

Rubric

Teaching / Learning

1) After reviewing a cell model from last class, present the following information to the students (either on the blackboard or a transparency) based on the cell.

The information required is as follows.

- The cell is the basic unit of life.
- All cells are organized in groups.
- Each group performs certain tasks.
- Cells are organized into tissues.
- Tissues are organized into organs.
- Organs are organized into organ systems.

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- Organ systems are organized into an organism.
- These are called levels of biological organization.

2) After reviewing the information found in BLM 3.1, the students will create a flowchart reflecting the Progression of Life. The flowchart must include a real-life example at each level of organization.

3) At this point, you should introduce the Culminating Activity (Subtask 15) based on the idea that they need to understand and apply these levels of organization in order to begin the activity.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



3.2 Flow Chart Rubric



3.1 Organization of Cells

3.1 Organization of Cells.cwk

Notes to Teacher

- 1) Consider incorporating the lesson from the Grade 7 Religion "Believe In Me" Unit 6 - students explore the nature of the kingdom of God and what it means to be a part of that kingdom.
- 2) Students are required to have an understanding of the structure and content of flowcharts.
- 3) Introduction of the Culminating task takes place at the end of this lesson. You may distribute the actual assignment sheet (BLM 15.1 and BLM 15.2), but caution students that they are not to attempt to complete this assignment, as the lessons taught during the unit are required information for the Culminating Task. Attaching Assessment Rubric to the assignment is suggested.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

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~ 60 mins

Description

The Grade 8 students will further investigate the cell, focusing on the organelles and their functions. They will complete an activity to reinforce this new information.

The Grade 7 students will further investigate the components of an ecosystem, focusing on biotic and abiotic elements.

Catholic Graduate Expectations:

CGE 3f - examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio- economic and ecological) for the development of a just and compassionate society.

CGE 5a - works effectively as an interdependent team member.

Expectations

- 8s6 A – identify organelles in cells through observation (e.g., vacuole, nucleus, chloroplast) and explain their functions;
- 8s18 A – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);
- 8e48 A • listen to and communicate connected ideas and relate carefully-constructed narratives about real and fictional events;
- 7s4 A – identify living (biotic) and non-living (abiotic) elements in an ecosystem;
- 7s15 A – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as biosphere, biome, ecosystem, species);

Groupings

- Students Working In Pairs
- Students Working Individually

Teaching / Learning Strategies

- Brainstorming
- Collaborative/cooperative Learning
- Reader's Theatre

Assessment**Grade 7**

If time permits, have students orally share ABC word lists either at end of this period, or beginning of next. This would be an opportunity for anecdotal assessment.

Grade 8

Assessment Rubric (4.3) provided for the Cell Sells assignment.

**note: CGE 5a is assessed within the Oral Communication Category

Assessment Strategies

- Questions And Answers (oral)
- Classroom Presentation

Assessment Recording Devices

- Anecdotal Record
- Rubric

Life Systems

Teaching / Learning

This lesson is taught to each grade separately.

Grade 7

- 1) The Grade 7 students will be required to work in pairs to establish an ABC vocabulary word list. Each unit-related word must begin with a different letter of the alphabet (e.g., a=abiotic / b=biotic / c=consumer).
- 2) From their word list divide each word into one of two categories: living or nonliving.
- 3) Provide the Grade 7 students with vocabulary words relevant to this lesson and previous lessons (see Subtask Notes for suggested words). In pairs, have students create a word search.

Grade 8

- 1) Distribute the handout containing the parts of a cell and their functions (BLM 4.1). Read aloud the information contained in this handout.
- 2) The students are now required to complete the Assignment "The Cell Sells" (BLM 4.2). Using the following as an introduction and example of what is required of the students.

3) Read aloud... MITO MANIA

Hello everyone! Let me introduce myself as Mighty Morgan the Mitochondrion. You really cannot help but notice me for I am the most prominent organelle found in both plant and animal cells. If you wonder why they call me Mighty Morgan, it's because I am the powerhouse of the cell. Yes folks, without me there would be no energy for all of the critical pathways within the cell to operate effectively. You see, I am responsible for those extremely important chemical processes that extract energy from food molecules and incorporate this energy into a special little package called adenosine triphosphate. My friends call me ATP for short.

Not only this but I also contain my own genetic information which means I can identically reproduce simply by division (very similar to the entire cell).

Ladies, gentlemen and fellow organelles, my time has expired, but let me tell you this, when selecting the president of the organelles club, remember, there is no one else but Mighty Morgan that could possibly have enough energy to fulfill the requirements of this position. Thank you for listening!
- 4) Students are required to present orally next period.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



4.3 Cell Sells Rubric



4.1 Parts of the Cell

4.1 parts of cell.cwk



4.2 Cell Sells

4.2 Cell sells.cwk



Biomes and Natural Cycles

Life Systems**Subtask 4****Interacting Organisms An Integrated Unit for Grade 7/8**

~ 60 mins

**What Is An Ecosystem?**

Science Essentials

Notes to Teacher

1) The following words are suggestions for the Grade 7 students to use in their word search: biome, abiotic, biosphere, individual, species, adaptation, sampling, ecosystem, biological population, biotic, ecologist, habitat, climate, biological community. Many others are possible!

2) The Grade 8 assignment "Cell Sells" states that students will present next period. An assumption is made that there is a minimum of one day between Science classes in order to allow the students two nights to prepare. Presentations will be approximately one minute each. Please allow an appropriate amount of time (based on the number of Grade 8 students in class) at the beginning of next period.

3) Consider providing "Mito Mania" to students visually (transparency or individual copies), in order to accommodate different learning styles.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.



Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Description

This lesson will be introduced to both grades through an activity that demonstrates the interdependence of living organisms. Following the activity, the students will focus on food chains and webs.

Catholic Graduate Expectations:

CGE 7d - promotes the sacredness of life.

CGE 3b - creates, adapts, evaluates new ideas in light of the common good.

Expectations

- 7s6 A – identify and explain the roles of producers, consumers, and decomposers in food chains and their effects on the environment (e.g., plants as producers in ponds);
- 7s9 A – interpret food webs that show the transfer of energy among several food chains, and evaluate the effects of the elimination or weakening of any part of the food web;
- 7s21 – describe the conditions in an ecosystem that are essential to the growth and reproduction of plants and micro-organisms, and show the connection between these conditions and various aspects of the food supply for humans;
- 8s13 – compare the structure of different plants (e.g., cactus, coniferous tree, moss) and show how their structure enables them to live in specific conditions;
- 8e46 A • provide clear answers to questions and well-constructed explanations or instructions in classroom work;

Groupings

- Students Working As A Whole Class
- Students Working Individually
- Students Working In Pairs

Teaching / Learning Strategies

- Collaborative/cooperative Learning
- Concept Clarification
- Simulation

Assessment

Anecdotal observations may be recorded during student participation in the game. All of the students are required to take the skills and knowledge learned from the 'Ecological Tag' game and apply it to the follow-up questions provided.

You may wish to use the Self-Assessment and/or Group Assessment checklists (BLM 5.1 and 5.2)

Use Anecdotal assessment to grade questions submitted by the students.

Assessment Strategies

- Exhibition/demonstration
- Questions And Answers (oral)

Assessment Recording Devices

- Anecdotal Record
- Checklist

Teaching / Learning

Allow approximately ten minutes for steps 1 - 3



Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

- 1) Last day, the Grade 7 students gained an understanding of biotic and abiotic components. Allow them to pair up with Grade 8 students and provide that student with an understanding as well. Encourage the Grade 8 students to ask their 'partner' questions, in order to facilitate communication using appropriate vocabulary.
- 2) Brainstorm with the students examples of biotic and abiotic components to an ecosystem. Answers are to be put on board.
- 3) See Subtask Notes for a detailed discussion outline.
- 4) Play "Ecosystem Tag". Allow approximately 20 minutes for this game. Detailed instructions are given under Subtask Notes.
- 5) Upon completion of the game, review the concepts addressed in the Discussion Outline, and apply them to the game, thereby clarifying the scientific principles involved throughout "Ecosystem Tag." In this manner, the Catholic Graduate Expectations involving Responsible Citizenship will also be addressed. God's natural cycle of life and death, rehearsed in this game, may also be addressed. Question the students as to the effects of altering this unique creation.
- 6) Present the following questions to all students - to be handed in when completed:
 - a) How are all the groups dependent on one another? Use real-life examples in your answer.
 - b) How does each group contribute to the continuous functioning of the ecosystem? Include the significance of energy transfer within a particular food web.
 - c) If the decomposers from the ecosystem were removed, would the ecosystem continue to function smoothly? Explain your answer, reflecting on God's 'divine plan' for creation.
- 7) Collect answer sheets for assessment.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources

- | | | |
|---|--|-----------------------|
|  | 5.1 Group Assessment | Group Assessment3.cwk |
|  | 5.2 Self-Assessment | Self Assessment3.cwk |
|  | Ecolab: The Food Chain | |
|  | Balls, frisbees, crumpled paper | |
|  | Name tags | 1 |



Life Systems

Notes to Teacher

This subtask lends itself to the Grade 8 Religion Program "Stand By Me" Unit 2 - students learn that God makes things holy by giving them a special purpose within the Divine Plan.

Discussion Outline

Explain that all life exists within a thin shell of air, water, and soil called the biosphere. The biosphere is Earth's life support system, or the parent ecosystem. Smaller ecosystems are found in any environment (e.g., meadow, forest, pond) containing biotic (living) and abiotic (non-living) components. The interaction between biotic and abiotic creates an ecosystem. The interacting components within an ecosystem are so tightly knit that even if only one relationship is broken, the entire ecosystem may be threatened. The biotic components of an ecosystem can be further broken down into three groups: producers, consumers, and decomposers. Producers are largely green plants, which through photosynthesis are able to absorb light and energy to manufacture their own food from simple inorganic substances. Consumers are organisms which directly or indirectly depend on plants for their food and energy. Decomposers break down dead plant and animal materials into abiotic elements. The abiotic elements return to the soil, water, and air for use again.

Class Activity - Ecosystem Tag

Gather balls, flying discs, crumpled paper, or any other objects that can be tossed around.

- 1) People form three groups: decomposers, consumers (about twice the number of decomposers), and producers (about twice the number of consumers). Each group should be easily identifiable (e.g., name tags, coloured shirts). The three groups do not necessarily reflect an accurate representation of the populations in an ecosystem. The decomposers would normally be the largest group. However, in order to maximize student participation and interaction, the population sizes of decomposers and producers are reversed.
- 2) Set a boundary for the playing area (which represents the "environment"). Players must remain in the playing area. Objects such as balls represent abiotic components. The number of balls equals the number of producers. Place balls in two or more piles within the playing area.
- 3) The game involves the basic chain of abiotic components to producer, producer "eaten" by consumer, and consumer "broken down" by decomposer to return abiotic components to the environment. The overall idea is to maintain the ecosystem, while each group fulfills its goal.
- 4) Producers are the only players who can take balls from the piles. A safety zone around the pile protects the producer from being tagged only when he or she is picking up a ball. Their goal is to get all the balls (or as many as possible) out of the safety zones and keep the balls in the hands of producers only. The consumer's goal is to obtain and hold on to as many balls as possible. They can only get balls by making a two-handed tag on a producer holding a ball. Decomposers can only get balls by making a two-handed tag on a consumer holding a ball. Decomposers return balls to the piles and their goal is to get all the balls (or as many as possible) back to the safety zones.
- 5) When players are tagged, they must give up the ball they are holding. Players can toss and pass balls to members of their own group.
- 6) Play continues as long as you wish (producers keep taking balls, decomposers keep returning them). Adjust the number of balls used in the game or players in each group if play is not progressing smoothly. Supplementary material could be used to enhance the students' understanding of the food chain. Your local board Resource Centre may have a collection of resources related to ecosystems.



Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Description

To keep a human body or an ecosystem healthy, the components must work together as a system. The students will examine the relationship between the structures and the functions of cells in plants and animals. Viewing videos on the human body's organ systems will further enhance the concepts taught.

Catholic Graduate Expectations:

CGE 3f - examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio-economic and ecological) for the development of a just and compassionate society.

Expectations

- 8s22 A – describe the basic factors that contribute to the efficient functioning of the human respiratory, circulatory, digestive, excretory, and nervous systems;
- 8s23 A – describe some ways in which the various systems in the human body are interdependent;
- 7e48 • ask questions and discuss different aspects of ideas in order to clarify their thinking;

Groupings

- Students Working As A Whole Class
- Students Working Individually

Teaching / Learning Strategies

- Computer Assisted Learning
- Mini-lesson
- Research

Assessment

BLM 6.1 may be collected, or taken up orally and marks recorded using a class checklist.

Assessment Strategies

- Questions And Answers (oral)

Assessment Recording Devices

- Checklist

Teaching / Learning

- 1) Discuss with the students the relationship between structure and function of cells. Give examples that demonstrate how the structure of something determines its function, e.g., sports balls - Why could you not use a football in a game of golf? Why do you need special shoes to play particular sports?
- 2) Refer to the labelled diagrams of plant and animal cells in the students' notes from Subtask 2, and call their attention to at least one distinctive feature that relates to its function, e.g., muscle cells - contractibility. Explain that cells are basically of the same structure, but they have different functions.
- 3) Present videos on the human body systems (local board resource).
- 4) Distribute BLM 6.1 for individual completion during viewing of the videos. Some questions will require further research beyond the information given in the video. Have students create two questions and answers of their own that can be shared with a partner.

Adaptations

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



6.1 Video Questions

6.1 video Questions.cwk



Introduction to Human Control Systems and the Neuron

Access - The Education Station, Edmonton, AB



Human Body Systems

McIntyre Media



Human Body Systems At Work

McIntyre Media



Systems Working Together

Magic Lantern Communications

Notes to Teacher

Some examples of possible video titles have been provided in Resources.

Consider modifying BLM 6.1 in order to organize the questions in such a manner that the students are basically able to fill in the blanks for fact and list-type questions. This will depend upon the availability and type of videos you are able to access. Most resources/videos have excellent activities and/or questions. Use these if suitable.

Some questions from BLM 6.1 may require further research in order to be answered properly.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Description

The students will understand that living organisms can adapt to their surroundings. In order to survive living things must be able to adapt. Adaptation is a gradual, but continuous process from one generation of a species to the next. The Grade 7 students will examine adaptations within ecosystems, while the Grade 8 students will examine adaptations within the human species.

