
«The Mathematics Club Meets»

Author(s): Wilimina Everett Pitcher and Pauline Mason

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THE MATHEMATICS TEACHER

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*The Mathematics Club Meets**

By WILIMINA EVERETT PITCHER

Rawlings Junior High School, Cleveland, Ohio

CAST OF CHARACTERS

ERNEST, club president. Later, poses as Napier.

PAULINE, club secretary, in charge of club program.

WINIFRED, acting secretary.

HENRIETTA } club members. They also pose for little French girls.
ROSE }

CARMELLA, club member. Also poses as Egyptian.

GAZZIE, club member. Poses as Roman.

GLEN, announcer. A bored club member.

MARY
IRENE
CAROLYN
LUCILLE
MARTIN
IRENE RUTH
GUS
LENA } other club members.

* Presented by the Mathematics Club of Rawlings Junior High School, Cleveland, January, 1931.

PROPERTIES

Large picture frame.

Small easel or support of some sort for "stone tablet." Stone tablet may be drawn on cardboard. A good picture is given in Smith: *History of Mathematics*, Volume II, page 46.

A large chair for Napier.

SETTING

A well-equipped mathematics classroom. In center of room a large picture frame, behind which the pictures can be posed.

An easily drawn curtain should hang in front of the frame.

COSTUMES

A long white or colored robe for the Roman.

A short, scantily cut, one-piece white garment and matching head-dress for the Egyptian.

An academic gown, white ruff, shaggy beard for Napier.

French peasant costumes for little French girls.

ANNOUNCEMENT

The Rawlings Math Club adopted as its project this fall the study of early methods of writing numbers and ways of adding, subtracting, and multiplying with such numbers. We did not choose this work because we were interested in it, but because our sponsor said it would make an interesting assembly, and we were determined to give an assembly. We have, therefore, learned to multiply as people did when multiplication was an almost impossible task for most people.

We have had so much fun doing these things, that today we are going to give you the opportunity of enjoying some of them with us. However, we can show you only a few of the ways in which people added. We mention only one of the ways by which the Greeks wrote numbers. Our time is too limited for us to attempt more. The assembly which the Math Club presents to you today is a one-act play called *The Mathematics Club Meets*.

(PAULINE, *notebook in hand, enters auditorium from west door and starts to walk across the front of the auditorium.*

ROSE, WINIFRED, and HENRIETTA, *carrying books, hurry in after her.*)

WINIFRED. (*calling*) O Pauline, wait for us.

PAULINE. (*turning*) Hello, girls. Hurry! You know there is a lot to do.

ROSE. We know there is, and aren't you excited? I could hardly wait for club period to come. I thought those first two periods would never end. I'm so glad Mrs. Pitcher was able to get those pictures to show us.

WINIFRED. Minutes ready, Pauline?

PAULINE. Yes they are, and Winifred, be a good sport and read them for me. I have plenty to do without them. Here they are. I hope you can read them. (*Points them out carefully in the notebook which she passes to Winifred. Girls go up on stage just as another group enters from the other side. The two groups exchange greetings.*)

HENRIETTA. (*looking about*) Where's Ernest?

ROSE. Wouldn't you just know he'd be late on a day like this?

Ernest enters

ROSE. It's about time.

IRENE RUTH. Where were you? What teacher kept you?

ERNEST. I guarded last period. I had to take a guy to the office. Mrs. Pitcher was there, too. Mr. Porter sent for her. Something about a boy in her home room. She said we'd have to get along without her today. (*Looking about*) The meeting will now come to order. (*Waits while children settle in seats*) The secretary will read the minutes of the last meeting.

WINIFRED. Tuesday, January 13, 1931. The meeting was called to order by the president at 9:45. The minutes were read and adopted as read. The meeting was then turned over to the sponsor, Mrs. Pitcher.

We had a review of finger notation by our great mathematician, Gus. We took our rods and multiplied some very large numbers. Our motto is "Multiplication is vexation," but we didn't have a hard time doing the multiplication.

Mrs. Young visited our club and it was explained to her how we could use these rods. Mrs. Young is a math teacher, but she doesn't know how to multiply anything larger than five times five so we showed her how. She likes the work we are doing and she said she is going to visit us again. The club was adjourned at 10:30.

Pauline Mason, secretary

ERNEST. Any business to come before the club today? (*Pause*) If not, I'll turn the meeting over to Pauline Mason who has charge of today's program.

PAULINE. (*rising*) Mrs. Pitcher has borrowed some pictures to show us today. They all tell something about the curious mathematics we have studied this year in the club. We are going to look at the pictures and see how much we can remember about the stories that go with them. You better push back your chairs and stand here and here so all can see better. (*Pulling back curtain*) Now this is a picture of an early Egyptian and the kind of figures he used when he wanted to write numbers.

