

Fibonacci Sequencing Art Lesson Plan

Grade: Third		Subject: Language Arts/Literacy, Math, and Visual Arts	
Materials: Different colors of construction paper, white paper, rulers, pencils, glue, and scissors		Technology Needed: None	
Instructional Strategies: <input type="checkbox"/> Direct instruction <input type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list)		Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain:	
Standard(s) W.3.3a – Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally. 3.MD.4 – Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. VA:Cr2.3.a – Create artwork using a variety of artistic processes and materials by constructing representations, diagrams, or maps of places that are part of everyday life.		Differentiation Below Proficiency: Above Proficiency: Approaching/Emerging Proficiency: Modalities/Learning Preferences:	
Objective(s) By the end of the lesson, students will be able to identify what a sequence is by completing their Fibonacci Sequence Artwork. By the end of the lessons, students will demonstrate their understanding of measurement by measuring the correct sizes for each circle used for the artwork. By the end of the lesson, students will complete their Fibonacci Sequence Artwork using the materials provided. Bloom’s Taxonomy Cognitive Level: Remembering, Understanding, & Applying			
Classroom Management- (grouping(s), movement/transitions, etc.) After the afternoon meeting has ended, the students will move to their desks for whole group instruction. The students will be seated at their desks during the whole group lesson. If the students become distracted during the lesson, the teacher will use the verbal cue of flat tire. The teacher will say, “Flat tire.” The students will say, “Pshhh” like the tire is losing its air. When the students are working on their Fibonacci Sequence Art, the teacher will walk around the room to check the students understanding along with seeing if they need help.		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) - The students will stay seated in their desks during the whole group lesson - If a student has a question, they will raise their hand and wait to be called on - When a student is answering a question, they must raise their hand and wait to be called on and answer the question at a voice level 1 - The students must not blurt out any answers (voice level 0), they must raise their hand - The students must be at a voice level 0 during the lesson - The students will demonstrate “whole body listening” during the lesson, when the teacher is talking, and when their peers are talking - The students will respect the space they are in and their peers around them - The students will follow the directions when writing their own pourquoi - The students must participate	
Minutes	Procedures		
1-2	Set-up/Prep: The teacher will gather the needed materials for the lesson: different colors of construction paper, white paper, rulers, pencils, glue, and scissors.		
1-2	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) The teacher will say, “Today we are going to do an art project which involves sequencing. Can anyone tell me what sequencing means?” <ul style="list-style-type: none"> • Sequencing is doing things in order (step by step) The teacher will say, “When we are doing our art project today, we need to listen to directions closely as you (the students) will be following step by step of what you will need to do.”		

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12-15

Explain: (concepts, procedures, vocabulary, etc.)

The teacher will say, "Today we are going to do an art project called Fibonacci Art. This type of art involves sequencing which means there are steps we have to follow in order so we are able to complete the art project. If the steps are not followed in order, then the art project may not work which is why it is important that we are listening to the directions I will be giving in order."

The teacher will say, "Before we start our art project, we are going to briefly discuss the Fibonacci sequence which involves numbers so we are able to better understand the process of how we are going to create Fibonacci Art.

- "Does anyone know what the Fibonacci sequence is?"
 - Named after Leonard Fibonacci
 - Each number is the sum (+) of the previous two numbers
 - Begins with number 1
 - Write sequence on white board for students to visually see the sequence: **(leave on white board)**
 - 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ... ect.
 - $1 + 1 = 2$
 - $1 + 2 = 3$
 - $2 + 3 = 5$
 - $3 + 5 = 8$
 - $5 + 8 = 13$
 - $8 + 13 = 21$
 - $13 + 21 = 34$
 - $21 + 34 = 55$
 - Ect.
 - The sequence continues for forever

The teacher will say, "Now that we have discovered the sequence in the Fibonacci sequence, we are now going to create our Fibonacci Art project. There are six steps we must follow so we are able to create this project which we can see because we have six different colored pieces of paper."