Catholic Graduate Expectations:

CGE 7a - acts morally and legally as a person formed in Catholic traditions.

CGE 7d - promotes the sacredness of life.

CGE 2b - reads, understands and uses written materials effectively

Expectations

- 7s11 A – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully);
- 7s13 – formulate questions about and identify the needs of various living things in an ecosystem, and explore possible answers to these questions and ways of meeting these needs (e.g., research the population levels of a species over time and predict its future levels on the basis of past trends and present conditions; determine how the structure of specific plants helps them withstand high winds, live on the surface of water, or compete for sunlight);
- 8s13 A – compare the structure of different plants (e.g., cactus, coniferous tree, moss) and show how their structure enables them to live in specific conditions;
- 8s23 A – describe some ways in which the various systems in the human body are interdependent;
- 8s83 – compare the automatic functions of the human eye to functions in an automatic camera (e.g., focusing power, adaptation to brightness);
- 7e3 • organize information to develop a central idea, using well-linked and well-developed paragraphs;
- 8e2 • use writing for various purposes and in a range of contexts, including school work (e.g., to write technical instructions, to clarify personal concerns, to explore social issues, to develop imaginative abilities);

Groupings

- Students Working In Small Groups
- Students Working Individually

Teaching / Learning Strategies

- Computer Assisted Learning
- Jigsaw
- Research

Assessment

Grade 7 Students

The completed written description of the animals' adaptation strategies, along with a brief explanation of how specific adaptations affect that particular animal population, may be evaluated using the accompanying rubric (7.2).

Grade 8 Students

BLM 7.1 may be evaluated using the accompanying rubric (7.2).

You may wish to use the Self-Assessment and/or Group Assessment checklists for students to complete (BLM 5.1 and 5.2). You may wish to assess students group work skills. (See BLM 2.3.)

Assessment Strategies

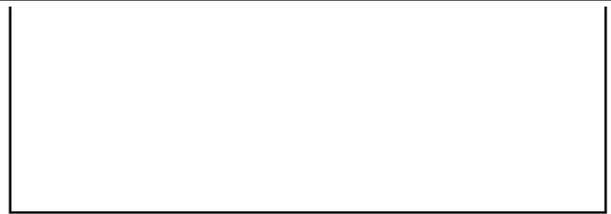
- Essay

Assessment Recording Devices

- Rubric
- Checklist

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8



Teaching / Learning

Prior to this lesson, collect research materials on animal adaptation, as well as disease related resources.

Animals and humans have adapted to climatic changes, changes in food supply, and changing land forms in order to survive.

1) The Grade 7 students will research three of the following animals and write a brief description of each of their special adaptations. A Jigsaw activity may be an effective way to cover most of the animals suggested.

- polar bear, hummingbird, earthworm, stick insect, pelican, koala, camel, sloth, giraffe, giant panda, chimpanzee, owl, flying squirrel, deer

2) The Grade 8 students will focus their attention on human adaptations, specifically referring to the body's responses to invasion by a disease.

Using BLM 7.1, the students will be required to complete a brief research assignment, in which they choose one viral OR bacterial disease, and:

- identify the causes of the disease (bacterial or viral);
- describe the effects of the disease on the human body;
- describe how the diseases are prevented and/or treated.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



7.2 Adapt or Die



7.1 Bacterial and Viral Diseases

7.1 Virus Bacteria.cwk

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**

Notes to Teacher

Many infectious diseases are caused by an invasion of the body by viruses or bacteria. Diseases such as polio, smallpox, measles, and AIDS are caused by viruses. In most viral infections, a virus attacks cells as it reproduces. It destroys these cells, causing symptoms of the disease. Despite this, most people manage to stay healthy because of the body's natural defenses and modern medical practices.

Prior to this lesson, collect research materials on animal adaptation, as well as disease-related resources.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**

~ 60 mins

Description

Both Grade 7 and 8 students will investigate how fluids enter and exit cells (diffusion and osmosis). They will gain an understanding of the different types of membranes that make these processes possible.

Expectations

- 8s17 A – plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions;
- 8s16 – formulate questions about and identify needs related to the functioning of cells, and explore possible answers to these questions and ways of meeting these needs (e.g., design and conduct an experiment to test a hypothesis about the effect of chemicals on a unicellular organism; design and conduct an experiment to test the effectiveness of different substances in preventing cut flowers from wilting);
- 8s9 A – explain the function of selectively permeable membranes in cells;
- 8s14 A – describe, using their observations, the movement of gases and water into and out of cells during diffusion and osmosis.

Groupings

Students Working In Pairs

Teaching / Learning Strategies

Inquiry
Mini-lesson
Collaborative/cooperative Learning

Assessment

Both Grade 7 and 8 students will be required to conduct and hand in a formal lab report (following the scientific method) on the assigned experiment. Refer to Rubric (8.3) for assessment.

Assessment Strategies

Observation
Questions And Answers (oral)

Assessment Recording Devices

Rubric

Teaching / Learning

Teacher needs to soak eggs in vinegar 24 hours prior to this lesson.
The lesson will extend over two days because of the osmosis experiment.

MINI-LESSON (Grades 7 and 8)Cell Membranes

A cell membrane allows some substances to enter or leave the cell, and it stops other substances. Because it allows only certain materials to cross it, the cell membrane is said to be "selectively permeable." (A membrane that lets all materials cross it is "permeable." A membrane that lets nothing cross it is "impermeable.")

Pose the following questions to the students:

- 1) **Q** - How does a cell membrane allow only SOME substances to enter or leave the cell? **A** - The structure of the membrane determines its permeability.
- 2) **Q** - Imagine you have two small bags. One is made of plastic, the other cheesecloth. Imagine what might happen if you pour water into both. **A** - The plastic holds water, while the cheese cloth does not. Therefore the plastic is impermeable to water; cheesecloth is permeable to water.

Make sure the students understand that the difference is due to the "structure" of the materials from which the

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

bags are made. The structure of the cell membrane controls what can move into and out of a cell.

3) **Q** - If you were pouring a mixture of water and sand into both bags what would the result be? (This can be conducted as an experiment or demonstration).

EXPERIMENT

Divide the class into two groups, the Diffusion group and the Osmosis group.

Diffusion group - The students will conduct the experiment on the first day and complete reflection questions next day. (Refer to BLM 8.1.)

Osmosis Group - The students will complete the first part of the experiment. It will require them to leave their eggs soaking for 24 hours before they can complete the remainder. (Refer to BLM 8.2.)

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



8.3 Investigation Rubric



8.1 Osmosis

8.1 Osmosis Experiment.cwk



8.2 Diffusion

8.2 Diffusion Experiment.cwk

Notes to Teacher

1) Teacher needs to soak eggs in vinegar 24 hours prior to this lesson. See BLM 8.1 and BLM 8.2 for complete list of materials required for this lesson.

2) The lesson will extend over two days because of the Osmosis experiment.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**

~ 60 mins

Description

Continuation of Subtask 8. Students will take their conclusions and apply the knowledge gained to a Venn Diagram.

Expectations

- 8s9 A – explain the function of selectively permeable membranes in cells;
- 8s14 A – describe, using their observations, the movement of gases and water into and out of cells during diffusion and osmosis.
- 8s16 – formulate questions about and identify needs related to the functioning of cells, and explore possible answers to these questions and ways of meeting these needs (e.g., design and conduct an experiment to test a hypothesis about the effect of chemicals on a unicellular organism; design and conduct an experiment to test the effectiveness of different substances in preventing cut flowers from wilting);
- 8s17 A – plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions;

Groupings

Students Working In Pairs

Teaching / Learning Strategies

Inquiry
Mini-lesson
Collaborative/cooperative Learning

Assessment

See Subtask 8.

Assessment Strategies

Observation
Questions And Answers (oral)

Assessment Recording Devices

Rubric

Teaching / Learning

Upon completion of the experiment the students will pair up with a member from the other group. The pairs of students will be required to discuss the findings of their particular experiment. A completed Venn diagram will demonstrate their understanding of diffusion and osmosis.

TAKE HOME ACTIVITY

Some diseases are caused by a defect in the transport of chemicals across the cell membrane.

Grade 7 students - find an example of this in some form of plant life.

Grade 8 students - find an example of this in some form of human life.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources

9.1 Sample Venn Diagram

9.1 Venn Diagram.cwk

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Notes to Teacher

See BLM 9.1 provided to assist you and the students in understanding a Venn Diagram and its basic requirements.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Subtask 10

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Description

Our bodies' organ systems work together as a single unit for a common purpose: to stay alive. In our bodies there are many systems that take on specialized tasks. For example, our digestive system is responsible for extracting essential nutrients from the foods we eat. The class will look at the respiratory, circulatory, digestive, and excretory systems within humans. This will lend itself to the next lesson focusing on the unique digestive system of an owl.

Catholic Graduate Expectations:

CGE 4a - demonstrates a confident and positive sense of self and respect for the dignity and welfare of others.

Expectations

- 8s21 A – describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;
- 8s27 – describe ways in which various types of cells contribute to the healthy functioning of the human body (e.g., red blood cells transport oxygen throughout the body);
- 8s3 • describe ways in which study of the structure, function, and interdependence of human organ systems can result in improvements in human health.
- 8s23 A – describe some ways in which the various systems in the human body are interdependent;
- 7e27 • read independently, selecting appropriate reading strategies;

Groupings

Students Working In Small Groups
 Students Working As A Whole Class
 Students Working Individually

Teaching / Learning Strategies

Brainstorming
 Note-making
 Research

Assessment

Students are required to hand in the Systems Assignment (BLM 10.2). Use Rubric 10.4 to assess students' work.

You may wish to assess students group work skills. (See BLM 2.3)

Assessment Strategies

Self Assessment
 Learning Log

Assessment Recording Devices

Rubric

Teaching / Learning

- 1) In small groups, the students will be required to brainstorm six specialized body systems (BLM 10.1). Students may need to refer to classroom texts, or perhaps review the video from Subtask 6
- 2) In a whole group activity, the students will share their findings on chart paper.
- 3) Individually, they will be required to choose one of the six systems to elaborate on. This activity will require them to look

Life Systems

Subtask 10

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

at a particular system, its structures, their functions, and factors that help the system as a whole to function. See BLM 10.2 for students' questions.

4) Rubric 10.4 has been provided for holistic grading on this assignment.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



10.4 Systems Assign.



10.1 Body Systems

10.1 Body Systems.cwk



10.2 Systems Assignment

10.2 Systems Assign..cwk

Notes to Teacher

Classroom resources (textbooks, Internet, various print resources) will be necessary for the task completion.

You may wish to partially organize the web diagram for the students, either on a separate sheet of paper using graphics in which they will write the system names, or adding it to BLM 10.1.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Description

Owl pellets are masses of undigested food that are regurgitated by these birds, containing the bones of their prey, as well as any fur, feathers, claws, and teeth. A part of the owl's digestive system presses these parts together to form a pellet. Scientists learn many things about the owls and their habitats by examining their pellets. The students will dissect their own owl pellets, compare their findings to an Owl Pellet Bone Chart (provided), and draw conclusions from their results.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

Expectations

- 8s22 A – describe the basic factors that contribute to the efficient functioning of the human respiratory, circulatory, digestive, excretory, and nervous systems;
- 7s7 A – explain the importance of micro-organisms in recycling organic matter (e.g., as decomposers);

Groupings

Students Working In Pairs

Teaching / Learning Strategies

Classifying
Inquiry
Working With Manipulatives

Assessment

BLM 11.2, once completed, will be handed in for formal assessment, using Rubric 11.3 (Owl Pellet Dissection).

You may wish to use the Self Assessment and/or Group Assessment checklists (BLM 5.1 and BLM 5.2).

Assessment Strategies

Questions And Answers (oral)

Assessment Recording Devices

Rubric

Teaching / Learning

- 1) Review the digestive system of the human body and introduce the unique digestive system of raptors, to be used as a comparison. Explain to the students that today's lesson will focus specifically on the owl. Brainstorm ideas/facts known about owls and record them on chart paper. After the first few minutes, direct the student's conversation towards the owl's prey, and the digestion of its food.
- 2) Distribute BLM 11.1 and BLM 11.2. Read the introductory paragraph aloud together and review the procedures for this activity.
- 3) Following the directions on BLM 11.1, the students, working in pairs, will dissect their pellet, using the Questions, Observations, and Conclusions sheet (BLM 11.2) provided in order to record their tallies.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Subtask 11

~ 60 mins

- 4) When they have completed the dissection the students will answer the required questions on BLM 11.2.
- 5) Answers to all of these questions will be submitted for a formal assessment, using rubric 11.3 (Owl Pellet Dissection)

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources

	11.3 Owl Pellet Dissection	
	11.1 Owl Pellet Dissection	11.1 Owl Pellet.cwk
	11.2 Pellet Questions	11.2 Pellet Questions.cwk
	owl pellets	1

Notes to Teacher

Owl Pellets need to be ordered 4-6 WEEKS in advance of this lesson.

- 1) Gather chart paper
- 2) Pictures of owls would be a useful visual aid
- 3) Remind students to be aware of the safety issues while conducting this investigation (i.e., correct and safe use of wooden splints; no moving around between lab stations/desks; no ingestion of pellets).

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Description

Both Grade 7 and 8 students will explore the harmful and beneficial effects of microbes on the human body. They will have the opportunity to observe these effects firsthand, through the Dishcloth Experiment. Many microbes play a role detrimental to human health, while at the same time they play an integral role in the ecosystem.

Expectations

- 7s11 – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully);
- 7s8 A – identify micro-organisms as beneficial (e.g., yeast) and/or harmful (e.g., bacteria or viruses that cause disease);
- 8s11 – recognize that cells in multicellular organisms need to reproduce to make more cells to form and repair tissues;

Groupings

- Students Working As A Whole Class
- Students Working In Small Groups
- Students Working Individually

Teaching / Learning Strategies

- Independent Reading
- Lecture
- Direct Teaching
- Inquiry

Assessment

Final observations and conclusions will be submitted for evaluation.

You may wish to use the Self Assessment and/or Group Assessment checklists (BLM 5.1 and BLM 5.2).

You may wish to assess students group work skills. (See BLM 2.3.)

