

Narrative of Lesson Plan

I will be teaching a class of twenty Biology 1 students at Athens High School. These students are all freshman and sophomores, and they are all white. The school is very good in academics and does well in the standardized tests every year compared to the other schools in the state. The school district is very rural, and almost all of the population is Caucasian.

The room is in the shape of a big square. There are posters, mounted animals, lab tables, and chalkboards all around the room. Each class period is 1 hour, 30 minutes long. I have resources to a transportable laptop lab, a projector, a computer, and microscopes.

I determined their prior knowledge of the cell through a pre-test before the unit started. This is becoming mandatory in our school district to have a pre-test so we can gauge how much the students have learned throughout the unit.

The students will be able to understand the cell theory by writing down a good definition of it in 50 words or less. They will be able to identify a prokaryotic cell from a eukaryotic cell by seeing pictures know the main organelles in a cell and identify where they can be found and what their functions are. This will be demonstrated in our group assignment at the beginning of class, as well as in their homework for next class.

I think differentiation in assessment has been mostly taken care of. There isn't a lot of necessary differentiation in this classroom, and I have assigned them different methods of assessment: drawing, writing, modeling, and identifying. When we compare prokaryotic vs. eukaryotic cells, I will have a slide where I circle parts of the cells that are different. I will also draw a Venn diagram on the board. This will help students who are visual learners to see the differences between the two types of cells. I will allow students to sit in the front of the

classroom if they can't see or can't concentrate in the back. I will also be very attentive to any IEP's or students with disabilities as to fulfill any needs that they might need.

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: X

Date: September 10, 2012

Course/Subject: High School Biology

Grade: 10

Title of Unit: Cell Structure and Function

Title of Lesson: Cell Theory and Parts of a Cell

VA SOL(s): (write out)

BIO.3 The student will investigate and understand relationships between cell structure and function. Key concepts include

- a) evidence supporting the cell theory;
- b) characteristics of prokaryotic and eukaryotic cells;
- c) similarities between the activities of the organelles in a single cell and a whole organism;
- d) the cell membrane model;

SPA Standard(s): (write out) NSTA Life Science Standards Level 9-12: The Cell

From http://www.nap.edu/openbook.php?record_id=4962&page=106

Students will learn about the cell in their life science unit in grades 9-12.

Materials:

For Teacher: include resources & appropriate citations, technology support, etc.

For Students: include resources & appropriate citations, technology support, manipulative materials, handouts, etc.

For Teacher:

- Biology Textbook
- Slides of Cells, both online and through microscope
- Smart Board/Powerpoint
- Cell Model

For Students:

- Biology Textbook
- Powerpoint paper with slides of cells
- Cell Model
- Microscopes
- Laptops

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (audience, behavior, conditions & degree of expectation).

1. Given a 2 minute time limit, the student will be able to accurately describe the cell theory in 20 words or less in order to demonstrate a clear understanding of what it is.
2. Given pictures of cells, the student will be able to know and identify the difference between a prokaryotic cell and a eukaryotic cell with 100% accuracy.
3. **Given laptops and their textbook, the student will be able to accurately display a cell organelle with all the major parts by drawing or constructing a model of it.**

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
Know what a theory is; have a good idea of what a cell is	Accurately describe cell theory	Be able to have a better understanding of how theories come to be and why we understand some theories to be true more than others
A good understanding of what a cell is	Know and identify the difference between a prokaryotic cell and a eukaryotic cell	Have a greater knowledge of the complexity of cells and the limitations of prokaryotes vs. eukaryotes
Have decent artistic skills and materials to construct or draw a model of a cell. Students must have spatial abilities so they can picture the cell and then draw it.	Display a cell with all the major parts	Knowing parts of a cell will give them a huge advantage when they learn cycles like respiration

Assessment

4. Content and process skills to be assessed as identified in the instructional objectives.
 - Accurately describe cell theory
 - Know and identify the difference between a prokaryotic cell and a eukaryotic cell
 - Display a cell with all the major parts
5. Specific strategies or methods of assessment: (Describe & attach specific assessments)
 - a. After the “lecture” on cell theory, I will tell students to get out a sheet of paper. They will need to describe to me in less than 20 words what they believe the cell theory to be. I will collect their papers when they’re done, and then I’ll read my 20 word description to the class. Later that day I will read their descriptions and give them 2

points for a relatively good answer, 1 Point for a bad answer, and 0 points for no answer.