HENRIETTA. Oh, yes! I'll always remember them because I think hieroglyphics is such a funny name to call figures by.

IRENE. Wonder what those are written on?

IRENE RUTH. I know. I read a story about Egyptians just last week. They wrote on papyrus—

IRENE. What's papyrus?

IRENE RUTH. It was a kind of paper. They made it from a reed that grew along the banks of the Nile. They used a reed pen, too. They could get plenty of reeds, and they used papyrus for all long records. Sometimes they wrote on wood or broken pottery and they carved numbers on stone if they wanted them to last a long time. I bet that's a stone tablet. (*Children nod vigorously*)

PAULINE. (*pointing*) This number is one. They made numbers up to ten just by using enough ones. This is ten. They grouped ones and tens for figures to one hundred. There is one hundred.

HENRIETTA. (*pointing*) Wonder what that old Egyptian could do with his numbers?

PAULINE. Oh, add, and maybe subtract. I don't think he could multiply or divide, though. You remember what a hard time people were having with multiplication and division six or seven hundred years ago. That Egyptian may have lived 4,000 years ago. Just remember that multiplication and division were hard.

MARTIN. I'll say! I missed all my division yesterday just on account of an old decimal point. I wish I could have seen that old Egyptian add, though.

GUS. Huh. You could now if you had any imagination. Just look at him hard. I see him add.

LENA. What's he going to add, Gus?

GUS. Well, let's see. Give him something easy and a nice clean papyrus. (*Changes paper on stone as he talks*) Now, Ahmes—

HENRIETTA. Oh, Gus, is he really Ahmes?

GUS. I don't know, but I can call him Ahmes if I want to. Now, Ahmes, add thirty-two and twenty-six.

LENA. Why I see him too, Gus. Doesn't he write funny? He puts the tens on the right.

ERNEST. Number order meant nothing to an Egyptian. He wrote from left to right, or from right to left. Sometimes he even wrote the tens above the units. I think, though, that the best educated Egyptians started at the right.

MARY. This Egyptian's good. Do you think we could make him add if he had to carry?

PAULINE. Of course he could. Just imagine him adding seventy-five and forty-six. (*Egyptian writes numbers and points slowly*)

MARY. (*counts*) One, two, three, four, five, six, seven, eight, nine, ten. (*Egyptian reaches ten and stops pointing to write ten*)

LUCILLE. Oh, he carried ten!

PAULINE. Didn't I say he could? Now watch him finish. He wrote that one just as we would. I like the way he carries numbers. One hundred twenty-one is the correct answer, too. Let's see another picture. (*Draws curtain*)

LENA. I'm glad we don't write numbers that way. It takes too long. The addition is easier than ours, though. No number combinations to remember. Just count figures.

GUS. I'd like to see an old Greek add.

ERNEST. Yes, just because you're Greek. Well, I don't think their numbers were interesting. They just used the letters as they came in the alphabet and put a line over them so they would know they were numbers and not letters. Nothing to that. I don't think the Greeks knew much about math.

GUS. Oh, they didn't? What about Euclid?

ROSE. Euclid—geometry—ugh!

Carmella enters

LUCILLE and LENA. What made you so late?

CARMELLA. The dentist sent for me and he wants Henrietta and Rose right away. (*Girls leave*) Say, Gus, I heard you trying to brag about the Greeks. Well, just remember that story about Italian mathematics.

LUCILLE. What was it?

CARMELLA. A wealthy German who lived in the fifteenth century had a son who wanted to be a merchant. The father wanted his son to be a very good merchant, so he asked a German college professor to tell him the name of a good college for his son. The professor said, "If you want him to learn to add and subtract send him to any German university. They are all good. If you want him to learn difficult mathematics, such as multiplication and division, send him to an Italian university. The Italians are the only people who teach such difficult mathematics."

GUS. Oh, Carmella, think about Euclid, and Plato, and Pythagoras, and—

PAULINE. You better shut up and look at the rest of these pictures. You know we can't have them next week. (*Draws curtain*) Now here is an old Roman and his addition with Roman notations.

CAROLYN. Oh, let me try it. L is fifty; those three X's are tens; V is five; and I is one. The top number is eighty-six. (*Children nod approval*)

IRENE. And the bottom number is thirty-two. He didn't carry tens, though. He carried fives.

CAROLYN. (*Roman slowly does addition while Carolyn talks*) Two and one is three. Write the three. There is nothing to add to five so he writes the five. Ten, twenty, thirty, forty, fifty, and one more ten. Of course he wrote ten and carried fifty. Fifty and fifty make one hundred. He has to carry that so he has nothing to write in the fifty column. He puts C in the hundred column. I suppose that is easier than our addition especially if your math is so poor you can't count well above five.

PAULINE. *That's* not such a good joke. You know very well, or you ought to, that for a long time lots of people couldn't count even so far as five. Wait till you see the next picture. Oh, and did you see this old book? (*Passes it around*) It has such funny looking letters in it.

