

LESSON PLAN

Lesson Title	The finger multiplication algorithm – making an equation	Grade Level 10 to 11
Subject	Mathematics (With an integration of ethnic studies)	
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IDENTIFY DESIRED RESULTS

Objective in student-friendly language What will students understand/experience/appreciate as a result of this lesson?	Resources What materials/resources/technology will be required?
<p>By the end of this lesson students will have an algebraic and cultural understanding of the finger multiplication method. This lesson can serve as an introduction to proofs or review of proofs and looking at bases in different ways (i.e. introduction to modules)</p>	<p>Attached document - <i>Finger multiplication method- history, equation and proof</i>. (The first page of this document can be distributed to the students)</p> <p>Resource for teachers for further explanation: <i>Cajun Multiplication: A History, Description, and Algebraic Verification of a Peasant Algorithm</i> (Elizabeth D. Gray) http://www.lamath.org/journal/Vol1/cajunmultiplicationfinal.pdf</p>

LESSON PLAN SEQUENCE

Introduction How will you ACTIVATE prior knowledge and ENGAGE them in the lesson and how does this lesson connect to prior lessons?
<p>Briefly explain to the students that the goal for the lesson today is to follow the steps a mathematician takes in creating and checking an algorithm.</p> <p>Introduce the finger method with a story-like explanation of its historical significance. This is to engage the students in the lesson, and to connect it to the cultural objectives in the next lesson.</p>

Learning/Activity Sequence

How will students ENGAGE, EXPLORE, EXPLAIN, ELABORATE, and/OR EVALUATE their understandings of the outcomes.

What is the TEACHER doing? What is your plan for the body of the lesson? What steps are taken during the lesson?	What are the STUDENTS doing? How are they engaged while you are teaching the lesson?	Approx. time
Introduce the finger multiplication method with its history and teach the algorithm. After showing the algorithm, go through some examples with the students, following along with the algorithm for each example.	The students should be following along with the examples, both by using their hands, and by writing down the steps for each example in terms of the algorithm.	10 min
<p>Either in small groups, or as a class, discuss how using this method might be useful to younger students.</p> <p>To tie this into the next lesson:</p> <ul style="list-style-type: none"> ● Finish with a quick class lead discussion, and, if not already brought up by students, prompt the idea that for some young students, this may be the method their parents taught them. 	Students should be actively discussing, preferably starting in small groups, so each student is critically thinking about ways this could be helpful for young students.	10 min
<p>Ask the students to describe the algorithm as an equation in terms of x and y, where x and y are two integers they are multiplying. Once they have an equation, they should show it works. (Prove their equation equals $x*y$).</p> <p>Prompts to help students start:</p> <ul style="list-style-type: none"> ● If you start with an example, how does it work? You can choose to start with 6 times 7, and show how 6 times 7 (x times y) is obtained from the multiplication method. <ul style="list-style-type: none"> ○ Write out the entire equation: $6*7=(1+2)*10+3*4$ ● What is the domain and range/restriction of x and y? (This is to prompt the recognition of using 5's in the equation) 	<p>Students will be trying to make an equation to go along with the finger trick and proving algebraically that it works. (This work will be handed in to ensure students understand the method)</p> <p>If time permits, students can repeat the process with 4 fingers on each hand, or work with a partner to repeat the process with 20 fingers on each hand.</p>	30 min

<p>Extra time (or for higher grades):</p> <p>If there is extra time, ask the students to recreate the algorithm and equation for someone with 4 fingers on each hand.</p> <p>They can also make it with a partner, creating an algorithm and formula for someone with 20 fingers.</p>		
<p>Finish the lesson going over the common equation for the algorithm:</p> $xy=10(x+y-10)+(x-5)(y-5)$		10 min
<p>Conclusion</p> <p>How will you ensure students walk away with a sense of understanding the PURPOSE of the lesson and its IMPORTANCE to their learning?</p>		
<p>Conclude in reviewing the equation, and also tying it back to the discussion from the beginning of the class.</p>		