- b. After going over prokaryotic vs. eukaryotic, I will have 5 slides on the PowerPoint that are 5 different pictures of cells. We will have a class vote (by raising their hand) on whether they think the picture of the cell is a prokaryotic or eukaryotic cell. After each vote I will randomly pick a student or two why they chose what they chose. The students will not have a formal grade on this, but it will give me a good idea where the students are at, and hopefully after five slides, the students will be able to identify differences
- c. This project will be due for homework the next class period. Students will need to draw, paint, or model a cell with all of the organelles we have talked about in it, as well as list one job of the organelle. This assignment will be worth 5 points, and will be graded on correctness of position of organelles, relative size and shape of organelles, and accuracy of the job description of each organelle.
6. Differentiation: How will you differentiate your assessment for the specific needs of diverse learners?

Assessment is differentiated because there are different ways I am assessing. They are writing, identifying pictures, modeling/painting/drawing, and thinking abstractly for a metaphor. These do not tailor to any one type of learner's needs; I am trying to care for the whole spectrum by giving them many different types of assessments.

Lesson Body:

Anticipatory Set: Before the students walk into the classroom, I will rearrange the desks into small sections: nucleus, mitochondria, cell membrane, golgi body, endoplasmic reticulum, vacuole, lysosome, and cytoplasm. There will be a sign on each section of desks saying what the section represents. The section of desks will also have a big sheet of paper and markers. Also, the students were to have read the section on parts of a cell for homework last night. As the students come in, I will tell them, "Good morning class! Find a seat anywhere in the classroom, just don't move the desks." When they are all in the classroom, I will begin the activity. "You are to work together in your sections to research your part of the cell using your textbooks and computers. Once you have a good grasp on your organelle, draw and label your part of the cell with the markers on the sheet of paper, and then write down characteristics of that cell part. Some example of characteristics would be what the purpose of it is, briefly how it accomplishes its task, and what other parts of the cell it interacts with." After about 15 minutes of working, the students will share their posters with the class and explain what the job of their part of the cell is. The students will then present their posters for a total of 15 minutes (about 2 minutes per group).

Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	Differentiation, Support Learning, & Adaptations What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Transition from parts of cells to the cell theory by asking if anyone can describe the cell theory. "What is cell theory and why it is important?"	If students need to sit in the front because they can't see or can't focus in the back, I will certainly allow that. This is learning

This is a convergent-thinking question and intermediate level. This is also guided practice. 2. I'll have a PowerPoint and teach the class the history of cells with Robert Hooke and the cell theory. This should take about 10 minutes. I will expect the students to be taking notes during the PowerPoint. I do not believe in giving the PowerPoint to the students in class (unless it's necessary due to a disability of some sort) because then the student will not focus since it is right in front of them. I will, however, have the PowerPoint available online. This is guided practice. Notes: Slide 1: Introduce Cell Biology Slide 2: • Explain that cell biology was “invented” with the invention of the microscope • Highlight Robert Hooke, Leeuwenhoek, and Schwann Slide 3: • Who knows what these could have been called if he didn't think of a monastery! Slide 4: • 3 Components of Cell Theory • What is an example of a multicellular organism? Unicellular? This is a convergent-thinking question and low level. Questions: What do you think is missing in this timeline? This is a divergent-thinking question and intermediate level. Evaluate the cell theory. Why is it a theory? Are there any loopholes or problems with the theory? What would you change about it? This is all one big question. It is a probing question and high level. What questions do you have? This is a clarifying question and low level. 3. Then I will tell the students to describe in 20	environment differentiation. I will definitely try to have pictures and color in my PowerPoint to draw attention to it. Process is being differentiated because it is how the students are learning.
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words or less the cell theory by writing it down on a piece of paper. This will take 3 minutes. "I want you to get out a piece of scrap paper for our next activity. Write down, in 20 words or less, a description of cell theory in your own words. I will collect your answer once you are done." This is independent practice.

