

I. What do we want to learn from this lesson? (*Research Lesson Goals for Teachers*)

- ❖ USE PART-TO-PART RELATIONSHIPS TO FIGURE OUT THE WHOLE
- ❖ A CLEAR UNDERSTANDING OF HOW ONE WHOLE CAN BE DIVIDED AND ITS VALUE REPRESENTED

II. The overarching Lesson Study goals are:

- ❖ TO SEE IF THE STUDENTS ARE RISK TAKERS AND CRITICAL THINKERS

Steps of Research Lesson	Students	Teacher	Evidence of student learning/engagement	Observer’s Comments: Things to think about for next time
<p>Building a context for the lesson (<i>Connecting to meaningful things or previous lesson</i>) 4 X 4 GRIDS</p> <p>1. EQUAL DIVISION OF THE GRIDS TO INCLUDE THE FOLLOWING PORTIONS: HALVES, FOURTHS, EIGHTS, AND SIXTEENTHS USING BOTH VERTICAL, HORIZONTAL, AND NON VERTICAL/HORIZONTAL LINES</p> <p>2. RECORD WAYS TO DIVIDE A WHOLE INTO HALVES, FOURTHS, EIGHTS, AND SIXTEENTHS</p>	<p>Doing:</p> <ul style="list-style-type: none"> ➢ VISUAL AND TACTILE IDENTIFICATION OF EQUIVALENT OBJECT REPRESENTATIONS <hr style="border-top: 1px dashed black;"/> <p>Possible Questions or Misconceptions:</p> <ul style="list-style-type: none"> ➢ HARD TIME DISTINGUISHING FROM THE OBJECT NOT LOOKING EQUAL TO ACTUALLY BEING EQUAL 	<p>Doing:</p> <ul style="list-style-type: none"> ☆ PRESENTING ACTIVITY AND SCHECKING FOR STUDTN ENGAGEMENT; VISUAL CHECK OF STUDENT UNDERSTANDING OF TASK <hr style="border-top: 1px dashed black;"/> <p>Possible Responses/ Questions to Pose:</p> <ul style="list-style-type: none"> ☆ WHO CAN EXPLAIN TO ME ☆ WHAT WE DID LAST CLASS? ☆ WHERE ALL THE SHAPES EQUAL IN SIZE? 	<p>STUDENT GENERATED WORK</p>	<p>NOT PRESENT FOR THIS LESSON</p>
<p>Laying the framework for the learning experience (<i>Launching the activity</i>)</p> <p>THE STUDNTS WILL BEGIN THE LESSON BY TRYING TO MAKE A SQUARE USING A COMPLETE SET OF TANGRAM PIECES (7 PIECES: TWO LARGE, ONE MEDIUM, TWO SMALL, TRIANGLES, ONE SQUARE, AND ONE PARALLELOGRAM)</p>	<p>Doing:</p> <ul style="list-style-type: none"> ➢ STUDENTS ARE TRYING TO MAKE A SQUARE WITH THE TANGRAMS FOR A FEW MINUTES, TO FAMILIARIZE THEMSELVES WITH THE SEVEN TANGRAM PIECES, AND HOW TO MANIPULATE THEM IN RETROSPECT TO EACH OTHER 	<p>Doing:</p> <ul style="list-style-type: none"> ☆ MOITORING PROGRESS, ASSESSING ABILITY 		

