

Using Games to Improve Basic Fact Competency

In conversations with mathematics educators across North America, the topic of basic facts and student's lack of proficiency with them comes up time and time again. Teachers all the way from upper elementary to high school express this concern. How can we address this common gap in students' math competency?

History shows us that rote memorization does not work for all students. Ask any group of adults and you will find several who are quite proud of the fact that they were not good at math. However, they still want their children taught using the same methods that didn't work for them.

There are better ways to develop students' fluency and recall of basic math facts that work for all students while putting the "fun" back in **fundamentals**. Using math Games allows us to do this.

There is a vast array of games available for teachers to use. "Everybody is starting to understand the power of games, and they're remembering what is fun about them—what's fantastic about games is that we can use them at any point in time," said Barbara Chamberlin, project director at the New Mexico State University Learning Games Lab. Games give the students a reason to practice the basic facts and to become fluent using them. Practicing math is always more fun and enjoyable in a game context. Aside from wondering if games can help students learn, educators should focus on other questions—it's not the act of playing a game that makes students learn, but rather, it's the content and design of those products that lead to learning, Chamberlin said.

"Games in the classroom are especially powerful when there's a teacher there to guide. If you're using games in the classroom, that's not the time to sit and get caught up—you're still the facilitator of the learning that happens during that gameplay."

Games like Trading Up (Box Cars and One Eyed Jacks) can be adapted for any coin combination to teach skip counting as well as developing money sense. Dominoes is a game that covers many outcomes all at once, mental addition, number sense, rounding, multiples of 5, and reasoning. Snake can be adapted to practice addition or multiplication facts. Quip, Bowl-a-Fact, Krypto and 24 are all variations of practicing order of operations, number sense and reasoning. Crib teaches number sense, reasoning, groups of 15. Games that can be differentiated are the best ones to use.

In my experience, students enjoy practicing facts in game contexts. Kindergarten students love to use the Double Six Dominoes to match the dots to either number words or ordinal numbers. Students who will groan and act out in a regular math class cheer when I walk in and tell them we are going to play math games. The down side to this is when parents ask their children what they learned in math today the students usually respond with "We didn't learn anything. We just played games." Students who struggle in the traditional classroom are often the students who benefit the most from math games. The game aspect seems to take the stress and lack of self-confidence out of the equation. The students realize that they can shine. This self confidence can then transfer to other areas of math..

There are a few things that need to be in place before games are successful in class. Students need to be taught the games. This is sometimes a painful process but gets easier as more games are used in the class. Self-checking games are important so the teacher has time to focus on students who may need extra help. Games must be structured in such a way that students know when someone gives an incorrect answer. You cannot just expect the other student to know whether or not the answer is wrong. It is also uncomfortable for some students to challenge another student on whether or not their answer is correct. Teachers need to be sure that the focus is on accuracy and not speed. If needed, use a student umpire with a calculator for the 2-person games. A cooperative classroom needs to be in place. Playing games without keeping score is one way of avoiding the need to be the “winner”.

Games teach more than just math concepts. They teach students how to cooperate with others, coach others who may be struggling, reflect on their own learning and set personal goals for improvement. Games can teach students that it is okay to lose or win. It is how you play the game and what you learn that is important.

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