Gross Medicine!

Rachel Campbell

4th-6th Grade

August 6th, 2015

A. Rationale:

For my unit, I focused on the concept on "interdependence". Interdependence is the mutual relationship that exists between things. A prime example of this is the interdependent relationship, which is displayed between humans and insects. For my essential question, I focused on "How does interdependence impact society?" Based off of this question, the essential understanding for my unit was "Interdependence impacts society." By using these as my essential understanding and essential question, I wanted students to gain an understanding of specific ways that humankind impacts insects and how insects impact humankind. To gain an understanding of this, I focused on the different uses that humans have for insects and the important role that they play in society.

Concept:

Interdependence is an important concept for students to learn because interdependence is needed for survival in the world. Interdependence is displayed all around us. Without interdependent relationships everything would have to function as an independent, which is impossible. A prime example of this is pollination. Without pollination of crops, society would not have certain foods and if farmers did not plant crops, there would be no crops to be pollinated. Within my unit, students studied this concept by learning about the interdependent relationship that exists between insects and humans.

Skills:

Throughout my unit, students used a variety of skill sets. To gain an understanding of the concept and content of the unit, the skills that students used the most were communication, collecting/ interpreting data and analysis of research. Communication was an essential skill in this unit because students had to clearly articulate and communicate the importance of interdependence. One way students used this specific skill was when they created presentations in class. Analysis of research was an essential skill for students because students were expected to pull out specific information that supported the concept of interdependence. Students were exposed to a variety of articles and texts throughout the unit. Interpreting and collecting data was also an important skill for students throughout this unit to provide evidence of specific information. When students were looking at the decline in the honeybee population, students had to look at the percentage of decrease and analyze the reasons behind it.

Content:

Throughout my unit, students were exposed mostly to content related to insects and society. Building a solid foundation in the beginning was important. In my first 2 lessons, I tried to focus mainly on content dealing with interdependence and society. This allowed me to build a foundation and then extend on that knowledge. For example, I focused on the definition of interdependence and why it is important in one of my first lessons so that I could go more in-depth about interdependence and get into specific examples in my later lessons. By the end of the unit, students were expected to know why insects are so important to our society and the role that they play. Content was important for this unit, because without the content knowledge, students would not be able to go more "in-depth" with the unit and concept.

B. Differentiation:

Differentiation is essential when it comes to meeting the needs of gifted students. By differentiating, a teacher is providing more opportunities for gifted students to become engaged in learning activities that require more depth and complexity. By differentiating, a teacher can accelerate students and provide them with more challenge; Differentiation for gifted students was essential for this unit. The dimensions for differentiation were: Content, Process, Learning Environment and Products.

- **Content-**
  In my unit, content was differentiated for students because my lesson plans were lessons that were written for students who are "above" grade level in reading. Majority of the texts that students were exposed to were above grade level. This allowed students to have exposure to different vocabulary and gain a more in-depth understanding. It also met the individual needs of the students. In my unit, I also focused on "questioning". Throughout my lessons, I tried to incorporate higher-level questions by using Bloom's Taxonomy and Costa's Levels of Questionings. By using these as a reference, it allowed me to plan out questions that encouraged higher-level thinking skills and challenged students to think "deeper".

- **Process-**
  Throughout my unit, the process was differentiated to meet the unique learning styles of students in the classroom. In one lesson, I used the "Bruner" model, which allowed students the

opportunity to authentically practice the skills and thinking practices of experts within a given field. This particular model challenges students and allows a teacher to constantly be aware of students' level and push them to the next level.

- **Learning Environment-**
  Throughout my unit, the learning environment was differentiated to meet the needs of gifted students by organizing students into groups and allowing them to collaborate with group members. The learning environment was student- focused and the teacher served as a facilitator. Students did the learning and the teacher assisted students only when needed. This type of environment provided students with a more challenging and engaging environment. This also allowed students to work to their full ability and to be engaged in the lesson.

- **Product-**
  Differentiation of the product was important throughout my unit. By differentiating the product, the teacher improves the quality of work and enjoyment by accommodating their preferred modes of expression. One way I differentiated student products was providing students with choice. This allowed students to pick something that they would enjoy.

The depth, and challenge of my unit is what made it appropriate for gifted learners. My specific unit challenged students to complete research and gain an understanding of interdependence. Students were exposed to a variety of items from which they were expected to gain an understanding of this concept. By doing this research, students were able to go more "in-depth" and exploration with the content presented.

