



TLJ Consulting Group, LLC

*Creating & Sharing
Educational Experiences*

ABOUT US

MATHEMATICAL MOMENTS BLOG

PROFESSIONAL LEARNING

RESOURCES

HOMESCHOOL

ALGEBRA I EMPLOYMENT STANDARDS – 2020-2021

The Top 5 Reasons for Using Manipulatives in the Classroom

AUGUST 2, 2019 BY TAMMY JONES

The Top 5 Reasons for Using Manipulatives in the Classroom

Have you ever asked or said or heard a fellow educator ask or say...

- “Exactly what constitutes a manipulative?”
- “I have some of these manipulatives in my closet, but do not have a clue how to use them!”
- “How do I find the time to use manipuatives in the classroom when I have so much to cover already?”
- “Aren’t these just toys that students will play with?”
- “Are these really helpful to students or do they just become a crutch?”
- “If my students can’t use these manipulatives on the test, why should I spend my valuable instruction time on them?”
- “I have tried using these before and they just ended up confusing my students even more!”
- “I see how manipulatives might help my struggling students, but do I really need to use them with my students who can do the math anyway?”

- “I might want to try these with my students but won’t it take a lot of time to get them out and then put them up?”
- “I teach secondary and my students think manipulatives are for children and I tend to agree.”

This is but a sampling of the many and varied comments and questions that I have heard from educators over my years of training on the effective use of manipulatives in the classroom. Many of these initial reactions and responses to the manipulatives often leads to this comment”

“Can you just show us everything we can do with these?”

But first....

The use of manipulatives has a long history with solid research supporting it. [NCSM's](#) 2013 position paper, *Improving Student Achievement in Mathematics by Using Manipulatives with Classroom Instruction*, begins with this statement:

It is the position of the National Council of Supervisors of Mathematics (NCSM) that in order to develop every student's mathematical proficiency, leaders and teachers must systematically integrate the use of concrete and virtual manipulatives into classroom instruction at all grade levels. This position can be accomplished when leaders and teachers:

- *Understand that manipulatives are not toys but are powerful learning tools which build conceptual understanding of mathematics;*
- *Use research to guide instructional use of manipulatives;*
- *Provide sustained professional learning opportunities in the use of manipulatives; and*
- *Recognize that learners—both adults and students—progress through varying levels of proficiency as they use manipulatives before they can realize their full impact.*

The [Math Forum](#), in response to a question about using manipulatives in the classroom states,

“Although the use of manipulatives in combination with other methods can enrich and deepen students' understanding, relying only on manipulatives as a means of instruction can also be ineffective. Students may lose the opportunity for deeper conceptual learning if manipulatives are used without further formal discussion, abstraction, and mathematical connection.”

Those that know me, know that I firmly believe that learning mathematics for many students is [experiential](#); meaning that active involvement in the topic being studied will enhance a student's learning. For many educators, applying this idea proves challenging, in part, because of the abstract nature of mathematics. The first question, “Exactly what constitutes a manipulative?” can

be easily answered. Any object that students can touch, move, feel, and interact with is a manipulative. NCTM (The National Council of Teachers of Mathematics) defines a manipulative as, “...materials are supports for children to explore and make sense of mathematical ideas—but only if the children actually handle and manipulate them. They are often thought of as a representation for a concept.” (The Young Child and Mathematics, NCTM, Copley, 2000) Herein lies the rub. Teachers must facilitate students’ making connections between the manipulative being used and the mathematical topic being studied. For some educators, this can prove challenging as they may have never used the manipulatives themselves or had proper training on how to effectively incorporate the manipulative’s use into the classroom setting.

NCTM, in its landmark publication, *Principles to Action*, 2014, states as one productive belief that successful mathematics teachers hold is, “Students at all grade levels can benefit from the use of physical and virtual manipulative materials to provide visual models of a range of mathematical ideas.”

I have used manipulatives since my early days in the classroom. They provide a concrete representation that can initially open the door to developing understanding for a challenging topic being studied. What follows is my list, compiled over several years, of my *Top 5 Reasons for Using Manipulatives in the Classroom*.