4. I will then go into parts of a cell and echo what the class said. I will not spend a whole lot of time on this because the class taught the class this information earlier in the period. I will simply go over each organelle and perhaps go a little more indepth if need be on some of the organelles. This will hopefully take 20 minutes. This is independent practice.

Notes:

Slide 5:

- **"There are all of the parts of the cell that you will be responsible for. You will not have to know the centrosome, although we will talk about it in cell division. Also, the nucleolus and nuclear membrane are good things to know, but they will not be on the test."**

Slide 7:

- **"ATP is the currency in a cell. It is the energy that allows your body to function." I will draw a diagram of ATP on the board to show them what ATP looks like.**

Slide 8:

- **"A phospholipid bilayer is a membrane made up of two phospholipids. One side of the phospholipid is hydrophobic and one side is hydrophilic." Then I will draw a diagram of the bilayer and show them what sides are hydrophobic and hydrophilic. Question: Why is it necessary for the hydrophilic heads to be facing the inside and outside of the cell? This is a divergent-thinking question and intermediate level.**

Slide 9:

- **The ER is made up of the rough ER and**

smooth ER.

Slide 12:

- **“Lysosomes get rid of wastes that are in the cell.”**

Slide 14:

- **SPECIFY that cell walls are in plants and not in animals!!**

Slide 15:

- **SPECIFY that chloroplasts are in plants and not in animals!!**

5. After this I will describe differences in cells, such as prokaryotic vs. eukaryotic, and plant vs. animal cells. The students need to have a grasp on the parts of a cell and how they work first before they can learn these concepts. If they have not understood cell theory or parts of a cell, this part of the lesson might be moved to tomorrow. This will probably take 10 minutes. This is guided practice.

Notes:

Slide 16:

- **Use the Smartboard to circle differences between the two cells**
- **Explain that animal cells can be any shape, not just circular.**

Questions: Why do you think a prokaryotic cell would have a flagellum? This is a convergent-thinking question and low level.

Speculate why do you think a plant cell needs a cell wall? This is a probing question and high level.

What questions do you have? This is a clarifying question and low level.

6. After teaching the class about prokaryotic vs. eukaryotic, I will show pictures of five different cells on the board and they will raise their hand to vote for whether they think it is prokaryotic

When we compare prokaryotic vs. eukaryotic cells, I will have a slide where I circle parts of the cells that are different. I will also draw a Venn diagram on the board. This will help students who are visual learners to see the differences between the two types of cells. This is process differentiation.

or eukaryotic. This will give me an idea of where the class is at and how well they are understanding the material. I will also randomly pick a student or two to tell why they think the cell is what they voted for. I think it will be good to pick a student to explain why they voted for something BEFORE I say what the right answer is, that way they won't be wishy-washy about their answer; they'll truly try to defend it. This will take about 10 minutes. This is kind of a guided practice activity, because the students get to decide in the presence of the teacher what kind of cell they think it is, and they get instant feedback on whether they are right or wrong and why. 7. Next I will describe their homework assign, which should take about 5 minutes. "Class, for homework, due the next time we meet, I want each of you to construct a model of a cell. It can be a prokaryotic, animal, or plant cell, whatever you'd like. You may construct the cell in any way you'd wish, clay, drawing, painting, diorama, etc. You must label the cell with all of the organelles we have talked about today, as well as list one job of the organelle. This assignment will be worth 5 points, and will be graded on correctness of position of organelles, relative size and shape of organelles, and accuracy of the job description of each organelle." This will be independent practice. What questions do you have? This is a clarifying question and low level. 8. Lastly, I will transition into my closure which will take about 2 minutes. "Okay class, now in your groups..." This will be independent practice.	If a student needs material to do their project, I am very willing to go borrow supplies from the art room and give them to the student to use for the night. I would probably get big sheets of paper and markers for them to make a poster. The markers would be supplied by me if the school didn't have any I could use. This might be a combination of affect and product because it's has an effect on both the student's affect and the final product he/she is producing. If a student does not like to work in groups, I will keep a keen eye on that group and make sure that the group in including him/her. If not, I will try to facilitate the group to get that student more involved. (I will also differentiate in this way for the anticipatory set.) If an individual requests to work by him/herself, I will allow it. However, I will not make the class aware of this "clause" until someone asks because I believe language development and social skills are things that are very important to be learning through group work. This is a differentiation for learning environment.
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Closure: “Okay class, now in your groups, talk about a metaphor that could represent a cell. For example, on a football team, the head coach is the nucleus because he decides what everyone else does. The linemen are the mitochondria because they’re the workmen who help everyone to do what they need to do. (Explain a few more examples). Come up with a metaphor for the cell and we will discuss them tomorrow.”