Assessment Strategies

- Performance Task
- Questions And Answers (oral)

Assessment Recording Devices

- Anecdotal Record
- Checklist

Teaching / Learning

1) Students will copy the note relating to Mitosis (see Subtask notes). If you have a diagram/flow chart explaining Mitosis, please provide for the students. Allowing them to label the diagram/flow chart would help to assimilate the information copied in the note.

2) Broaden the discussion to an explanation of bacteria. Ask the students where they think bacteria exist. Refer to BLM 12.1 (Invasion of An Unknown World). This activity should acquaint students with human bacteria in different parts of the body.

Life Systems

Subtask 12

Interacting Organisms An Integrated Unit for Grade 7/8

~ 60 mins

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



12.1 Invasion

12.1 Invasion.cwk

Notes to Teacher

Students record the following facts (from blackboard or transparency), to ensure that they understand the concept of cell division (mitosis).

Cells are the building blocks of living things. They are alive, they grow, but they also grow old, wear out, and die (e.g., skin cells wear away from your hands).

Organisms must replace worn out cells and repair damaged parts.

Cells make new cells by the process called cell division, otherwise known as "mitosis."

A cell divides to form two cells. Biologists call the original cell the "parent cell," and the others are the daughter cells.

Daughter cells grow to a certain size then they divide as well.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Description

This task is a continuation to the previous lesson on Microbes. The Grade 7 students have investigated food chains, webs, and biological pyramids. The students will use this past knowledge to recognize the effects of pesticides/toxic chemicals in a food web. In the Grade 8 component, students will focus on the functions of specialized cells, white blood cells, in the defence against invaders. Defence against infection is described at the cellular level.

Catholic Graduate Expectations:

CGE 7a - acts morally and legally as a person formed in Catholic traditions.

CGE 7i - respects the environment and uses resources wisely.

Expectations

- 7s5 A – identify populations of organisms within an ecosystem and the factors that contribute to their survival in that ecosystem;
- 7s18 A – investigate the impact of the use of technology on the environment (e.g., the “greenhouse effect”; redirection of water flow for human needs; use of pesticides);
- 8s21 A – describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;

Groupings

Students Working As A Whole Class
Students Working Individually

Teaching / Learning Strategies

Role Playing
Simulation
Homework

Assessment

Students may submit the answers to the posed questions, for evaluation.

**note: CGE 7a & 7i should be considered when evaluating this assignment

CGE 7a - Acts morally and legally as a person formed in Catholic traditions.

CGE 7i - A Responsible Citizen: Respects the environment and uses resources wisely.

Assessment Strategies

Questions And Answers (oral)

Assessment Recording Devices

Anecdotal Record

Teaching / Learning

Whole Class Activity

- 1) Play the "Food Chain Game" (see Subtask notes for complete list of materials and instructions).

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**~ 60 mins

- 2) Use additional information provided in the Subtask notes to conclude the activity, prior to assigning the questions to the students.
- 3) Grade 7 Evaluation - Give three examples of ways in which pesticides could enter a food chain. Discuss two possible consequences of pesticides, entering the food chain for each of the examples you have given.
- 4) Grade 8 Evaluation - Give three examples of ways in which pesticides could enter a food chain. What effect does a pesticide's entering the food chain have on humans?
- 5) If time permits, you may want to view a video on pesticides.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources**Bill Nye: Pollution Solutions**

Magic Lantern Communications - copyright 1997

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Notes to Teacher

Materials to be gathered prior to this lesson: White pipe cleaners and coloured pipe cleaners (2/3 white, 1/3 coloured; or white paper dots and coloured paper dots); 30 of these items per students is recommended; one paper bag per grasshopper.

- 1) Tell the students that this is an activity about "food chains." A "food chain" is a sequence of living things in a community based on one member of the community eating the member above it.
- 2) Divide the students into three groups - hawks, shrews, and grasshoppers. (Work with approximately three times as many shrews as hawks and three times as many grasshoppers as shrews.) You may want to provide coloured tags for easy identification.
- 3) Hand each grasshopper a small paper bag, which represents the 'stomach' of whatever animal is holding it.
- 4) Do not let the students watch while you place the 'food' (pipe cleaners or dots) around in a large open space.
- 5) Instructions: grasshoppers are the first to go looking for food. Hawks and shrews are to sit quietly, watching grasshoppers. At a given signal, the grasshoppers are allowed to enter the area to collect food and place it in their stomachs (the bags). They have to move quickly. At the end of 30 seconds, they stop collecting.
- 6) The shrews are now allowed to hunt the grasshoppers. Hawks remain sitting quietly, watching the activity. Allow approximately 30-60 seconds (depending on size of playing field). Each shrew should have time to catch one or more grasshoppers. Any grasshopper caught by a shrew - that is, tagged or touched by the shrew - must give its bag of food to the shrew and then sit on the sidelines.
- 7) The next time period (from 30-60 seconds) is time for the hawks to hunt for food. The same rules follow. Any shrews still alive may hunt for grasshoppers; grasshoppers are hunting for the food; and the hawks are hunting for the shrews. If a hawk catches a shrew, the hawk gets the food bag and the shrew goes to the sidelines. At the end of the designated time period, ask all the students to come together in a circle, bringing whatever food bags they have with them.
- 8) Ask the students who are 'dead' to identify what animal they are and what animal ate them. Next, ask the hawks to empty their food bags out onto the floor or on a piece of paper where they can count the number of food pieces they have. They need to count the total number of white food pieces and the total number of coloured food pieces. Repeat for grasshoppers and shrews. List the number of each colour for each animal.
- 9) Inform the students that there is something called a 'pesticide' in the environment. This pesticide was sprayed onto the crop the grasshoppers were eating, in order to prevent a lot of damage by the grasshoppers. If there was crop damage by the grasshoppers, the farmers would have less of their crop to sell, and some people and livestock might have less of that kind of food - or it might cost more to buy because a smaller quantity was available. This particular pesticide is one that is poisonous, accumulates in food chains, and stays in the environment for a long time.
All of the coloured pieces represent the pesticide. All of the grasshoppers that were not eaten by shrews may now be considered dead if they have any coloured food pieces. Any shrews for which half or more of their food supply was coloured would also be considered dead. The hawk with the highest number of coloured pieces will not die at this time; however, it has accumulated so much of the pesticide in its body that the egg shells produced by it and its mate during the next nesting season will be so thin that the eggs will not hatch successfully. The other hawks are not visibly affected at this time.
- 10) Talk with the students about what they have experienced. Ask for their observations about how the food chain seems to work and how toxic substances can enter the food chain, with a variety of results.

DISCUSSION NOTE: Encourage students to draw upon, or develop, opinions based on their moral Catholic teachings, keeping in mind the two CGEs listed for this Subtask.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

People have developed pesticides to control organisms. Herbicides are used to control unwanted plants; insecticides to control unwanted insects, etc. When these pesticides involve use of poisons, they frequently end up going where they are not wanted. Many toxic chemicals have a way of persisting in the environment and often get concentrated in unexpected and undesirable places - from food and water supplies to wildlife. Indirect effects can include accumulation of such pesticides in the bodies of animals such as predatory birds, fish, mammals, and humans.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Description

Grade 7 and 8 students are required to investigate, research, and solve an ecological or environmental mystery. In place of a murderer or villain, the culprit is something that has disturbed the ecological balance. Students will be required to apply their understanding of habitats and the interrelationship of plants and animals within a habitat to a real situation.

Catholic Graduate Expectations:

CGE 7d - promotes the sacredness of life.

CGE 5a - works effectively as an interdependent team member.

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Expectations

- 7s11 A – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully);
- 7s9 A – interpret food webs that show the transfer of energy among several food chains, and evaluate the effects of the elimination or weakening of any part of the food web;
- 8s20 A – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a simulation illustrating movement of water and nutrients between cells and through various organs and systems).
- 7s17 A – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., design a multimedia presentation explaining the interrelationships of biotic and abiotic elements in a specific ecosystem).
- 7e1 • communicate ideas and information for a variety of purposes (to outline an argument, to report on observations) and to specific audiences, using forms appropriate for their purpose and topic (e.g., write a lab report for an audience familiar with the scientific terminology);
- 7e3 A • organize information to develop a central idea, using well-linked and well-developed paragraphs;
- 7e47 • use instructions and explanations to plan and organize work;
- 8e2 A • use writing for various purposes and in a range of contexts, including school work (e.g., to write technical

Groupings

Students Working In Small Groups

Teaching / Learning Strategies

Case Study
Decision-making Models
Inquiry
Issue-based Analysis
Open-ended Questions
Research

Assessment

Refer to rubric 14.2 for assessment of assignment. When providing students with Rubric 14.2, ensure they have a clear understanding of both the Language and Science expectations being addressed within the same Rubric.

**You may wish to use the Self-Assessment and/or Group Assessment checklists (BLM 5.1 and BLM 5.2)

**You may wish to assess students group work skills. (See BLM 2.3.)

Assessment Strategies

Essay

Assessment Recording Devices

Rubric
Checklist

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

instructions, to clarify personal concerns, to explore social issues, to develop imaginative abilities);

Teaching / Learning

- 1) Read a number of mystery stories to the students, making sure to include at least an ecological mystery (see suggestions in Teacher Notes). Discuss and record how the mystery is investigated and solved in the story (record the clues, the scientific facts, the interrelationships between the animals and the habitats).
- 2) Do activities with students that will help them identify the characteristics of good mysteries: suspense, red herrings (false clues), clues, tools of investigation, character and setting development, etc.
- 3) Identify the cause and effect relationships within habitats.
- 4) Identify ways that humans affect and change natural habitats.
- 5) Review research skills, including active investigation.
- 6) Review assignment with students (BLM 14.1; rubric 14.2). Students may work with a partner, or in a small group. However, each student will be responsible for submitting their own copy of the final product. When providing students with Rubric 14.2, ensure they have a clear understanding of both the Language and Science expectations being addressed within the same Rubric.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



14.2 Mystery Sleuthing



14.1 Ecological Mystery

14.1 ecological_mystery.cwk

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Notes to Teacher

Consider incorporating into the unit:

- the Grade 7 Religion Program "Believe In Me", Unit 4 - students consider the wonder of creation and the ways in which God invites us to participate in creation and in God's creative action;
- the Grade 8 Religion Program "Stand By Me", Unit 1 - students will explore the gifts of the Holy Spirit and how these gifts are present when we are doing God's will. Specifically address the gift of 'Wonder and Awe'.
- this may be linked directly to the preparation of Confirmation (gifts of the Holy Spirit).

Gather a variety of mystery stories, including some by Jean Craighead George.

When providing students with Rubric 14.2, ensure they have a clear understanding of both the Language and Science expectations being addressed within the same Rubric.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8**

~ 120 mins

Description

The students will research and explore the problem of persistent pollutants and their harmful effects on both humans and ecosystems. The Grade 8 students will concentrate on the effects of chemical pollution on the human body and its organs and tissues, while the Grade 7 students will focus on the effects of chemical pollution on species within a food chain. Throughout the development of this task, the students will be encouraged to recognize "...that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it." (Witnesses to Faith)

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Expectations

- 7s18 – investigate the impact of the use of technology on the environment (e.g., the “greenhouse effect”; redirection of water flow for human needs; use of pesticides);
- 7s21 A – describe the conditions in an ecosystem that are essential to the growth and reproduction of plants and micro-organisms, and show the connection between these conditions and various aspects of the food supply for humans;
- 7s23 A – explain the long-term effects of the loss of natural habitats and the extinction of species (e.g., loss of diversity of genetic material, both plant and animal);
- 7s24 A – identify and explain economic, environmental and social factors that should be considered in the management and preservation of habitats (e.g., the need for recycling; the need for people to have employment).
- 8s21 – describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;
- 8s26 A – describe ways in which substances work by altering the way cells function (e.g., insulin);
- 8s27 A – describe ways in which various types of cells contribute to the healthy functioning of the human body (e.g., red blood cells transport oxygen throughout the body);
- 7e1 • communicate ideas and information for a variety of purposes (to outline an argument, to report on observations) and to specific audiences, using forms appropriate for their purpose and topic (e.g., write a lab report for an audience familiar with the scientific terminology);
- 8e1 • communicate ideas and information for a variety of purposes (to evaluate information, to compare points of view) and to specific audiences, using forms appropriate for their purpose (e.g., a survey soliciting opinions on an environmental issue) and features appropriate to the form (e.g., focused questions);

Groupings

- Students Working As A Whole Class
- Students Working Individually

Teaching / Learning Strategies

- Advance Organizer
- Concept Clarification
- Demonstration
- Independent Study
- Inquiry
- Issue-based Analysis
- Oral Explanation
- Research

Assessment

Refer to rubric 15.3 for assessment of the Culminating Task. You may wish to use the Self Assessment and/or Group Assessment checklists (BLM 5.1 and 5.2)

Assessment Strategies

- Classroom Presentation
- Essay
- Conference

Assessment Recording Devices

- Rubric
- Anecdotal Record
- Checklist

Teaching / Learning

The students have encountered many examples of pollutions throughout this unit. The culminating activities revolve around this concept. Be sure to provide the students with a copy of the accompanying Rubric 15.3 when reviewing this final task.

Introduction

- 1) Draw the students' attention back to the outline of the Culminating Task presented in Subtask 3. Briefly review the components as well as the key points addressed in the specific grade descriptions of this lesson.
- 2) Indicate that some chemicals made by humans for use in industry and as pesticides are known as "persistent pollutants." That means that when they are released into the environment, they do not disappear. They remain in the environment or in the bodies of living creatures for decades. These pollutants settle and affect all the species in the food chain from plants to invertebrates, fish, and mammals.
- 3) Brainstorm sources of chemical pollutions in your local area (field run-off carrying pesticides). Create a list to be displayed.

Grade 7 Task

Oral Presentation

- 4) Students will individually choose a specific pollutant and research its effects on a particular food chain.
- 5) Students will look at animals at the top of the food chain - where these pollutants pose the biggest threat - and establish the chain reaction this will have on an entire ecosystem. A diagram must enhance this explanation.
- 6) In their presentation they must include solutions to the problem they have discovered.
- 7) Upon completion of their task they will present to their peers.

