

64TH CONFERENCE ON EXCEPTIONAL CHILDREN



WORKING TOGETHER TO ACHIEVE STUDENT SUCCESS

Using Technology to Support Special Education Teachers and Students in Math

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Wake County Public Schools

Special Education Services



Wake County Public Schools - Special Education Services - Math

Math Resources

**Supporting Teachers
and Students in Math
with Technology**

Where do I start?

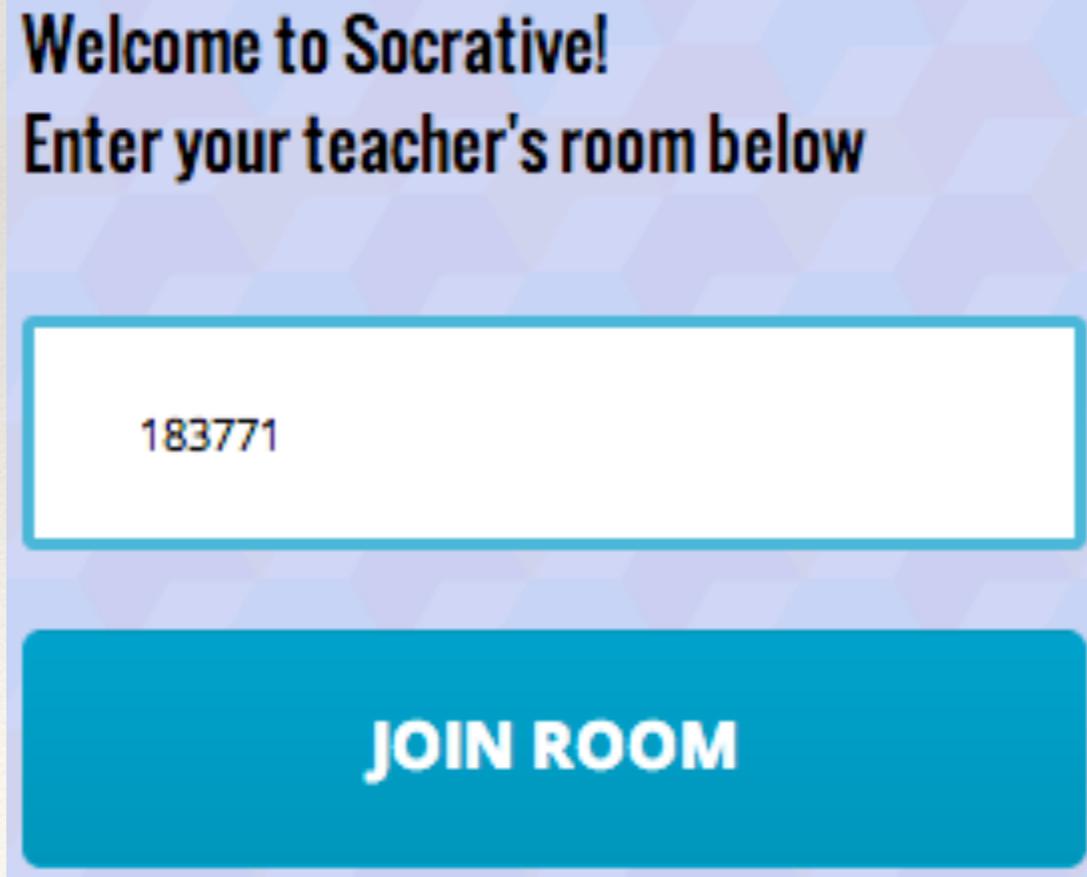
Student Data

The most important consideration when determining HOW to instruct is to determine what your students' NEEDS are.



Let's Go Interactive!

- ❖ Please go to <http://www.socrative.com>
- ❖ Type in 183771 under room number.