III. Goals and Outcomes- Gross Medicine

A. Content Goals and Outcomes

Goal 1: Understand the interdependence of plants and animals with their ecosystem.

Students will be able to…

1. Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).
2. Infer the effects that may result from the interconnected relationship of plants and animals to their ecosystem.

(From: NC DPI Science Essential Standards- Ecosystems)

B. Process Goals and Outcomes:

Students will be able to…

1. Have experiences that allow them to recognize patterns in data and use data to create reasonable explanations of results of an experiment or investigation.
2. Employ more sophisticated language, drawings, models, charts and graphs to communicate results and explanations. Students must always use appropriate safety procedures, including listening skills, when conducting simple investigations.
3. Analyze research and data.
4. Collect and organize data.

(From: NC DPI Science Essential Standards)

C. Concept Goals and Outcomes:

Students will be able to…

1. Understand the interdependence of plants and animals with their ecosystem.

(From: NC DPI- Science Essential Standards- Ecosystems)

IV. Assessment Plan-
Gross Medicine

Throughout my unit I used both formative and summative assessments. Formative assessments were used in this unit to monitor student understanding throughout all of my lessons.

Formative Assessments:

The intention of using formative assessments was to provide me with feedback and allow me to quickly see student's understanding of the content presented that day. One way that I completed formative assessments throughout this unit was in the form of exit tickets or a ticket out of the door. For this, I would ask students to answer one question, which was based on content learned that day. In one of my lessons, I also had student's reflect on the content learned that day.

Example of Exit Ticket Questions:

- How are humans and other organisms interdependent?

Summative Assessments:

Due to the SPARK Camp only lasting 4 days, I was limited to the amount of summative assessments that I could do with students. The intention of using summative assessments is to evaluate student learning at the end of a unit/concept. Most of the time in the classroom summative lessons are unit test, projects, or a paper. For my summative assessment, I had students complete a performance task. In order to complete a performance task, students must be clear of the following:

- Goal- Define the role of the student in the task.
- Role- Define the role of students within the task. State the job of the student for the task.
- Audience- Identify the target audience within the context of the scenario.
- Situation- set the context of your scenario. Explain the situation.
- Product- Clarify what the students will create and why they will create it.
- Standards and Criteria- Provide students with a clear picture of success. Identify specific standards for success. Issue rubrics to the students or develop them with the students.

Below is the performance task that students were expected to complete:

(Performance Task Toolbox- Kristen Stephens)

Performance Task Entomology-
Gross Medicine

Specific Product or Performance:
Students will create an informational Brochure on the importance of Honeybees and the interdependent role that exists between them and humans.

TASK:
You are an entomologist; your task is to create an informational brochure informing the public of the decline in honeybee population. In your brochure you will need to outline the important role honeybees play in society and ways in which we can help protect and save the honeybees. Your brochure needs to illustrate and make the audience aware of the interdependent relationship that exists between humans and honeybees. Your brochure must be appealing to the public. You will need to convince the public without the pollination of honeybees, we would not have certain foods/plants in our environment. You will complete this in a small group of 3-4. Your work will be scored using a rubric.

Overall, the students did well with this task. Students were creative when creating their brochures. Students also provided information that they have learned throughout the unit on the brochure. Students had an understanding of what was expected of them and were engaged throughout the performance task.

TEACHER NAME	*Lesson #*
Rachel Campbell	**1**

MODEL	**CONTENT AREA**	**GRADE LEVEL**
Questioning	**Science**	**4th-5th**

CONCEPTUAL LENS	**LESSON TOPIC**
Interdependence	**Students will learn about specific organisms and how they are beneficial to humankind.**

LEARNING OBJECTIVES *(from State/Local Curriculum)*

5.1.2- Understand the interdependence of plants and animals within their ecosystem.

THE ESSENTIAL UNDERSTANDING ***(What is the overarching idea students will understand as a result of this lesson?***	**THE ESSENTIAL QUESTION** ***(What question will be asked to lead students to "uncover" the Essential Understanding)***
Interdependence impacts society.	In what ways does interdependence impact society?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	**PROCESS SKILLS (What will students be able to do as a result of this lesson?)**

• Students will learn about specific cultures around the world.
  o Mexico
  o Africa
  o Southeast Asia
  o South America
• Students will learn how many cultures around the world eat insects as part of their daily diet.
• Students will learn about the health benefits of eating insects.
	Students will be able to…
	• Analyze research and pull out specific information on different cultures.
	• Analyze research in order to learn about the different insects that people eat in different cultures.
	• Work collaboratively with group members.
	• Navigate and use a variety of resources to obtain information.