- Show example (Appendix A) and reference throughout the process of stating each step
- When describing each length of each circle, model how to measure on a piece of paper by drawing a piece of paper on the white board and complete the measuring process on the "piece of paper"
- The six steps for measurement:
 1. First, take one piece of colored paper and measure so your circle is 8 inches in diameter (length) and has a radius of 4 inches (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
 2. Next, take a second piece of colored paper and measure so your circle is 5 inches in diameter (length) and has a radius of 2.5 inches (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
 3. Then, take a third piece of colored paper and measure so your circle is 3 inches in diameter (length) and has a radius of 1.5 inches (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
 4. Next, take a fourth piece of colored paper and measure so your circle is 2 inches in diameter (length) and has a radius of 1 inch (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
 5. Then, take a fifth piece of colored paper and measure so your circle is 1 inch in diameter (length) and has a radius of 1/2 inch (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
 6. Last, take your last piece of colored paper and measure so your circle is 1 inch in diameter (length) and has a radius of 1/2 inch (half). You will mark the middle of the circle then measure four inches from the middle of the circle on both sides, do this for the top and bottom as well.
- Write steps on the white board for measurement:
 - First, measure a circle that is **8 inches** in diameter and has a radius of 4 inches (half).
 - Next, measure a circle that is **5 inches** in diameter and has a radius of 2.5 inches (half).
 - Then, measure a circle that is **3 inches** in diameter and has a radius of 1.5 inches (half).
 - Next, measure a circle that is **2 inches** in diameter and has a radius of 1 inch (half).
 - Then, measure a circle that is **1 inch** in diameter and has a radius of 1/2 inch (half).
 - Last, measure a circle that is **1 inch** in diameter and has a radius of 1/2 inch (half).

While the teacher is going through the steps, **ask the students** if they are seeing the sequence of the numbers by either looking at the diameter (length) or at the radius (half).

The teacher will say, "Now that I have given you the steps in order, known as sequencing, you (the students) will now create your own Fibonacci Art."

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	<ul style="list-style-type: none"> • “As you see in my example, that is how I chose to place my circle on the white piece of paper. You (the students) can place your circles on the white piece of paper however you would like.” <ul style="list-style-type: none"> ○ Examples: <ul style="list-style-type: none"> ▪ All circles could be touching somehow ▪ Some circles are touching ▪ Circles are not touching and are spread out on the paper • Process (Write on white board if there is room): <ul style="list-style-type: none"> ○ First, measure the six circles <ul style="list-style-type: none"> ▪ Students may write the measurements on the back of each circle if they choose to help with staying organized ○ Next, cut out the six circles ○ Then, glue the circles on the white piece of paper in the order they choose to do so ○ Last, students will write their names on their art project <p>The teacher will say, “Repeat after me.” (Students will repeat after the teacher.)</p> <ul style="list-style-type: none"> • For my Fibonacci Art, I will follow the six steps for measuring my circles, cut out the circles after measuring them, and arrange and glue the circles how I would like. I will write my name on my art project.”
<p>20-25</p>	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions) The students will create their Fibonacci Art</p> <p>If the students finish early, I will have them create their own number sequence just as Leonardo Fibonacci did</p>
<p>1-2</p>	<p>Review (wrap up and transition to next activity): Have the students discuss with a peer about their artwork of how they decided to arrange the circles on their white piece of paper Have the students discuss why it is important to follow steps in order (sequencing)</p>
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <p>Consideration for Back-up Plan:</p>	<p>Summative Assessment (linked back to objectives) End of lesson:</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?): After teaching this lesson and looking back at how it went, it went alright. I did enjoy teaching the lesson, but it took me a little bit to become comfortable with teaching the lesson. I have not taught math before and integrated it with language arts and art so it was a little difficult for me to find the correct language to use to help the students better understand the content. At the beginning, I began to teach the math portion of explaining what the students needed to do to measure each circle and I could not find the right language to use so Mrs. Hoffer stepped in and helped explain it to the students which I was grateful for. Once she better explained to the students of what I was wanting them to do to measure each circle, the lesson went much better. The students began to enjoy the art lesson as they better understood of what they were supposed to be doing with each color of paper which was measuring a different sized circle on each color of paper. The students were able to follow the directions that I wrote on the white board in sequence as that was the language arts concept they were learning about. After they finished one step, they moved onto the next until all of their circles were cut out and were ready to glue them onto the white piece of paper in the order as they cut them out in. As I wrote out each step on the white board, I could tell this helped the lesson greatly because the students were able to visually see what they were supposed to be doing for each step rather than having to listen to the teacher explaining each step which helped with their reading comprehension skills. The students had to read the step then complete it as it was written. The last thing that went well during the lesson was watching the students create their Fibonacci Art project by gluing the circles on the white piece paper however they wanted to, but had to place the circles in order of how they cut them out. It was great to see how the students’ glued each circle on the paper and to hear their thinking process of why they glued the circles they way they chose to.</p> <p>From this lesson, the students learned a few new things. First, they learned what the Fibonacci Sequence is by visually seeing the number sequence written on the white board by the teacher and listening to the teacher explain the concept. From this, the students learned that sequencing is not only by following steps, but in numbers as well by seeing how the first two numbers are the sum of the following number and so on. Second, the students learned how to measure the diameter of each circle in inches by seeing the teacher model it on the white board a couple of times then measure the rest of the circles on their own. This helped me see what students were able to grasp onto the content and what they were supposed to do and what students needed some extra guidance with measuring each circle. Most of the students understood how to measure the circles, whereas a few students needed some extra guidance which helped me see their thinking process while working through it with them. Third, the students learned how to follow clear and concise directions by reading each step that was written out on the white board. As they completed each step, they moved onto the next one until all of their circles were measured correctly and then cut out.</p>	

