Tennessee Tech University  
Lesson Plan Template

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| Name: Beth Barger, Tabitha Hatmaker, Samm Ashley, Reneé Van Druff  Date: 10/21/13 Lesson Title: Comparing plant and animal cells Grade/Level: 5th |
| Curriculum Standards |
| GLE.0507.1.1 Distinguish between the basic structure and function of plant and animal cells. SPI.0507.1.1 Identify the major parts of plant and animal cells such as, the nucleus, cell membrane, cell wall, and cytoplasm.SPI.0507.1.2 Compare and contrast basic structures and functions of plant and animal cells.GLE 0507.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data.GLE 0507.Inq.2 Select and use appropriate tools and simple equipment to conduct an investigation. |
| Focus Questions/Big Idea/Goal (List all 3) |
| **Questions**:What things are made of cells? What are some major differences between plant and animal cells?  **Big Idea:** Cells are the smallest unit of all living things and can be observed using a microscope. There are some similarities and differences in plant and animal cells. Both plant and animal cells have a nucleus but only plant cells have chloroplasts and cell walls.  **Goal:** Students will have a basic understanding of Cell Theory. Students will be able to identify similarities and differences in plant and animal cells. Students will apply their knowledge as they observe cellular life in samples of pond water. |
| Lesson Objective(s) |
| 1. Students will be able to list the three parts of Cell Theory.  2. Students will be able to identify at least two similarities and differences between plant and animal cells.  3. Students will be able to use a microscope to observe prepared slides and pond water and record their observations in their science journal. |
| Vocabulary/ Academic Language |
| **Cell** - the smallest part of any living thing.  **Cell Membrane** - a flexible wrapping on the outside of the cell, and is used to let certain things in and out of the cell (in both animal and plant cells).  **Cytoplasm** - a gel-like liquid inside of a cell (in both animal and plant cells).  **Nucleus** - the “brain of the cell” that controls the activity of the cell (in both animal and plant cells)  **Mitochondria** - breaks down food and releases energy for the cell (in both animal and plant cells)  **Vacuoles** - storage areas for the cell (in both animal and plant cells)  **Chloroplast** - contains chlorophyll and that makes food for the plant cell (found in ONLY plant cells)  **Chlorophyll** - green pigment in plants that absorb light energy used to carry out photosynthesis (found in ONLY plant cells).  **Cell Wall** - a hard outside of a plant cell; protects and gives the cell structure (found ONLY in plant cells)  **Cell Theory** - there are 3 parts to the Cell Theory  1) All living things are composed of cells  2) Cells are the smallest unit of structure and function in living organisms  3) Living cells come only from other living cells  Students will use Academic Vocabulary in their Science Journals, during class discussions, and on the exit slip assessment.building units of life" |
| Material/Resources |
| Concept Cartoon  Cell Theory graphic  Plant and Animal Comparison Graphic  Venn Diagram handout  Science Journals  Exit Slip Assessment Sheet  1 for every 3-4 students  Microscope  Prepared Slides (one onion and amoeba for each microscope)  Website: <http://www.harcourtschool.com/activity/science_up_close/510/deploy/interface.html>  Pond Water |
| Assessment/Evaluation |

**Formative***: How will students demonstrate understanding of lesson objective(s)? How will you monitor and/or give feedback?*

Throughout the lesson, the teacher(s) will monitor students for understanding. Also, the teacher will ask questions to make sure that students understand new material. If a student demonstrates a misconception, the teacher will point it out right away and go over the material again.

During, the microscope activity, the teacher(s) will walk around the room to make sure the students know how to use the microscopes properly and to ensure that each student gets to view the slides clearly. The teacher(s) will also make sure that the students are staying on task to accomplish the stated objectives.

At the end of the activities with the microscopes, the teacher(s) will ask the students if they have any questions about the assignment or if they saw something different than the other kids in the microscopes. All of the student’s observations will go into their Science journal which the teacher will collect at the end of class..

We are also going to include the following FACTs:

* Concept Cartoon
* Fishbowl Think Aloud
* Muddiest Point
* Paint a Picture
* VENN Diagram

**Summative:** *What evidence will you collect and how will it document student learning/mastery of lesson objective(s)*

At the close of the lesson the teacher will distribute a short assessment that covers the three objectives of the lesson. Students will be asked to write:

1)A rule on how to tell if something is made of cells

2) Two similarities and differences between plant and animal cells

3)The three parts of cell theory

If students satisfactorily complete the exit slip assessment then they have met the objectives of the lesson.

