Lesson Plan Template
Date: 01/29/2020

Grade: 3rd	**Subject:** Math
Materials: Tetrominoes, graphing paper, coloring utensils,	**Technology Needed:** None

Instructional Strategies:

☐	Direct instruction	☐	Peer teaching/collaboration/ cooperative learning
☐	Guided practice		
☐	Socratic Seminar	☐	Visuals/Graphic organizers
☐	Learning Centers	☐	PBL
☐	Lecture	☐	Discussion/Debate
☐	Other (list)	☐	Modeling

Guided Practices and Concrete Application:

☐	Large group activity	☐	Hands-on
☐	Independent activity	☐	Technology integration
☐	Pairing/collaboration	☐	Imitation/Repeat/Mimic
☐	Simulations/Scenarios		
☐	Other (list)		
Explain:			

Standard **3 MD.8** Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths. Find an unknown side length. Exhibit rectangles with the same perimeter and different area or with the same area and different perimeters.	**Universal Design for Learning** **Below Proficiency:** Students struggle with understanding tetrominoes and how one needs to rotate and move the tetrominoes on the graphing sheet for it to fit. These learners will be paired with Above Proficient learners.
Objective By the end of the lesson, students will understand how to fill in a 10 by 8 graphing paper sheet with (one of the 5) tetrominoe shapes.	**Above Proficiency:** Students understand the complexity of rotating and moving tetrominoes to fit on the graphing sheet. Pair below proficient workers with them. **Modalities/Learning Preferences:** • **Visual:** The students will use graphing paper and colors to mark the places they have already filled with the tetrominoes • **Tactile :** the students will be working with tetrominoes- making shapes of four bocks
Bloom's Taxonomy Cognitive Level: Comprehension	
Classroom Management- (grouping(s), movement/transitions, etc.) Students will start at their table seats in partners. (Listening quietly to directions (level 0) While the overview of tetrominoes is taking place Students will continue working with partners and groups for the rest of the lesson- at a level 0 unless instructed otherwise Whole Group discussion will be done with students at their tables Students will get into table groups to create the 5 shapes Students will begin filling out their worksheets to and tetrominoe sheets with partners or individually Reflection done whole-group with the same expectations	**Behavior Expectations- (procedures/expectations specific to the lesson, rules and expectations, etc.)** Students will start at their table seats in partners. (Listening quietly to directions (level 0) While the overview of tetrominoes is taking place Students will continue working with partners and groups for the rest of the lesson- at a level 0

Minutes	Procedures
	Set-up/Prep before lesson:
3 min	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Put the students into partners: Give the students a handful of the tetrominoes. Ask students to not take them apart yet and just look at them. Can anyone tell me what these groups of blocks are called? **Answer: they are called tetrominoes**

	Ask students if they can see a similarity in the tetrominoes (even though they're different colors) **Answer: they are all made up of four blocks** **Tetrominoes** are called this because **"tetra"** the beginning of the word means **four**.
15 min	**Explain: (teacher-led)** Explain that we are going to be working with tetrominoes, or **blocks of four today** Explain that they will try to make as many shapes as they can **(out of the four blocks)** with their partners **HINT: There are 5 ways to get this shape. It's okay if you don't get them all, just try to make as many as you can!!** "Okay students now we know that tetrominoes are made of four blocks. There are more ways to build tetrominoes besides this one. With your partner, you will try making as many different groups of four blocks, that you can" You should be checking with each other to see if your partner's shapes are **congruent** to your shapes Does anyone know what the word congruent means? It means that your shapes are the same size and shape. (show them the example of two blocks of four that are the same. **See they are the same size and shape- that means they are congruent** **Tell students they should turn and flip their tetrominoes to make sure they don't have a congruent shape. Give example of a straight tetrominoe being an X.** Once students think they have found all the shapes have one student volunteer to share one of their shapes Have students raise their hands if they got the same shape. Keep going until they get through the shapes and **make sure to ask if the shapes are congruent** (or the same shape and size). **Have them explain themselves and their answers!** **If they don't get all the shapes – tell the students the shapes by drawing pictures of them on the board**
15 min	**Elaborate: (concreate practice/application with relevant learning task -connections from content to real-life experiences)** Students will now sit in their table groups and work together to create a set of tetrominoes of 10-15 in each of the 5 shapes (L's, T's, Z's, I's and Squares). After they do this, they will work **individually or with a partner** to fill up their graphing sheets with **one** tetrominoe shape **only** There should be **no gaps** in between your blocks, otherwise you may not have a perfect fit. Must also be **flat** and **stay inside the lines** of the graph paper .

