

EDST 3000 SYMBIOSIS LESSON PLAN

Name: Lauren Huntington	Grade level: 10	Expected Duration of Lesson (hours, minutes, days): 75 minutes	Date: 4-16-15
Lesson Topic: Symbiotic Relationships Title: Symbiosis: Nature's Buddy System Essential Question: What is a symbiosis? What are the three main categories of symbiosis? Why are organisms in symbiotic relationships?			

Standards/Benchmarks Addressed (use practicum district's or *Common Core* curriculum standards AND Discipline specific standards from relevant professional organization):

Source	#	Content Area	Standard (write it out)
nextgenscience.org	LS2.A	Interdependent relationships in Ecosystems	Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges as predation, competition, and disease. Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem.

	LS2.C	Ecosystem dynamics, functioning, and resilience	A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability. Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.
	LS2.D	Social Interactions and Group Behavior	Animals, including humans, having a strong drive for social affiliation with members of their own species and will suffer, behaviorally as well as physiologically, if reared in isolation, even if all of their physical needs are met. Some forms of affiliation arise from the bonds between offspring and parents. Other groups form among peers. Group behavior has evolved because membership can increase the chances of survival for individuals and their genetic relatives.

Lesson Objectives: Students will be able to:

Students will be able to perform quality research about symbiotic relationships, and recognize and describe the differences between mutualism, commensalism, and parasitism as well as define the benefits of each relationship for a variety of organisms to 100% accuracy on a provided web quest activity.

Academic Language Objectives

<u>Language students will learn:</u>	<u>Language students need to already know:</u>
<p>Symbiosis: living together</p> <p>Symbiotic Relationships: when two species of organisms lives are very closely intertwined within their environment.</p> <p>Mutualism: A relationship between two species where both benefit.</p> <p>Commensalism: A relationship between two species where one benefits and one is neither helped nor harmed.</p> <p>Parasitism: A relationship between two species where one benefits and one is harmed.</p>	<p>Ecology: the study of the interrelationships between organisms and their environment.</p> <p>Web quest: a discovery learning activity in which students explore provided websites to help them answer questions.</p>

Evaluation/Assessment: (Include samples in appendix)

<u>Informal/Formative:</u>	<u>Formal/Summative:</u>
<p>Observational: During the lecture, the teacher will ask students to provide examples that they might be familiar with, if they can think of them, of mutualism, commensalism, and parasitism. The teacher will be available for questions during the activity and walk around the class room to monitor the progress of the students on the web quest, and ensure that they are using the internet for the assignment and nothing else.</p>	<p>The students will turn in completed individual web quests (attached) to be graded out of 32 points (2 points per question). The links provided in the web quest should lead the students to correct answers for the questions. Effort, details, and correct answers will be evaluated on each web quest to determine points given.</p> <p>The topics covered in this lesson will also be assessed on the unit exam.</p>

<p>Primary Instructional Model(s) used:</p> <p>Direct Instruction using the Madeline Hunter Model: Symbiosis is a new topic for the students so the teacher will present the facts and definitions about symbiotic relationships in a lecture with an accompanying PowerPoint. The teacher will also walk the students through the directions for the symbiosis web quest activity (attached) before allowing the students to explore the new found information on their own to complete the activity.</p>	<p>Materials and Equipment Needed:</p> <p>Teacher will need: Projector: Teacher-led instruction will be accompanied by a PowerPoint slideshow</p> <p>Computer: To be connected to the projector</p> <p>Students will need: Individual computers: each student has been equipped with a computer and will use them for the web quest.</p> <p>Web quest worksheet: Students can find the web quest in the class's dropbox folder.</p> <p>Notecards, or notebooks and pencils: Students will find it in their best interests to jot down the information that is presented by the teacher, as it will be on the unit exam.</p>
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Step by Step Procedures:

	Expected time frame	What are you teaching? What is the content? What is happening? (include guiding questions and their purposes)	Standard(s) being met
Lesson Opening	1 minute	<p>1. Anticipatory Set: To introduce the idea of symbiosis and symbiotic relationships, the teacher will present the class with two illustrated cartoons that show a little humor in the topic.</p> <p>° The teacher will then ask the students if anybody can provide a definition for a symbiotic relationship and if they can give an example.</p> <p>Expected answers from students: Nemo and the anemone from the movie "Finding Nemo."</p>	

Transition	30 seconds	After showing two cartoons, the next slide begins the PowerPoint presentation on symbiosis.	
10-15 minutes	10-15 minutes	<p>Instructional Input: The teacher will explain that symbiosis means “living together” and is any relationship in which two different species live closely together.</p> <p>The teacher will go on to the next slide, and explain that there are three main classes of symbiotic relationships recognized in nature: mutualism, commensalism, and parasitism.</p> <p>The teacher will ask if any student wants to take a stab at defining a mutualistic relationship?</p> <p>Expected response: A student might say “if it’s mutual, both are in agreement.”</p> <p>The teacher will guide the students to the next slide, and explain that in mutualism, both species in the relationship benefit.</p> <p>The teacher will ask for examples of mutualism.</p> <p>Expected responses: Bees and flowers. Seed dispersal</p> <p>The teacher will guide the students to recognize other mutualistic relationships in nature including ants and aphids (which will be pictured on the slide), more than 48% of land plants rely on mycorrhizal relationships with fungi to provide them with inorganic compounds like phosphorous and nitrogen, and in return the fungi receives carbs.</p> <p>The teacher will ask the students if they can think of any mutualistic relationships that humans have and if they can share?</p> <p>Expected answers: bacteria in our guts.</p>	<p>LS2.A LS2.C LS2.D</p>