GUIDING QUESTIONS ***What questions will be asked to support instruction?*** ***Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding***		
Pre-Lesson Questions:	**During Lesson Questions:**	**Post Lesson Questions:**
• What is interdependence? • What factors influence what people eat? • Why do people in different places eat different food? • How does what we eat reflect our culture?	• What are the benefits of entomophagy? • Who and what cultures eat bugs? • In what ways does entomophagy demonstrate interdependence? • Which insect provides the most protein? • How much protein does your favorite food provide? • Does your favorite food provide more or less iron than a weevil? • How much more or less? • How much fat does the giant water beetle contain? • How much fat does your favorite food contain? • Does it contain more fat or less fat than a giant water beetle does? • How much more or less?	• In what ways does interdependence impact society? • How did your favorite food compare in nutritional value to the insect? • Why do certain cultures still eat insects? • How does culture influence the food that people eat?
DIFFERENTIATION ***(Describe how the planned learning experience has been modified to meet the needs of***		

gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.			
Content	**Process**	**Product**	**Learning Environment**
			Student- focused. Teacher acts as facilitator. In this particular environment, students will be doing the learning while the teacher assists when needed. This provides students with a more challenging and engaging learning environment. This type of environment will allow gifted students to work to their full ability and be engaged in the lesson.

PLANNED LEARNING EXPERIENCES
(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Before beginning the lesson, teacher will ask students: "What is interdependence?" The teacher will pick 2-3 students to share. Teacher will then provide students with the correct definition. Students will write the definition in their science journals as a reference to refer to throughout the week. Teacher will explain that today we will be looking at the interdependent relationships that exist between humankind and insects. Teacher will explain that throughout this lesson, we will gain a deeper understanding of how interdependence directly impacts societies.

Next, the teacher will have students watch the video "Should we eat bugs?" http://ed.ted.com/lessons/should-we-eat-bugs-emma-bryce#watch After viewing the video, the teacher will lead a discussion asking the following questions…

- When did our attitudes about eating bugs begin to change? Why?
- Which part of the world currently eats the most insects?
- How could insect farming address some of the issues associated with food insecurity?
- How is this an example of interdependence?

The teacher then says: Let's investigate this topic further.

Teacher will say: The thought of eating insects may be very unsettling to most people in this day and age. However, in many cultures insects and other arthropods have been eaten as a staple and/or as a delicacy. What are some foods that we view as delicacies? (Caviar, Cacao Bean) Teacher will discuss the different arthropods that are commonly eaten (Crabs, Lobster, Shrimp).

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will be divided into small groups (3-4). Each group will be given a copy of *Insects are Food; Entomophagy is the Future.* As a group students will discuss and answer the following questions in their science journals:

- What are the benefits of entomophagy?
- Who and what cultures eat bugs?
- In what ways does entomophagy demonstrate interdependence?

After discussing these questions, students will then compile a list of 3 questions that they

have after investigating the text. The teacher will circulate during this exploration to facilitate groups.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Teacher will state:

- Many cultures around the world eat insects as part of their daily diet. Insects are nutritious and provide essential vitamins and minerals. Today we are going to look at different cultures around the world and the variety of insects that they eat.

Students will still be in groups. Each group will be provided with a laptop. Each group will be given a specific country (Mexico, Africa, Southeast Asia, and South America). Students will research specific insects that this country eats. Students will pick **THREE** of the insects and write the benefits that come from eating this specific insect (For example, the protein content in Fly Pupae is 63%). Students will record their responses in a handout provided by the teacher.

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Using the laptops, each student in the group will pick **ONE** of their favorite foods. As a group students will complete "My Nutrition" worksheet where the list the nutritional values of one of their favorite foods. Students will then use the "Nutritional Value of Various Insects" table to compare their favorite food to specific insects.

Students will answer the following questions: (Record answers on handout provided by the teacher)

- Which insect provides the most protein?
- How much protein does your favorite food provide?
- Does your favorite food provide more or less iron than a weevil?
- How much more or less?
- How much fat does the giant water beetle contain?
- How much fat does your favorite food contain?
- Does it contain more fat or less fat than a giant water beetle does?
- How much more or less?

