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0 Kindergarten but done with 1st grade RTI students	The students struggled when the answers were written first in the equation. There was continued confusion with part-part-whole relationship. Ten-frames and one-to-one correspondence was also an area of struggle.	The students were given layered card sorts for figuring out equations and asked to find equal equations. The students had to explain why they partnered cards the way they did.	The students continued to struggle with reverse equations. They didn't seem to pay attention to the signs when the saw the same numbers written in an equation.	We will continue to work on reversed order and matching numbers. In whole class they will be working on determining an unknown factor.	Increase the size so that the students can physically could the objects by touching the dots.
3 - Problem Solving	Students were adding, subtracting, or multiplying given numbers. Two students who represented with pictures or table did not follow snails path to the end, one student did not take into account the snails slide at night	How far does the snail travel in one day? What sort of picture could you draw that might help you? Does the snail always move forward?	Students who determined the snail moved forward 1 foot per day did not recognize the snail would be out on the 8th day and therefore would not slide back, Students had difficulty representing the data in a picture form. Students did not take into account the slide of the snail. Students had difficutly determining a problem strategy that would be effective to solve the problem	Continue modeling and decomposing word problems to pick effective strategies for solving based on the task. Continue to teach/model determining what the problem is asking.	Problem solving needs to be scaffolded to reach this level of problem. Starting with single step, decomposing problems, problem solving strategies, determination of best strategy to use when solving a word problem.
3 Multiplication	Students had a difficult time with some of the terms like area model and equal groups.	I asked students what they thought it meant. Many students had an understanding of the concepts but were not familiar with the terms.	Students were able to complete the tasks with very little effort or discussion.	The classroom teacher wanted to continued with the task using additional facts.	No suggestions.
5 - division and interpreting remainders	Students were not able to identify correctness on question 1 (Sam and Julie) because the methods looked differently than they were used to using. Students were not sure how to interpret remainders. Explanations lacked detail or understanding.	Where did 14 come from (Sam)? Why subtract 70 (Julie)? How do they use place value to solve? How can you check to see if your answer is correct? What does the remainder represent and what does that mean?	Students still had difficulty with the format of long division. Although students were able to use long division, they were not able to connect Julie's example because of this difference. Sam's example still proved difficult to explain although students we able to identify as correct because of the final answer.	Discussion as to how students achieved the correct answer through the examples. Even though it may look different, they did get the correct answer, so how did that happen. Provide examples from their classmates and do the same task.	Mix an incorrect answer in the examples. Have students label the parts of the division problem in each (quotient, divisor, dividend, remainder). Verbiage in explanation of remainders, "rounded the answer up" changed to "round quotient to next whole number"

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5 th Grade	Student explanations were lacking. Students were confused by the format of Sam's and Julie's method of solving the division problem. Looking at all of the ways to solve the problem, deciding which are correct and which are incorrect, choosing a method and solving a problem using that method, writing a division problem for a story, solving the problem and deciding what to do with the remainder is a lot for one task.	What is division? What does it mean? If we are dividing by 15, what does that mean (guided discussion to help students understand that they are taking away 15 each time)? Which method is most like the traditional method? Partial Quotient method?	Student explanations were still lacking on post assessment. Deciding what to do with the remainder when reporting it as a fraction or a decimal and when this is appropriate. Students need a deeper understanding of what division is.	Teachers are always working to help students explain their thinking (in writing). This is an area of need for us and we will continue to work on this. A focus will need to be on what to do with the remainder. Another next step would be to go through the entire FAL together and discuss each problem, how it works, what the problem would look like for each story and more discussion of what to do with remainders.	Next time, I will copy the students cards in black and white and try to take away the shading. I think the colors provide too much guidance for the students on this task. I think (for time purposes) I will divide the task into two parts and complete numbers 1 and 2 in one session and then numbers 3 and 4 in another.
6 grade designing candy	Not drawing a net of the 3D figure to make the design. Not putting any dimensions into the design to prove it will work.	How could you prove your design will work? How could you show what your design looks like 2D rather than 3D?	Still no proof with actual figures. Not including pieces to actually create the box.	Going back and having students show their work and provide evidence. Providing tasks that include all of the different pieces	Provide a better example of a box .... Read through the task more thoroughly with them to make sure reading is not an issue.
6-8 - Baseball Jerseys	Some students forgot the initial fee for the second company. Others started at 1 or 0 for the number of jerseys but mixed up the cost appropriate for that value.	Is there an initial fee? How much does it cost per jersey?	After students were in groups and worked to help each other, they cleared up misconceptions. In part 2 students needed to find a slope and y intercept that would fit the data of never being more expensive or less expensive than the other two companies.	Working with systems of equations in relation to the two equations.	More time was needed than stated.