Grade 8 Task

Oral Presentation

- 4) Students will individually choose a specific pollutant and research its effects on a particular system within the human body.
- 5) Students must include how this pollutant enters the human body, the body's reaction to it, and ultimately the long-term effect it may have on the overall functioning of the body.
- 6) Students should also discuss any medical interventions that have arisen in response to the pollutant they have researched.
- 7) In their presentations the students must include diagrams to help explain how a particular system in the body is affected.

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

~ 120 mins

8) The students must include a solution to the problem they have discovered.

9) Upon completion of their task students will present to their peers.

Adaptations

See notes in Unit Overview for a list of suggested Adaptations suitable for your students.

Resources



15.3 Polluting Our Thoughts



15.1 Culminating Task - Gr. 7

15.1 Polluting Thoughts - 7.cwk



15.2 Culminating Task - Gr. 8

15.2 Polluting Thoughts - 8.cwk

Notes to Teacher

The students have encountered many examples of pollution throughout this unit. The culminating activities revolve around this concept.

Teacher Reflections

Outline potential changes/improvements you would make to the subtask, or raise questions/concerns for future thought.

Record decisions you wish to pass on in the Subtask Notes; contents of this field are not passed along in the published unit.



Appendices

Life Systems

Interacting Organisms

Resource List:
Blackline Masters:
Rubrics:
Unit Expectation List and Expectation Summary:
Unit Analysis:

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8****Rubric**

- 10.4 Systems Assign.** **ST 10**
3
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 11.3 Owl Pellet Dissection** **ST 11**
3
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 14.2 Mystery Sleuthing** **ST 14**
2
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 15.3 Polluting Our Thoughts** **ST 15**
1
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 2. 2 Cell Construction Rubric** **ST 2**
2
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 3.2 Flow Chart Rubric** **ST 3**
3
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 4.3 Cell Sells Rubric** **ST 4**
3
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 7.2 Adapt or Die** **ST 7**
3
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.
- 8.3 Investigation Rubric** **ST 8**
1
Note: Teachers should consider this rubric as a framework. Criteria column should reflect the task assigned to assist students to meet learning expectations.

**Blackline Master / File**

- 10.1 Body Systems** **ST 10**
10.1 Body Systems.cwk
- 10.2 Systems Assignment** **ST 10**
10.2 Systems Assign..cwk
- 11.1 Owl Pellet Dissection** **ST 11**
11.1 Owl Pellet.cwk
- 11.2 Pellet Questions** **ST 11**
11.2 Pellet Questions.cwk
- 12.1 Invasion** **ST 12**
12.1 Invasion.cwk
- 14.1 Ecological Mystery** **ST 14**
14.1 ecological mystery.cwk
- 15.1 Culminating Task - Gr. 7** **ST 15**
15.1 Polluting Thoughts - 7.cwk
- 15.2 Culminating Task - Gr. 8** **ST 15**
15.2 Polluting Thoughts - 8.cwk
- 2.1 3-D Cell Construction** **ST 2**
2.1 3-D Cell Construction.cwk
- 2.3 Group Work Assessment** **ST 2**
Teacher Group Evaluation.cwk
- 3.1 Organization of Cells** **ST 3**
3.1 Organization of Cells.cwk
- 4.1 Parts of the Cell** **ST 4**
4.1 parts of cell.cwk
- 4.2 Cell Sells** **ST 4**
4.2 Cell sells.cwk
- 5.1 Group Assessment** **ST 5**
Group Assessment3.cwk
- 5.2 Self-Assessment** **ST 5**
Self Assessment3.cwk
- 6.1 Video Questions** **ST 6**
6.1 video Questions.cwk
- 7.1 Bacterial and Viral Diseases** **ST 7**
7.1 Virus Bacteria.cwk
- 8.1 Osmosis** **ST 8**
8.1 Osmosis Experiment.cwk
- 8.2 Diffusion** **ST 8**
8.2 Diffusion Experiment.cwk
- 9.1 Sample Venn Diagram** **ST 9**
9.1 Venn Diagram.cwk

Life Systems**Interacting Organisms An Integrated Unit for Grade 7/8****Licensed Software**

- Biomes and Natural Cycles** ST 4
- Ecolab: The Food Chain** ST 5

**Print**

- Building Catholic Character - Developing Christian Life Skills** Unit
Gustafsan, Jamie
0-87793-642-0
Will assist students and teachers, in applying the Catholic Graduate Expectations to their own thoughts, words and actions.
- Catechism of the Catholic Church** Unit
0-385-47967-0
Draws on the Bible, Mass, Sacraments, Church tradition, and teaching, in order to offer a complete summary of what Catholics throughout the world share as common belief.
- Cells, Tissues, Organs and Systems** Unit
Nelson Science and Technology 8 - copyright 2000
Textbook series
- Everyday Life Science** Unit
Fuller, Mel
ISBN 0-7647-0158-4
High-interest activities students can complete in order to learn about Life Science topics.
- Interactions with Ecosystems** Unit
Nelson Science and Technology 7 - copyright 2000
ISBN 0-17-612010-6
Textbook series
- Project WILD** Unit
Canadian Wildlife Federation
ISBN 1-55029-044-4
An interdisciplinary, supplementary environmental and conservation education program.
- Science and Technology 7: Ecosystems** Unit
Addison Wesley - copyright 2000
ISBN 0-201-66453-4
Textbook series
- Science Is...** Unit
Bosak, Susan V.
ISBN 0-921181-00-0
A series of hands-on activities designed to supplement many Science units.
- Science & Technology 8: Cells and Cell Systems** Unit
Addison Wesley - copyright 2000
ISBN 0-201-65461-x
Textbook series

- SciencePower 7: Interaction Within Ecosystems** Unit
McGraw-Hill Ryerson - copyright 2000
Textbook series

- SciencePower 8** Unit
McGraw-Hill Ryerson - copyright 2000
Textbook series

**Media**

- Bill Nye: Pollution Solutions** ST 13
Magic Lantern Communications - copyright 1997
Bill demonstrates how important it is for all humans to prepare for the future by developing innovative solutions to combat world-wide pollution.
- Human Body Systems** ST 6
McIntyre Media
S00382
- Human Body Systems At Work** ST 6
McIntyre Media
S00933 IS 1998
- Introduction to Human Control Systems and the Neuron** ST 6
Access - The Education Station, Edmonton, AB
29703, VH - 1999
- Systems Working Together** ST 6
Magic Lantern Communications
28288, VH - 1993
- What Is An Ecosystem?** ST 4
Science Essentials
This video explores the difference between populations and communities, herbivores and carnivores and explains the pattern known as the 'Pyramid of Numbers'

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8



Website

- Cells Alive** **Unit**
<http://www.cellsalive.com>
Provides students an opportunity to engage in interactive activities relating to cells.
- World Wildlife Organization** **Unit**
<http://www.worldwildlife.org/toxics>
Enables students to investigate local and world-wide situations involving the destruction of animal, human and ecosystem habitats.



Material

- Balls, frisbees, crumpled paper** **ST 5**
per class
The number of items being thrown must equal the number of producers.
- Name tags** **ST 5**
1
per person
Label appropriate tags with producer, consumer or decomposer.
- owl pellets** **ST 11**
1
per pair
Be certain to order these well in advance.
- Photographs/Pictures** **ST 1**
per group
Provide pictures of vertebrates and invertebrates for the students to use in classification activity.

Three Dimensional Cell Construction

Objectives:

- to be able to contrast the structures of plants and animals
- to understand the 3-D aspect of cell structures
- to identify the various parts of plant and animal cells

Required Cell Structures and Materials:

Cytoplasm -- modelling clay (plain approximately 260 g or 8 oz.)

Endoplasmic Reticulum -- yarn or cooked spaghetti

Ribosomes -- pepper

Mitochondria -- modelling clay (purple approximately 7 g.)

Vacuole -- plastic bubble wrap/packing

Lysosomes -- modelling clay (red approximately 5 g.)

Chloroplasts -- modelling clay (green approximately 10 g.)

Cell Wall -- aluminum foil (approximately 30 cm X 12 cm)

Cell Membrane -- plastic wrap (approximately 30 cm X 42 cm)

Nucleus -- modelling clay (blue approximately 20 g.)

Nuclear membrane -- plastic wrap (approximately 9 cm X 18 cm)

Modelling clay recipe : Makes about enough for three groups

1C soda (salt for baking)

1C flour

1C corn starch

4 tsp. cream of tarter

2 tbsp. oil

1-3/4 C water

Mix and cook until dough leaves the side of the pan. Cool with wet cloth on top.

To colour - use food colouring or tempera paints (wearing disposable gloves is a good idea)

Organization of Cells

Cells are:

- organized in groups
- each group performs certain tasks
- cells are organized into tissues
- tissues are organized into organs
- organs are organized into organ systems
- these are called levels of biological organization

The Cell Level

- the cell is the basic unit of all living things
- nothing smaller than a cell is considered living
- one-celled organisms (amoeba) can only be organized at the cell level - within the cell each organelles performs a specific task - this is the smallest division of labour
- in complex multi-cellular organisms their cells show specialization - each type performs a certain function - e.g., Humans contain nerve cells, muscle cells, bone cells, etc.

The Tissue Level

- tissue is a group of cells which have the same structure and function
- many muscle cells work together in a tissue - e.g., To move an arm.
- vertebrates have many types of tissues - e.g., Muscle tissue, bone tissue, nerve tissue, etc.
- plants have tissue too - e.g., Flowering plants have conducting tissue, photosynthesis tissue, storage tissue, epidermal tissue (skin), etc.

The Organ Level

- an organ consists of several tissues that work together as a unit to perform specific functions
- e.g., Heart is an organ with muscle tissue, nerve tissue, fibrous tissue, etc.
- e.g., Arm is an organ with bone tissue, muscle tissue, shin tissue, etc.
- plants have organs too - plant leaf is an organ - it consists of conducting tissue, support tissue, epidermal tissue, photosynthetic tissue

The Organ System Level

- group of organs that work together to perform a specific function - this level is

found only in animals

- e.g., Human digestive system consists of jaws, salivary glands, esophagus, stomach, intestines, liver, etc.
- other organ systems are the respiratory system, the circulatory system, the nervous system, the skeletal system, etc.

The Organism (or Individual)

- biological organization does not end with the organ systems: organ systems function together to form the organism - biologists call this level the individual

Population

- individuals of a certain species function together in a population
- e.g., Population of herring gulls on a lake
- e.g., Population of maple trees in a wood lot

Community

- several populations live together to form a community
- e.g., All the different types of trees in a wood lot form a community

Biome

- many communities in a geographical region with similar climate
- e.g., Desert region/ tropical rain forest/ arctic region

Biosphere

- all life on earth - in land, air, and water

PARTS OF THE CELL

CELL MEMBRANE

- holds cell together or intact
- keeps cells separated from each other
- membrane is selectively-permeable (lets only certain substances in or out)

CELL WALL

- found only in plants
- makes cell rigid
- used as support, protection
- made of cellulose

NUCLEUS

- control centre of cell processes
- usually round or oval
- usually near centre of cell but may be off to the side

A) NUCLEAR MEMBRANE

- thin membrane that surrounds nucleus
- pores allow substances to move in or out of it

B) NUCLEOLUS

- thick area in nucleus
- cell may contain one or more
- made of DNA, RNA, and proteins

C) CHROMATIN

- inside nucleus
- when it thickens and becomes thread-like it is a chromosome
- chromosomes become visible just before cell division
- chromosomes are of DNA and proteins
- DNA carries the genetic code of an organism from generation to generation

CYTOPLASM

- watery, granular medium
- moving, "cytoplasmic streaming"
- includes cytosol, cell membrane, and organelles

ORGANELLES

RIBOSOMES

- tiny, grain-like organelles
- can be found floating in cytoplasm or attached to endoplasmic reticulum
- site of protein synthesis

MITOCHONDRIA (plural) MITOCHONDRION (singular)

- spherical or rod-shaped

- have double membrane
- involved in energy release
- centres of respiration in cell
- release energy that powers cell

PLASTIDS (green - chloroplasts)

- found in green plants
- chloroplasts help in manufacturing and storage of food
- contains green pigment chlorophyll which is needed for photosynthesis

CENTRIOLES

- found in animal cells
- two bundles of rod-like structures, located at right angles to each other
- play a role in cell division

VACUOLES

- can contain fluid, food, waste, gases, water
- looks like bubbles
- mature plant cells contain few large vacuoles
- animal cells contain many small vacuoles

ENDOPLASMIC RETICULUM

- found in cytoplasm
- appears as a network of flattened sac-like structures
- often have ribosomes attached near the surface of them
- involved in protein synthesis

GOLGI BODIES

- often located near nucleus
- set of several flattened membrane sacs
- edges of sac have tiny balloon-like swellings
- exact function is not known, appear to help in transport of materials in cell

LYSOSOMES

- found in most animal cells
- spherical in nature
- function as storage vessel for many powerful digestive enzymes

THE CELL-SELLS

Mark Value:

Due Date:

Length:

Two approaches:

1. You are in the sales department for Organelles Incorporated. Your task is to present an organelle as being more important than any other. Give reasons why this organelle should be viewed as second to none.
2. You, as an organelle, are running for president of the Organelles Club.

** Marks will be allotted for creativity*

** All statements must be factual*

- misrepresentation of an organelle will result in charges of contempt

MITO MANIA

Hello everyone! Let me introduce myself as Mighty Morgan the Mitochondrion. You really cannot help but notice me for I am the most prominent organelle found in both plant and animal cells. If you wonder why they call me Mighty Morgan, it's because I am the powerhouse of the cell. Yes folks, without me there would be no energy for all of the critical pathways within the cell to operate effectively. You see, I am responsible for those extremely important chemical processes that extract energy from food molecules and incorporate this energy into a special little package called adenosine triphosphate. My friends call me ATP for short.

I also contain my own genetic information which means I can identically reproduce, simply by division (very similar to the entire cell).

Ladies, gentlemen, and fellow organelles, my time has expired. If you were faced with the serious dilemma of selecting a president of the organelles club, there is no one else like myself, Mighty Morgan, that could possibly have enough energy to fulfill the requirements of this position. Thank you for listening.

