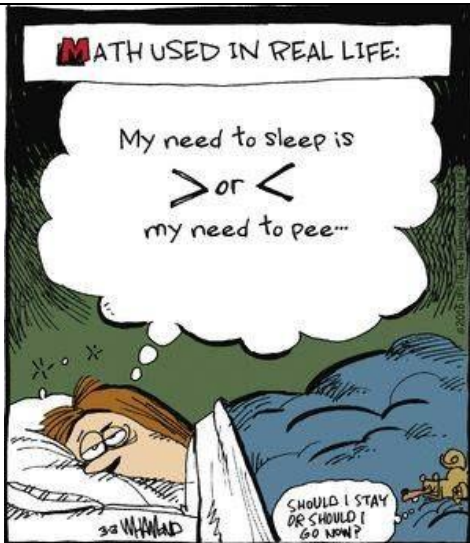# Lesson Plan Template

Grade: 9	Subject: Algebra 1-Multiply/Divide to Solve Inequalities
Materials: Notes Foldable, Stations around the room, stations sheet to show work on	**Technology Needed:** Projector, Calculators, phone/computer if completing activity online

Instructional Strategies:	Guided Practices and Concrete Application:
☐ Direct instruction ☐ Peer teaching/collaboration/ cooperative learning ☐ Guided practice ☐ Socratic Seminar ☐ Visuals/Graphic organizers ☐ Learning Centers ☐ PBL ☐ Lecture ☐ Discussion/Debate ☐ Technology integration ☐ Modeling ☐ Other (list)	☐ Large group activity ☐ Hands-on ☐ Independent activity ☐ Technology integration ☐ Pairing/collaboration ☐ Imitation/Repeat/Mimic ☐ Simulations/Scenarios ☐ Other (list) Explain: Students will work with a partner at each station. (Or alone if partner is absent)

Standard(s) HS.AREI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **Objective(s)** Students will, at the end of the 9th grade Algebra 1 period, be able to solve inequalities involving multiplication and division, then be able to graph the solution set. **Bloom's Taxonomy Cognitive Level:** Apply, Analyze	Differentiation **Below Proficiency:** Students who struggle with solving and/or graphing inequalities will be encouraged to ask questions and will receive one on one help from the teacher. **Above Proficiency:** Students who excel with solving and graphing inequalities will be expected to complete most, if not all, of the activity. These students will also have the opportunity to help peers who are below or approaching proficiency. When aiding peers, students are not to just give the answer, but guide peers on the right track. **Approaching/Emerging Proficiency:** Students approaching/emerging proficiency will work on the activity and can ask questions when confusion arises. **Modalities/Learning Preferences:** Students will be allowed to work with a partner of their choosing or work independently. Students can choose to do the activity around the room, but, if necessary, can work on the activity at their desk having it pulled up online.
Classroom Management- (grouping(s), movement/transitions, etc.) After finishing notes as a class, I will explain the stations activity. Every student will get an activity sheet to do their work on and all students must show all work. Every station must be completed. Then they will receive the activity sheet. Students are then free to partner up and work together. All students will remain in the classroom during worktime. There is a time limit at each station, so students need to be on task. Voice levels during worktime need to be low.	**Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)** Students will know the classroom routine of entering the classroom and finding their assigned seats, as well as taking out notes. Phones are to be put away during notes and work time. Students will be expected to take notes and stay focused on the activity until the end of class or completion of the activity. All work is to be shown on the worksheet or scratch paper. Bell dismisses the class, no congregating at the door before the bell rings.

Minutes	Procedures
75	**Set-up/Prep:** Walk through notes and examples, create stations to be posted around the room, create sheet as workspace for stations, create answer key of stations activity, print stations to be posted and print worksheet, create additional worksheet of more challenging problems, partners in advance by placing sticky notes on students' desks before class (top name listed gets sticky note with partner's name and station # to start at)
2	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Start the class by asking how everyone is doing and greeting students as they come into the classroom. Before beginning notes, I will introduce that we are continuing our content on inequalities and ask students to get their notes foldable out. While students get their notes, I will project this image on the board.

Comment and say something like 'See?! You do use math in real life!'

Then I will take the picture off the screen and use the overhead camera to project my notes foldable onto the screen so students can see how I am filling out my notes.