TOP 5 REASONS FOR USING MANIPULATIVES in the Classroom

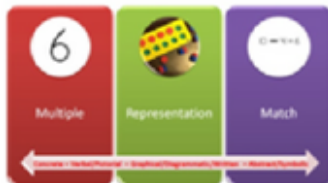


MANIPULATIVES CAN PROVIDE A BRIDGE
BETWEEN THE CONCRETE AND ABSTRACT
LEVELS OF MANY MATHEMATICAL TOPICS.





MANIPULATIVES CAN SERVE AS MODELS THAT SUPPORT STUDENTS' AS THEY THINK ABOUT, REMEMBER ABOUT, AND COMMUNICATE ABOUT THE MATHEMATICS BEING STUDIED.



MANIPULATIVES PROVIDE ANOTHER REPRESENTATION FOR THE MATHEMATICS BEING STUDIED.

MANIPULATIVES SUPPORT STUDENT ENGAGEMENT AND DIFFERENTIATION.



MANIPULATIVES CAN GIVE STUDENTS OWNERSHIP OF THEIR OWN LEARNING.



© 2017, TAMMY JONES, TLJ CONSULTING GROUP, LLC
<http://TLJConsultingGroup.com>

Top 5 Reasons for Using Manipulatives in the Classroom

1. **Manipulatives can provide a bridge between the concrete and abstract levels of many mathematical topics.**

Educators must carefully and deliberately choose the manipulatives being used as well as the sequence of introducing the manipulatives associated with the development of the mathematical topic being studied to maximize effectiveness. Also, studies suggest that mathematics achievement does increase when manipulatives were used over extended periods of time. (Suydam & Higgins (1977) and Sowell (1989))

2. **Manipulatives can serve as models that support students' as they think about, remember about, and communicate about the mathematics being studied.**

The Common Core standards for mathematics states, "Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions." (CCSSM, 2010) Modeling in mathematics is foundational to developing deeper understandings of the topics being studied as well as making connections between topics. Models can range from the simple to the more complex. The kinesthetic and visual experiences that are offered when students use manipulatives supports students' retention and recall of important mathematical procedures, facts, and understandings when manipulatives may not be provided.

3. **Manipulatives provide another representation for the mathematics being studied.**

Representations has long been one of the process standards for NCTM. In the *Principles and Standards for School Mathematics*, NCTM states, "The ways in which mathematical ideas are represented is fundamental to how people can understand and use those ideas." In their *Principles to Action* book, NCTM lists *Use and Connect Mathematical Representations* as one of the eight mathematics teaching practices. They state, "Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving." Using manipulatives effectively offers students another representation for many challenging mathematical concepts.

4. **Manipulatives support student engagement and differentiation.** The National Council of Supervisors of Mathematics in their *Improving Student Achievement Series* states as one of their four positions on using manipulatives in the classroom: "Recognize that learners—both

adults and students—progress through varying levels of proficiency as they use manipulatives before they can realize their full impact. ... Hattie (2012) states “when teachers see learning occurring or not occurring, they intervene in calculated and meaningful ways. In particular, they provide students with multiple opportunities and alternatives for developing learning strategies based on the surface and deep levels of learning some content or domain matter, leading to students building conceptual understanding of this learning, which the students and teachers then use in future learning” (p. 15). Hattie later cites research on the power of balance in the classroom:

“There is a balance between teachers talking, listening, and doing; there is a similar balance between students talking, listening, and doing” (p. 76). **Manipulatives provide a foundation around which teachers and students can talk, listen, and do.** Other research from Hattie (2009) concludes that, more often than not, when students do not learn, they do not need “more;” rather, they need “different” (p. 83).”

5. Manipulatives can give students ownership of their own learning.

In *Teaching for Tomorrow*, Ted McCain lists six ways to teach for independent and higher learning:

1. Resist the temptation to ‘tell’;
2. Stop teaching decontextualized content;
3. Stop giving students the final product of our thinking.
4. Make a shift in our thinking – problems first, teaching second;
5. Progressively withdraw from helping students; and
6. Re-evaluate evaluation.

When students use manipulatives to create and use representations to organize, record, and communicate their mathematical ideas, they begin to develop a more positive math disposition and take ownership of their own learning.