	They won't have enough shapes to fill up the whole graphing sheet!
	Ask the students to fill out their sheet from page 234- to decide if they think the tetrominoe will fit or not
	Students can build more tetrominoes if they can't decide if the shapes will fit or not
	Student' may also use their colors to color the spaces that they have already fit shapes on and continue using more shapes. **If you use the coloring method- you must color each shape section a different color so you don't get confused.**
	Tell students to move onto a new shape once they have fit one shape into the graph.
	Closure (wrap up and transition to next activity):
	Students will likely not finish the activity completely, have a group discussion about if anyone had their shapes fit, and how they got the shapes to fit into the graph

Formative Assessment: (linked to objective, during learning)	**Summative Assessment (linked back to standard, END of learning)**
• **Progress monitoring throughout lesson (document of student learning, data collection)** Watching to see if the students are placing the blocks randomly or are thinking strategically to see if they will fit	See how many students were able to effectively use the tetrominoe graphing sheet and reflection sheet- to assess comprehension
Asking students if they think the tetrominoe shape will cover the graph or not and why they think that.	

Teacher Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

Reflecting on this math lesson for tetrominoes, I feel that the students had a full understanding of what a tetrominoe was and the different ways you can make a tetrominoe. I think that letting the students play with the tetrominoes (groups of four) to find the 5 different types of tetrominoes by themselves helped the students build concrete understanding of the shapes they could create.

While I taught the lesson, questions would come up, which reminded me to mention things I had forgotten to mention. For instance, it was in my lesson plan to mention that the tetrominoes they created, needed to be able to lie flat on their tables. Though, as I taught the lesson, I forgot to mention it. One of the students brought a shape up to me as one of the 5 shapes. I used this as an opportunity to tell the students (apologetically) that I forgot to tell them about this rule. I explained to them that if the shapes don't lie flat on the table, their may be "hidden" congruent shapes, which means the shape that doesn't lie flat on the table is not one of the five tetrominoes. I showed them that if you rotate this shape (that doesn't lie flat) so that it does lie flat, it is congruent with one of the tetrominoes that we already found. This part of the lesson was humbling for me. I recognized that I need to make sure to take time to go over necessary rules, to reduce student confusion.
I think drawing the 5 tetrominoes on the board helped the student's picture which tetrominoes they could use for their final project of filling up the graph paper. Also, giving the tetrominoe shapes was helpful for naming shapes later in the lesson. It also made the lesson more engaging because we named the blocks based off of what they looked like.

Another area which I think I could improve my lesson, is by explicitly telling the students what they would be doing with the knowledge of tetrominoes, at the beginning of the lesson. I began the lesson speaking about the meaning of tetrominoes and explaining the first part of the activity, but I didn't explain that they would use these tetrominoes to fill the area of a sheet of graphing paper. Because I neglected to explain the purpose of learning the tetrominoes (at the beginning of the lesson), there was some student confusion later on in the lesson.

One part of the lesson that I felt helped the students learn how they were supposed to fill in the graphing sheets with tetrominoes, was where I had students come up to the projected graphing sheet to draw the shapes. This provided many "teachable moments" because sometimes they filled out the graph on the board with faulty methods. For instance, one student

came to the board to draw their shapes as an example, and they drew two shapes next to one another, that directly left a space on the graph. (I had previously told the students that the shapes had to fit perfectly with no spaces). I asked the students if they saw anything wrong with how the shapes were put together. They understood the problem and one student volunteered to show the class an alternate way of using that same tetrominoe to make sure there were no spaces on the graphing paper. This was a great learning opportunity for the students to see a wrong and right way to fill in the graph paper.