		<p>domesticated animals ...</p> <p>The teacher will guide them to recognize that certain bacteria inside our guts do help us with digestion and, in turn, are able to thrive themselves. Some species of farmed corn cannot reproduce without human intervention because the sheath does not fall open on its own.</p> <p>The teacher will go to the next slide, which displays commensalism and a definition: In commensalism one member of the association benefits and the other is neither helped nor harmed.</p> <p>The photo on the slide will show a commensalistic relationship between barnacles that attach themselves to whales. The whales are not harmed, nor do they receive any known benefits, and the barnacles benefit from the constant movement of water which carries food particles to them.</p> <p>The teacher will ask the students to provide more examples of commensalism.</p> <p>Expected responses: Birds nesting in trees ... this is most likely a relationship they are not familiar with.</p> <p>The teacher will mention birds nesting in trees, the cattle egret which follows cows and horses around, as the cows and horses stir up dirt they uncover insects for the egrets to eat.</p> <p>The teacher will go to the next slide, which is parasitism. The teacher will state the definition that is in parasitism one organism lives on or inside another organism and harms it. The teacher will talk about how most the time the parasites do only harm, but sometimes they do kill their hosts.</p> <p>The teacher will ask the class to provide examples of parasitism relationships.</p>	
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	5 minutes	<p>Expected response: The students will most likely be more familiar with the term parasitism and provide common examples like fleas and ticks, and possible come up with parasites that affects humans like lice and tapeworm.</p> <p>The teacher will then discuss that parasitism comes in all forms, like a parasitic wasp that lays it's eggs inside other insects, and when the insects hatch they eat their way out and then consume the host insect. The picture on the slide depicts a parasitic larvae erupting out of a host caterpillar.</p> <p>The next slide provides two different tables that reiterate the information that was just discussed, but allows the students to see it in a different way.</p> <p>Modeling Instruction: The teacher will go on to the next slide and ask the students to provide which kind of symbiotic relationship is depicted in each photo. (The cactus wren and the cactus is commensalism, the remora and the shark is commensalism, and the clown fish and the anemone is mutualism.</p> <p>The teacher will explain to the students that they will take the information that was just discussed and explore it further with a web quest.</p> <p>They can find the web quest in the class drop box.</p> <p>Each student is to complete a web quest individually, but they can discuss findings with their table partners.</p> <p>They are to answer the 10 questions with the provided sites on the web quest in detail, then fill out the table on the last page.</p> <p>They will find six different symbiotic relationships and in one column define the species, then define what type of relationship, describe the interaction between the two, then the effect of each interaction</p>	
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	50 minutes	<p>The students must have one of each type of relationship in their table, but all six need to be filled out.</p> <p>The teacher will encourage them to find symbiotic relationships that were not discussed in class, or elsewhere on the web quest.</p> <p>The teacher will remind the students to turn their completed assignment into dropbox by the end of the class period.</p> <p>Checking for Understanding: The teacher will ask the students if the objectives and the activity are clear and if they have any questions before the begin.</p> <p>The students will ask if they type or write the answers on another sheet of paper.</p> <p>The teacher will ask them to type if they brought their computers, if they did not they may write their answers on a sheet of paper, but will need to look off a partners computer to research the answers.</p> <p>Transition: The students will begin working on the web quest on their computers.</p> <p>Guided Practice: The teacher will continually monitor the students on the web quest to make sure they are staying on task, finding the correct information and understanding the questions.</p> <p>The teacher will provide assistance to any student who might need it. If the students are asking the same question, the teacher will address it with the entire class.</p> <p>Independent Practice: The students will complete the web quest in class, or it will become homework due the next day.</p>	<p>LS2.A LS2.C LS2.D</p>
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Lesson Closure	5 minutes	<p>As the class draws to a close, the teacher will revisit the objectives and make sure the students adequately reached them and that the students leave class with an understanding of why they learned what they did.</p> <p>The teacher will provide any clarification that might be needed to further understanding of the material.</p> <p>The teacher will remind them that in ecology, relationships between organisms and the environment are very closely interwoven and symbiotic relationships demonstrate that.</p>	
Classroom Management and Organizational Considerations: <p>The lecture portion of the lesson will be kept as short as possible, and involve the students as much as possible in order to keep them engaged in the material. A self-motivated environment has already been established, and students should be able to be productive while working individually, but also keeping lines of communication open with classmates during the activity. Students will be more motivated if they are able to share research findings and interesting ideas with peers. Students are allowed to move around the room if they need access to an outlet to plug in their computers. If students prefer to have the web quest activity in a hard copy, printing will be available by the teacher.</p>		Differentiation/Special Consideration: <p>Student A has a learning aid that will read the questions and the articles on the websites for him. The aid will also do the typing for this student, as well as take notes for him.</p> <p>Students that need more time to complete the activity will be asked to turn it in by Monday (the activity was done on a Thursday).</p> <p>Students who forgot their computers will be asked to work with another student in researching the questions, but will need to hand write their own answers on a sheet of paper and turn that in.</p>	

Diversity/Cultural Considerations:

The classroom setting allows students that have a hard time sitting quietly and doing independent work opportunity to socialize and share perspective with other peers, as long as they stay on task. For students who prefer to work independently and in a quiet setting, they can take their computer to a quiet area of the room, or work in the hallway.