Self-Reflection: To be written once the lesson has been presented in your practicum.

Eastern Mennonite University Middle/Secondary Lesson Plan Rubric

	Exemplary 3	Competent 2	Does Not Meet Expectations 1	Score (Weight)
Introductory Information/ Narrative Description	Information of course, grade level, lesson/unit, SOLs, SPAs, materials, is thorough and accurate	Information of course, grade level, lesson/unit, SOL's, SPAs, materials, is complete and accurate	Information is missing, inaccurate or inappropriate See notes below. Insert narrative.	(<u> </u> 2 <u> </u> X 1 = <u> </u> 2 <u> </u>)
Instructional Objectives¹	Objectives are observable & measureable; ABCD format is thoroughly and accurately included in all objectives; aligned with SOLs and SPA standards	Objectives are observable & measureable; ABCD format is addressed in all objectives; linked to SOLs and SPA standards	Objectives are not observable & measureable; one or more components of the ABCD format is missing in one or more objective Add SPA standard.	(<u> </u> 2 <u> </u> X 2 = <u> </u> 4 <u> </u>)
Task Analysis	Thorough and accurate statement of Prerequisite, Essential, and Desired content knowledge	Complete and accurate statement of Prerequisite, Essential, and Desired content knowledge	Incomplete statement of Prerequisite, Essential, and Desired content knowledge or missing category Minor revision.	(<u> </u> 2.5 <u> </u> X 2 = <u> </u> 5 <u> </u>)
Assessment¹	Clearly linked to learning outcomes and monitored throughout the lesson (formal and informal)	Assessment linked to learning outcomes or monitored somewhat throughout the lesson	Assessment not linked to learning outcomes or monitored throughout the lesson Good so far; add #3.	(<u> </u> 2 <u> </u> X 2 = <u> </u> 4 <u> </u>)
Anticipatory Set/Closure	Compelling introduction draws students into the lesson and closure focuses on student summary of learning; procedure is written out verbatim	Introduction draws students into the lesson; Closure focuses on student summary of learning; written out verbatim	Introduction or closure not included in lesson; not written out verbatim	(<u> </u> 3 <u> </u> X 1 = <u> </u> 3 <u> </u>)
*Instruction: Instructional Strategies/Independent Practice¹	Detailed and purposeful teacher notes, instructional strategies, guided practice, independent practice. Reflects best practice; organized, sequential, varied strategies, timing optimizes student learning; practice extends student learning	Includes: teacher notes, instructional strategies, guided practice, independent practice. Reflects best practice; organized, sequential, varied strategies, timing optimizes student learning.	Does not include or is missing some required components. Does not reflect best practice; lacks one or more components: organized, sequential, varied strategies, timing; jeopardizes student learning Lesson needs development.	(<u> </u> 2.5 <u> </u> X 4 = <u> </u> 10 <u> </u>)
*Instruction: Support Learning/Differentiation of Instruction¹	Extends and adjusts instruction appropriately for all students	Extends and adjusts instruction appropriately for most students	Instruction designed without consideration for individual student learning	(<u> </u> 2 <u> </u> X 2 = <u> </u> 4 <u> </u>)
*Instruction: Questions	Types/levels of questions identified; extend and promote, and extrapolate higher level thinking from students	Types/levels of questions identified; extend or promote some higher level thinking	Questions do not extend or promote higher level thinking; types/levels not identified	(<u> </u> 2.5 <u> </u> X 1 = <u> </u> 2.5 <u> </u>)
Total				34.5/45

***An interactive SmartBoard activity is required in one of these categories.**

¹Criteria will be used for admission to student teaching decisions beginning July 2012.
Assignment is completed when a competent "2" rating is achieved in every category.