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| Instruction  (Include a suggested time for each major activity)  Total Lesson time: 65 Minutes | List Questions for higher order thinking *These cannot be answered by yes or no.*  (Identify Bloom’s Level of Thinking) |
| This section of the lesson will take approximately 5 minutes  **ENGAGE:**  The teacher will gain knowledge of the students’ current understanding about what things are comprised of cells. The teacher will display the FACT Concept Cartoon using the document camera and the smart board. The concept cartoon lists several items (milk, butterfly, tree, rain, rocks etc.) and asks the question “Is it made of cells?” Then possible answers are given to the question that reveal common misconceptions students have. Then the question is asked “What do you think?” and students discuss which of the given answers they agree with most and why, or they can even pose their own answer and reasons. At this point the teacher will point out that it is common for students to have the same ideas as those expressed in the cartoon, but that some of them are not accurate. The teacher will ask the students to pay close attention during the lesson so they can figure out which ideas are accurate and which are not. | **Remembering**: What is a cell?  **Understanding**: Why do you think that \_\_\_\_\_ is made of cells? Why do you think that \_\_\_\_\_ is not made of cells? |
| The following section of the lesson will take approximately 15 minutes  **EXPLORE:** We will do the FACT “Paint a Picture” and ask the kids to draw what they think a plant and animal cell might look like. They can compare pictures with their neighbor and then we will move into our microscope activity where we see what they actually look like. Students will use the microscope to examine a prepared onion slide (plant cell) and a prepared amoeba slide (animal cell). Students will sketch what they see on each slide in their science journals. Students will be given a Venn Diagram in order to record similarities and differences between the two types of cells. At this point it will be based just on what they observed in the microscope, but this will be added to as the lesson progresses and more detailed information is learned.  The following section of the lesson will take approximately 20-25 minutes  **EXPLAIN**: The teacher will lead the class in discussion of the three parts of cell theory. The teacher will display a visual aid on the smart board that lists each of the three parts. Students will be asked to record these in their science journals. The teacher will revisit the concept cartoon activity and ask the students if they would change their answers based on what they have learned so far.  Following the discussion on cell theory the teacher will use the smart board to display a graphic of a plant cell and an animal cell side by side. The teacher will ask the students to identify similarities and differences in the two cells and record them in their Venn Diagram. The teacher will have the students use the interactive cell tool on the following website <http://www.harcourtschool.com/activity/science_up_close/510/deploy/interface.html>  to look up some of the organelles identified as similar and different and have the students record their function in their science journals. While the students may discover that there are many similarities and differences the teacher will focus on the following: 1) both plant and animal cells have a nucleus 2) only plant cells have chloroplasts and a cell wall. The function of each of these will be discussed.  The teacher will also use this time to perform the FACT titled “Muddiest Point”. Students will be asked to write a sentence or two about what was most confusing or difficult in the lesson.  The following section of the lesson will take approximately 15 minutes  **EXTEND:** After discussion students will view some samples of pond water under the microscope. Students will sketch in their science journals what they see through the microscope. Students will decide if they see animal cells, plant cells, both or neither in their water. Students will give reasons for their conclusions. | **Analyzing**: What similarities and differences do you find when you compare and contrast plant and animal cells.  **Applying**: Do you see anything in the pond water that could be an animal cell? A plant cell? |
| This section of the lesson will take approximately 10 minutes  **CLOSURE:** If time permits we will do the FACT “Fishbowl Thinkaloud” where we have 5 students come to the center of the room and discuss the question “How do you know if something is or was made of cells?”  At the close of the lesson the teacher will distribute a short assessment that covers the three objectives of the lesson. Students will be asked to write  1)A rule on how to tell if something is made of cells  2) Two similarities and differences between plant and animal cells  3)The three parts of cell theory | **Evaluating**: Can you write a rule for determining if something is made of cells? |