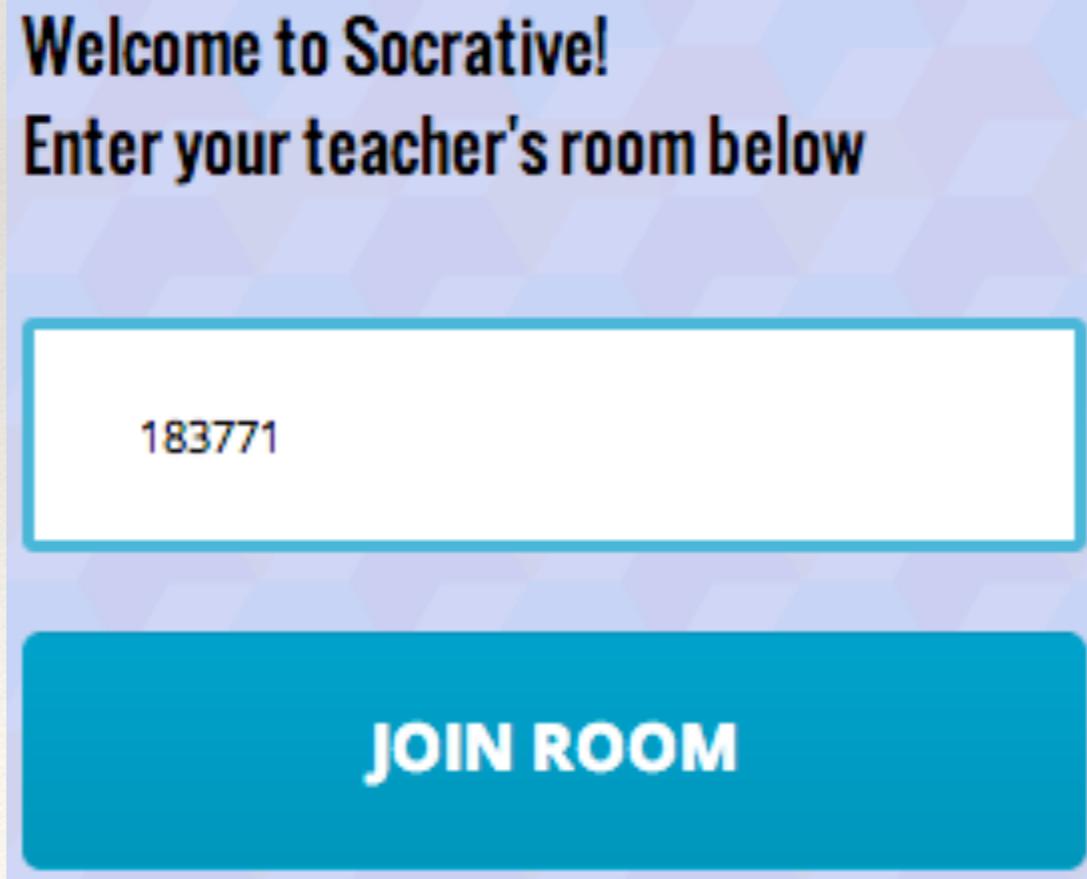


Welcome to Socrative!
Enter your teacher's room below

JOIN ROOM

Examples of Data?

- ❖ Please go to <http://www.socrative.com>
- ❖ Type in 183771 under room number.