Comments:

9/14/12:

SPA:

1. See notes above. To be updated in the next submission.

Objectives:

1. Great work thus far with only the small revision to 3 needed.

Re-submission should include: 1) revisions typed in bold text in the original assignment submission; and 2) the lesson plan rubric with the professor's comments intact.

9/29/12:

SPA:

- See above note requesting more info.

Task Analysis:

- One small revision in Prior column.

A.S.:

- Write out verbatim.

Closure

- Creative idea! See minor revision noted above.

Nice progress!

10/27/12:

Narrative Description:

- In your next submission, insert the Narrative section at the very beginning of the lesson plan. Thanks.
- Expand your differentiation answer.

Assessment:

- Complete #3.

Great work, X. With only a few revisions, you are ready for the Instruction section

11/10/12:

From my last review:

Narrative Description:

- In your next submission, insert the Narrative section at the very beginning of the lesson plan. Thanks.
- Expand your differentiation answer.

Assessment:

- Complete #3.

From this review:

Instruction:

- So far you have an outline. Next you need to develop everything in this lesson so you could actually teach it (Ppt, gather photos to show, your lecture notes, etc.)
- I counted 70 minutes; 90 required.
- The next submission requires questions and the SmartBoard activity.

11/21/12:

Revise Narrative description as noted above in 10/27 and 11/10 reviews. –OK.

Questions:

- Label ALL questions throughout the Instruction by type and level as per the Kellough and Carjuzaa textbook.

Instruction:

- I counted 95 minutes this time; 90 is required.
- SmartBoard has been completed.
- Insert ALL required parts of the Instruction section:
 - Label what is guided practice. -OK.
 - Label what is independent practice. -OK.
 - Develop and insert teacher notes. -OK.
- Now that you've developed the instruction section, take a look back at the earlier sections you developed in your lesson plan and ensure that these components are in the Instruction section:
 - a. Obj. 3 - Given their notes and their textbook, the student will be able to accurately display a cell with all the major parts by drawing or constructing a model of it.
 - b. From the assessment section:

After going over prokaryotic vs. eukaryotic, I will have 5 slides on the PowerPoint that are 5 different pictures of cells. We will have a class vote (by raising their hand) on whether they think the picture of the cell is a prokaryotic or eukaryotic cell. After each vote I will randomly pick a student or two why they chose what they chose. The students will not have a formal grade on this, but it will give me a good idea where the students are at, and hopefully after five slides, the students will be able to identify differences -OK.
 - c. From the assessment section:

This project will be due for homework the next class period. Students will need to draw, paint, or model a cell with all of the organelles we have talked about in it, as well as list one job of the organelle. This assignment will be worth 5 points, and will be graded on correctness of position of organelles, relative size and shape of organelles, and accuracy of the job description of each organelle. -OK.
 - d. From the Assessment/Differentiation section:

Assessment is differentiated because there are different ways I am assessing. They are writing, identifying pictures, modeling/painting/drawing, and thinking abstractly for a metaphor. These do not tailor to any one type of learner's needs; I am trying to care for the whole spectrum by giving them many different types of assessments. -OK.

Differentiation:

- Align right column items with corresponding items in left column. -OK.
- Consider content, process, product, affect, learning environment as you revise this section. -OK.

With attention to the above revisions, it is conceivable that this next submission could be your last. Please ensure that all parts are revised and submitted.

11/29/12:

Instruction:

- 85 minutes; 90 required. -OK.
- Teacher notes – when actually teaching this lesson, you might find it simplest to follow if you insert your notes directly into the lesson plan so you have fewer papers to juggle. -I think you'll find this approach easier to teach from.

Questions:

- Add or revise questions to include some at the high level to promote higher levels of thinking among students. -OK.

Just a few very minor revisions this time, X, and you should be finished with this assignment. Submit asap. Thanks!

12/2/12:

Congratulations! This assignment is finished!