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From this, the students were able to see a sequence writing of what to do first, next, then, and last which added to their knowledge of sequencing which they will be working on throughout the week. Lastly, the students learned how to create a Fibonacci Art project by following each step correctly throughout the art project. This helped the students learn how to look back at previous instructions after they had cut out each circle to know what order the circles needed to be glued on the piece of paper. Once the students were able to do that, their result was creating a Fibonacci art piece.

After teaching my lesson, there are a few things I would change or add to my lesson if I were to teach it again. The first thing I would change would be how I would explain what the students need to do to measure each circle. As I stated above, I struggled with finding the correct language to use to help the students understand how I wanted them to measure each circle. For this, I would become better prepared with the correct use of language such as, "First I want you to mark the center of your paper with a dot then place the 4-inch mark on your ruler below that dot. Since we are measuring a circle that is 8 inches long, I want you to place a dot on the 8-inch mark and the 0-inch mark because half of 8 is four so we need four inches in between each mark. Now that you have three dots on your paper, we need to place two more dots going vertically. Once again, place your ruler going vertically under the center dot at the four-inch mark, then make a dot on the 8-inch mark and then another dot on the 0-inch mark. Now that you have 5 dots, make a circle out of those dots." This is the language I would use or something similar to it and would continue to use when measuring the rest of the circles. The second thing I would change would be modeling how to measure two-three circles for the students then having them do the rest on their own. My original plan was to just measure one circle then have the students complete the rest on their own, but as I noticed they did not quite understand, I continued to model two more circles for them which helped with their understanding. The third thing I would change would be taking the circles from my example and placing them next to each step that is written on the white board so the students would know what size each circle is supposed to be. This would help them know that they are measuring the circles correctly and are able to move onto the next step. The last thing I would change would be writing each step on the board as the students move from circle to circle. I noticed that when I continued to write each step on the board, it became too much for some of the students and they became lost/confused of what step they were on as there was a lot of writing on the board. This will help the students not feel as rushed while working on their art project.

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Appendix A

Ms. Rebecca