Welcome to Socrative!
Enter your teacher's room below

JOIN ROOM

Examples of Data



Pathdriver

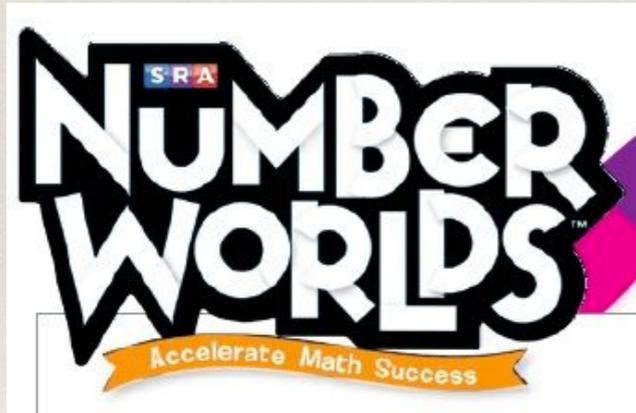
EOGs



mClass Math

Work Samples

Case 21



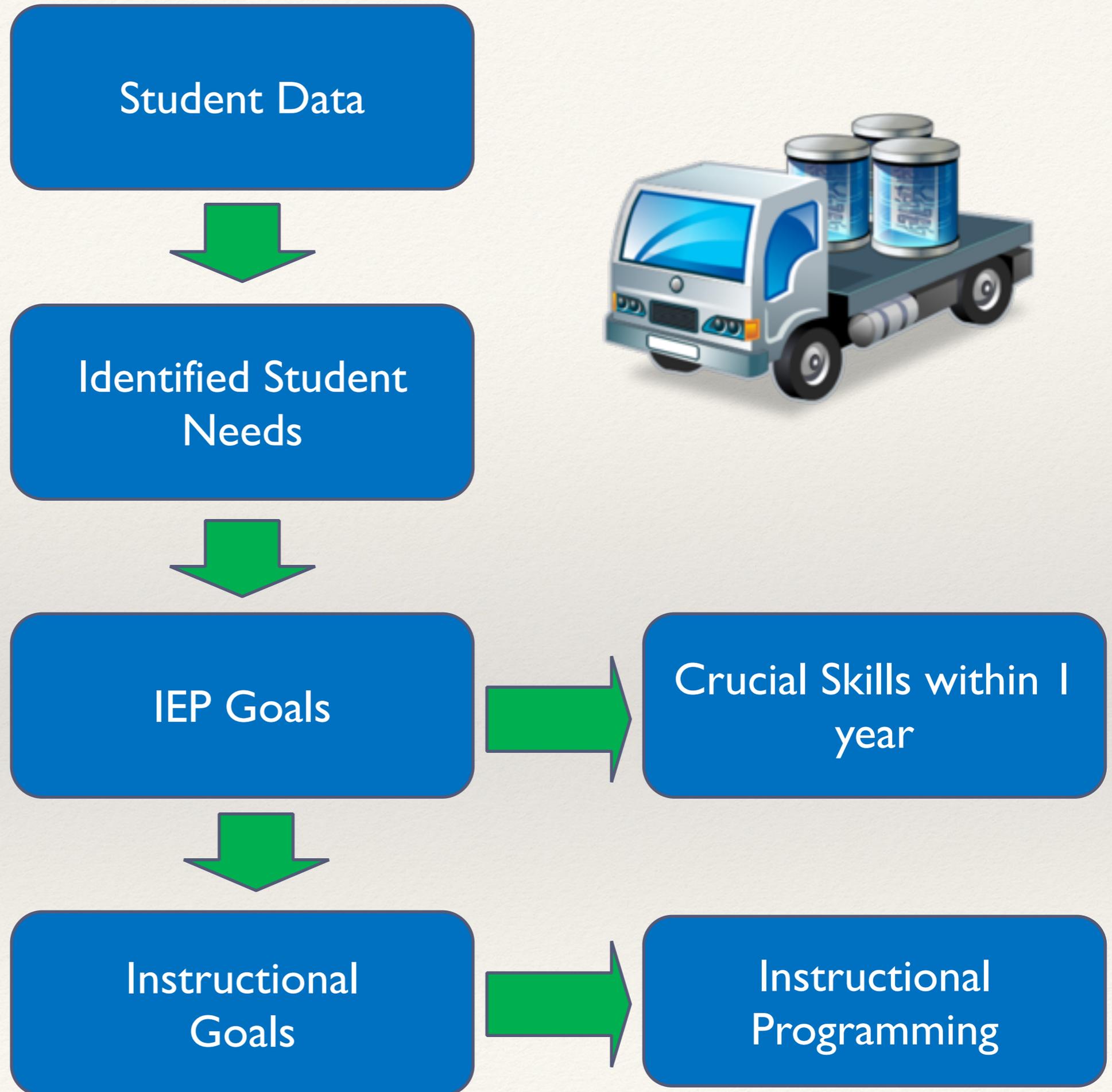
**Number Knowledge
Test**

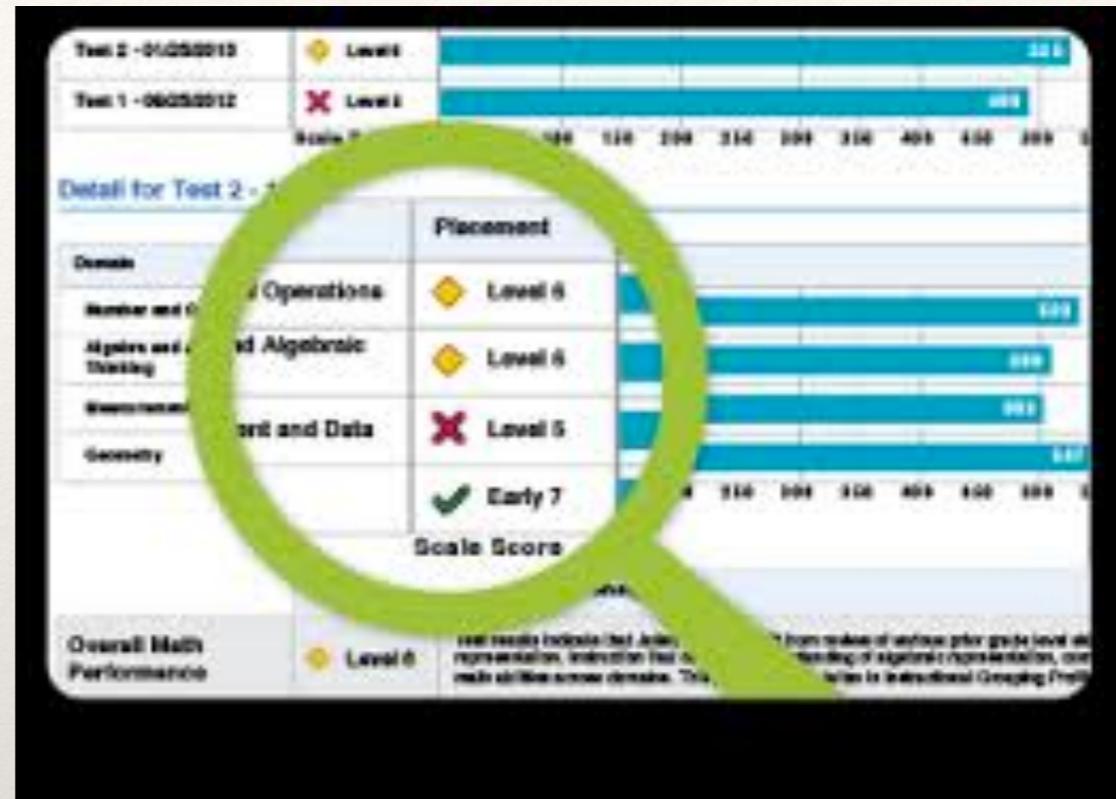
Real-Time Formative Assessment

**Student Interactive
Notebooks**

Number Talks

Data DRIVES Instruction





Data, data, data.....

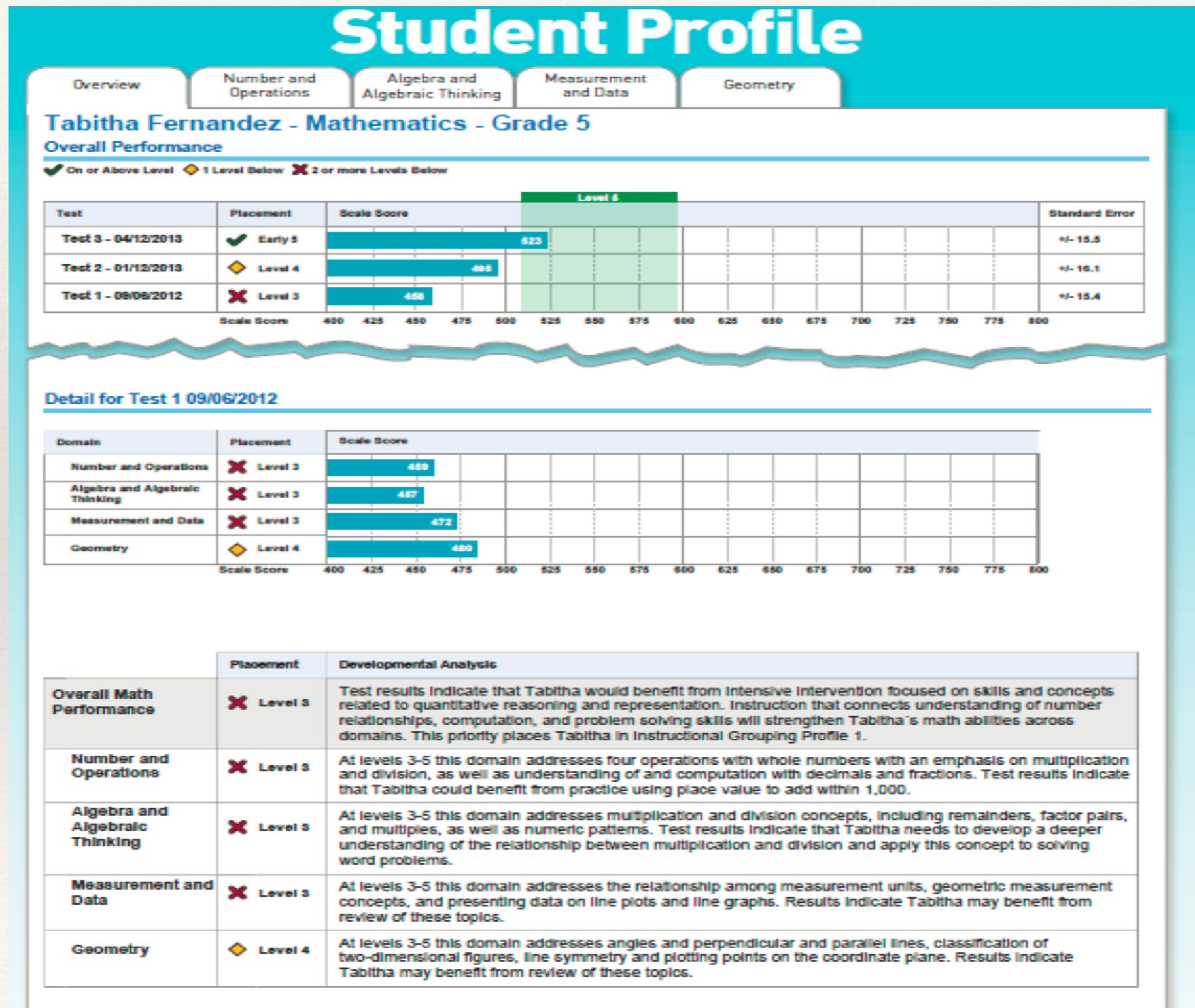
Assessment

Assessment in Wake County
for Special Education
Students

Are you ready? i-Ready facts...

- ❖ **4,158** special education students were assessed in i-Ready last year
- ❖ **6,823** separate full math diagnostic assessments completed before the end of May
- ❖ **+15 scale score gain** across the district for students who took initial assessment and were assessed again after 2/1/14
- ❖ **138 schools** had students assessed in i-Ready

What does i-Ready give us?



What does i-Ready give me?

Student Profile

Number and Operations Detail

Tabitha Fernandez – Mathematics – Grade 5

Test 1-09/06/2012	Placement	Scale Score
Number and Operations	✗ Level 3	458

Scale Score: 0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800

Building Number and Operations Skills

Number and Operations in grades K-8 focuses on representing, comparing, and performing operations with numbers. As in the CCSS, this domain includes whole numbers, decimals, fractions, integers, and irrational numbers, and emphasizes both conceptual understanding and computation. In grades 3-5, students gain an understanding of fractions and decimals and develop fluency with all four operations involving whole numbers, fractions, and decimals.

What Tabitha Can Do

Results indicate that Tabitha can likely do the skills shown below.

Base Ten

- Model three-digit numbers.
- Compare and order three-digit numbers.
- Know multiplication facts through 9×9 .

Fractions

- Identify fractions ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$) as parts of a whole using pictures.
- Identify fractions that name part of a whole (denominators of 2, 3, 4, 5, 6, 8, 10, 12).

Next Steps for Instruction

Results indicate that Tabitha will benefit from instruction and practice in the skills shown below.

Base Ten

- Know division facts through $81 \div 9$.
- Add multi-digit numbers.
- Subtract multi-digit numbers.
- Multiply two-digit numbers by one-digit numbers.

Fractions

- Identify fractions shown on a number line.
- Use models to find equivalent fractions.
- Write equivalent fractions, including fractions in simplest form.
- Express fractions with denominators of 10 or 100 as decimals.
- Decompose a fraction into a sum of fractions with like denominators.
- Add and subtract fractions with like denominators.

Tools for Instruction

- Know Division Facts
- Add Multi-Digit Numbers
- Subtract Multi-Digit Numbers
- Multiply by One-Digit Numbers
- Fractions on the Number Line
- Find Equivalent Fractions

Student Profile Domain Detail

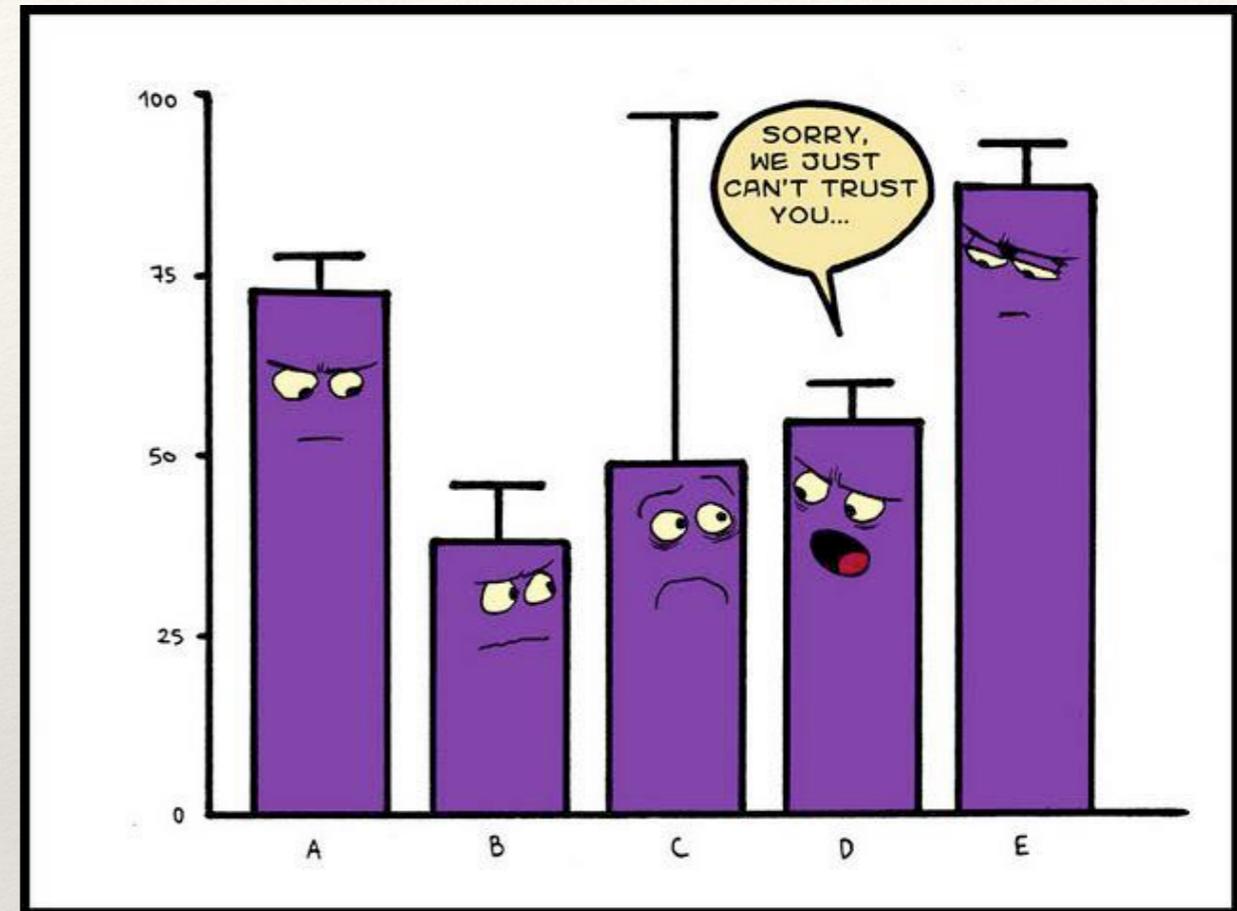
➤ Shows what the student can do

➤ Next steps for instruction

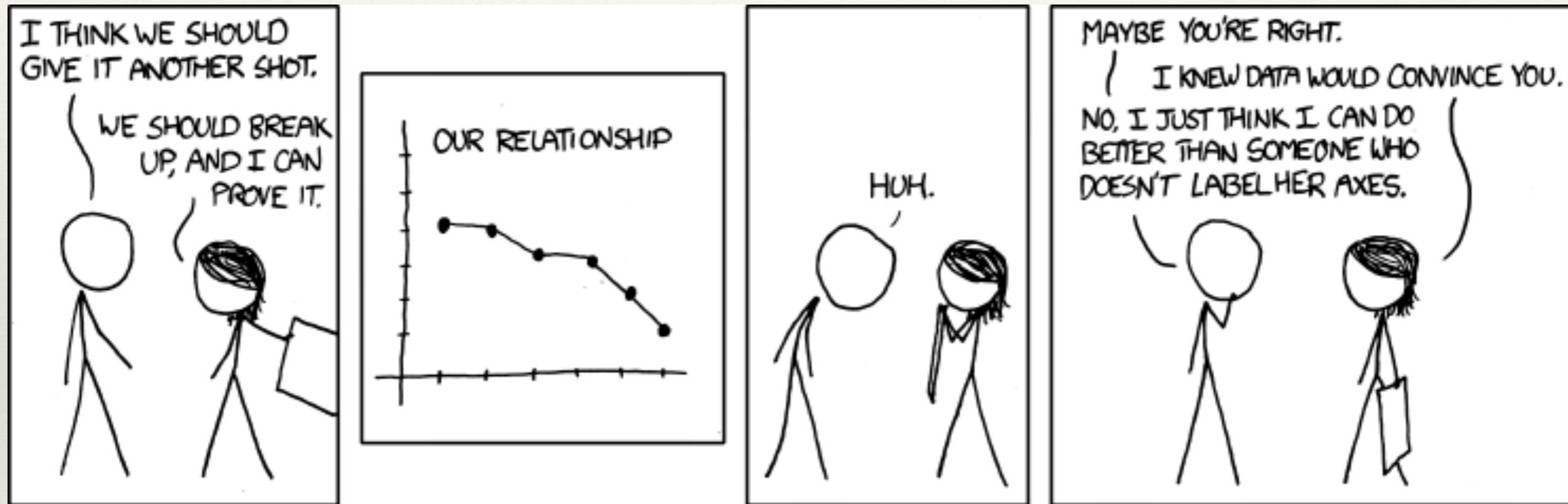
➤ Provides “Tools for Instruction” to directly address next steps

i-Ready is NOT perfect....

- ❖ Students rush!
- ❖ Computer adaptive - Not necessarily 100% accurate
- ❖ Use OTHER data to justify or refute what's in the report.
- ❖ i-Ready is a starting point and NOT the end point of data collection.
- ❖ Lack of teacher interaction of test = lack of important “thinking process” information



So you have data...now what?



SES Math Wiki - Leak this Wiki!

The **SES Math Wiki** – The hub for everything we do

<http://specialprogramsmath.pbworks.com>

or

<http://tinyurl.com/SESMath>

WCPSS Special Education Math Workspace

The purpose of this wiki is to:

- Allow special educators an opportunity to collaborate and share ideas about improving math instruction
 - Act as a repository for important information regarding various instructional topics
- Give educators access to resources and discussion related to specific math programs in use across the county
- Keep educators up to date on the latest news and announcements regarding special programs math instruction

Are you sick of getting e-mail notifications of changes to the Wiki every day? Here is how you can change that!

Elementary Resources **Middle School Resources** **High School Resources**

Common Core Resources **Math Program Resources** **Assessment**

Navigator

- Math Program Files
 - GO SOLVE
 - NUMBER WORLDS
 - TEAM MATH ASSESSMENT
 - TEAM Short Form Questions
 - TOUCH MATH

Pages Files

SideBar

- [FRONTPAGE](#)
- [GENERAL DISCUSSION/CO](#)
- [MATH FOUNDATIONS](#)
- [NUMBER WORLDS](#)
- [GO SOLVE](#)
- [BUILDING BLOCKS \(Online](#)
- [TOUCH MATH](#)
- [TEAM MATH ASSESSMENT](#)

Try it out!

The SES Math Wiki – The hub for everything we do
<http://specialprogramsmath.pbworks.com>

or

<http://tinyurl.com/SESMath>

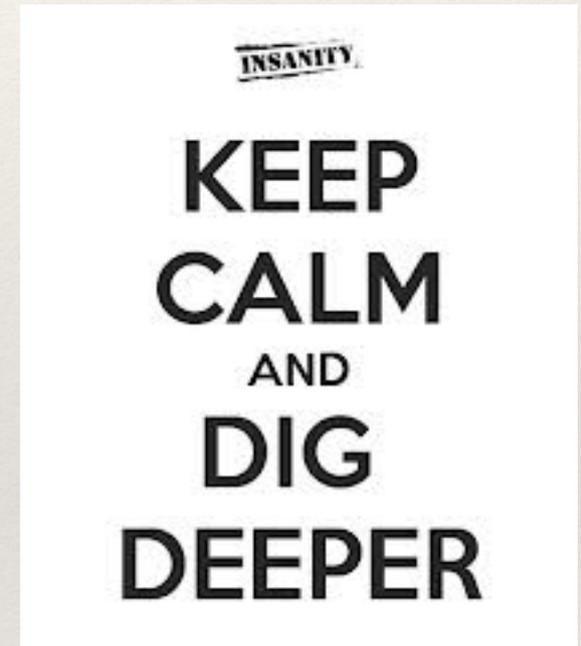
Please log in to the Wiki now. If you aren't a member already, feel free to use:

User name: sesmathrocks@gmail.com

Password: password

Let's dig deeper.....

- ❖ Find at least **ONE** resource (find more if time allows) that you think would be helpful for you or your teachers this school year.
- ❖ Discuss the resource(s) with your table and explore it further.
- ❖ Discuss how you can use the resource in your classroom.
- ❖ Report out.....



The Problem



Unsatisfactory growth from students in
ICR and Resource math classes.

Integrating Technology via Blended Learning





What is Blended Learning?