ORGANELLES TO CHOOSE From

nucleus	ribosome	endoplasmic reticulum
nucleoplasm	nucleolus	nuclear membrane
Golgi Body	plastids	chromatin network
chloroplasts	vacuole	microtubule/filament
cytoplasm	centriole	flagella/cilia
cell wall	lysosome	chromosomes (DNA)

Group Assessment

Name : _____

Group Members:

STATEMENT	Level 1	Level 2	Level 3	Level 4	Why I chose that level
Our group supported and encouraged each other.					
Everyone in our group shared their ideas and information with each other.					
Members of our group, including myself, willingly accepted tasks.					
Everyone worked together to meet our group goal.					
Members of our group took their roles seriously.					
Our group shared responsibility for preparing and presenting our results.					

SURVEY

1. Describe how your group organized itself so that everything would get done for this project/assignment. Explain how well you think your method worked.

2. Describe a difference of opinion or approach experienced by your group and how you handled this disagreement.

3. List at least three things you would do differently in your next group project.

SELF ASSESSMENT

Name : _____

Group Members:

STATEMENT	Level 1	Level 2	Level 3	Level 4	Why I chose this level
I contributed to discussions and listened when required.					
My ideas, knowledge, and opinions were important to my group/partner.					
I kept our goal in mind throughout the task.					
I worked well as a team/group member.					
I made sure I prepared what I said I would - and prepared it on time.					

Human Body Systems

Video

Some of the following questions you will be able to answer directly from information presented in the video. Other questions will require you to use resources both within the classroom and out.

1. From the video, write down each system presented and their specific function within the human body.
2. What are the five major systems of the body?
3. List activities in which the systems are working together to accomplish a specific task or activity.
4. Write about how the systems are used in everyday life. What things in our daily living affect specific systems and their ability to function smoothly?
5. What would happen to our body if it were unable to use a particular system?

Bacterial and Viral Diseases

Examples of Human Diseases Caused by Viruses

PATHOGEN	DISEASE	HOW DISEASE IS CONTRACTED
DNA Viruses		
Epstein-Barr	Infectious mononucleosis	Direct contact; air-transmitted droplets
Poxvirus	Smallpox	Direct contact; air-transmitted droplets
Varicella-zoster	Chickenpox	Direct contact; air-transmitted droplets
RNA Viruses		
Enteroviruses	Polio; infectious hepatitis	Direct contact; fecal contamination
Rhinoviruses	Common Cold	Direct contact; air-transmitted droplets
Paramyxoviruses	Measels; Mumps	Direct contact
Orthomyxoviruses	Influenza	Direct contact; air-transmitted droplets
Retroviruses	AIDS, associated with cancer	Direct contact
Rhabdoviruses	Rabies	Bite by infected animal

Examples Of Human Diseases Caused by Bacteria

BACTERIA	DISEASE	HOW DISEASE IS CONTRACTED
Clostridium botulinum	Botulism	Bacterial toxins in food
Clostridium novyi	Gangrene	Contamination of deep wounds
salmoneli typhe	Typhoid fever	Fecal contamination of food and water
Streptococcus pneumoniae	Pneumonia	Direct contact; air transmitted droplets
Micrococcus pyogenes	Food poisoning	Bacterial toxins in food
Neisseria gonorrhoeae	Gonorrhoea	Direct contact
Pasteurella pestis	Bubonic plague	Flea bites from rat to man
Borrelia burgdorferi	Lyme disease	Tick bites
Vibrio cholerae	Asian cholera	Fecal contamination of food and water
Mycobacterium tuberculosis	Tuberculosis	Air-transmitted droplets; contaminated dairy products

Osmosis Experiment

Purpose:

To measure the effects of Osmosis and predict what will happen to the water content of an egg placed in distilled water, and one placed in salt solution.

Materials:

2 uncooked eggs
white vinegar
pen or marker
labels
200 mL distilled water
200 mL salt solution
paper towel
water

Procedure:

- 1) Get the eggs that have been soaked in vinegar for 24 hours from your teacher.
- 2) Carefully remove the eggs from the vinegar, rinse them with water, and dry them with a paper towel. Record the appearance of the eggs.
- 3) Label one jar “distilled water” and the other jar “salt solution”
- 4) Measure and record the mass of each egg.
- 5) Place one egg in each jar. Pour 200 mL of distilled water into one jar and 200 mL of salt solution into the other. Cover and let stand for 24 hours.

NEXT DAY:

- 6) Carefully remove one egg and dry it. Measure and record its mass.
- 7) Using a graduated cylinder, measure and record the volume of liquid remaining in the jar.
- 8) Repeat steps 6 and 7 for the other egg.
- 9) Wash your hands.

Reflection:

- 1) Make an inference about the effect of vinegar on egg shells.
- 2) Make an inference on the effect of osmosis on an egg in a) distilled water and b) salt water.

Diffusion Experiment

Purpose:

To try to determine the process that causes food colouring to move all around a glass of water. To look at any differences that may exist with the use of different temperatures of water (hot and cold).

Hypothesis:

You are to make an educated guess as to why food colouring spreads through the water and whether temperature will have any affect on this.

Materials:

2 clean beakers

hot water

cold water

bottle of food colouring

SAFETY - be careful when handling hot water - only fill the beakers half full and handle them by the top edges only.

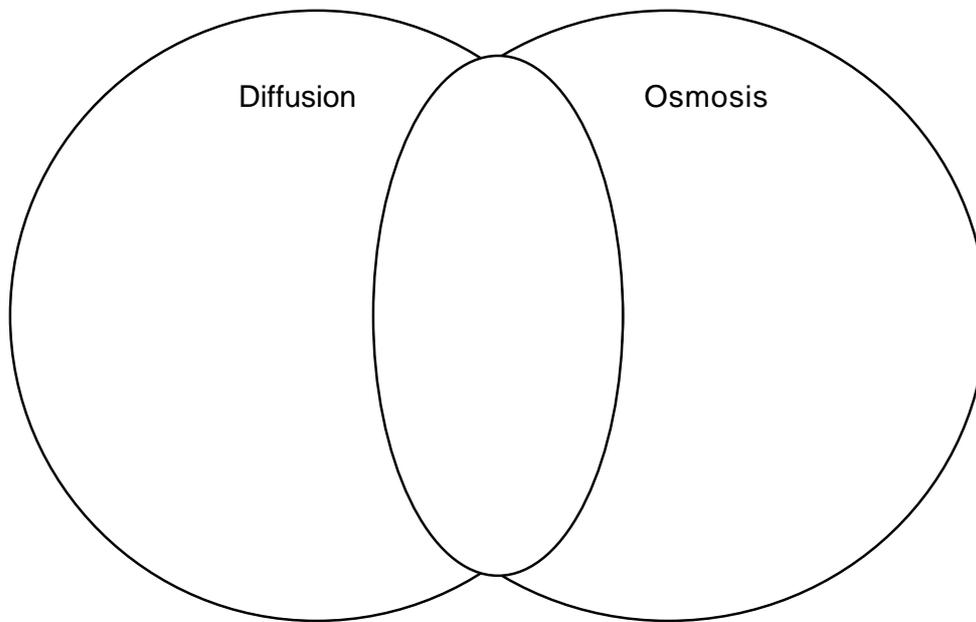
Procedure:

- 1) Fill each beaker half full - one with cold water the other with hot.
- 2) Put one drop of food colour into the cold water. Observe what happens.
- 3) Draw a diagram of the pattern of food colouring after observing it in the cold water for one minute.
- 3) Put one drop of food colouring into the hot water. Observe what happens.
- 4) Draw a diagram of the pattern of food colour after observing it in the hot water for one minute.

NEXT DAY:**Reflection:**

- 1) What do you think would happen if you put more than one drop of food colouring into the water? Why?
- 2) What is diffusion?
- 3) At which temperature did diffusion occur faster?
- 4) Why do you think diffusion is important for cells?

Venn Diagram



Rationale:

- Have the students provide characteristics that were unique to “diffusion” and “osmosis” in the areas provided/titled by the circles.
- Have the students provide characteristics that were similar to both “diffusion “ and “osmosis” in the centre oval.
- This provides the student and teacher with a clear visual representation of the knowledge and understanding gained through the experiment.

BLM 10. 1

Body Systems

You will use this outline to brainstorm different body systems as well as their importance. In our bodies, there are many systems that take on specialized tasks. For example, our digestive system has the responsibility of extracting nutrients from all the different foods we eat.

- 1) Brainstorm six specialized body systems (other than the digestive).
- 2) Write your answers using a web diagram.
- 3) Underneath the name, outline why it's essential to our bodies.
- 4) Think about all the things the body does. Each function of the body requires a part of a body system.

SYSTEMS ASSIGNMENT



You have looked at six different systems within the human body. You are now required to choose one system from the list below, on which you are to become an expert. You are required to:

- i) identify the structures (a minimum of three);**
- ii) identify the function(s) of the system;**
- iii) list factors that would help the overall functioning of that particular system. An example might be that a balanced diet would help the overall functioning of the digestive system. You are looking for everyday activities that you think would help the functioning of a system.**

SYSTEMS:

- Circulatory System**
- Respiratory System**
- Digestive System**
- Muscular System**
- Skeletal System**
- Nervous System**
- Excretory System**



OWL PELLET DISSECTION

Many large animals feed on smaller mammals or birds. Owls are counted among these predators. They usually swallow their food whole. If the prey is too large, they will rip it apart into smaller pieces. The owl does not digest hair, bones, teeth or feathers. Instead, a part of the owl's digestive system presses these parts together to form a **pellet**. Owls will eventually spit these **pellets** out. Your job is to take apart a **pellet**. Scientists and students can learn many things about the owls and where they live by examining their **pellets**.

MATERIALS:

- one owl pellet per pair of students
- two wooden probes
- sheet of white paper

PROCEDURE:

- 1) Place owl pellet on the white paper. Using your fingers or the skewers, break off a small chunk of the pellet. Be gentle and do not push the skewers any further into the pellet than necessary. Remember, the bones you are looking for are small and easily broken.
- 2) Carefully tear the pellet apart with the skewers and set aside any bones that you find.
- 3) Compare the bones with the ones pictured on your Owl Pellet Bone Chart. Rats, mice, moles, and pocket gophers are some of the rodents that barn owls eat.
- 4) Identify as many bones as possible. Make a different pile for each kind of bone that you find.
- 5) Try to keep track of the bones by placing the ones you find over the matching

bones on the Rat skeleton chart. The animals eaten by the owl that produced your pellet may not have included a rat, but the bones of the other rodents will be similar.

- 6) Repeat this process until you have completely taken apart the pellet and removed the bones.
- 7) Record your findings by completing the questions provided.
- 8) Compare your findings with some of your classmates.

Pellet Questions:
Reflections, Observations



1. How many skulls **and** how many different kinds of skulls did you find?

2. Record the number of each of the animals that your owl ate in forming your pellet.

Rodent: Shrew: Mole: Bird: Other:

3. Assume that an owl forms one pellet each day and that your pellet is average. How many animals would an owl eat:

in a week?

in a month?

in a year?

4. Why do you think farmers like having barn owls on their farms?

5. How many other bones did you find?

Ribs: Jaws: Pelvis: Scapula: Vertebrae:
Other:

6. How close did you come to finding a complete skeleton?

7. Why do you think it may be so difficult to put together a whole skeleton?

8. What can you say about the mammal population in the area where your pellet was found? Is your answer a good guess, or would you need more pellets to be sure? Why?

9. What do you think are some of the differences between the human digestive system and that of an owl? Try to find specific similarities and differences.

BLM 12.1

Scientific Information:

Bacteria are tiny organisms that are invisible to the human eye. Millions of bacteria begin growing on and in a human being at the minute of birth and remain until a person's death - and even after that! The bacteria are actually quite harmless and, in fact, can work to keep other, more harmful bacteria away. Different types of bacteria live in each area of the human body.

The following information relates to the story you are about to read:

The hardest places for bacteria to grow are the arms and legs (the desert). The crusty slabs that break loose are dead skin cells which get blown away as the baby moves. The scaly, tree-like growths that some invaders encounter are hairs. The deep pits are pores in the baby's scalp where the hairs are rooted. The cave which the invaders visit is, of course, the baby's mouth (the floor being the tongue). As milk enters the baby's mouth, it carries bacteria down the throat to the stomach and then to the baby's intestines.

INVASION

WARNING! *This story will shock and surprise you. It is a true account of the invasion of a strange yet vaguely familiar world.*

The surface had barely begun to dry when the first of the invaders had arrived. Alone, and in groups, they drifted in on gusts of wind. They carried no weapons, despite that their simple bodies were almost defenseless against the hostile new environment. To colonize this world they would have to rely on luck and the size and variety of their invasion force.

Millions of invaders were doomed immediately: they landed in dry, barren areas that could hardly support any life at all. Yet, miraculously, a few of them did survive on the crusty, slab-like surface, only to face continual hazards. From time to time, the surface heaved, causing some of the slabs to break loose. Any aliens unlucky enough to be on loosened slabs

were carried off by raging winds as the slabs were whirled away. But the surface of the new world wasn't totally hostile. Some areas offered shelter from the terrible winds. These rough, irregular landscapes were full of strange towering growths that rose like leafless, scaly tree trunks out of deep pits. Many of the invaders who settled in these sheltered pits thrived. Sausage shaped aliens grew to almost impossible lengths before splitting in two, and clusters of spherical aliens became swollen as their numbers grew. Other invaders, who found the atmosphere poisonous, wriggled to the very bottom of the pits. Here they discovered a type of air lock, where poisonous gases couldn't reach them. And so, they too survived.

Some aliens landed close to the opening of a huge cave. The wind there was overpowering, gusting from ever-changing directions. First it seemed to come from the mouth of the cave itself, then suddenly it reversed and sucked everything in its path, including hundreds of aliens, into the warm, moist interior of the cave.

Inside, the invaders came face to face with the cave's inhabitants. Some were strange corkscrew shaped creatures, others lashed around with whip like tentacles. But they took no notice of the invaders, as if to say there is room for all.

Being inside the cave was much better than being on the surface. But as on the surface, there were unseen hazards. Gases constantly rushed back and forth through the opening of the cave. At times, the floor of the cave convulsed and darkness descended. And there were sudden floods, bringing fork shaped invaders into the cave and sweeping them down into a dark gaping tunnel at its rear.

The invaders who were swept down the tunnel, however, turned out to be the luckiest of all. They found themselves in a labyrinth of connecting tunnels and chambers where the heat and wetness suited them perfectly. They wedged themselves into cracks and folds in the tunnels walls. And there they thrived, silently growing and splitting until the innermost tunnels were stuffed with them.