The choice between typing the assignment or hand writing it is given to each student. The students know their individual learning styles, and can choose whichever way they feel more comfortable learning the material.

Differences in learning is taken in to consideration by providing opportunities to see pictures, tables and charts, hearing it from the teacher, and writing information down. Students are also given the opportunity to read the information with the activity.

Enrichment Activity:

Some students may complete the activity before the end of class. These students will be asked to finish a previous project that involves designing a poster. If this project has been completed, the student will be asked to complete another table of symbiotic relationships representing strictly humans. They will be earning extra points on the activity for examining six more symbiotic relationships involving human beings.

Rationale/Reflection:

This lesson was planned to be taught using a teacher centered, direct instruction approach because the topic is one the students were not familiar with. The foundation for the concept and the facts about symbiotic relationships needed to be laid in order for the students to make connections between symbiosis and the bigger picture of Ecology, and the interrelationships between organisms, the environment, and each other. In order to introduce the students to these ideas, a presentation was created using PowerPoint. The presentation showed the information using definition and photos. The students were asked to write down the important facts in their notes so they could revisit it before the upcoming exam.

The students were asked to participate in the presentation by providing examples of each concept we discussed. The end of the presentation provide photos for the students to figure out as a class what type of relationship was represented. This allowed for the teacher to participate in a guided practice with the students before they jumped in to their assignment.

The web quest activity allowed the students to gain a deeper understanding of the concept independently. They were given the opportunity to research the material, and look further into the ideas in order to properly answer the questions provided for them. The last portion of the activity involved the students filling out a chart with their own findings and research. This allows them choice in what they put into the chart, as well as more independence in developing their research skills.

The lesson was successful, but there are a few things I would change/consider before teaching it again.

The presentation was paced too fast. More slides per topic with more examples would have been more helpful for the students. I did not hit on all the examples from the plan, and having photos, or another reminder in the presentation I would not have missed mentioning those.

I also think it would have been helpful for students to be given more opportunities at the end of the presentation to decipher as a group what relationship the photos represented. This could have easily been addressed by adding more photos for the guided practice portion of the presentation.

Many students proffered having a hard copy of the web quest, which was not anticipated. We were caught off guard, and asked to print multiple copies of the activity. Had I known students wanted a hard copy, I would have printed them in advance.



Symbiosis Web Quest

NAME:

Introduction: During our study of ecology we will focus on specific relationships between organisms. Organisms interact in many ways. In the process, organisms may be helped, harmed, or may not experience any impact of the interaction. In this web quest, we will explore many types of interactions among organisms.

Directions: Use the following websites to respond to the requirements below.

<http://www.ms-starship.com/sciencenew/symbiosis.htm>

1. Define the three types of symbiotic relationships and provide an example of each.

2. What are the two basic categories of parasites?

3. Give two examples of mutualism and provide the benefits for each organism.

<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/Symbiosis.html>

4. Read the story on the Australian rabbits and explain how the remaining rabbits changed after the myxoma virus eliminated almost its entire population.

5. Read the section about the evolution of symbiotic relationships. How do scientists think symbiotic relationships evolved? What two organisms were involved in the first ever studied primitive type of symbiotic relationship?

<http://science.howstuffworks.com/life/evolution/symbiosis2.htm>

6. What is the theory of symbiogenesis? How does this explain the existence of life?

http://www.botany.uwc.ac.za/sci_ed/grade10/ecology/symbiosis/commen.htm

7. What metaphor is used to describe the commensalism relationship?

8. Explain the commensalistic relationship the Remora fish are in.

<http://www.cals.ncsu.edu/course/ent525/close/symbiosis.html>

9. Scroll down to “Pollination symbiosis” and click on “Nectar Guides”. What are nectar guides and what are the benefits to the organisms involved?

10. Click on “Bottle Gentian” under “Pollinations symbiosis”. Why is this such a great mutualistic association?

Symbiotic Relationship Table

Fill out the table using symbiotic relationships between organisms that were not mentioned in the previous web quest questions. Feel free to use the sites you've already been to, or find new ones. Please include at least one example of mutualism, one of commensalism, and one of parasitism. The rest are up to you.

Symbiotic Relationship Table

Fill out the table using symbiotic relationships between organisms that were not mentioned in the previous web quest questions. Feel free to use the sites you've already been to, or find new ones. Please include at least one example of mutualism, one of commensalism, and one of parasitism. The rest are up to you.

[illegible]

PRACTICUM LOG (use multiple copies if needed)

Name Lauren Huntington

Mentor Teacher (MT) Jerry Realing Grade/subject 10 / Biology

Date	Time In	Time Out	Total Hours	Practicum Activities	MT initials (if required)
2/12	8 a.m.	11:30 a.m.	3.5	Macromolecule lab	JR
2/17	8	11:30	3.5	Buffer lab / intro to microscopes lecture	JR
2/26	8	11:30	3.5	Microscope / Slide lab	JR
3/5	8	11:30	3.5	Onion cell / cheek cell hyper/hypo/isotonic lab	JR
3/12	8	11:30	3.5	Cellular respiration	JR
3/26	8	11:30	3.5	Conservation reading / discussion Tate museum trip	JR
4-9	8	2	6	Intro to ecological pyramids / Biomes project	JR
4/16	8	11:30	3.5	Symbiosis lesson Plan	JR
4-23	8	11:30	3.5	Bottle ecology / populations / water + Carbon cycles	JR