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6-8 Multiple Representations of rational numbers	Students were not able to order decimals and fractions. Most did not remember strategies since they were lacking a strong conceptual base with these concepts. For the decimal portion, most students were able to select 0.04 as the smallest, but the rest of the numbers do not seem to have any rhyme or reason for why they placed these numbers in order.	Based on the misconceptions, I prompted students to think back to strategies they learned in the past about ordering fractions and decimals. We also talked about the difference between 0.04 and .4 to think about the meaning of place value.	Students did much better on the post assessment since it was a duplicate of the actual cards. They were able to struggle through the comparing, but I am not sure that if given different decimals and fractions to match and order that they would be able to transfer their knowledge. Maybe having a different post assessment with different values would show that the students could apply what they learned instead of just remembering the correct answers from the activity.	Since this FAL was completed with 6, 7, and 8th grade students, it is apparent that students have not transferred the skills learned in earlier grades to complete this activity. With that being said, it is apparent that students are taught procedurally rather than developing a deep understanding of concepts.	I made changes to the activity itself to allow for more small group discussions. Students consider their results with other pairs which created a more comfortable environment to challenge each other's thinking. I also used large cards of the small cards to create a more dynamic review and discussion of the ordering of the card piles. This was more engaging then placing the cards on posters and doing a gallery walk type review. With the large cards, I had one class tape the cards on the board and sort, and then resort as needed. I also had students create a life-size ordering of the fraction and decimal cards (they did not sort the picture cards, but match them up once we had the fraction and decimals in order.

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7 - Interpreting/Evaluat Expressions	Students showed strong evidence of being able to trranslate words to algebra for the most part. The main misconception occurred when the phrase suggested that something had to be done first followed by another operation. This was supported by the card sort activity - stage 1 - matching words and expresssions. Students were able to recognize when expressions are equivalent if they can use properties or rules that they recognized (distributive property, etc). When confronted with an expression that didn't seem to follow the rules, they failed to realize that by simply substituting a number into the exprssions, they could easily decide, When evaluating expressions, students didn't seem to have the common difficulty of forgetting to do multiplication whne substituting numbers in phrases such as 3x, but difficulty with order of operations seemed to be a problem. When confronted with tables and asked to match exprssions to tables, students were able to do so when all the cells in the tbales were filled in and the numbers	Do the words suggest that you shoudl do one operation before another? How can you tell this? Are there words to suggest this? Words to expressions Does order make a difference in this expression? How do you know? Read the expression again and pause when you see the word THEN. Does this change what you think the problem is saying? How so? Listen to these 2 expressions. Are they the same - why or why not" Evaluating How did you determine this answer? Does this make sense based on what you already know? Look at this example. Here is what Bob did? Do you agree with this? Why or why not? Equivalent expressions So you say these expressions are the same. How can you show me this is true? I see you based your answer on the distributive property. Can you tell me what the distributive helsp us to do? How would that work in this problem?	Although we are not completely finished with the post assessment, it seems that students are still having difficulty when the table is given but nor complete.	Revisit similar problems. Extend the lesson to deal with area models. This was not appropriate at the time I did it. I will save their work and bring it out again when we come to this concept later in the year.	Allow plenty of time for the group activity. The first part went quickly but make sure you have students justify their pairings and have other students who have found the correct answers do dome questioning as well. The area portion was challenging for several of my students.