The invasion was a success. The new world was colonized and the invaders would be at home there forever.

ECOLOGICAL MYSTERY

Write an ecological mystery. This is the problem:

You are a nature detective. You are an expert on habitats and how nature works together in a community. Paula Smith, mayor of Empire Lake, phoned you last night. The townspeople are upset, and demanding action, because the ducks at the local pond have been dying in large numbers. Last week alone, 50 dead ducks were found. No one in the community has been able to solve this problem. She needs your help.

In your mystery you will need to:

- decide why the ducks have died.
- give at least four clues to discovering the culprit, including at least two red herrings to make the story more interesting.
- include evidence of a food chain
- include at least four factors that affect plants and animals in the habitat, with at least one man-made cause.
- describe the habitat, the plants, and the animals.
- show at least three ways that animals and plants are interconnected with each other and the habitat
- include an action plan to prevent further duck deaths.
- make sure that the information is scientifically correct.
- make the story interesting and exciting to read.

Getting Ready

1. Facts about the pond:

2. Things to check:

3. Reasons why the ducks might be dying:

4. Possible clues:

5. Possible red herrings:

6. Possible action plans:

7. Ways that the plants and animals interact:

8. Other useful information:

Scientific Fact Planner

1. Scientific facts, what do you know about the habitat:

2. What are your clues:

-
-
-

3. What are your red herrings?

-
-
-

4. How did you, as investigator, discover the clues?

5. Action plan:

POLLUTING OUR THOUGHTS

Culminating Activity Grade 7

This activity requires you to relate many of the lessons and activities studied throughout the unit to your personal project.

Recently there have been grave concerns about the amount of pollution in our waters, land, and air. Many pollutants once released into the environment, don't disappear. These are known as 'persistent pollutants.' It is evident that many forms of life are affected by these 'persistent pollutants.' It is your job to become an **expert** on an environmental issue that is affecting a specific food chain.

You must meet the following **Design Criteria**:

- identify the source of the persistent pollutant
- identify the effects it has on our environment
- identify the effects it has on a particular food chain - you must include how it enters into that food chain and how it effects the food chain at all levels
- identify future (long term) effects this may have if something is not done to change the existing problem
- create a solution that you think would help rectify the problem you have recognized.

Consider:

- what difficulties you might encounter trying to implement your plan?
- how much time and money would it take before we would see a positive change in the ecosystem (food chain) you chose to study?

Your finished Project must consist of:

- a written report
- an oral presentation
- a visual aid

See Rubric for Assessment Criteria

POLLUTING OUR THOUGHTS

Culminating Activity

Grade 8

This activity requires you to relate many of the lessons and activities studied throughout the unit to your personal project.

Recently there have been grave concerns about the amount of pollution in our waters, land and air. Many pollutants once released into the environment, don't disappear. These are known as 'persistent pollutants.' It is evident that many forms of life are affected by these 'persistent pollutants.' It is your job to become an **expert** on an environmental issue that has negatively affected a particular system within the human body (something that has become a health concern).

You must meet the following Design Criteria:

- identify the source of the persistent pollutant
- identify the effects it has on our surrounding environment
- identify the effects it has on a body system - you must include how it enters into the human body (from cell - to tissue - to organ - to organ system -to the entire body)
- because our systems are interdependent you must state the ultimate result of this pollutant on our well-being.
- identify future (long-term) effects this may have if something is not done to change the existing problem.
- create an environmental solution that you think would help rectify the problem you have recognized.

Consider:

- are there any medical interventions that have been taken to counteract the problem you have studied and how do they work within our body?
- what difficulties might you encounter trying to implement your plan to eliminate the environmental problem you studied?
- how much time and money would it take before we would see a positive change?

Your finished Project must consist of:

- a written report
- an oral presentation
- a visual aid

See Rubric for Assessment Criteria

8.3 Investigation Rubric



for use with Subtask 8 : Sneaking Through from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 8s9** – explain the function of selectively permeable membranes in cells;

- 8s14** – describe, using their observations, the movement of gases and water into and out of cells during diffusion and osmosis.

- 8s17** – plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Initiating (Questioning and Hypothesizing)	-asks few questions about the task; questions are vague and unfocused -unable to generate hypotheses	-asks simple questions which somewhat focus the investigation -generates a questionable hypothesis	-asks questions which clarify the task and focus the investigation -generates a valid hypothesis	-asks relevant, clear questions about the task -generates an insightful hypothesis
Conducting	-follows few of the prescribed procedures -requires constant reminders to follow safety procedures -uses tool/equipment with limited competence	- follows some of the prescribed procedures -requires some reminders to follow safety procedures -uses tools/equipment with some competence	- follows most of the prescribed procedures -follows safety procedures -competently uses tools/equipment	- follows all of the prescribed procedures -routinely follows safety procedures -uses tools/equipment with a high degree of competence
Reporting	-records little data; data is irrelevant and/or inaccurate -recordings are disorganized and contain major errors	-records data but organization is lacking; some inaccuracies -recordings are somewhat organized and contain major errors	-records most relevant data in an organized way; generally accurate -recordings are organized and contain few minor errors	-records all relevant data in an organized and skillful way; accurately -recordings are organized efficiently with practically no errors
Interpreting	-minimal analysis of the data -unable to arrive at logical conclusions -little to no inferences made	-explains data but provides limited analysis -conclusions are partial and not clearly stated -makes few inferences	-provides some analysis of data -draws some valid conclusions; relevant and clearly stated -makes some appropriate inferences	-provides insightful analysis of the data -draws clearly stated conclusions -makes insightful inferences
Communicating	-provides incomplete and confusing explanations -displays information but without clear organization	-provides some explanations that may be incorrect -displays information but may lack organization	-provides explanations that are generally correct but may lack detail -displays information in an organized way	-provides explanations that are correct and detailed -displays information in a skillful and organized way

15.3 Polluting Our Thoughts



for use with Subtask 15 : Polluting Our Thoughts from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 7s18** – investigate the impact of the use of technology on the environment (e.g., the “greenhouse effect”; redirection of water flow for human needs; use of pesticides);
- 7s21** – describe the conditions in an ecosystem that are essential to the growth and reproduction of plants and micro-organisms, and show the connection between these conditions and various aspects of the food supply for humans;
- 7s24** – identify and explain economic, environmental and social factors that should be considered in the management and preservation of habitats (e.g., the need for recycling; the need for people to have employment).
- 8s21** – describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;
- 8s27** – describe ways in which various types of cells contribute to the healthy functioning of the human body (e.g., red blood cells transport oxygen throughout the body);

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	<ul style="list-style-type: none"> – demonstrates significant misconception – gives explanations showing limited understanding of the concepts 	<ul style="list-style-type: none"> – demonstrates minor misconceptions – gives partial explanations 	<ul style="list-style-type: none"> – demonstrates no significant misconceptions – usually gives complete or nearly complete explanations 	<ul style="list-style-type: none"> – demonstrates no misconceptions – always gives complete explanations
Communication of required knowledge in written component of assignment	<ul style="list-style-type: none"> – communicates with little clarity and precision – rarely uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – communicates with some clarity and precision – sometimes uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – generally communicates with clarity and precision – usually uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – consistently communicates with clarity and precision – consistently uses appropriate science and technology terminology
Relating of science and technology to each other and to the world outside the school, which includes reflective and creative	<ul style="list-style-type: none"> – shows little understanding between science and technology and the world outside the school – is unable to evaluate situations and solve environmental problems 	<ul style="list-style-type: none"> – shows some understanding between science and technology and the world outside the school – with assistance, is able to evaluate situations and solve environmental problems 	<ul style="list-style-type: none"> – shows understanding between science and technology and the world outside the school – is able to independently evaluate situations and solve environmental problems 	<ul style="list-style-type: none"> – shows understanding between science and technology and the world outside the school, as well as their implications – thinks reflectively about environmental problems
Creative work * (Visual Aid)	<ul style="list-style-type: none"> – visual representation of food chain/body system is not demonstrated – performs and creates only in limited and incomplete ways 	<ul style="list-style-type: none"> – visual representation of food chain/body system is demonstrated with a few errors and/or omissions – occasionally performs and creates in complete ways 	<ul style="list-style-type: none"> – clear visual representation of food chain/body system is demonstrated – usually performs and creates in complete ways 	<ul style="list-style-type: none"> – clear and precise visual representation of food chain/body system is demonstrated – consistently performs and creates in well-developed ways
Oral Presentation	<ul style="list-style-type: none"> – difficult to hear at times – articulation is weak – minimal eye contact – rarely uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – speech volume is erratic – unclear articulation – erratic eye contact – sometimes uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – appropriate volume – clear, easy to follow, – eye contact is intermittent – usually uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – loud and easy to understand – variation in voice expression consistent throughout presentation; excellent vocabulary – eye contact engages audience

2. 2 Cell Construction Rubric



for use with Subtask 2 : The Cell Construction Crew

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 8s1** • demonstrate an understanding of the basic structure and function of plant and animal cells, and describe the hierarchical organization of cells in plants and animals;
- 8s6** – identify organelles in cells through observation (e.g., vacuole, nucleus, chloroplast) and explain their functions;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Select Levels A Collaborative Contributor	-shows little respect towards the rights, responsibilities and contributions of self and others. -does not work effectively as an interdependent team member	-respects few of the rights, responsibilities and contributions of self and others. -works as an interdependent team member	-respects the rights, responsibilities and contributions of self and others. -works effectively as an interdependent team member	-consistently respects the rights, responsibilities and contributions of self and others. -consistently works effectively as an interdependent team member
Understanding of basic concepts	– shows understanding of few of the basic concepts (very few recognizable organelles identified in model) – demonstrates significant misconception	– shows understanding of some of the basic concepts (some recognizable organelles identified in model) – demonstrates minor misconceptions	– shows understanding of most of the basic concepts (most organelles identified clearly in model) – demonstrates no significant misconceptions	– shows understanding of all of the basic concepts (organelles identified clearly and precisely in model) – demonstrates no misconceptions
Inquiry and design skills	– applies few of the required skills and strategies – shows little awareness of the safety procedures – uses tools, equipment, and materials correctly only with assistance	– applies some of the required skills and strategies – shows some awareness of safety procedures – uses tools, equipment, and materials correctly with some assistance	– applies most of the required skills and strategies – usually shows awareness of safety procedures – uses tools, equipment, and materials correctly with only occasional assistance	– applies all (or almost all) of the required skills and strategies – consistently shows awareness of safety procedures – uses tools, equipment, and materials correctly with little or no assistance

14.2 Mystery Sleuthing



Student Name: _____

Date: _____

for use with Subtask 14 : Mystery Sleuthing from the Grade 7/8 Unit: Life Systems

Expectations for this Subtask to Assess with this Rubric:

- 7s9** – interpret food webs that show the transfer of energy among several food chains, and evaluate the effects of the elimination or weakening of any part of the food web;
- 7s11** – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully);
- 7s17** – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., design a multimedia presentation explaining the interrelationships of biotic and abiotic elements in a specific ecosystem).
- 8s20** – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a simulation illustrating movement of water and nutrients between cells and through various organs and systems).

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts, including reflective and creative thinking skills	<ul style="list-style-type: none"> – shows understanding of few of the basic concepts – adapts scientific facts to story format with assistance – unable to identify and evaluate situations and solve problems 	<ul style="list-style-type: none"> – shows understanding of some of the basic concepts – adapts scientific facts to story format with some assistance – with assistance is able to identify and evaluate situations and solve problems 	<ul style="list-style-type: none"> – shows understanding of most of the basic concepts – adapts scientific facts to story format – independently identifies and evaluates situations and solve problems 	<ul style="list-style-type: none"> – shows understanding of all of the basic concepts – adapts scientific facts to story format with thorough understanding – thinks reflectively and creatively
Initiative and Planning	<ul style="list-style-type: none"> – shows little awareness of the checklist and /or concepts stressed in lessons 	<ul style="list-style-type: none"> – takes into account some of the items on the checklist and/or some concepts stressed in lessons 	<ul style="list-style-type: none"> – takes into account most of the items in the checklist and/or some concepts stressed in lessons 	<ul style="list-style-type: none"> – takes into account all of the items on the checklist and the concepts stressed in lessons
Communication of required knowledge	<ul style="list-style-type: none"> – communicates with little clarity and precision, giving explanations that are inaccurate and lack any detail; shows little evidence of characteristics of mystery stories 	<ul style="list-style-type: none"> – communicates with some clarity and precision, giving explanations that are accurate but lack detail; shows some evidence of characteristics of mystery stories 	<ul style="list-style-type: none"> – communicates with clarity and precision, giving explanations that are accurate and detailed; shows characteristics of mystery stories 	<ul style="list-style-type: none"> – communicates with clarity and precision, giving explanations that are accurate, detailed and insightful; shows creativity in mystery story
Performing and Recording	<ul style="list-style-type: none"> – display of information is disorganized; little evidence of paragraphs or editing; minor errors 	<ul style="list-style-type: none"> – display of information is somewhat organized; evidence of paragraphs and editing; few errors 	<ul style="list-style-type: none"> – display of information is organized; evidence of paragraphs and editing; few errors 	<ul style="list-style-type: none"> – display of information is organized and clearly labeled; includes paragraphs, editing; no errors

3.2 Flow Chart Rubric



for use with Subtask 3 : Your Order's Up from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 7s15** – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as biosphere, biome, ecosystem, species);
- 8s8** – describe the organization of cells into tissues, organs, and systems;
- 8s18** – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	<ul style="list-style-type: none"> – shows understanding of few of the basic concepts – demonstrates significant misconception – gives explanations showing limited understanding of the concepts 	<ul style="list-style-type: none"> – shows understanding of some of the basic concepts – demonstrates minor misconceptions – gives partial explanations 	<ul style="list-style-type: none"> – shows understanding of most of the basic concepts – demonstrates no significant misconceptions – usually gives complete or nearly complete explanations 	<ul style="list-style-type: none"> – shows understanding of all of the basic concepts – demonstrates no misconceptions – always gives complete explanations
Communication of required knowledge	<ul style="list-style-type: none"> – communicates with little clarity and precision – rarely uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – communicates with some clarity and precision – sometimes uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – generally communicates with clarity and precision – usually uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – consistently communicates with clarity and precision – consistently uses appropriate science and technology terminology and units of measurement
Organizational Skills	<ul style="list-style-type: none"> – included few, if any, appropriate examples at each level – levels not easily differentiated within the hierarchy 	<ul style="list-style-type: none"> – included some appropriate examples at each level – levels are somewhat differentiated within the hierarchy 	<ul style="list-style-type: none"> – included appropriate examples at each level – each level differentiated within the hierarchy 	<ul style="list-style-type: none"> – included appropriate and unique examples at each level – each level clearly and uniquely differentiated within the hierarchy