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Teacher ends independent work time by announcing it is close to time for class to end. The teacher will ask for questions from students about what they learned during the lesson.

The teacher will then request: Tell me something that you discovered today that surprised you and why it surprised you. Tell me something that you discovered today that you want to share with someone else and why you want to share this knowledge?

Students will then be given an index card on which to write a response. Teacher says: Based on what we learned today, answer the following question:

- In what ways does interdependence impact society?

Insects are Food; Entomophagy is the Future

After reading the article, answer the following questions.

1. What are the benefits of entomophagy?

2. Where are some places where entomophagy is still common? Why do you think it is more common in these areas than the United States?

3. In what ways does entomophagy demonstrate interdependence?

Insect vs. Food

1. Which insect provides the most protein?

2. How much protein does your favorite food provide?

3. Does your favorite food provide more or less iron than a weevil?

4. How much more or less?

5. How much fat does the giant water beetle contain?

6. How much fat does your favorite food contain?

7. Does it contain more fat or less fat than a giant water beetle does?

8. How much more or less?

Icebreaker! Getting to know you!

Imagine you could be a butterfly, bee or cricket. Which insect do you see yourself being? Why? What traits do you think that you share with this insect or what are some traits that you like about this specific insect?

Example: If I had to choose an insect I was most like, I would choose to be a butterfly. A butterfly is bright and friendly. I am most like a butterfly because I have a bright outlook on life and I am friendly.

TEACHER NAME		Lesson #
Rachel Campbell		3

MODEL	CONTENT AREA	GRADE LEVEL
	Science	4th-6th

CONCEPTUAL LENS	LESSON TOPIC
Interdependence	**Students will learn about the importance of honeybees and how the decline in population has an effect on our society.**

LEARNING OBJECTIVES *(from State/Local Curriculum)*

5.1.2- Understand the interdependence of plants and animals within their ecosystem.

THE ESSENTIAL UNDERSTANDING *(What are the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Interdependence impacts society.	In what ways does interdependence impact society?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
• Students will learn about the important role that the honeybee plays in society. • Students will learn about the current issue of the honeybee population becoming extinct. • Students will learn about the ways in which humans can have an impact on the honeybee population. • Students will learn about the interdependent relationship that exists between society and honeybees.	• Analyze research and pill out specific information on the benefits of honeybees. • Work collaboratively with group members. • Navigate and use a variety of websites to obtain information.

GUIDING QUESTIONS
What questions will be asked to support instruction?
Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:

• In what ways do you think honeybees are important to society? • How is the relationship between humans and honeybees interdependent? • What is pollination?	• How many hives of bees are left in the United States? • Why is pollination so important to our society? • Imagine a world with no bees? How would our world look different? What are some effects that this could have on our society? • In what ways are humans responsible for the decline in honeybee population? • Name some of the reasons why honeybees are becoming extinct.	• In what ways does this interdependent relationship affect us? • What are some alternatives or changes that society can make to help save the honeybee population? What are some solutions?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
			Student- focused. Teacher acts as facilitator. In this particular environment, students will be doing the learning while the teacher assists when needed.

			This provides students with a more challenging and engaging learning environment. This type of environment will allow gifted students to work to their full ability and be engaged in the lesson.

PLANNED LEARNING EXPERIENCES
(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Teacher will begin lesson by asking students the following question:
"Why are honeybees important to society?" The teacher will pick 2-3 students to share. Teacher will then ask… "How do honeybees display an interdependent relationship?" and "What is pollination?" Teacher will then call on 2-3 students to share their response.

Teacher will explain that today we will be learning about the interdependent relationship that exist between humans and honeybees and about what we can do to help their population from declining. Teacher will explain that throughout this lesson, we will gain a deeper understanding of how this interdependent relationship impacts our society.

Next, the teacher will have students watch the video "The Flight of the Honeybee".
http://video.pbs.org/video/2220821658/

After viewing the video the teacher will lead a discussion on the following questions…

- How many hives of bees are left in the United States?
- Why is pollination so important to our society?
- Can you imagine a world with no bees? How would our world look different? What are some effects that this could have on our society?

Teacher will say: Now we are going to do our own science experiment that will illustrate the importance of pollination. Using Cheetos we are going to gain an understanding of the pollination process!
1. Have each student draw a flower on construction paper and lay it on his or her desk.
2. Next, have them eat Cheetos without licking their fingers. They want to collect as much Cheetos dust on their fingers as possible! Tell the students that this represents collecting pollen from their flowers.
3. Next, have them" fly" to another flower in the room and rub their fingers on their peer's flower.
4. Then, have them fly back to their seats. Did all of the flowers get pollinated? What will happen to the flowers that did not?