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7 - Interpreting/Evaluat Expressions	filled in and the numbers allowed them to see the rate of change clearly. However, if cell elements were missing or the numbers skipped so that the rate of change was dificult to find, students needed prompting to try substitution to decide. They almost acted as if this was "cheating".	This problem doesn't look like anything we've done before, but I know you can tell the expressions are the same. Is there anything you can do to see what answers these exprssions would yield?	Although we are not completely finished with the post assessment, it seems that students are still having difficulty when the table is given but nor complete.	Revisit similar problems. Extend the lesson to deal with area models. This was not appropriate at the time I did it. I will save their work and bring it out again when we come to this concept later in the year.	part went quickly but make sure you have students justify their pairings and have other students who have found the correct answers do dome questioning as well. The area portion was challenging for several of my students.
7 - Solving Linear Equations in One Variable	That you could get a larger answer when dividing (were not thinking about negatives) Like terms - tried combinig unlike terms	"What about a negative number? Could you use that?" "Is that ALWAYS true? Have you tried a variety of numbers?" "You have found one solution, but does that mean that it is true for everything?" "How can you show that the value of x does NOT satisfy the equation?"	If one value made it not true, then the equation was NEVER true. And, if there was 1 value that made it true, they assumed that it was true for every value. We had to stop and address this during the lesson. Incorrect distribution. Reversing the order of numbers in a division equation.	Review of the distributive property and evaluating equivalent expressions. Include more rational numbers - review what they mean and how to work with them.	Stress that they need to prove/explain for each one.
7 -- Steps to Solving Equations	Just one way to solve the problems. Not matching an equation with the problem and/or diagram.	Why do you think that there were two slips that had the same answer? Could you find a second way to solve the problem coming up with the same answer? How did you know to do that?	Dividing by the coefficient of the sum prior to using the Distributive Property.	Moving the students who saw that they could divide by the number outside of the parenthesis than just using the Distributive Property. Working with the students that struggled with setting up an equation from a word problem. Could you divide when the equation doesn't have the Distributive Property in it?	Setting up the rest of the Card Set: Steps to Solving - putting the equation work for all of the equations?
7 grade increasing and decreasing quantities by a percent	%change 6% = .6	Does your answer make sense? How? Look at a simpler number to make connection. If I take off 20%, what percent am I paying?	Still some with percent change, #4 still a problem.	More exposure to what percentage really mean.	This lesson takes a lot of prep work! Too many cards to cut!

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HS Algebra 2, Quadratic Functions	1. Students didn't realize that the different forms of the quadratic functions give different information about the graphs of the functions. 2. Students thought the y-intercept had to be the vertex.	1. What information can you get about the graph from this form without manipulating the equation? 2. Is the y-intercept the maximum (or minimum) of the graph?	Students still tried to manipulate the equations to put them in a form they were more comfortable with.	Concentrating on finding the y-intercept from standard form. This is very easy, but we had devoted much more time to max, min, vertex, and x-intercepts.	
HS Algebra II Defining regions using inequalities	use guess strategy rather then most efficient method insufficient explaination	Can you think of a quicker way to find the location? How can you use the graph to locate the treasure?	Students still lack the basic skills of graphing lines and evaluating a function for a given point. Students continue to struggle with explaining why.	Continue working on basic skills via bell ringers. Continue to show good examples of explanations and to provide opportunities for students to write explanations.	Instead of shading to eliminate answers shade possibilities one color and non possibilities another. To differentiate, have struggling groups list the possible points and eliminate as they work through the game
HS Forming quadratics / Grade 10	-no clue that graph can be expressed using an equation in different forms. x^2-6x+8 (x-4)(x-2) (x-3)^2-1 -different forms of equations gives different information ie standard/ factored/ vertex	-how are the equations connected/ how are they different	combining info from different forms example (0,5) and min of (3,-4)	need further work on combing equation forms. apply "situations" to the graphs and equations.	

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HS grade 11-Representing Polynomials	I assigned the pre-assessment on a day there was a substitute, so they were essentially blank, maybe a big "I DONT KNOW!.... YOU DIDN'T GO OVER THIS!!...WE HAVEN'T LEARNED THIS" I do believe, if I were present, the responses would not have been much better. The idea would be for the students to use their knowledge from quadratics and factoring from quadratics. The students would be perfectly capable of doing this, but maybe not on just one isolated assignment.	I approached the students with questions that requires the students to take more of personal authority, such as them CREATING an equation with such and such key features of the graph. I think simply smaller chunks of more independent based problems where there is no one "correct" answer, they are learning how to take more of an initiative for independent thinking.	The lesson went very well, there was some productive struggling! The post assessment posed more questions (that I didn't quite get to during the discussion) but I think that I gave the students a great opportunity to think about those problems. I think I can hold another discussion to address the problems.	I saw a huge difference with this FAL with the student performance and their willingness to approach the problem.	
HS11-12 Calculus	Knowing the difference between tangent and secant lines and the notation used for both. Also, students were having trouble with what the question was looking for in the solution.	I gave the students three different questions that had the same concept but asked in a different way.	Students understood the notation better and also understood the questions.	Continue with this concept in real world problems.	
Sorting equations and identities 12th transitional math	That 2x+3=2(x+3). The application of the distributive property was the greatest source of error	The discussion between the students moved a lot of the learners forward. After rather spirited discussions, most of the misconceptions were corrected	Very few for computation wise. Most of the problem was in the explanation of the identities	Students will have further study in the how and why identities work	After the students sort the cards, allow time for student discussion . Do not just give the answers....make them prove their answers