4.3 Cell Sells Rubric



for use with Subtask 4 : Who's in Charge? from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 8e48** • listen to and communicate connected ideas and relate carefully-constructed narratives about real and fictional events;
- 8s6** – identify organelles in cells through observation (e.g., vacuole, nucleus, chloroplast) and explain their functions;
- 8s18** – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Oral Communication: A Collaborative Contributor	<ul style="list-style-type: none"> – with assistance – unclearly – for a limited range of simple purposes – is unable to work as an interdependent team member 	<ul style="list-style-type: none"> – independently – with some clarity and some precision – for a variety of simple purposes – requires reminders in order to work as an interdependent team member 	<ul style="list-style-type: none"> – independently – clearly and precisely – for specific purposes – works effectively as an interdependent team member 	<ul style="list-style-type: none"> – independently – clearly, precisely, and confidently – for a wide variety of purposes and in a wide variety of contexts – works creatively and effectively as an interdependent team member
Understanding of basic concepts	<ul style="list-style-type: none"> – shows understanding of few of the basic concepts – demonstrates significant misconception – gives explanations showing limited understanding of the concepts 	<ul style="list-style-type: none"> – shows understanding of some of the basic concepts – demonstrates minor misconceptions – gives partial explanations 	<ul style="list-style-type: none"> – shows understanding of most of the basic concepts – demonstrates no significant misconceptions – usually gives complete or nearly complete explanations 	<ul style="list-style-type: none"> – shows understanding of all of the basic concepts – demonstrates no misconceptions – always gives complete explanations
Communication of required knowledge	<ul style="list-style-type: none"> – rarely uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – sometimes uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – usually uses appropriate science and technology terminology and units of measurement 	<ul style="list-style-type: none"> – consistently uses appropriate science and technology terminology and units of measurement

7.2 Adapt or Die



Student Name: _____

Date: _____

for use with Subtask 7 : Adapt or Die
from the Grade 7/8 Unit: Life Systems

Expectations for this Subtask to Assess with this Rubric:

- 7s11** – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully);
- 8s13** – compare the structure of different plants (e.g., cactus, coniferous tree, moss) and show how their structure enables them to live in specific conditions;
- 8s23** – describe some ways in which the various systems in the human body are interdependent;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	<ul style="list-style-type: none"> – shows understanding of few of the basic concepts – demonstrates significant misconception – gives explanations showing limited understanding of the concepts 	<ul style="list-style-type: none"> – shows understanding of some of the basic concepts – demonstrates minor misconceptions – gives partial explanations 	<ul style="list-style-type: none"> – shows understanding of most of the basic concepts – demonstrates no significant misconceptions – usually gives complete or nearly complete explanations 	<ul style="list-style-type: none"> – shows understanding of all of the basic concepts – demonstrates no misconceptions – always gives complete explanations
Communication of required knowledge	<ul style="list-style-type: none"> – communicates with little clarity and precision – rarely uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – communicates with some clarity and precision – sometimes uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – generally communicates with clarity and precision – usually uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – consistently communicates with clarity and precision – consistently uses appropriate science and technology terminology
Relating of science and technology to each other and to the world outside the school, including responsible citizenship	<ul style="list-style-type: none"> – shows little understanding of connections between science and technology and the world outside the school – does not demonstrate an appreciation of the sacredness of life 	<ul style="list-style-type: none"> – shows some understanding of connections between science and technology and the world outside the school – with encouragement, is able to demonstrate an appreciation of the sacredness of life 	<ul style="list-style-type: none"> – shows understanding of connections between science and technology and the world outside the school – is able to independently demonstrate an appreciation of the sacredness of life 	<ul style="list-style-type: none"> – shows understanding of connections between science and technology and the world outside the school, as well as their implications – is able to creatively and reflectively demonstrate an appreciation of the sacredness of life

10.4 Systems Assign.



for use with Subtask 10 : Where Does It Go From Here? from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

8s21 – describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;

8s23 – describe some ways in which the various systems in the human body are interdependent;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	<ul style="list-style-type: none"> – demonstrates significant misconception – gives explanations showing limited understanding of the function and structure of a particular system 	<ul style="list-style-type: none"> – demonstrates minor misconceptions – gives partial explanations of the function and structure of a particular system 	<ul style="list-style-type: none"> – demonstrates no significant misconceptions – usually gives complete or nearly complete explanations of the function and structure of a particular system 	<ul style="list-style-type: none"> – demonstrates no misconceptions – always gives complete explanations of the function and structure of a particular system
Communication of required knowledge	<ul style="list-style-type: none"> – communicates with little clarity and precision – rarely uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – communicates with some clarity and precision – sometimes uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – generally communicates with clarity and precision – usually uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – consistently communicates with clarity and precision – consistently uses appropriate science and technology terminology
Relating of science and technology to each other and to the world outside the school	<ul style="list-style-type: none"> – shows little understanding of connections between the specific system and the efficient overall functioning of the body 	<ul style="list-style-type: none"> – shows some understanding of connections between the specific system and the efficient overall functioning of the body 	<ul style="list-style-type: none"> – shows understanding of connections between the specific system and the efficient overall functioning of the body 	<ul style="list-style-type: none"> – shows thorough and insightful understanding of connections between the specific system and the efficient overall functioning of the body

11.3 Owl Pellet Dissection



for use with Subtask 11 : Owl Pellet P.A. from the Grade 7/8 Unit: Life Systems

Student Name: _____

Date: _____

Expectations for this Subtask to Assess with this Rubric:

7s7 – explain the importance of micro-organisms in recycling organic matter (e.g., as decomposers);

8s22 – describe the basic factors that contribute to the efficient functioning of the human respiratory, circulatory, digestive, excretory, and nervous systems;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Inquiry and design skills	<ul style="list-style-type: none"> – applies few of the required skills and strategies – shows little awareness of the safety procedures – uses tools, equipment, and materials correctly only with assistance 	<ul style="list-style-type: none"> – applies some of the required skills and strategies – shows some awareness of safety procedures – uses tools, equipment, and materials correctly with some assistance 	<ul style="list-style-type: none"> – applies most of the required skills and strategies – usually shows awareness of safety procedures – uses tools, equipment, and materials correctly with only occasional assistance 	<ul style="list-style-type: none"> – applies all (or almost all) of the required skills and strategies – consistently shows awareness of safety procedures – uses tools, equipment, and materials correctly with little or no assistance
Communication of required knowledge	<ul style="list-style-type: none"> – communicates with little clarity and precision – rarely uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – communicates with some clarity and precision – sometimes uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – generally communicates with clarity and precision – usually uses appropriate science and technology terminology 	<ul style="list-style-type: none"> – consistently communicates with clarity and precision – consistently uses appropriate science and technology terminology
Relating of science and technology to each other and to the world outside the school	<ul style="list-style-type: none"> – shows little understanding of connections between science and technology and the world outside the school 	<ul style="list-style-type: none"> – shows some understanding of connections between science and technology and the world outside the school 	<ul style="list-style-type: none"> – shows understanding of connections between science and technology and the world outside the school 	<ul style="list-style-type: none"> – shows understanding of connections between science and technology and the world outside the school, as well as their implications

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Selected	Assessed
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Science and Technology---Life Systems

- | | | | |
|------------------------------|---|---|--|
| <input type="checkbox"/> 4s1 | • demonstrate an understanding of the concepts of habitat and community, and identify the factors that could affect habitats and communities of plants and animals; | 1 | |
| <input type="checkbox"/> 4s3 | • describe ways in which humans can change habitats and the effects of these changes on the plants and animals within the habitats. | 1 | |
| <input type="checkbox"/> 4s9 | – classify plants and animals that they have observed in local habitats according to similarities and differences (e.g., in shape, location). | 1 | |

Science and Technology---Life Systems

- | | | | |
|------------------------------|--|---|--|
| <input type="checkbox"/> 6s6 | – identify and describe the characteristics of vertebrates, and use these characteristics to classify vertebrates as mammals, birds, amphibians, reptiles, and fish (the five main classes); | 1 | |
|------------------------------|--|---|--|

English Language---Writing

- | | | | |
|------------------------------|---|---|---|
| <input type="checkbox"/> 7e1 | • communicate ideas and information for a variety of purposes (to outline an argument, to report on observations) and to specific audiences, using forms appropriate for their purpose and topic (e.g., write a lab report for an audience familiar with the scientific terminology); | 2 | |
| <input type="checkbox"/> 7e3 | • organize information to develop a central idea, using well-linked and well-developed paragraphs; | 1 | 1 |

English Language---Reading

- | | | | |
|-------------------------------|---|---|--|
| <input type="checkbox"/> 7e27 | • read independently, selecting appropriate reading strategies; | 1 | |
|-------------------------------|---|---|--|

English Language---Oral and Visual Communication

- | | | | |
|-------------------------------|--|---|--|
| <input type="checkbox"/> 7e47 | • use instructions and explanations to plan and organize work; | 1 | |
| <input type="checkbox"/> 7e48 | • ask questions and discuss different aspects of ideas in order to clarify their thinking; | 1 | |

Science and Technology---Life Systems

- | | | | |
|-------------------------------|---|---|---|
| <input type="checkbox"/> 7s4 | – identify living (biotic) and non-living (abiotic) elements in an ecosystem; | 1 | 1 |
| <input type="checkbox"/> 7s5 | – identify populations of organisms within an ecosystem and the factors that contribute to their survival in that ecosystem; | 1 | 1 |
| <input type="checkbox"/> 7s6 | – identify and explain the roles of producers, consumers, and decomposers in food chains and their effects on the environment (e.g., plants as producers in ponds); | 1 | 1 |
| <input type="checkbox"/> 7s7 | – explain the importance of micro-organisms in recycling organic matter (e.g., as decomposers); | 1 | 1 |
| <input type="checkbox"/> 7s8 | – identify micro-organisms as beneficial (e.g., yeast) and/or harmful (e.g., bacteria or viruses that cause disease); | 1 | 1 |
| <input type="checkbox"/> 7s9 | – interpret food webs that show the transfer of energy among several food chains, and evaluate the effects of the elimination or weakening of any part of the food web; | 2 | 2 |
| <input type="checkbox"/> 7s11 | – investigate ways in which natural communities within ecosystems can change, and explain how such changes can affect animal and plant populations (e.g., changes affecting their life span, their gestation periods, or their ability to compete successfully); | 1 | 2 |
| <input type="checkbox"/> 7s13 | – formulate questions about and identify the needs of various living things in an ecosystem, and explore possible answers to these questions and ways of meeting these needs (e.g., research the population levels of a species over time and predict its future levels on the basis of past trends and present conditions; determine how the structure of specific plants helps them withstand high winds, live on the surface of water, or compete for sunlight); | 2 | 2 |
| <input type="checkbox"/> 7s15 | – use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as biosphere, biome, ecosystem, species); | 1 | 2 |
| <input type="checkbox"/> 7s17 | – communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., design a multimedia presentation explaining the interrelationships of biotic and abiotic elements in a specific ecosystem). | 1 | 1 |
| <input type="checkbox"/> 7s18 | – investigate the impact of the use of technology on the environment (e.g., the “greenhouse effect”; redirection of water flow for human needs; use of pesticides); | 1 | 1 |
| <input type="checkbox"/> 7s21 | – describe the conditions in an ecosystem that are essential to the growth and reproduction of plants and micro-organisms, and show the connection between these conditions and various aspects of the food supply for humans; | 1 | 1 |
| <input type="checkbox"/> 7s23 | – explain the long-term effects of the loss of natural habitats and the extinction of species (e.g., loss of diversity of genetic material, both plant and animal); | 1 | 1 |
| <input type="checkbox"/> 7s24 | – identify and explain economic, environmental and social factors that should be considered in the management and preservation of habitats (e.g., the need for recycling; the need for people to have employment). | 1 | 1 |

English Language---

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

		Selected	Assessed
<input type="checkbox"/> 8e1	• communicate ideas and information for a variety of purposes (to evaluate information, to compare points of view) and to specific audiences, using forms appropriate for their purpose (e.g., a survey soliciting opinions on an environmental issue) and features appropriate to the form (e.g., focused questions);	1	
<input type="checkbox"/> 8e2	• use writing for various purposes and in a range of contexts, including school work (e.g., to write technical instructions, to clarify personal concerns, to explore social issues, to develop imaginative abilities);	1	1
English Language---Oral and Visual Communication			
<input type="checkbox"/> 8e46	• provide clear answers to questions and well-constructed explanations or instructions in classroom work;		1
<input type="checkbox"/> 8e47	• listen attentively to organize and classify information and to clarify thinking;	1	
<input type="checkbox"/> 8e48	• listen to and communicate connected ideas and relate carefully-constructed narratives about real and fictional events;		1
Science and Technology---Life Systems			
<input type="checkbox"/> 8s1	• demonstrate an understanding of the basic structure and function of plant and animal cells, and describe the hierarchical organization of cells in plants and animals;		1
<input type="checkbox"/> 8s3	• describe ways in which study of the structure, function, and interdependence of human organ systems can result in improvements in human health.	1	
<input type="checkbox"/> 8s6	– identify organelles in cells through observation (e.g., vacuole, nucleus, chloroplast) and explain their functions;		2
<input type="checkbox"/> 8s7	– describe, using their observations, differences in structure between plant and animal cells;		1
<input type="checkbox"/> 8s8	– describe the organization of cells into tissues, organs, and systems;		1
<input type="checkbox"/> 8s9	– explain the function of selectively permeable membranes in cells;		2
<input type="checkbox"/> 8s11	– recognize that cells in multicellular organisms need to reproduce to make more cells to form and repair tissues;	1	
<input type="checkbox"/> 8s13	– compare the structure of different plants (e.g., cactus, coniferous tree, moss) and show how their structure enables them to live in specific conditions;	1	1
<input type="checkbox"/> 8s14	– describe, using their observations, the movement of gases and water into and out of cells during diffusion and osmosis.		2
<input type="checkbox"/> 8s16	– formulate questions about and identify needs related to the functioning of cells, and explore possible answers to these questions and ways of meeting these needs (e.g., design and conduct an experiment to test a hypothesis about the effect of chemicals on a unicellular organism; design and conduct an experiment to test the effectiveness of different substances in preventing cut flowers from wilting);	2	
<input type="checkbox"/> 8s17	– plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions;		2
<input type="checkbox"/> 8s18	– use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results (e.g., use scientific terms such as organelle, diffusion, osmosis, selectively permeable);		2
<input type="checkbox"/> 8s20	– communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a simulation illustrating movement of water and nutrients between cells and through various organs and systems).		2
<input type="checkbox"/> 8s21	– describe the needs and functions of various cells and organs in relationship to the needs of the human body as a whole;	1	2
<input type="checkbox"/> 8s22	– describe the basic factors that contribute to the efficient functioning of the human respiratory, circulatory, digestive, excretory, and nervous systems;		2
<input type="checkbox"/> 8s23	– describe some ways in which the various systems in the human body are interdependent;		3
<input type="checkbox"/> 8s26	– describe ways in which substances work by altering the way cells function (e.g., insulin);		1
<input type="checkbox"/> 8s27	– describe ways in which various types of cells contribute to the healthy functioning of the human body (e.g., red blood cells transport oxygen throughout the body);	1	1
Science and Technology---Energy and Control			
<input type="checkbox"/> 8s83	– compare the automatic functions of the human eye to functions in an automatic camera (e.g., focusing power, adaptation to brightness);		