Total Practicum Hours: 34

EDST 3000 MENTOR TEACHER EVALUATION

Mentor Teacher Jerry Realing Grade/Subject 10 / Biology

Preservice Teacher/EDST 3000 Student Name Lauren Huntington

UW Instructor Dr. John Kambutu

Please circle the appropriate rating for each item:

A. Professionalism:

1. Shows responsibility; is prompt and completes required hours.

0 1 2 3 4

2. Has a good working rapport with mentor teacher

0 1 2 3 4

3. Exhibits appropriate dress and behavior

0 1 2 3 4

4. Demonstrates motivation and purpose

0 1 2 3 4

B. Communication:

1. Communicates and interacts effectively with students

0 1 2 3 4

2. Communicates and interacts effectively with mentor teacher and other school faculty and staff

0 1 2 3 4

C. Management Strategies:

1. Is consistent and fair in dealing with student behavior

0 1 2 3 4

2. Shows respect for individual students and student differences

0 1 2 3 4

3. Demonstrates appropriate management/discipline & expectations of students

0 1 2 3 4

D. Facilitation of Student Learning:

1. Establishes rapport with students

0 1 2 3 4

2. Presents material clearly and in an appropriate manner; instruction was well planned and executed.

0 1 2 3 4

3. Indicates knowledge of various teaching strategies

0 1 2 3 4

E. Preservice Teacher's Personal Growth:

- | | | | | | |
|--|---|---|---|-----|-----|
| 1. Asks questions about students | 0 | 1 | 2 | 3 | (4) |
| 2. Demonstrates confidence while showing enthusiasm for teaching. | 0 | 1 | 2 | (3) | 4 |
| 3. Appears to be committed to becoming a professional teacher by demonstrating a desire to improve teaching skills | 0 | 1 | 2 | 3 | (4) |

Comments:

Lauren is well on her way to being an outstanding educator. She treats kids well and that is the most important quality one can have.

Please determine an overall evaluation for this student's practicum experience (Distinguished, Proficient Basic, or Unsatisfactory) by assigning a point total within the appropriate range (60 points total possible):

Distinguished (55 – 60 points) POINTS: X 56 Shows excellent potential for teaching young or adolescent students; went beyond the requirements and expectations for the practicum

Proficient (40 - 54 points) POINTS: _____ Shows good potential for working with young or adolescent students; met all requirements and expectations for the practicum experience

Basic (26 - 39 points) POINTS: _____ Shows a possible potential for teaching, but needs more opportunities to work in educational settings with students

Unsatisfactory (0 – 25 points) POINTS: _____ Requires additional practical experience before continuing in the teacher education program

Mentor Teacher Signature

Date

A. 23. 15

Mentor Teacher's Lesson Observation and Critique

Please take a few minutes to observe and critique the lesson or lessons your practicum student has taught. It is very helpful if you can debrief with the student about his/her strengths as well as the areas that need improvement.

Student

Lauren Huntington

Lesson title/topic

Symbiotic Relationships

Lesson date/time

4-16-15

Lesson:

Setup/Anticipatory set:

Instructional input (Actual teaching process):

- Direct Instruction
- Discover, learning

Content:

- material Related to Population dynamics. Power Point Lecture

Closure:

- Question / answer
- Webquest Assignment

Other:

Evidence of thorough preparation:

- Created lecture from scratch
- Personalized w/ cartoon
- Prepped webquest Activity

Classroom management:

- MOVED AROUND ROOM
- ASKED INDIVIDUALS QUESTIONS

Rapport with students:

- Common conversations w/ STUDENTS
IS GOOD. BUILD RELATIONSHIPS

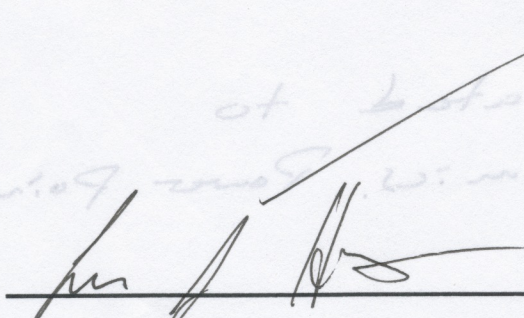
Overall strengths:

- Prepared for the lesson
- Confidence w/ material

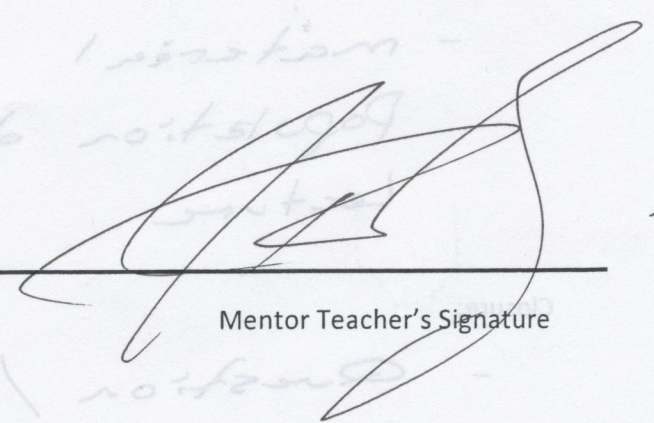
Areas to improve:

