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| Teacher’s Name:  |  | GRADE: 7 |   | UNIT: 3 | Sequences | DATE: |  |
| TEXTBOOK and PAGE NUMBER:Alabikan book from page 103 - 110 | LESSON TITLE:Introduction to Growth Patterns  |
| ***CURRICULUM STANDARDS*:** 7.8.1 Extend and find missing terms in numeric or geometric patterns or sequences using words, diagrams, or symbols (term-term).7.8.3 Generalise the relationship between one term of a sequence and the next, using words or symbols. |
| ***NPST:****(National Professional Standards for Teachers)* | **[ ]  1** | **[ ]  2** | **[ ]  3** | **[ ]  4** | **[ ]  5** | **[ ]  6** | **[ ]  7** | **[ ]  8** | **[ ]  9** | **[ ]  10** | **[ ]  11** | **[ ]  12** |
| **LESSON OBJECTIVE:** Students will be able to:1. Build a pattern geometrically and numerically and describe the changes from term-term geometrically and numerically.
2. Find the next term in an arithmetic sequence.
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| **KEY VOCABULARY:** term, predict, pattern | **RESOURCES:**

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| Whiteboard ⌧  | OHP/data show ⌧  | Manipulative ❒  |
|  Textbook ⌧  | Internet/Websites ⌧  | Demonstration Tools ❒  |
| PowerPoint ⌧  | Calculators ❒  | Worksheet, Handouts ⌧  |
| Other ❒  |

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| **STARTER**  8 minutes | Let the students open the following link on their tablets:[www.shodor.org/interactive/activities/PatternGenerator/](http://www.shodor.org/interactive/activities/PatternGenerator/)Ask them to work independently on this activity. |
| **MAIN ACTIVITY :**  |
| **TEACHER’S ROLE:** | **STUDENT’S ROLE:** |  |
| Today we are going to use tiles to show patterns.**What do you think of when you hear the word pattern?** | [Accept different answers and examples: repeating patterns on clothing or in designs, patterns that change in a predictable way.] | **TIME:****10 min.** |
| [Show ppt slide of patterns.]**What is the difference between these patterns?** | [One is a repeating pattern. The other pattern changes.] |
| Sometimes we have repeating patterns in art work. Today we will talk about a special pattern called a growth pattern. These are patterns that grow or get bigger each time in a way that is predictable. We will look at the changes in the pattern in two different ways, geometrically (or how it looks) and numerically (how the number of parts is growing).Here is an example of a growing pattern that changes in a very predictable way: **How does this pattern change from one term to the next term?** | [Numerically-It is adding 1 tile each time (to the right or to the left). Geometrically -It is a growing horizontal line of tiles.] |

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| This is an example of a growing pattern. It grows in a very predictable way so we know how it changes from **term** to **term** geometrically (it is a growing horizontal line with a new tile added to the right each time) and numerically (it adds 1 each time). Why isn’t this a growing pattern? | [This pattern grows numerically (adds 1 each time), but it does not grow visually in a predictable way so we will not include it in our growth patterns.] |  |
| Here is the beginning of a new pattern.  Questions to ask as students are working:*Term-Term* 1. **What is changing?, What would the next term look like?**
2. **How is your pattern changing from term to term?**
3. **What steps are you doing over and over?**
4. **Could I build a different pattern that changes the same way numerically?**

*EXTENSION: Position-Term*1. **What will happen in a later term?**
2. **How would you describe the 20th term? What will it look like? How many tiles will it have? How do you know?**

[Look for different participants (2) to share their patterns on the board. Look for a pattern with a constant change from pile to pile (EXAMPLE: 1, 3, 5, 7…)and a pattern that does not have a constant change from pile to pile. (EXAMPLE: 1, 3, 6, 10…)] | **Activity Directions, Part 1: “Growth Patterns, Introduction”**1. **Use your pattern blocks to build this pattern.**
2. **Build the 3rd and 4th term of this pattern.**
3. **Build this pattern in as many ways as possible.**
4. **Record your patterns:**