	<p>Possible Questions or Misconceptions:</p> <ul style="list-style-type: none"> ➤ THE PIECES DON'T FIT. ➤ WE NEED MORE PIECES. ➤ I AM MISSING SOME SHAPES ➤ I NEED ANOTHER ONE OF THESE ➤ USIND THEIR NEIGHBORS PIECES / TRADING PIECES. 	<p>Possible Responses/ Questions to Pose:</p> <ul style="list-style-type: none"> ☆ YES, THEY DO ☆ THEY ARE ALL THERE. ☆ USE YOUR OWN PIECES, NO MORE THAN SEVEN ☆ TRYING IS THE WAY YOU WILL FIND OUT 		
<p>Engaging students with concepts (Exploring, investigating, problem solving) IDENTIFYING TRIANGLE COMPONENTS OF A GIVEN WHOLE WITH RESPECT TO THE FRACTIOANL EQUIVALENCY MARK WILL THEN GAIN THE ATTENTION OF THE CLASS, AND THEY WILL BE GIVEN A HANDOUT WITH SEVERAL PRE-MADE SQUARES. THEY WILL THEN BE ASKED TO SELECT THEIR LARGE TRIANGLE AND FIGURE OUT HOW MANY OF THE PARTICULAR SIZE MAKE UP ONE WHLE SQUARE. THEY WILL BE DIRECTD TO BOTH LABEL THE FRACTIONAL EQUIVALENCY AND WRITE A NUMERICAL EQUATION THAT CORRELATES TO THAT PARTICULAR SIZE TRIANGLE. THE STUDENTS WILL BE GIVEN A FEW MINUTES TO WORK THE PROBLEM. THE STUDENTS WILL POSSIBLY NEED TO BE INSTRUCTOR GUIDED THROUGH THIS ACTIVITY. AFTER A FEW MINUTES,</p>	<p>Doing:</p> <ul style="list-style-type: none"> ➤ THE STUDNTS WILL BE WORKING IN SMALL GROUPS OF NO MORE THAN 4. THE STUDETNS WILL THEN BE DIRECTED TO IDENTIFY HOW MANY OF EACH SHAPE MAKE UP THE WHOLE AND ITS FRACTIONAL VALUE (THE STUDETNS WILL BE LABELING AND WRITING FRACTIONAL EQUATIONS THAT CORRELATE TO EACH TANGRAM PIECE. 	<p>Doing:</p> <ul style="list-style-type: none"> ☆ WALKING AROUND VISUALLY ASSESSING PROGRESS ☆ CLARIFYING QUESTIONS ABOUT THE TASK 		

<p>ONE STUDENT WILL BE SELECTED TO SHARE THE ANSWER WITH THE CLASS (HOW MANY, WHAT IS THE FRACTINAL EQUIVALENCY, AND THE NUMERICAL EQUATION AND THE REASONING BEHIND THEIR FINDINGS). QUESTIONS WILL BE CLARIFIED, AND THE STUDENTS WILL BE ASKED TO SOLVE THE SAME QUESTION FOR THE MEDIUM AND SMALL TRIANGLES, THE SQUARE AND THE PARALLELOGRAM. THE STUDENTS WILL BE EXPECTED TO LABEL THE FRACTIONAL COMPONENTS AND WRITE A NUMERICAL EQUATION FOR EACH SHAPE.</p>	<p>Possible Questions or Misconceptions:</p>	<p>Possible Responses to student questions and/or strategies:</p> <ul style="list-style-type: none"> ☆ IS THERE ANOTHER WAY TO DO THAT? ☆ IS THAT THE ONLY WAY THAT SHAOE FITS THERE? ☆ HOW MANY SHAPES CAN FIT THERE? ☆ WHAT IS EQUAL TO THAT SHAPE?? 		
<p>Sharing ideas/solutions <i>(Whole group, small group, written)</i></p> <p>SMALL GROUP WORK, SELECTED INDIVIDUALS PRESENT ANSWERS THROUGH OUT THE ENTIRE LESSON. UPON COMPLETION OF EACH SHAPE, THE STUDETNS WILL SHARE THEIR FINDINGS</p>	<p>Doing: INTERMITTENT</p> <ul style="list-style-type: none"> ➤ BLACKBOARD USAGE ➤ OVERHEAD USAGE ➤ PAPER IDENTIFY <p>Possible Questions or Misconceptions:</p> <ul style="list-style-type: none"> ❖ ONE ONJECT IS EQUAL TO ONE ❖ PARTS DO NOT EQUAL ONE 	<p>Doing: ORCHESTRATING TO MINIMIZE CONFUSION</p> <p>Possible Responses to student questions and/or strategies:</p>		
<p>Closure/Summarizing <i>(Tying ideas together – summarize what math/ strategies were learned)</i></p> <p>FITTING ALL THE TANGRAM PIECES INTO A SQUARE (AS EARLIER ATTEMPTED) AND IDENTIFYING THEIR PRACTIONAL VALUE THROUGH</p>	<p>Doing:</p> <ul style="list-style-type: none"> ➤ LISTENING TO INSTRUCTION ➤ WORKING THROUGH EQUATION WHILE TEACHER IS INSTRUCTING ➤ NOT PAYING ATTENTION 	<p>Doing:</p> <ul style="list-style-type: none"> ☆ EXPLAINING ❖ REINFORCING CONCEPTS ❖ CLARIFYING MIS-CONCEPTIONS 		

LABELING AND WRITING AND SOLVING A NUMERICAL EQUATION	Possible Questions or Misconceptions: <ul style="list-style-type: none">➤ THEY DO NOT EQUAL ONE WHOLE➤ THEY CAN'T SEE THE EQUIVALENT RELATIONSHIP➤ SUBSTITUTION VS ACTUAL UNDERSTANDING	Possible Responses/ Questions to Pose:		
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