- DELIVERY
- VOICE

Other comments/observations:



Practicum Students' Signature



Mentor Teacher's Signature

Practicum Reflection and Instruction Commentary

Lauren Huntington

University of Wyoming

Introduction

“Becoming a quality teacher is a process, not an event” (J. Kambutu, personal communication, 2015). This is something that can not be stressed enough to all beginning teachers. Engaging in our practicum experiences throughout our college education are small steps in this process. The process will probably never end, but it has to begin somewhere, and practicums are a good place. In my second practicum experience of my career, I was privileged to be mentored by Mr. Jerry Realing at Kelly Walsh High School in his tenth grade Biology classes. Throughout my time with Mr. Realing, I learned a lot about teaching in a high school setting. I came to realize that teaching is very personal, and each teacher finds their own methods of planning, organizing, managing, and instruction that work for them. Planning and teaching my own lesson gave me the opportunity to reflect upon my skills and knowledge that I’ve gained in the areas of teaching and learning, as well as allow me the opportunity to continue to nurture and develop those skills. I see every new experience in the classroom as an opportunity to continue to mold my own personal teaching beliefs, methods, and strategies which will help me continue the ongoing process of becoming a quality teacher.

Observations

Upon entering Mr. Realing’s classroom, the first thing most people observe, including myself, is the smell. It always smells a little fishy in there, literally. If you ask anybody, they will quickly, and excitedly point out that the smell is probably coming from the tank that houses the alligator snapping turtle, or from the 15-year-old, 15-pound tortoise that roams around the room, and sometimes the hallways. His name is Doorstop, and he is very popular with the students and teachers throughout the school. This gave me the impression that I was not in an ordinary

classroom. Creating an environment where students feel comfortable is one of the keys to building relationships with them (Quate & McDermott, 2009), and Mr. Realing has done a great job at doing this. His classroom is welcoming, and intriguing.

The second thing that I noticed right away is Mr. Realing himself. It is very apparent that he has a huge presence in his classroom. His rapport with the students is hard to match. Students really enjoy being in this class, and most are continually engaged in the content. He knows his students well inside the classroom, as well as develops relationships with some of them outside the classroom in his time as a soccer coach. The most important thing Mr. Realing stressed to me was building these relationships, and letting students know that you care. For students don't care how much you know until they know how much you care (J. Kamutu, personal communication, 2015).

Perhaps one of the biggest takeaways from this experience was the different dynamics that were present in each of his three classes. I was exposed to three different classes of students in my time there, and each class was exponentially different. The energy in each class was different, and Mr. Realing was able to adapt his instructional and management strategies to fit the dynamics of each different class. His advanced class doesn't need much direct instruction. They are very self-motivated, and are always engaged in the work. That is completely opposite from one of his other classes, where they need a lot of direction, and step-by-step instruction to process the information. His organization methods are also different for his classes. He expects his advanced students to keep their own materials organized, where his non-advanced classes keep folders in a box in his room, where they keep their materials so they are always easy to find.

Mr. Realing always knows where he is going with the curriculum. He doesn't use much lesson planning, but I suppose after 15 years, he knows what works and what doesn't. He does modify his lessons for the advanced classes, and gives them more in-depth, complex projects to complete. All of his classes seemed to be at different places within each unit whenever I was present, yet Mr. Realing never lost his place. He always knew where each class was with the content.

Mr. Realing's methods of instruction, management, and organization were completely different than what I had experienced in my first practicum, which I really enjoyed. He's not very organized, but always knows where he is going. He is great at making adjustments on the fly, and knows what instructional and management strategy works best for each different class. It's more helpful to see how teachers do things different, than how they do things the same. Each experience allows me to develop my own methods, and take what I like and what I don't like from each teacher and use that to become my own teacher. I know that I will be prepared to deliver instruction and management in a variety of different ways to meet the needs of my students.

Teaching Reflections

I chose to introduce the students to the idea of symbiotic relationships in my lesson that I designed and taught. This topic fit in with the ecology unit the students were currently studying. Each student would be asked to partake in a discovery learning exercise by completing a web quest, after a brief, yet detailed direct instruction introduction of the topic. The topic of symbiosis helps the students relate the interdependence of relationships that exist within ecosystems, as well as the dynamics of how ecosystems function, and the social interactions that

occur within an ecosystem to a much smaller scale of an organisms-to-organisms relationship. These are standards that exist within the Next Generation Science Standards. The web quest activity allowed students to discover more in depth information on the idea by conducting independent research using specified websites on the Internet. By following directions, and reading to answer specific questions, as well as using their own research skills to explore their own interests within the topic of symbiosis, students were able to gain a deeper understanding of the topic, and relate it to the bigger picture of ecology and the relationships that all living things have with one another and their environments.

The web quests were used to to document and assess student learning of the targeted objectives. There were ten total questions for the students to answer, as well as six symbiotic relationships for the students to discover and describe within a table. Each question, and table entry was worth two points, making the activity worth a total of 32 points. Partial credit was given to partial answers. As long as students followed directions, and carefully read the questions and followed the specific websites, each student was capable of earning full credit for the activity.

I chose to introduce my lesson using direct instruction. I crafted a PowerPoint with descriptions and visuals, and asked the students to take notes using the definitions provided for them in the PowerPoint. I made the decision to use direct instruction because the topic of symbiosis was brand new to my students. Most of them had no prior knowledge of the content, and so I knew it was my job to lay the foundation for them.