15	**Explain: (concepts, procedures, vocabulary, etc.)** *Allow students enough time to write notes down as we work through the notes as a class.* Students have already worked with solving inequalities with addition and subtraction, so I will reflect on that and recognize that they know how to do that. Then I will explain to them that we are going to be solving inequalities using multiplication and division. First, we will fill in the blanks at the bottom of 'Solve with single step' page to explain that we have to change the inequality sign when multiplying and dividing by a NEGATIVE number. 'Remember to change the inequality sign when you <u>multiply</u> or <u>divide</u> by a <u>negative number</u>!!!' Then, we will walk through the four examples in the foldable of solving and graphing. *see my filled in foldable Make sure to emphasize that we use the inverse operation to solve and to watch carefully for negatives! When graphing, we first mark the point that x is inequal to, determine if it is an open or closed dot, then decide which way our arrow will go on the graph depending on the sign of the inequality. After the four example problems, we will move to the top of the page to describe and correct the error. *see my filled in foldable Finally, we will match the remaining two graphs to the inequality on the top left of the page under 'Test Your Knowledge'.
20-25	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** I will leave my completed notes projected on the screen so students have the chance to fill in anything they may have missed while we went through the notes. I will ask "Are there any questions on how to solve inequalities using multiplication and division?" and I will reinforce "What do we do to the inequality sign when we multiply or divide by a negative?" (Looking for a response of 'Flip the sign.') Then I will explain the Stations activity: "There are 12 stations posted around the room in which you have to solve and graph inequalities using addition, subtraction, multiplication and division. Read the directions at each station and make sure you answer the whole question. You must complete every station and <u>show all your work on this sheet</u> (show them the activity sheet of their workspace)." "Here's the catch: You will have 90 seconds at each station before I say 'ROTATE' and then you will rotate, clockwise, to the next station. Stay focused at each station so you do not run out of time. If you don't finish at a station, it is up to you to complete it at another time, and you must move on to the next station. I recommend writing the problem down first in case you have to go back later to finish it." "If you finish at a station before time is up, stay at that station, please don't distract other groups, and wait until I say rotate before moving on." "You may want to use a notebook to put your paper on as something hard to write on while walking around the around the room." "You will be working with a partner that has already been assigned. Some of you have sticky notes on your desk with your name and a classmate's name as well as a number. That is your partner and the station you will start at." "But wait! There are 26 of you, in 13 pairs, so there should be another station, right? The 13th station is ME! At my station I will ask you some questions to test your knowledge about inequalities. While you are at my station, you can also ask me any questions you have on any of the problems you've seen so far." "Your job right now is to find your partner, both of you grab a worksheet and head to your first station. Wait for me to say go and start the time!" Then I will pass out the stations activity sheet and project partner pairings and what station each pair will start at.

	At my station, I will ask questions like: "What do you do when dividing or multiplying by a negative?" "What is an example of an inverse operation?" "What is the inverse operation of multiplication? Subtraction?"
	When the final round of stations is completed, I will instruct the students to keep their worksheets until test day.
3	**Review (wrap up and transition to next activity):** When there are about 5 minutes left of class, I will ask if there are any other questions or major confusions the class has. If students do not finish the worksheet, it is homework (stations will be posted online) and needs to be turned in at the end of the unit, prior to the unit test. The bell dismisses the class, but students are not to gather at the door.

Formative Assessment: (linked to objectives)

   Progress monitoring throughout lesson- clarifying questions, check-

   in strategies, etc.

During the Stations activity, my station will be me checking in with students to see if they understand by asking questions to test their knowledge. My station will also be a chance for students to ask any questions they have about the content.

During stations, if the same question keeps occurring from multiple students at my station, I will regroup the class at the end and go over that specific question with everyone to help with the confusion.

   Consideration for Back-up Plan:

If students are not on task when working with a partner, the students will be asked to have a seat and complete the stations online, by themselves.

If a student can't do the stations physically around the room, the stations will be posted online for them to do while seated at their desk.

If someone's assigned partner is gone, they can work individually, or they will join another pair to make a group of three. (Depends on who the student is)

If 90 seconds is not enough time, reassess in the moment and allow up to 2 minutes instead.

If there is time left at the end of the period, the Percent Exit Ticket will be given (prior lesson).

Summative Assessment (linked back to objectives)

   End of lesson:

N/A

   If applicable- overall unit, chapter, concept, etc.:

Unit test will be given.

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

*Prior to teaching the lesson, I created a key to have at my station to answer any questions students have. When making the answer key, it took me 12 minutes to work through all the problems, so about 60 seconds at each station. It may take students longer to do these stations, so in the activity I have given them 90 seconds at each station.

During notes for this lesson, keep students engaged by posing questions for them to answer as we work through the notes together. Keep students on track and move at a consistent pace through the notes.

Overall, I think the activity engages students and increases understanding of the concepts. However, there were a few things to be adjusted or considered. I am not sure how to feel about the 90-second time limit. Some students needed more time, some didn't need as much time; and it also depended on the station and what was being asked. To address this concern, a bonus question could be added onto the lower-level stations for those students who finish before time is up. The bonus question would not be required but would be an option for students to challenge themselves.

I liked the 13th station where students were with me and could ask questions or I would challenge their knowledge of the content. It was nice to be able to check-in with each student and check for understanding, but by me being in that station, I was unable to walk around and help students when confusions arose in the moment. Further, by being in a station, I was unable to employ classroom management and ensure students were on task. To address these concerns, a few more stations could be added in so there are more stations than pairings. This would provide an opening in my station periodically which would allow me to observe and check in with students at various stations.

If there is time remaining after all students have finished the activity, review concepts, such as multiplying fractions, that caused common confusion for the students.

Expectations for graphing technique on a number line were not discussed and reviewed with the students, so various graphing techniques are seen in student work. However, after referring back to the standard and objective, graphing technique is not the main focus and can be addressed in a later lesson.