IRENE. I wish it were an arithmetic, because then it might have a really old picture of finger notation in it. Lots of arithmetics had finger notation even as late as the sixteenth century.

GUS. I can make good numbers on my fingers. I read about them in a book Mrs. Pitcher had on her desk. It said finger notation had to be given in arithmetics because all nations wrote figures in a differ-

ent way. All traders, though, knew how to make numbers on their fingers. They had to, or they couldn't trade with each other. With the left hand they made numbers less than one hundred. They used these three fingers for numbers below ten and these two for tens. Let Winifred and me show you. Winifred makes good numbers, too. (*Two children make numbers, naming them*) The numbers above one hundred were just like those below, except that they were made on the other hand. They went like this. (*Makes numbers*) (*Rubs his hand*) That's fine finger exercise if you play a piano or run a typewriter. (*Gazzie enters. Glen, who has been sitting off by himself, doing homework, looks up*)

GLEN. Where were you? Why didn't you get here on time? (*After Gazzie answers, Glen goes back to his homework*)

GAZZIE. I can't help it. I went on an errand for Miss Perner. Miss Miller says Mr. Porter wants Ernest Pastor right now.

ERNEST. (*starts out grumbling*) Did she say right now? Why can't he wait till next period? I have wood shop next period.

PAULINE. (*drawing curtain*) Here is another picture. Who knows what they are doing?

GAZZIE. Oh, I do. Let me tell. They are little French girls, and they are doing a multiplication problem. You know we learned that many French peasants still multiply on their fingers. Lots of people in Europe used finger multiplication hundreds of years ago. Multiplication was hard.

MARTIN. I say it is!

GAZZIE. For finger multiplication they only needed to know the multiplication table to five times five and be able to add a little. Of course they couldn't multiply big numbers.

LUCILLE. You mean they didn't have to know six times nine and seven times eight? I always mix those two. Let's all think hard and see if we can make them do problems for us as the Egyptian and Roman did. (*Children take what they think are "concentrating" poses. French girls slowly close their hands*)

IRENE. Let's pretend they are going to multiply seven times eight for Lucille. (*French children put up two fingers*)

MARTIN and LUCILLE. (*excitedly*) Look! Look!

IRENE. Five from seven is two so they put up two fingers. Five from eight is three, so they put up three fingers. The fingers standing are tens. (*Pointing*) She has ten, twenty, thirty, forty, fifty, on the

fingers that stand up. She has two fingers down on one hand for units and three on the other. They have to multiply those, but they can, because they know their tables to five times five. Two times three equals six. Fifty plus six is fifty-six. Remember that, Lucille, and seven times eight won't bother you.

LUCILLE. Wonder if I can do six times nine. (*As she does the multiplication, the French children in the picture do the same thing*) Five from six is one. One finger up. Five from nine is four. Four fingers up. Ten, twenty, thirty, forty, fifty. One times four is four. Fifty plus four equals fifty-four. Gee! I hope I remember that.

IRENE RUTH. Wonder if the little French girls can multiply fourteen times twelve. The rule is different and harder.

PAULINE. Of course they can. They look very intelligent. Just watch them.

LENA. Oh, let me help them. (*French children and Lena do multiplication*) Ten from twelve leaves two. Two fingers up. Ten from fourteen leaves four. Four fingers up. Count the fingers standing for tens. Ten, twenty, thirty, forty, fifty, sixty. Multiply the fingers standing for units. Two times four is eight. Sixty plus eight is sixty-eight. Add it to one hundred and you get one hundred sixty-eight for an answer, and if you don't believe that's right you'll have to multiply it out on paper.

PAULINE. Are you ready for another picture?

MARY. Please, Pauline, not yet. I want to tell Lucille a poem that my mother taught me. She said she learned it to say at school on Friday afternoon, when she was a little girl. They always spoke pieces on Friday afternoon.

LUCILLE. Let her tell me, Pauline. (*Pauline nods*)

MARY. Six Times Nine.

I studied my tables over and over
And backward and forward too.
But I couldn't remember six times nine
And I didn't know what to do.

But sister told me to play with my doll
And not to bother my head.
"If you call her Fifty-four for a while,
You'll learn it by heart," she said.

So I took my favorite, Mary Ann,
Though I thought 'twas a dreadful shame
To call such a perfectly lovely child
Such a perfectly horrid name.

But I called her my dear little Fifty-four
A hundred times till I knew
The answer to six times nine as well
As the answer to two times two.

Next day Elizabeth Wigglesworth
Who always acts so proud
Said, "Six times nine is fifty-two"
And I nearly laughed aloud.

But I wished I hadn't when teacher said,
"Now, Dorothy, tell if you can,"
For I thought of my doll, and sakes alive,
I answered, "Mary Ann."