Most of the instruction went well. The successful parts included asking the students to provide any examples they could think of for each type of symbiotic relationship: mutualism,

commensalism, and parasitism. I involved them in the lecture, which helped to keep them focused and engaged in the material. I also made sure I moved around the room throughout the presentation, which helped keep them actively involved. At the end of the lecture, I provided photos of different symbiotic relationships, and as a class we figured out what kind of symbiotic relationship was represented. This allowed me to assess whether or not the presented information was understood, and allowed me to use guided practice, as described in the Madeline Hunter model of planning a direct instruction lesson. The students went right to work on their activities, and seemed to be engaged in the discovery learning aspect of doing a web quest.

Although the lesson was mostly successful, there are a few things that I would change if I were to do it again. I opened the lecture with two cartoons depicting symbiotic relationships. I intended on these to be my hook, but they mostly fell flat. Since the students were not familiar with the topic, they did not understand the cartoons, and explaining them meant the humor in them alone was mostly lost. A different anticipatory set, that maybe involved a short video clip, or an image that they could relate to would have been more successful. I should have also included more images as examples of each type of relationship. I scripted out some examples in the lesson plan, but did not describe some of them during the presentation. I think that providing more images would have allowed me to remember all the examples that I had wanted to give.

The students really enjoyed the guided practice portion, where we, as a class, figured out what kind of relationship was depicted in the provided images. The one thing that was not successful, was that I did not provide enough examples to allow the students to discuss. This was the most engaging part of the presentation, and I only gave them three different images to discuss. More would have been more helpful for the students, and gave them more information

to carry over to their independent practices. If I were to reteach this, I would have used ten or so examples to use as discussion points for the students to figure out together, with my help.

Although the students were all asked to bring their school-issued computers to class, many of them failed to do so. I prepared the activity to be accessed through dropbox on their computers, and had not intended on any students to ask for a copy of the activity. I was prepared for students to not have their computers, as I gave them the opportunity to work together, as long as each student turned in an individual web quest. They were given the option to either answer the questions directly in a Word document on their computers, or use a sheet of paper, but many students preferred to have a hard copy of the document itself, so we were printing copies, which wasted valuable time. This time would have not been wasted had I come prepared with copies of the web quest for students who asked for them, rather than printing them on the fly.

Since I was introducing a brand new idea, I was sure to provide definitions of the vocabulary that students were not familiar with. They were asked to take notes in their notebooks, or on notecards, and it was reiterated that this information would show up again on the unit exam. The new language was written out on the PowerPoint slides, accompanied by photographs, spoken by myself in the lecture, and reiterated through questions in the web quest so they were able to read it, write it, and hear it on multiple occasions. This hopefully enable students to move the information to their long-term memories, connect it with prior knowledge, and store it in multiple ways.

By asking students questions throughout the lecture, and involving them in a discussion at the end, students were able to make their own, personal connections with the material, as well as continue to develop social skills and think a little deeper about the information. The classroom

environment is very open, and active so I made sure to give student the opportunity to work together if they chose to do so. The students who prefer to work independently were given that option as well. I was actually quite surprised as to how many students chose to do their work independently, as the two classes I taught tend to be very social. I think this is because I hadn't quite developed really close relationships with them, so they felt like they needed to stay on task and get their work done, rather than be loud and active.

The first class I taught the lesson to is the advanced class. I was prepared to give them the opportunity to explore symbiotic relationships even deeper by relating them to humans if they were to finish early. It was brought to my attention, though, that most the students had prior projects to finish with any remaining time, so they were instruction to use their time wisely, and work on prior projects when they completed the activity. As planned, the second class of students took the entire class period to complete their work, and those who were not finished were asked to use the weekend to complete it at home.

If I could teach this lesson to these same students again, I would alter the PowerPoint to include more examples. I would increase the length of the discussion involving the entire class, as the students seemed to really enjoy this and it was unfortunately cut short do to the lack of examples I included.

In the web quests that I assessed, students mostly provided answers that I was looking for. I did my best to provide positive, constructive feedback on the activity. According to Arends (2015), overall feedback should remain positive, and correct performance should be praised. An observed incorrect performance needs to be corrected, therefore negative feedback will be necessary, but it should be accompanied with a demonstration of the correct performance. In

most instances, a combination of positive and negative feedback is best. On this activity, students did not take the time to do the proper research, and simply repeated what we discussed in class as their answer. I was looking for more detailed answers to some of the questions than what the students provided. This has taught me to be very specific when writing up questions, and explain exactly what I am looking for.

After viewing the video of my instruction, I know that I need to work on pacing, as well as my voice projection. Providing more examples in my presentation would have helped with my pacing of the information. I did tend to move a little fast. Another thing that would help with my pacing, would be to work on asking the students more questions, and giving them more opportunities to get involved. Although I did ask questions throughout, I did not ask as many as I could have, or turn the student responses into more in-depth discussion. I think the more I teach, the better I will get at developing student answers into more. I know that I have a soft voice, and this is something that I've been told before. In order to really project my voice, I think the best option for me is to where a microphone. As much as I try to speak loud, my voice still manages to get lost.