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

English Language

7e1	2	7e2	7e3	1	1	7e4	7e5	7e6	7e7	7e8	7e9	7e10		
7e11		7e12	7e13			7e14	7e15	7e16	7e17	7e18	7e19	7e20		
7e21		7e22	7e23			7e24	7e25	7e26	7e27	1	7e28	7e29	7e30	
7e31		7e32	7e33			7e34	7e35	7e36	7e37		7e38	7e39	7e40	
7e41		7e42	7e43			7e44	7e45	7e46	7e47	1	7e48	1	7e49	7e50
7e51		7e52	7e53			7e54	7e55	7e56	7e57		7e58	1	7e59	7e60
7e61		7e62	7e63			7e64	7e65	7e66	7e67		7e68		7e69	7e70

Core French

7f1	7f2	7f3	7f4	7f5	7f6	7f7	7f8	7f9	7f10
7f11	7f12	7f13	7f14	7f15	7f16	7f17			

Mathematics

7m1	7m2	7m3	7m4	7m5	7m6	7m7	7m8	7m9	7m10
7m11	7m12	7m13	7m14	7m15	7m16	7m17	7m18	7m19	7m20
7m21	7m22	7m23	7m24	7m25	7m26	7m27	7m28	7m29	7m30
7m31	7m32	7m33	7m34	7m35	7m36	7m37	7m38	7m39	7m40
7m41	7m42	7m43	7m44	7m45	7m46	7m47	7m48	7m49	7m50
7m51	7m52	7m53	7m54	7m55	7m56	7m57	7m58	7m59	7m60
7m61	7m62	7m63	7m64	7m65	7m66	7m67	7m68	7m69	7m70
7m71	7m72	7m73	7m74	7m75	7m76	7m77	7m78	7m79	7m80
7m81	7m82	7m83	7m84	7m85	7m86				

Science and Technology

7s1	7s2	7s3	7s4	1	1	7s5	1	7s6	1	7s7	1	7s8	1	7s9	2	7s10	
7s11	1	2	7s12	7s13	2	7s14	7s15	1	2	7s16	7s17	1	7s18	1	1	7s19	7s20
7s21	1	1	7s22	7s23	1	7s24	1	7s25	7s26	7s27	7s28	7s29	7s30	7s31	7s32	7s33	7s34
7s41	7s42	7s43	7s44	7s45	7s46	7s47	7s48	7s49	7s50	7s51	7s52	7s53	7s54	7s55	7s56	7s57	7s58
7s61	7s62	7s63	7s64	7s65	7s66	7s67	7s68	7s69	7s70	7s71	7s72	7s73	7s74	7s75	7s76	7s77	7s78
7s81	7s82	7s83	7s84	7s85	7s86	7s87	7s88	7s89	7s90	7s91	7s92	7s93	7s94	7s95	7s96	7s97	7s98
7s101	7s102	7s103	7s104	7s105	7s106	7s107	7s108	7s109	7s110	7s111	7s112	7s113	7s114	7s115	7s116	7s117	7s118
7s121	7s122	7s123	7s124	7s125	7s126	7s127	7s128	7s129	7s130	7s131							

Geography

7q1	7q2	7q3	7q4	7q5	7q6	7q7	7q8	7q9	7q10
7q11	7q12	7q13	7q14	7q15	7q16	7q17	7q18	7q19	7q20
7q21	7q22	7q23	7q24	7q25	7q26	7q27	7q28	7q29	7q30
7q31	7q32	7q33	7q34	7q35	7q36	7q37	7q38	7q39	7q40
7q41	7q42	7q43	7q44	7q45	7q46	7q47	7q48	7q49	7q50
7q51	7q52	7q53							

History

7h1	7h2	7h3	7h4	7h5	7h6	7h7	7h8	7h9	7h10
7h11	7h12	7h13	7h14	7h15	7h16	7h17	7h18	7h19	7h20
7h21	7h22	7h23	7h24	7h25	7h26	7h27	7h28	7h29	7h30
7h31	7h32	7h33	7h34	7h35	7h36	7h37	7h38	7h39	7h40
7h41	7h42	7h43	7h44	7h45	7h46	7h47	7h48	7h49	7h50
7h51	7h52								

Health and Physical Education

7p1	7p2	7p3	7p4	7p5	7p6	7p7	7p8	7p9	7p10
7p11	7p12	7p13	7p14	7p15	7p16	7p17	7p18	7p19	7p20
7p21	7p22	7p23	7p24	7p25	7p26	7p27	7p28	7p29	7p30
7p31	7p32	7p33	7p34	7p35	7p36	7p37	7p38	7p39	7p40
7p41	7p42								

The Arts

7a1	7a2	7a3	7a4	7a5	7a6	7a7	7a8	7a9	7a10
7a11	7a12	7a13	7a14	7a15	7a16	7a17	7a18	7a19	7a20
7a21	7a22	7a23	7a24	7a25	7a26	7a27	7a28	7a29	7a30
7a31	7a32	7a33	7a34	7a35	7a36	7a37	7a38	7a39	7a40
7a41	7a42	7a43	7a44	7a45	7a46	7a47	7a48	7a49	7a50
7a51	7a52	7a53	7a54	7a55	7a56	7a57	7a58	7a59	7a60
7a61	7a62	7a63	7a64	7a65	7a66	7a67	7a68	7a69	7a70
7a71	7a72	7a73	7a74	7a75	7a76	7a77	7a78		

Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

English Language

8e1	1	8e2	1	1	8e3	8e4	8e5	8e6	8e7	8e8	8e9	8e10		
8e11		8e12			8e13	8e14	8e15	8e16	8e17	8e18	8e19	8e20		
8e21		8e22			8e23	8e24	8e25	8e26	8e27	8e28	8e29	8e30		
8e31		8e32			8e33	8e34	8e35	8e36	8e37	8e38	8e39	8e40		
8e41		8e42			8e43	8e44	8e45	8e46	1	8e47	1	8e48	8e49	8e50
8e51		8e52			8e53	8e54	8e55	8e56		8e57	8e58	8e59	8e60	
8e61		8e62			8e63	8e64	8e65	8e66		8e67				

Core French

8f1	8f2	8f3	8f4	8f5	8f6	8f7	8f8	8f9	8f10
8f11	8f12	8f13	8f14	8f15	8f16	8f17			

Mathematics

8m1	8m2	8m3	8m4	8m5	8m6	8m7	8m8	8m9	8m10
8m11	8m12	8m13	8m14	8m15	8m16	8m17	8m18	8m19	8m20
8m21	8m22	8m23	8m24	8m25	8m26	8m27	8m28	8m29	8m30
8m31	8m32	8m33	8m34	8m35	8m36	8m37	8m38	8m39	8m40
8m41	8m42	8m43	8m44	8m45	8m46	8m47	8m48	8m49	8m50
8m51	8m52	8m53	8m54	8m55	8m56	8m57	8m58	8m59	8m60
8m61	8m62	8m63	8m64	8m65	8m66	8m67	8m68	8m69	8m70
8m71	8m72	8m73	8m74	8m75	8m76	8m77	8m78	8m79	8m80
8m81	8m82								

Science and Technology

8s1	1	8s2	8s3	1	8s4	8s5	8s6	2	8s7	1	8s8	1	8s9	2	8s10			
8s11	1	8s12	8s13	1	1	8s14	2	8s15	8s16	2	8s17	2	8s18	1	2	8s19	8s20	2
8s21	1	2	8s22	2	8s23	3	8s24	8s25	8s26	1	8s27	1	1	8s28	8s29	8s30		
8s31		8s32	8s33		8s34	8s35	8s36	8s37	8s38	8s39	8s40							
8s41		8s42	8s43		8s44	8s45	8s46	8s47	8s48	8s49	8s50							
8s51		8s52	8s53		8s54	8s55	8s56	8s57	8s58	8s59	8s60							
8s61		8s62	8s63		8s64	8s65	8s66	8s67	8s68	8s69	8s70							
8s71		8s72	8s73		8s74	8s75	8s76	8s77	8s78	8s79	8s80							
8s81		8s82	8s83	1	8s84	8s85	8s86	8s87	8s88	8s89	8s90							
8s91		8s92	8s93		8s94	8s95	8s96	8s97	8s98	8s99	8s100							
8s101		8s102	8s103		8s104	8s105	8s106	8s107	8s108	8s109	8s110							
8s111		8s112	8s113		8s114	8s115	8s116	8s117	8s118	8s119	8s120							
8s121		8s122	8s123		8s124	8s125	8s126	8s127	8s128	8s129	8s130							
8s131		8s132	8s133		8s134	8s135	8s136	8s137	8s138	8s139	8s140							
8s141		8s142	8s143		8s144	8s145	8s146	8s147	8s148									

Geography

8q1	8q2	8q3	8q4	8q5	8q6	8q7	8q8	8q9	8q10
8q11	8q12	8q13	8q14	8q15	8q16	8q17	8q18	8q19	8q20
8q21	8q22	8q23	8q24	8q25	8q26	8q27	8q28	8q29	8q30
8q31	8q32	8q33	8q34	8q35	8q36	8q37	8q38	8q39	8q40
8q41	8q42	8q43	8q44	8q45	8q46	8q47	8q48		

History

8h1	8h2	8h3	8h4	8h5	8h6	8h7	8h8	8h9	8h10
8h11	8h12	8h13	8h14	8h15	8h16	8h17	8h18	8h19	8h20
8h21	8h22	8h23	8h24	8h25	8h26	8h27	8h28	8h29	8h30
8h31	8h32	8h33	8h34	8h35	8h36	8h37	8h38	8h39	8h40
8h41	8h42	8h43	8h44	8h45	8h46	8h47	8h48	8h49	8h50
8h51	8h52								

Health and Physical Education

8p1	8p2	8p3	8p4	8p5	8p6	8p7	8p8	8p9	8p10
8p11	8p12	8p13	8p14	8p15	8p16	8p17	8p18	8p19	8p20
8p21	8p22	8p23	8p24	8p25	8p26	8p27	8p28	8p29	8p30
8p31	8p32	8p33	8p34	8p35	8p36	8p37	8p38	8p39	8p40
8p41									

The Arts

8a1	8a2	8a3	8a4	8a5	8a6	8a7	8a8	8a9	8a10
8a11	8a12	8a13	8a14	8a15	8a16	8a17	8a18	8a19	8a20
8a21	8a22	8a23	8a24	8a25	8a26	8a27	8a28	8a29	8a30
8a31	8a32	8a33	8a34	8a35	8a36	8a37	8a38	8a39	8a40
8a41	8a42	8a43	8a44	8a45	8a46	8a47	8a48	8a49	8a50
8a51	8a52	8a53	8a54	8a55	8a56	8a57	8a58	8a59	8a60
8a61	8a62	8a63	8a64	8a65	8a66				



Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

Analysis Of Unit Components

- 15 Subtasks
- 74 Expectations
- 54 Resources
- 138 Strategies & Groupings
- Unique Expectations --
- 10 Language Expectations
- 37 Science And Tech Expectations

Resource Types

- 9 Rubrics
 - 20 Blackline Masters
 - 2 Licensed Software
 - 11 Print Resources
 - 6 Media Resources
 - 2 Websites
 - 4 Material Resources
 - 0 Equipment / Manipulatives
 - 0 Sample Graphics
 - 0 Other Resources
 - 0 Parent / Community
 - 0 Companion Bookmarks
-

Groupings

- 8 Students Working As A Whole Class
- 5 Students Working In Pairs
- 6 Students Working In Small Groups
- 11 Students Working Individually

Assessment Recording Devices

- 6 Anecdotal Record
- 7 Checklist
- 10 Rubric

Teaching / Learning Strategies

- 2 Advance Organizer
- 3 Brainstorming
- 1 Case Study
- 3 Classifying
- 6 Collaborative/cooperative Learning
- 3 Computer Assisted Learning
- 3 Concept Clarification
- 1 Decision-making Models
- 1 Demonstration
- 2 Direct Teaching
- 1 Discussion
- 3 Homework
- 1 Independent Reading
- 2 Independent Study
- 6 Inquiry
- 2 Issue-based Analysis
- 1 Jigsaw
- 1 Lecture
- 3 Mini-lesson
- 1 Model Making

Assessment Strategies

- 3 Classroom Presentation
- 1 Conference
- 3 Essay
- 2 Exhibition/demonstration
- 1 Learning Log
- 3 Observation
- 3 Performance Task
- 9 Questions And Answers (oral)
- 1 Self Assessment



Life Systems

Interacting Organisms An Integrated Unit for Grade 7/8

- 1 Note-making
- 1 Open-ended Questions
- 1 Oral Explanation
- 1 Reader's Theatre
- 5 Research
- 1 Role Playing
- 2 Simulation
- 1 Working With Manipulatives