After completing the experiment, students will view the video *Pollinators: Putting Food on the Table* https://vimeo.com/39219616

After viewing the video teacher will then say:
Though most people find bees as a pest, they are actually very valuable to our society and help provide much of the food that we depend on. Teacher will ask students the following question… "How many of you like chocolate?" Teacher will then explain to students that without pollination from bees, there would be no chocolate. Teacher will explain to students

that today we are going to explore the reasons why honeybees are becoming extinct and how we can help prevent this from happening.

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will be divided into small groups (3-4). Each group will research the benefits of honeybees to society outlining the interdependent relationship that exist. Teacher will provide students with a handout in which students will write the specific benefits of honeybees.

- Pollination (Specific Plants and the Importance)
- Benefits of Honey

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Students will remain in small groups (3-4). Each group will be researching a specific reason that we are seeing a decline in bee population. Teacher will allow students 30 minutes to research this information. Students will make a list of important ideas/reasons of how these specific factors are contributing to the decline in bee population. Teacher will provide a cause and effect handout for students to record their information. Students will be provided with a laptop.

- Pesticides
- Parasites
- Nutrition

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Once students have researched this information they will then find ways in which directly impact this and ways that humans can help resolve this issue. Within their groups, teacher will have students create a t-chart. One side will be titled **PROBLEM** and the other will be titled **SOLUTION.**
For example, certain types of pesticides that we use can be harmful to bees. What is an alternative?

Students will present their t-charts to the class.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

This will be student's performance task:

Students will imagine that they are an entomologist who is determined to make the public aware of the importance of honeybees. Students will create an informational brochure for

the local community that outlines the importance of honeybees and make the public aware of the issue that they are becoming extinct. In their brochure students will need to list ways in which humans can play an important role in saving the bee population. Students will list ways in which humans are currently contributing to this issue and how we can help solve this issue. Students will work in small groups (3-4).

The Importance of Pollination:

The Benefits of Honey:

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<tr><td colspan="2">Interdependence</td><td colspan="2">Students will learn about specific organisms are how they are beneficial to humankind.</td></tr>
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<tr><td colspan="4">5.L.2- Understand the interdependence of plants and animals with their ecosystem.</td></tr>
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<tr><td colspan="2">CONTENT KNOWLEDGE
(What factual information will students learn in this lesson?)</td><td colspan="2">PROCESS SKILLS
(What will students be able to do as a result of this lesson?)</td></tr>
<tr><td colspan="2">• Students will learn about specific insects.
  o Bees
  o Maggots
  o Leeches
• Students will learn about the interdependent relationship that exists between insects and society.
• Students will understand the use of insects as an alternative to medicine.</td><td colspan="2">• Students will be able to…
  o Analyze research and pull out specific information that supports the benefits of organisms to humankind.
  o Collect and organize data to create a presentation.
  o Work collaboratively with group members.
  o Navigate and use a variety of resources to obtain information.
  o Create a presentation based off of information obtain by research.</td></tr>
<tr><td colspan="4">GUIDING QUESTIONS
What questions will be asked to support instruction?
Include both “lesson plan level” questions as well as questions designed to guide students to the essential understanding</td></tr>
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Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
• Based off of your observation of the photo, what do you believe is happening in this picture? Why do you believe a leech is being used? • Why do you think Egyptians turned to insects as an alternative to medicine? • What was specific insect was used to treat the patient's foot? • Why was this specific insect chosen? • Name one benefit of using maggot therapy. • How does is this an example of interdependence?	• How is this insect used as an alternative to medicine? • What are the benefits of using this insect?	• How does the use of insects as an alternative to medicine illustrate interdependence? • In what ways does interdependence impact society?

DIFFERENTIATION *(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.*			
Content	Process	Product	Learning Environment
			Student-Focused. Teacher acts as facilitator. In this particular environment, students will be doing the learning while teacher assist when needed. This provides students with a more challenging and engaging learning environment. This type of environment will allow gifted students to work to their full ability and be engaged in the lesson.