MARTIN. That's a good poem for girls, but what I want is a way to multiply where you don't need any multiplication tables at all. I never remember them.

LUCILLE. You ought to use the Russian peasant multiplication, Martin.

MARTIN. What's that?

LUCILLE. I guess you were absent the day we had it, but I can show you how it goes. You have to know the table of two's though, and be able to divide by two and add well.

MARTIN. I knew there was a catch in it, somewhere.

LUCILLE. They say the peasants of Russia still use this method and get to be very quick at it. I'll multiply twenty-five by forty-eight. (*Writes numbers*) I'm going to divide the numbers in this column and multiply these. It doesn't make any difference which way I start though. (*Lucille writes and talks at same time*) Twenty-five divided by two is twelve and you don't have to bother about remainders.

MARTIN. Suits me.

LUCILLE. Forty-eight times two is ninety-six. Twelve divided by

two is six. Ninety-six multiplied by two is one hundred ninety-two. Six divided by two is three. One hundred ninety-two times two is three hundred eighty-four. Three divided by two is one. Two times three hundred eighty-four is seven hundred sixty-eight, and since we can't divide any more we are through dividing and multiplying. Even Martin will have to admit that that wasn't hard. Cross out the numbers opposite the even quotients. I suppose, Martin, you know what a quotient is. Add the products that are left. (*Adds rapidly, mentally*) The answer is twelve hundred.*

MARTIN. Well, that's a good method, but what would Mr. Miller say if he caught me using it?

CARMELLA. Huh, he'd be glad to see you get a multiplication problem right, just once, no matter what method you used.

MARTIN. I wish we had invited all the math teachers to this meeting. Maybe, if they could see what a hard time people had with the beginning of arithmetic, they wouldn't holler about our work.

PAULINE. I wish we had invited them. (*Drawing curtain*) Now this picture is that old Scotchman, Napier, that Mrs. Pitcher said worked twenty years on a problem. How's that for homework? I asked her what the problem was, and she said he was trying to make multiplication and division easier for people. He succeeded, too. He called his problem logarithms. I asked Mrs. Pitcher what logarithms were and she said exponents.

MARTIN. What are exponents, Pauline?

IRENE. Aw shut up. You wouldn't know even if Pauline told you. It's something the 9A's are always talking about when they do their algebra. Glen says it's hard. (*Glen looks up and nods*)

PAULINE. Napier also invented a very simple multiplication machine, the napier's rods that we made in club. Let's get the big set and do some problems for Mr. Napier. Someone has to tell the story though. (*Hands go up*)

PAULINE. I'll let Irene Ruth do it.

$$\begin{array}{r}
 * \quad 25 \qquad \qquad 48 \\
 \hline
 -12 \text{ ----- } 96 - \\
 -6 \text{ ----- } 192 - \\
 \hline
 3 \qquad \qquad 384 \\
 1 \qquad \qquad 768 \\
 \hline
 1200
 \end{array}$$

IRENE RUTH. People who had to do much multiplication made sets of rods which they carried about with them. Sometimes they made them of wood, but very often they made them of strips of paper about three and one-half inches long. This rod has on it the table of nines. People didn't have to know the table. They could copy it. Here is one times nine, two times nine, three times nine, etc. This is the table of sixes. This rod has just numbers on it. It is the multiplier rod. Let's multiply 4,296 by 123. The first thing they needed to do was lay out the multiplicand. Here, some of you kids, help. (*Places rods*) Pauline will write for us. Here is the multiplier rod. Will you hold it, Mary? Now, Pauline, write 123. They didn't write the multiplicand because they had it laid out where they could see it. They had to write the multiplier so they wouldn't forget it. The product by three is eight, eight, eight, two, one; by two is two, nine, five, eight, and by one is six, nine, two, four. Adding eight, zero, four, eight, two five. Martin wouldn't even need to learn the two's to do that. Let's try another one.

PAULINE. I wish we could but it's time for the bell, so we'll have to stop, now. If you want to see the rest of the pictures come to 216 tonight after school. (*Children start out*) (*Curtain*)

NOTE: The following four books will be found helpful to anyone who cares to follow out any of the topics taken up in this play.

1. DANTZIG, TOBIAS: *Number the Language of Science*, Macmillan, New York, 1930. Story of the German Merchant, p. 26; French peasant multiplication, p. 11.
2. SANFORD, VERA: *A Short History of Mathematics*. Houghton Mifflin Company, Boston, 1930, pp. 76, 77, 81, 202, 203.
3. SMITH, DAVID EUGENE: *History of Mathematics*, Ginn and Company, Boston, 1925, pp. 45-53, 54-64, 196-202, 202-203.
4. SMITH, DAVID EUGENE: *Source Book in Mathematics*, McGraw-Hill Book Company, New York, 1929, 182-186.