So....

Do you currently use manipulatives in your mathematics classroom? If so, what benefits or limitations have you experienced?

Are the manipulatives you need readily available?

Do you have the background and experience to effectively facilitate your students as they use the manipulatives or do you need professional development focused around the use of manipulatives?

Manipulatives can benefit the mathematical learning of students at all levels – from primary through even college classes. As NCSM states, “... the use of manipulatives is not viewed as optional by teachers, while recognizing that the nature and frequency of use will vary from course to course.” Educators owe it to themselves and their students to employ manipulatives in their mathematics instruction.

But remember, the most often asked question I get from teachers at any level is:

“Can you just show us everything we can do with these?”



Well...you asked for it! Here it is!

Strategy Saturdays Series, 2019-2020

Focus: Using Manipulatives in the Classroom

Limited to 10 Educators per session

This 9 – day e-conference training will take place over 9 Saturdays throughout the school year. There will be 9 sessions focused on elementary grades and 9 sessions focused on Secondary grades. This will allow teachers to see prior, current, and future content to better support intervention and differentiation for students. Districts may choose to enroll one teacher to each of the trainings or send a different teacher each session. It will be up to the district and school. But only 10 teachers will be accepted for each session to ensure one-on-one support.

Training includes:

- Introduction to the manipulative and how it can be used to support developing understanding in a variety of mathematical topics,
- Classroom ready activities and tasks,
- Journal and writing prompts,

- Suggested questions to use as students are working with the manipulatives, tasks, and activities,
- Activity/task cards for centers, learning stations, & small group instruction,
- Opportunity to develop tasks/activities personalized for your own students,
- Individualized attention due to the small group size,
- As applicable, trade books will be suggested and an opportunity will be given to create classroom sets of some of the manipulatives using the die cut.
- Certificate for 6 hours of Professional Development for each training successfully completed with the potential for 66* hours of Professional Development. * (Includes introductory webinar as well as some additional classroom work, if entire series is purchased.)
- On-going support via email throughout the school year.

Don't miss the opportunity to gain more tools to add to your and your students tool box to help maximize student achievement!

Email for more information:

TammyJones@TLJConsultingGroup.com



FILED UNDER: ELEMENTARY, FOR PARENTS, MATHEMATICAL MOMENTS, SECONDARY, SLIDER BAR

MATHEMATICAL MOMENTS

The Top 5 Reasons for Using Manipulatives in the Classroom

The Top 5 Reasons for Using Manipulatives in the Classroom Have you ever asked or said or heard a fellow educator ask or say... “Exactly what constitutes a manipulative?” “I have some of these manipulatives in my closet, but do not have a clue how to use them!” “How do I find the time [...]

Algebra I Employment Standards – 2020-2021

State Approved Hybrid Training Sponsored by the Tennessee Department of Education The State of Tennessee has provided various paths for qualified middle school teachers to teach Algebra I/Integrated Math I for high school credit. The various paths are described at <https://www.tn.gov/education/licensing/education-licensure/licensed-educators.html>. The purpose of the trainings offered here is to provide the pedagogical and content [...]

Putting the “A” in STEAM

Are you looking for a summer workshop for your K-12 students? In July, I will be hosting an art/writing workshop for students K-12. We will be focusing on Putting the “A” in STEAM. This 6-day enrichment workshop will focus around the arts and humanities. Students will create and begin to use a combined art journal [...]

NCTM, SAN FRANCISCO

My colleagues and I really enjoyed your presentation at NCTM. We have already convinced our principal to pre-

order us copies of your new book, but we would also like 4 class sets of the pyramids.

Many presentations talked about problem solving and the benefits of giving students higher level thinking problems, but yours was the only one that really told us how to teach it and scaffold it for students, rather than just modeling what problem-solving looks like. Thanks.

Julie Jacewicz
Beaverton, OR

WHAT OUR CLIENTS ARE SAYING...

TLJ CREATED CLASSROOM RESOURCES ON TLJ:



TLJ CREATED CLASSROOM RESOURCES ON:

TLJ CREATED CLASSROOM RESOURCES ON:

