



Games to Promote Student Learning

Dr. Janet Stramel

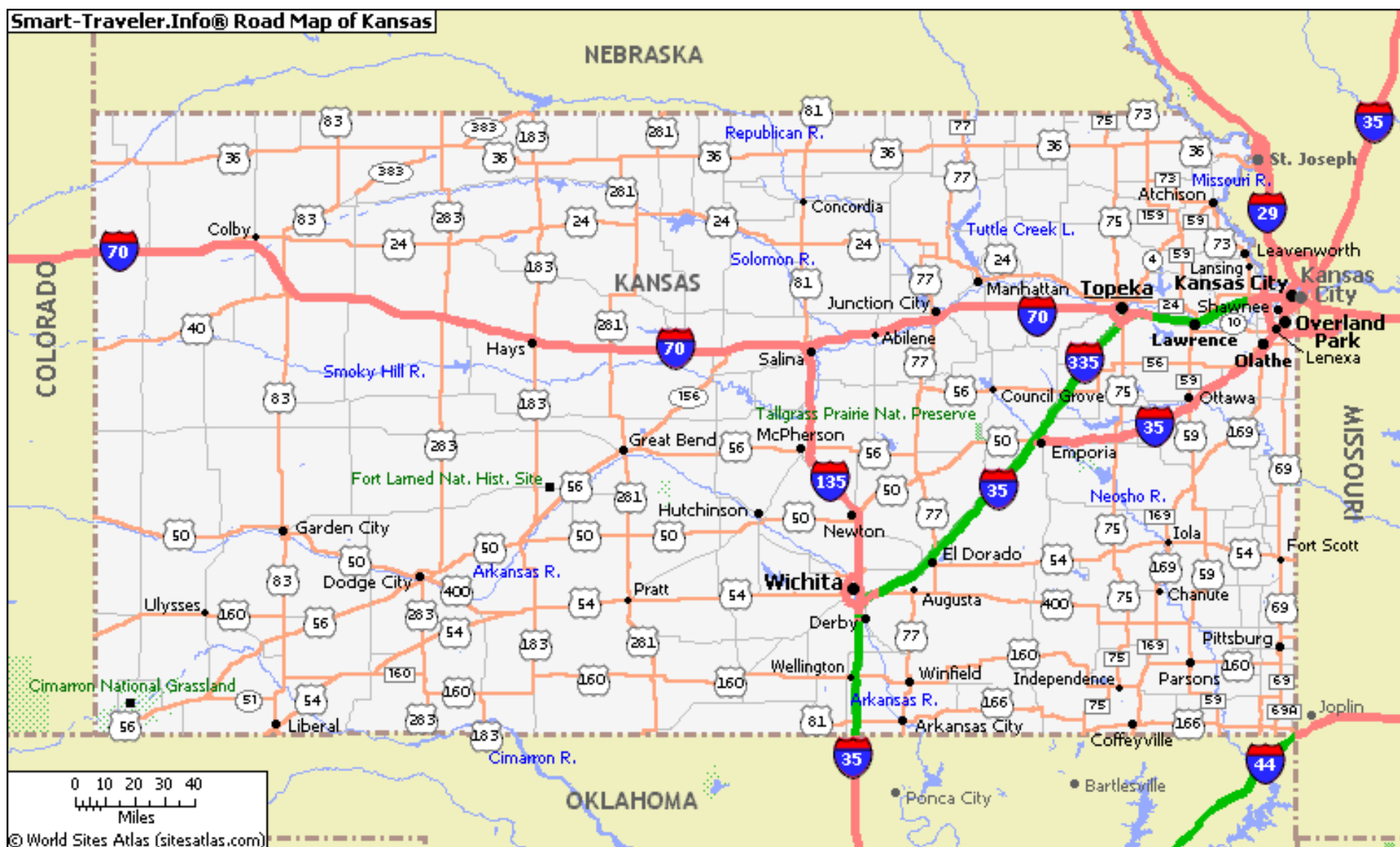
Fort Hays State University

Dr. Janet Stramel

- Fort Hays State University
 - Mathematics Methods
- National Board Certified Teacher
 - Early Adolescence Mathematics
- Teacher
 - Middle School Mathematics



Fort Hays State University



Five Levels of Student Engagement

- Authentic Engagement
- Ritual Compliance
- Passive Compliance
- Retreatism
- Rebellion

<http://www.readinghorizons.com/blog/seven-ways-to-increase-student-engagement-in-the-classroom>



Why Use Games to Teach?

"PLAYING SHOULD BE FUN! In our great eagerness to teach our children we studiously look for "educational" toys, games with built-in lessons, books with a "message." Often these "tools" are less interesting and stimulating than the child's natural curiosity and playfulness. Play is by its very nature educational. And it should be pleasurable. When the fun goes out of play, most often so does the learning."

- Joanne E. Oppenheim (*Kids and Play*, ch. 1, 1984)



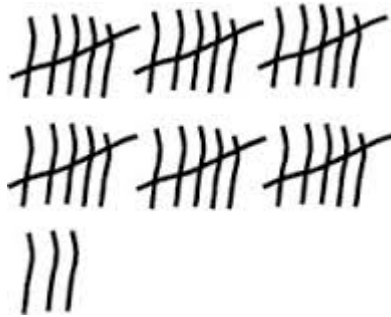
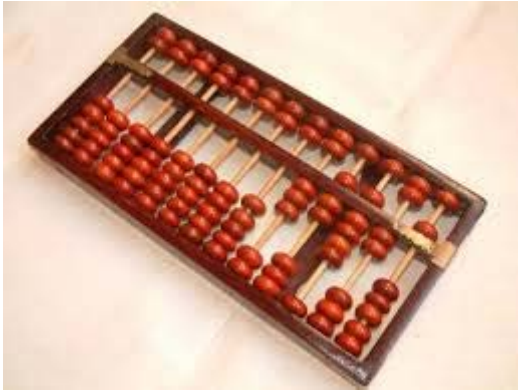
Why Use Games to Teach?

“Play gives children a chance to practice what they are learning... They have to play with what they know to be true in order to find out more, and then they can use what they learn in new forms of play.”

- Fred Rogers



Manipulatives



Joint Position Statement NAEYC & NCTM

- National Association for the Education of Young Children
- National Council of Teachers of Mathematics

<https://www.naeyc.org/files/naeyc/file/positions/psmath.pdf>





NCTM Principles & Standards for School Mathematics

- Developing fluency requires a balance and connection between conceptual understanding and computational proficiency. Computational methods that are over-practiced without understanding are forgotten or remembered incorrectly. Conceptual understanding without fluency can inhibit the problem solving process.

Student Engagement in Mathematics

- Mathematics lessons specifically designed for Pre-K students
 - counting and cardinality, operations and algebraic thinking, number and operations in base ten, measurement and data, and geometry
- Learning Center Activities
- Strategies, games, songs, etc



Games? In Mathematics?

- “Early childhood programs should furnish materials and sustained periods of time that allow children to learn mathematics through playful activities that encourage counting, measuring, constructing with blocks, playing board and card games, and engaging in dramatic play, music, and art.”

<https://www.naeyc.org/files/naeyc/file/positions/psmath.pdf>



Games? In Mathematics?

- “... and take-home activities such as mathematics games and manipulative materials tailored to the ages, interests, languages, and cultures of the children...”

<https://www.naeyc.org/files/naeyc/file/positions/psmath.pdf>



Why Play Games?

- People love games.
- Games are fun and motivating
- Games provide students opportunities to explore concepts
- Games provide opportunities for students to deepen their mathematical understanding and reasoning.



Playing Games...

- Playing games encourages strategic mathematical thinking
- Games support students' development of computational fluency
- Games present opportunities for practice
- Games allow students to develop familiarity with the number system and benchmark numbers

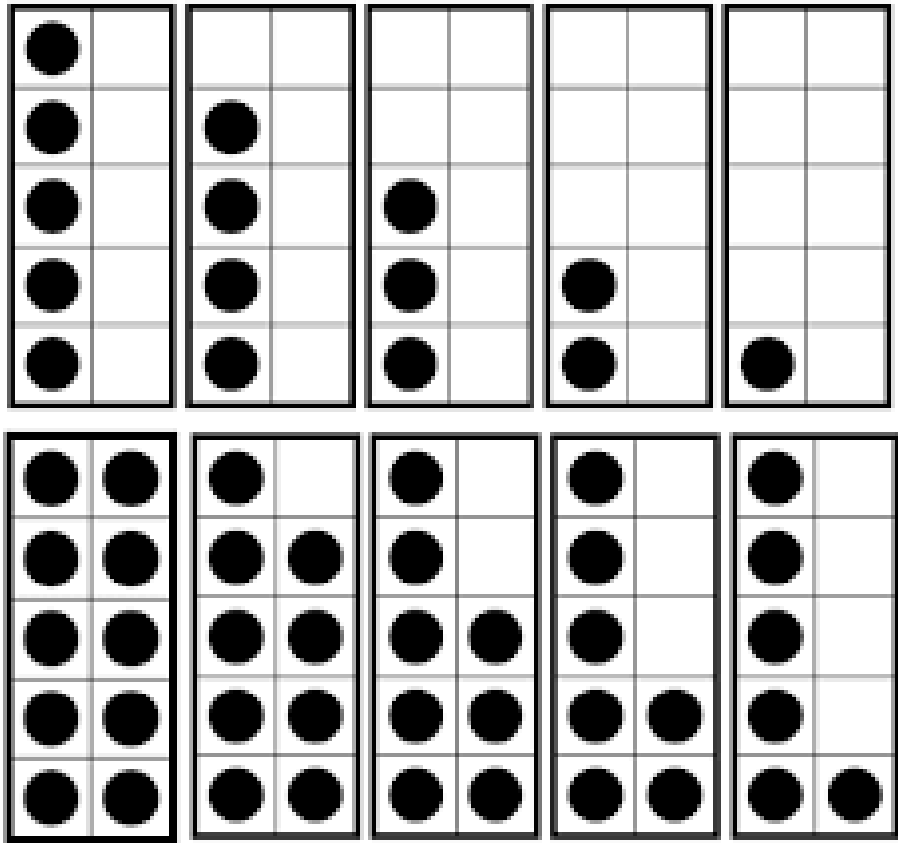


Games for Success

- Make sure the game matches the mathematical objective
- Use games for specific purposes, not just time-fillers
- The game should have enough of an element of chance so that it allows weaker students to feel that they a chance of winning
- Keep the game completion time short



Mathematics is Play



TEN FRAMES

- Anchors of Five and Ten
- One More
- One Less
- I Wish I Had Ten



How Many More to Make 10?

How many more to make 10?



Roll	To 10

Materials Needed:
How Many More Cards
Ten frames
Markers
Dice—6-sided &/or 20-sided

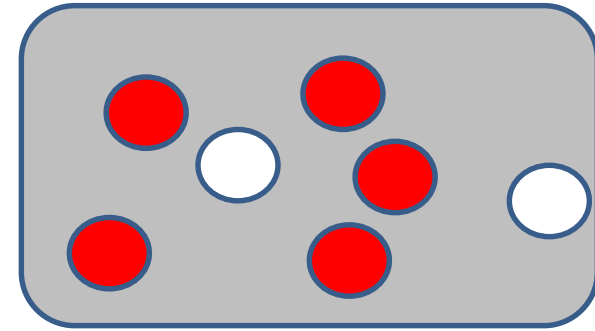


Shake & Spill

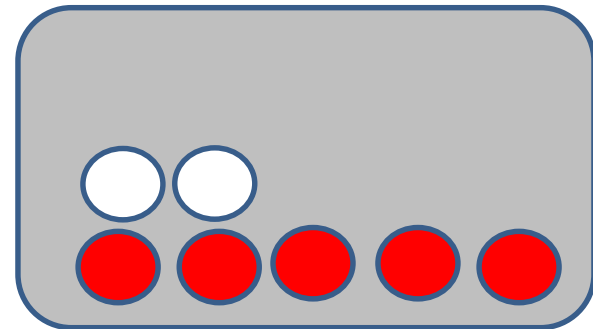
Math Tools: Red & White Counters
Tray or box

1. Count out your number of counters.
2. Put the counters in a cup.
3. Shake the cup.
4. Spill the counters on the tray or box.
5. Line up the red counters.
6. Next, line up the white counters.
7. Compare the red and white counters.

Spill



Compare



Connect Four!

Addition

8	2	7	11	3	9	6
4	10	5	12	9	2	11
7	3	8	10	5	8	4
9	11	4	2	6	12	9
6	10	7	5	3	8	9
10	7	2	11	6	3	12



Rekenrek



<http://www.k-5mathteachingresources.com/Rekenrek.html>





Racing to 100

1. Partner A rolls a dot cube & moves that many beads on the Rekenrek, starting at the top. As you move the beads, say the name for each number.
2. After Partner A has updated the Rekenrek, count what is left to get to 100.
3. Partner B records the start, the amount of the roll, the end result, and what is left on the table provided. Say each of these numbers out loud.
4. Partner B rolls, adding on where Partner A left off; Partner A is the recorder.
5. Repeat taking turns until you get to 100.

Race to 100 Recording Table

<i>Start</i>	<i>Roll</i>	<i>End</i>	<i>Left</i>
0			



Tens Go Fish



Materials Needed:
1 deck of cards
(1 through 9 playing
cards)



Are Games **REALLY** Mathematical??

- **YES**

- These concepts lay the foundation for future learning in math.



Building Conceptual Understanding and Fluency Through Games



K-5 Mathematics Games
created by
North Carolina teachers



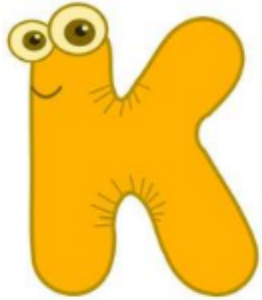
NCTM Publication

http://www.nctm.org/publications/teaching-children-mathematics/blog/why-play-math-games_/



Other Resources

Elementary



[Kindergarten](#)



[First Grade](#)



[Second Grade](#)



[Third Grade](#)



[Fourth Grade](#)



[Fifth Grade](#)



<http://maccss.ncdpi.wikispaces.net/Elementary>

Is It Enough to Just Play the Game?

“If children play a math game at school or at home without reflection afterwards, then chances are they have wasted an opportunity for learning.”

-Catherine Attard



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Thank You!

Dr. Janet Stramel

jkstramel@fhsu.edu