Retrospective Reflections

I believe that a teachers personal beliefs in the areas of instruction, differentiation, curriculum, and assessment are always developing, and subject to change depending on the students needss. Right now, I believe that the most important process of a teacher's job is to build quality relationships with students. I think that this will always be at the forefront of my teaching beliefs. It was apparent to me in my practicum class, that the relationship that Mr. Realing has with his students makes his instructional approaches and his lessons very successful. The

students trust and respect him, as well as feel comfortable and have fun in his class. With all of these things in place, they are open to the learning experience.

I also believe that it is important to differentiate instruction to meet the needs of all students. Providing students with a variety of opportunities within a unit of study to show their growth and understanding is key. I plan on delivering instruction in a variety of ways, and incorporating as many cooperative learning experiences as I can, because I feel that students learn best when they can work in a team. I think it is very important to have a repertoire of instructional strategies to use with different content and different students.

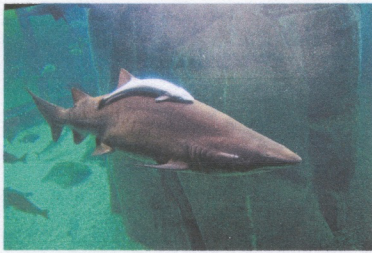
Conclusion

Having the opportunity to be exposed to different classrooms and the different ways in which teachers approach instruction, management, organization, and assessment is invaluable. Each classroom experiences helps me to continue to shape the teacher that I want to be and helps me to develop my own views and beliefs about pedagogy. I really enjoyed my time at Kelly Walsh High School. Before this experience, I wasn't sure how I was going to be with high school students. I previously had been around middle school students and loved it, and what this experience taught me was that high school students are also a great group to be around. I have learned that I am versatile when it comes to age groups, and I enjoy working with both middle school and high school students. They all just want to be in an environment where they feel respected, loved, and safe and where they can comfortably open themselves up to the experience of learning.

Resources

Arends, R.I. (2015). *Learning to Teach*. New York, NY: McGraw-Hill.

McDermott, J. and Quate, S. (2009). *Clock Watchers: Six steps to Motivating and Engaging Disengaged Students Across Content Areas*. Portsmouth, NH: Heinemann.



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Symbiosis Web Quest

NAME: [REDACTED]

Introduction: During our study of ecology we will focus on specific relationships between organisms. Organisms interact in many ways. In the process, organisms may be helped, harmed, or may not experience any impact of the interaction. In this web quest, we will explore many types of interactions among organisms.

Directions: Use the following websites to respond to the requirements below.

<http://www.ms-starship.com/sciencenew/symbiosis.htm>

1. Define the three types of symbiotic relationships and provide an example of each.

Mutualism, when both species involved benefit from the relationship, *Commensalism*, when one species benefits and the other isn't affected, and *Parasitism*, when one species benefits, and the other is harmed in the process. An example of mutualism is the bacteria in our stomachs that help us with digestion and we help them by providing food. An example of commensalism is when a bird lands on a tree; the tree is not affected but the bird benefits from the height. An example of parasitism is something like tics or fleas.

+1 - What is the bacteria? Do some research.

- Not so much birds landing in a tree, but nesting in a tree.

- How are ticks & fleas parasites? What organism is harmed?

2. What are the two basic categories of parasites?

+2 The two basic categories are *Ectoparasites* and *Endoparasites*, the former referring to external parasites, and the latter internal parasites.

Excellent! ☺

3. Give two examples of mutualism and provide the benefits for each organism.

Ants care for the aphids and in turn they receive honey dew.

+2 The clown fish lives in anemone which protects them and clown fish take care of the anemone.

<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/Symbiosis.html>

4. Read the story on the Australian rabbits and explain how the remaining rabbits changed after the myxoma virus eliminated almost its entire population.

+2 They became more resistant to infection than their predecessors and the virus circulating in the wild rabbits has become less virulent.

Good!
+2 5. Read the section about the evolution of symbiotic relationships. How do scientists think symbiotic relationships evolved? What two organisms were involved in the first ever studied primitive type of symbiotic relationship?

A parasitic relationship might over the course of time evolve into a mutualistic one as the two organisms evolve to minimize the damage to the host. The amoebas and some forms of bacteria.

<http://science.howstuffworks.com/life/evolution/symbiosis2.htm>

+1.5 6. What is the theory of symbiogenesis? How does this explain the existence of life?

This theory, which has fairly widespread acceptance, suggests that symbiosis is actually the key to the origins of complex life on earth. Because it shows how things started to work together.

How does this show things working together? Think about cells...

http://www.botany.uwc.ac.za/sci_ed/grade10/ecology/symbiosis/commen.htm

+2 7. What metaphor is used to describe the commensalism relationship?

'at a table together'

8. Explain the commensalistic relationship the Remora fish are in.

The fish does not hurt or harm the shark but the remora is protected and fed.

+1.5 How is the fish protected & fed? Is it attached to the shark?
How does it get food?

<http://www.cals.ncsu.edu/course/ent525/close/symbiosis.html>

9. Scroll down to "Pollination symbiosis" and click on "Nectar Guides". What are nectar guides and what are the benefits to the organisms involved?

yes!
+2 The nectar guide is the contrasting ultraviolet pattern which helps a bee quickly locate the flower's center. The bee gets nectar and the flower gets pollinated.

10. Click on "Bottle Gentian" under "Pollinations symbiosis". Why is this such a great mutualistic association?

+2 the bees benefit by having exclusive access to a bountiful nectar supply, and the plants benefit by attracting "loyal" pollinators that improve the chances for cross pollination.