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

After students have entered the classroom, the teacher will display a picture in the front of the room (Students view a photo in which a leech is attached to the skin of a human). Students will take 2-3 minutes to observe the picture. Students will write down the observations in their science journals. After observing the picture, the teacher will have students answer the following question:

Based off of your observation of the photo, what do you believe is happening in this picture? Why do you believe a leech is being used?

Once all students have answered the question, the teacher will call on 3-4 students to share their response. Once students have shared, teacher will explain that the leech is being used to drain blood. Teacher will explain that "Leech Therapy" was once used by the Egyptians as a form of treatment for headaches and ear infections.

Teacher will ask: Why do you think Egyptians turned to insects as an alternative to medicine?

Teacher will also explain that in present time, the use of insects in medicine is making a comeback and become more popular and acceptable.

Teacher will then say: Let's investigate this topic further.

Students will watch the video "Creepy Cures" (http://channel.nationalgeographic.com/wild/worlds-weirdest/episodes/creepy-cures/). After viewing the video, the teacher will lead a discussion asking the following questions:

- What was specific insect was used to treat the patient's foot?
- Why was this specific insect chosen?
- Name one benefit of using maggot therapy.
- How does is this an example of interdependence?

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Students will be placed into groups of 4-5. Each group will research a specific insect and how that insect is used as an alternative in medicine/healing. They will research in order to gain an understanding of the importance of these specific insects and the role that they play in treatment, using a variety of resources, which will be provided by the teacher (laptops, informational books, articles). Students will create a poster on which they will state how the insect is used in

medicine and the benefits of using this insect instead of medicine. Teacher will give the students 30-45 minutes total to complete the research and poster.

Insects for Groups: Honey Bee, Leech, Maggots

Items to be included on Poster:

- Insect Name
- How is the insect used as an alternative?
- Benefits of using this insect.

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

Once students have created their poster, the teacher will now have each group come up and present their presentation. Students will be scored based off of a rubric (Teacher created, presented to students before the assignment is given).

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Now that students have an understanding of the use of insects as an alternative to medicine, they will now create an advertisement informing the public of this alternative treatment that is available to them. Students will remain in small groups to complete this. The advertisement must be appealing to the public. Students will need to inform the public of the benefits that this type of alternative medicine can provide to them. For example, the use of maggot therapy could prevent an amputation from occurring. Students can choose to do a magazine, radio, television or newspaper ad.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Teacher will give 1 index card to each student. As a ticket out the door, students will answer the following questions:

- How does the use of insects as an alternative to medicine illustrate interdependence?
- In what ways does interdependence have an impact on society?

TEACHER NAME		Lesson #
Rachel Campbell		2
MODEL	**CONTENT AREA**	**GRADE LEVEL**
Service Learning	**Science and Social Studies**	**4th-5th**

CONCEPTUAL LENS	LESSON TOPIC
Interdependence	**The role insects play in different societies**

LEARNING OBJECTIVES *(from State/Local Curriculum)*

BIO. 2. 1. 3- Biology

Explain various ways organisms interact with each other (including predation, competition, parasitism, mutualism) and with their environments resulting in stability within ecosystems

THE ESSENTIAL UNDERSTANDING *(What are the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Interdependence Impacts Society.	**In what ways does interdependence impact society?**

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
• Role of insects in different societies and cultures • Beneficial insects to humanity • Different parts or products that come from specific insects that are beneficial (Example: Honey) • Understanding of Pollination • Crops and Plants that require or benefit from Pollination	• Collect, record, organize and interpret data using a variety of resources • Explain the benefits of insects to society. • Explain the different parts or products that come from specific insects and how they are beneficial • Name and locate specific countries and the use of insects in society. • Communicate knowledge through a presentation.

GUIDING QUESTIONS

What questions will be asked to support instruction?
Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
• Do you think insects are beneficial to humanity? • Do you know any specific insects that might be considered "beneficial"? • What is interdependence? Interdependence is the quality or state of being mutually reliant on one another.	• How are insects beneficial to humanity? • How are insects dependent on humans? • How are humans dependent on insects? • What is a service? • What is a good?	• Name a specific "service" that insects provide to humanity. • Name a specific "good" that insects provide to humanity. • How do insects play a role in pollination? • What are some specific insects that provide pollination? • Analyze the different ways that humans and insects are interdependent. • What did you learn about interdependence? • How are insects and humans interdependent? • Why is it important for the community to be aware of this relationship?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
	Students will engage in critical thinking skills as they gain an understanding of how living things and organisms are interdependent. This is model works well for gifted students because it gets the students actively engaged and gives them a deeper understanding.		To obtain an understanding of the essential question, the majority of the lesson will be student driven.