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| Adaptations to Meet Individual Needs:  **Gardner’s Learning Styles**  Visual/Spatial: Students are able to see the visuals through the microscope and the drawings of the different types of cells.  Bodily-kinesthetic: Students will be doing hands on activity to observe the different types of cells under the microscope.  Interpersonal: Students will interact with others when observing and discussing the information in the lesson.  Intrapersonal: Students will use their own knowledge and what they learned to share at the end of the lesson.  Management/Safety Issues: The teacher will explain that the microscope is a very expensive and fragile piece of equipment. The teacher will tell the students to be very gentle with the slides for the microscope, either hold them in the palm of your hand or with your two fingers, make sure to be gentle and not chip or drop the slide. The teacher will also walk around the room to observe the students while handling the slides and using the microscopes. |
| Rationale/Theoretical Reasoning:  **Common Misconceptions:**  Students tend to believe that plant and animal cells have the exact same parts that make up the insides of the cells.  <http://www.vast.org/_docs/Martin.pdf>  **Howard Gardner’s Theory of Multiple Intelligences:**  This lesson was created with Howard Gardner’s Theory of Multiple Intelligences in mind. The lesson specifically addresses visual, bodily-kinesthetic, and intrapersonal learning styles in order to help the students with varied learning styles learn about cells.  Gardner, H. (2000), Intelligence reframed: Multiple intelligences for the  21st century. New York: Basic Book  **Marzano’s Nine Essential Instructional Strategies:**  **Identifying Similarities and Differences:** stating the differences between plant and animal cells will help the students to better understand the cells and their structures.  **Summarizing and Note-taking:** taking notes notes and summarizing what the students have talked about in their discussion helps to promote the comprehension of what they have learned and they have to put it into their own words.  **Nonlinguistic Representations:** Using a Venn Diagram. The use of graphic organizers helps increase the students brain activities.  **Generating and Testing Hypothesis:** Students will discuss what they already know and will build on that throughout the lesson.  Dean, C., Hubbell, E., Pitler, H., & Stone, B. (2012). *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement, 2nd edition.* ASCD McREL |
| References: *List the references used in this lesson*  Information used for Lesson:  http://www.harcourtschool.com/activity/science\_up\_close/510/deploy/interface.html  [quizlet.com/1341037/science](http://quizlet.com/1341037/science)  <http://www.vast.org/_docs/Martin.pdf> |
| Reflections/Future Modifications:*To what extent did the class learn what you intended them to learn? What will be your next steps instructionally? What did you learn about your students as learners? What have you learned about yourself as a teacher?*  Renee: Doing the lesson demo was a great learning experience. It is one thing having a lesson on paper and a totally different thing actually executing the plan! I think that we had to condense our instructional activities so much that it might have been difficult for the students to really grasp the lesson content. I did the FACT concept cartoon, and one thing I would do differently next time, is to plan my response to student ideas. I was not intending to give explanations and answers but they just naturally came out, because I didn’t think before hand what I would say. We should have had a back up plan for the microscopes not showing clearly what we were trying to teach. We could have had a handout with pictures of good microscope images for the students to see after they looked in the microscopes. Teacher’s have to think on their feet! Some of the activities took a lot less time than we thought and we had to adjust as we went through the lesson. The Fishbowl thinkaloud was one example. We only planned for one question, but the students answered that fairly quickly, so we added a couple more questions on the spur of the moment.  Beth: I feel like preparing and completing the lesson demo plan was a wonderful learning experience. The lesson plan was one that could have very easily been a challenge but we all worked together and conquered the challenges that we faced with microscopes, slides, and overall piecing the lesson together. This lesson plan would have been a lot better executed if there wasn’t a need to condense it. The students weren’t really able to take away all the information on cells that they would have been if it had been the full lesson plan. I definitely think that we should have had a clear pictures of what the slides looked like on the microscope or if we could have incorporated a video as far as what the amoeba looked like they would have enjoyed it more. Just as any teacher has to be prepared for anything we were very on top of it when activities finished faster than what we had originally prepared for. I believe that overall we did a wonderful job with only minor bumps in the road!!  Samm: I feel like this lesson was a good learning experience for all of us in our group. This lesson wasn’t the easiest, but we somehow came across all of our obstacles. I feel like it did make the lesson somewhat harder when we had to condense so much information to a certain amount of time. It didn’t go as planned when things got finished faster than what we had expected, but we found a way to work around them. For instance, one of the activities we had planned got moved and completed sooner than we thought, however, I believe we handled it very well and redirected. As teachers we have to expect the unexpected and if something gets done before or after it should we have to know how to redirect our schedule for the lesson plan. Over all I think our lesson went pretty well because we all worked together to accomplish it.  Tabitha: I feel like this lesson was a wonderful experience for all of us as a group to. This lesson had some challenges like getting the microscopes, getting/preparing the slides, and putting all of the information together to make a lesson plan. This lesson plan would have been better if I had of condensed the slides (because I felt there was too much) and to label the microscopes properly. When the students came in to look at the microscopes it seemed like none of them knew what to do or how to draw the items that they saw under the microscope. I do believe that even though we didn’t have the microscopes labeled the right way or that there was some confusion that we has a group stepped in and did an overall pretty good task. As teachers we have to plan ahead, and that’s what we done. When the pond Amoeba wasn’t coming through the microscopes, we had a backup plan. I really like the fact that we came together as a group and accomplished the task at hand and did a pretty good job at doing so. |