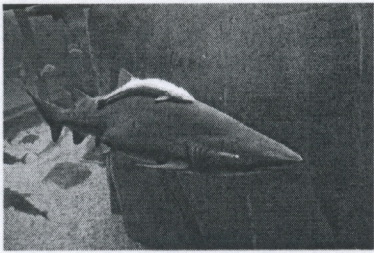
What is so special about these bees?

Symbiotic Relationship Table

Fill out the table using symbiotic relationships between organisms that were not mentioned in the previous web quest questions. Feel free to use the sites you've already been to, or find new ones. Please include at least one example of mutualism, one of commensalism, and one of parasitism. The rest are up to you.

Organisms	Symbiotic Relationship	Interactions between organisms	Effect of the interaction on each organism
+2 Barnacles and whales	Commensalism	Barnacles live on whales	The barnacles gain food and the whales are not affected.
+2 Tape worm and humans	Parasitism	Tape worm lives inside of humans	Tape worms harm the human by taking nutrients
+2 Termites and trees	Parasitism	Termites eats trees	Trees die termites live
+1 Cows and birds What kind of bird? Research!	Commensalism	Cows kick up dirt and birds get insects	Bird benefits because the it gets food
+2 Great! Zebra and oxpeckers	Mutualism	Oxpecker will be on the zebra and eat all the bugs and parasites off the animal	Both benefit because the zebra no longer has bugs on it and the bird gets food
+0 Bears and fish :(Parasitism	Bears eat fish	The fish dies

This is predation, where one animal hunts & kills its prey. Similar to parasitism, but in most instances, parasites do not kill their host.



Symbiosis Web Quest

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NAME: [REDACTED]

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Directions: Use the following websites to respond to the requirements below.

<http://www.ms-starship.com/sciencenew/symbiosis.htm>

1. Define the three types of symbiotic relationships and provide an example of each.

Make sure to use sources "snail thing" is not an organism! H.O.S.

Mutualism is when both species benefit, ant and aphid (Aphid)

Commensalism is when 1 benefits but other is not affected.

Parasitism is when 1 benefits and other gets harmed. (Whale and snail thing) (Tick and Dog.) Good.

2. What are the two basic categories of parasites?

+2 Endoparasite, ectoparasite

3. Give two examples of mutualism and provide the benefits for each organism.

Good!
+2

Ant and aphid, aphid makes honeydew and ant drinks it, then the ant protects aphid. Spider crab and algae, spider crab gets camouflage and the algae gets a good place to live.

<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/Symbiosis.html>

4. Read the story on the Australian rabbits and explain how the remaining rabbits changed after the myxoma virus eliminated almost its entire population.

They are more resistant to infection. How? More detail, please.

+1.5

5. Read the section about the evolution of symbiotic relationships. How do scientists think symbiotic relationships evolved? What two organisms were involved in the first ever studied primitive type of symbiotic relationship?

A parasitism^{relationship} to a mutualism, yes, but how?
Amoeba and bacteria - yes +1.5

<http://science.howstuffworks.com/life/evolution/symbiosis2.htm>

6. What is the theory of symbiogenesis? How does this explain the existence of life?

Why are microbes important to life? +1.5
microbes entered into a series of symbiotic relationships, with different microbes performing the tasks vital to microbe existence.
http://www.botany.uwc.ac.za/sci_ed/grade10/ecology/symbiosis/commen.htm

7. What metaphor is used to describe the commensalism relationship?

at table together

8. Explain the commensalistic relationship the Remora fish are in.

They can live on the ~~side~~ other animals and not harm them +1
What is the benefit to the Remora?

<http://www.cals.ncsu.edu/course/ent525/close/symbiosis.html>

9. Scroll down to "Pollination symbiosis" and click on "Nectar Guides". What are nectar guides and what are the benefits to the organisms involved?

+2 Middle of flower, ultraviolet pattern that helps bee locate middle of flower. flowers get pollen and bees get nectar Good. ☺

10. Click on "Bottle Gentian" under "Pollinations symbiosis". Why is this such a great mutualistic association?

+2 Because the large Bees have exclusive access and the plants benefit by cross pollination. It's great because there's only 1 insect that can get in.

This is an example of co-evolution. ☺

Symbiotic Relationship Table

Fill out the table using symbiotic relationships between organisms that were not mentioned in the previous web quest questions. Feel free to use the sites you've already been to, or find new ones. Please include at least one example of mutualism, one of commensalism, and one of parasitism. The rest are up to you.

Organisms	Symbiotic Relationship	Interactions between organisms	Effect of the interaction on each organism
+2 Barnacles whaler	commensalism	Barnacles ride on whales so they are where the food is	Barnacles get food food and whales aren't affected
+2 Atlantic Puffin Rabbits	commensalism	Rabbits make burrows puffin uses burrow for nesting	Rabbits aren't affected, Puffin use burrows
+2 cattle egret egret + cattle	" "	when cattle graze it stirs up insects for birds to eat	cattle aren't affected, bird gets insects
+2 Flatworms Horseshoe crab	" "	flatworm attaches and eats crabs food	Flatworm gets food, crab isn't harmed
+1.5 Gut bacteria triglycerides Bacteria Humans	mutualism	Bacteria eat digest food for us	Bacteria gets food and we get digested
+2 aphids plants	parasitism	aphids get sap	aphids get sap, plants eat have less energy

The bacteria help us digest. What kind of Bacteria? Do more research