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| 1 | 2 | 3 | 4 | Journal |

[Students that understand will build a pattern that changes in a predictable way numerically and visually and they will be able to describe this. Focus on students understanding term-term changes.]Numerically-The pattern is could be adding 2 each time, adding x 3 each time, or adding +n (the term number each time). Geometrically-There are many more ways that the pattern can be built. Check students work to make sure that the pattern is predictable.Students might be able to see that a pattern could look very different from another pattern visually, but be the same numerically.] | **20 min.** |
| Questions to ask as students are working:[See above questions.]Is the pattern predictable, geometrically and visually? | **Activity Directions, Part 2: “Growth Patterns, Introduction”**1. **Fold back the paper so that only 1,2,3 show.**
2. **Exchange papers with a different group.**
3. **Build the 4th term. Check your answer.**

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| 1 | 2 | 3 | 4 | Journal |

 | **20 min.** |
| Discussion:Draw the first 2 piles of one pattern on the board and choose a participant to draw the 3rd pile according to their pattern. {constant change from pile to pile (EXAMPLE: 1, 3, 5, 7…)}**Ask another to draw the 4th term.** | [Student should draw the correct 4th term.] | **20 min.** |
| **Who can describe the change from term to term?** | [Be sure that participants describe the change geometrically and numerically so allow different participants to share their way of describing the change. There might be different ways to describe the geometric change because different participants may see different tiles being added each time for the same pattern. Take time to understand their thinking. Let them come to the board and show the class.]

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| Repeat with another student with a 1, 3, 5…tiles.1. **Who can draw the 4th term?**
2. **What is different about these two patterns? What is the same?**
3. **Who can describe the change from term to term?**
 | [Numerically, they are the same with a constant change of +2, but geometrically they are different.] |  |
| Repeat with another student with a 1, 3, 6, 10…pattern.1. **Who can draw the 4th term?**
2. **Who can describe the change from term to term?**
3. **How is this pattern different from the other two patterns?**
 | [This pattern does not have a constant change from term to term. It is growing more quickly.] |
| [As students are writing, write down your own thoughts about the lesson and students’ understandings.] | **Journal Writing** 1. **Choose 1 pattern that your group did. Draw the 5th term.**
2. **Write as much as you can about the pattern based on what you learned in this lesson.**
3. **Can you describe the 20th term?**

(pre-assessment for the next lesson)[Students that understand will write about how their pattern changes geometrically and numerically. They might write about the different ways that someone might see the pattern growing. They will describe the 20th term geometrically and numerically.] | **10 min.** |
| **CLOSURE:**10 minutes | [Summarize student ideas.]In this activity, we practiced representing and describing patterns geometrically and numerically from term to term.Think about how much you understood today’s lesson assess yourself.**Self/Peer Assessment:**1. Assess whether you achieved the objectives.
2. Write how you will be successful in the next lesson.
3. Review your partner’s journal and think about how they worked today..
4. Assess whether your partner achieved the objectives.
5. List suggestions for them.

[Accept many answers. Students may write questions that they want to ask or include study habits that they want to improve for further actions to take. They might not be able to tell if their partner could build a pattern from the journal, but they can ask them or think about the patterns they built earlier in the lesson.] |
| ***DIFFERENTIATION / ACCOMODATIONS***Process differentiated by learning style.Tactile: Students work with tiles to build patterns.Visual: Students draw and look at pictures that represent the work they are doing with tiles.Auditory: Students discuss their work and listen to the teacher. |
| ***ASSESSMENT STRATEGIES:***

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| **❒ Teacher Observation, Conferencing with Student**  | **❒ Criteria based assessment** | **❒ Quiz** | **❒ Work from textbook/booklet** | **❒ Project** |
| **❒ Peer assessment** | **❒ Self assessment** | **❒ Pre/post test** | **❒ Investigation** | **❒ Activity Sheet** |

 | **HOMEWORK:** |
| ***METHODOLOGY (TEACHING STRATEGIES)***

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| ❒ Brainstorm Mind map | ❒ Student writing | ❒ Picture Photo activity | ❒ Think-pair-share | ❒ Role Play | ❒ Research | ❒ Problem Solving | ❒ Venn diagram |
| ❒ Shared writing | ❒ KWL chart | ❒ Graphicorganizer | ❒ Cooperative group activity | ❒ Learning stations | ❒ Modeling | ❒ Student reading | ❒ Jigsaw |
| ❒ Shared reading | ❒ Group debate or discussion | ❒ Projects | ❒ Other  |  |   |  |

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