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - *This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.*

Hook- Teacher will display a picture of 3 different insects (Bee, Maggot, and Leech). Teacher will ask students to write down how they think these specific insects are beneficial to society. Students will record their answers a worksheet that will be provided by the teacher. When students have finished, teacher will select several students to share their responses with the class.

- How are these insects dependent on humans?
- How are humans dependent on these insects?

Once students have shared their responses with the class, the teacher will then read the true reason/reasons that these specific insects are beneficial to society and how they are used in medicine. Teacher will explain to students that over the next few days we will be exploring the benefits of insects to humanity and gain an understanding of the specific part/product that makes the insect "beneficial" and the important role these insects play in society.

Day 1 -

Part 1- Preparation: Introduce Service Learning to students and emphasize that we will focus on addressing the need to inform our community/school of the importance of insects and ways other than medicine in which they are beneficial to society.

- Teacher will inform students that they are going to create a project (Informational Brochure) to educate others within the community about the importance of specific insects and the roles that they play in society.

Part 2-Action: After introducing "Service Learning" to students, teacher will have students view the video "*Why are Insects Important?* (https://www.youtube.com/watch?v=VT6Qi_x6WJQ) After watching the video, teacher will discuss the following questions: What are some ways that insects are beneficial to society?

Next, teacher will have students view a "Prezi" presentation. In this presentation students will learn specific ways in which insects play a role in society (Pollination, Garbage Collectors, Role in Medicine/Healing…etc.) Teacher will now put students into groups of 4. Teacher will give each group a specific "service" in which an insect provides to society. Students will use the laptops to describe the specific service the importance of it. (Example: Pollination) Students will need to identify how this service impacts our own society and community. (Teacher will provide students with a template to record their information on) Students will share their findings with the class. Teacher will record the "service" and its importance on chart paper.

When students have finished sharing their findings, students will need to **reflect** on the following questions in their science journals:

1. How are humans and insects interdependent?
2. What are 2 "services" insects provide to humanity?
3. Imagine that we were not provided with this service, how would it affect our society?

Days 2 and 3- Action Continued: Teacher will review the importance of "services" that insects provide to society. After reviewing, the teacher will have students get back into their groups from the previous day. Teacher will give students a specific insect to research. Students will use this research to create and informational brochure on this specific insect. The teacher will provide students with an example of an informational brochure so that students have an understanding of what the expectation is. This brochure is intended to inform the community of the importance

of this insect and the role that it plays in society. Completed brochures will be placed around the community at places such as the public library. Students will encourage the community to gain an understanding of the benefits that insects provide humanity by reading the informational brochure. Creating this brochure for the community will allow public knowledge to increase and an overall respect for insects. Students will be provided with a rubric (Teacher Created) to ensure that they are aware of all information that should be included in the brochure. (Example: Description, Picture…etc.)

Explore - *In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.*

Following the Service Project Implementation:

Part 3: Evaluation- Students will reflect about the impact of the service learning-project. Some questions that will facilitate the discussion include:

- What did you learn about interdependence?
- How are insects and humans interdependent?
- Why is it important for the community to be aware of this relationship?

Explain - *Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.*

After completing the brochures, students will complete an informational poster promoting the benefits of insects and how they impact our society as homework. Posters must include:

- List of things that insects can be beneficial to (Example: Medicine)
- A summary of a specific "service" that an insect provides and how it affects humanity.
- 2 websites that an audience can visit in order to obtain more information on this specific topic.
- Illustration/ Picture of Insects that are known as being "beneficial".

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Reflection: Following the completion if their informational brochures, students will **reflect** on the importance of interdependence to living things.

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Performance Task

Created by: Rachel Campbell

Entomology-

Specific Product or Performance: Informational Brochure on the importance of Honeybees and the interdependent role that exists between them and humans.

TASK: You are an entomologist; your task is to create an informational brochure informing the public of the decline in honeybee population. In your brochure you will need to outline the important role honeybees play in society and ways in which we can help protect and save the honeybees. Your brochure needs to illustrate and make the audience aware of the interdependent relationship that exists between humans and honeybees. Your brochure must be appealing to the public. You will need to convince the public without the pollination of honeybees, we would not have certain foods/plants in our environment. You will complete this in a small group of 3-4. Your work will be scored using a rubric.

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