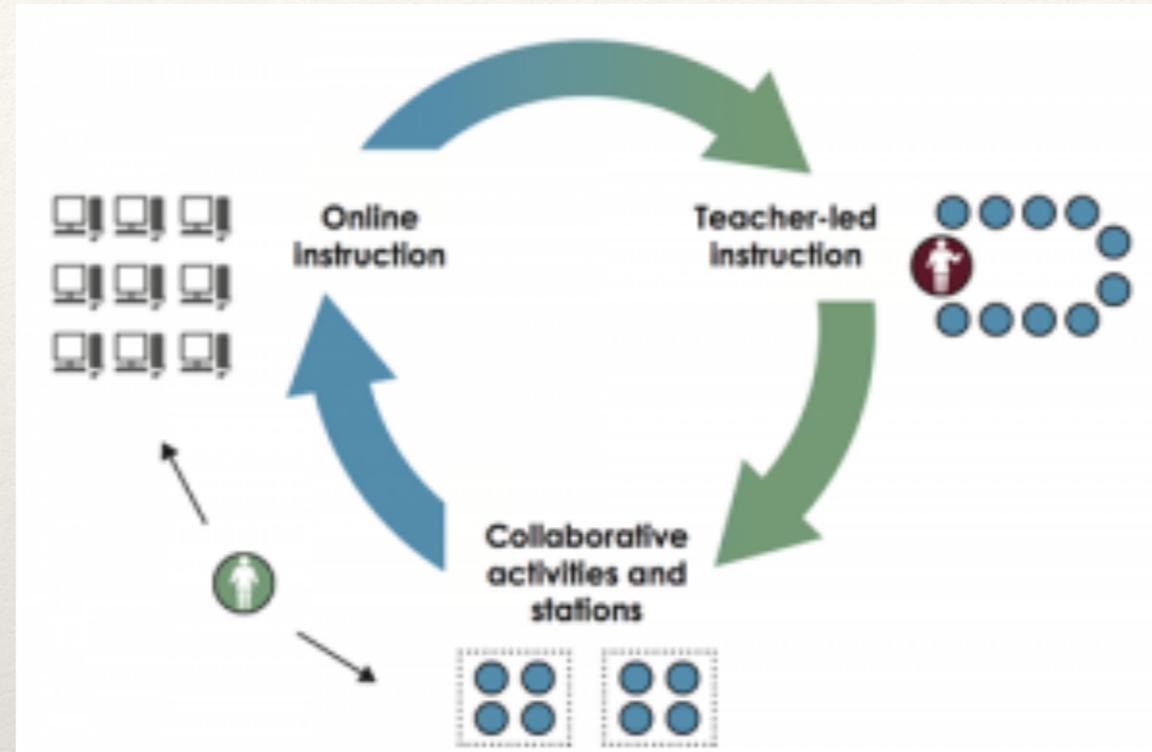
from The Learning Accelerator

05:17

HD vimeo

The video player shows a young girl sitting at a desk in a classroom. The background includes a whiteboard, a globe, and various educational posters on the wall. The video player interface includes a play button, a progress bar, and the Vimeo logo.

Blended Learning Models Considered



- ✓ Consider a 2 group rotation to start (online instruction/teacher-led instruction)
- ✓ For 2 group rotation – need at least 2:1 student to device ratio
- ✓ 3+ group rotation - Less need for devices - Project based learning possible
- ✓ Computer Lab Rotation - Rotate days between class and computer
- ✓ Flipped Model - Students watch videos at home/Discuss-enrich in class



Khan Academy Blended Learning Cohort

An Individualized Approach
to Learning



- ❖ Resources or <http://www.khanacademy.org>



Challenges



- ❖ Students have a WIDE variety of needs
- ❖ Students may be unmotivated
- ❖ Possible behavior issues due to lack of confidence and other factors
- ❖ Not enough time to address student needs
- ❖ Felt handcuffed to pacing guides leaving some behind and others unchallenged

Blended Learning

- ❖ Allows you to FOCUS on the skills students need help with
- ❖ Allows you real-time access to student data
- ❖ Allows students to be accountable for their own learning and for more opportunities to learn



Blended Learning Myths

Myth
BUSTED

- ❖ Students learn from the computer making teachers less important.
- ❖ My instructional and planning responsibilities will decrease.
- ❖ My interaction with students will decrease

The Main Takeaway

*Khan Academy will **INFORM** your instruction allowing you to meet the individual needs of your students.*





- ❖ Wake County Khan Cohort - 7th Grade ICR and Resource Math (<http://khancohort.weebly.com>)

WCPSS Khan Academy Blended Learning Cohort [HOME](#) [FAQS](#) [VIDEOS](#) [RESEARCH](#) [SES MATH WIKI](#) [CONTACT US](#)

How do we reach struggling learners in math in middle school?

FAQs
Frequently Asked Questions about the Khan Academy Cohort and Khan Academy

VIDEO
Videos about Khan Academy and teacher/student impact

RESEARCH
Research and documentation about Khan Academy

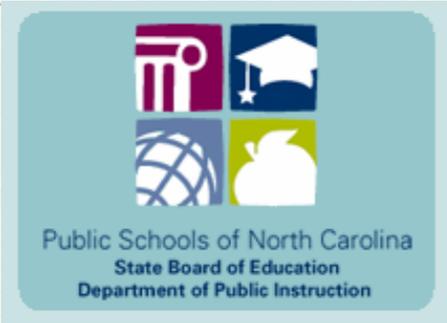
The complex block represents a website page. At the top is a navigation menu with links for HOME, FAQS, VIDEOS, RESEARCH, SES MATH WIKI, and CONTACT US. Below the menu is a header banner with the WCPSS logo on the left and the Khan Academy logo on the right. The main heading asks, "How do we reach struggling learners in math in middle school?". Below this heading are three columns, each with an icon and a title: "FAQs" with a computer mouse icon, "VIDEO" with a film reel icon, and "RESEARCH" with a globe icon containing various scientific terms.



Highlighting some of my favorite online resources.....

*Some of my
favorites.....*

**The Math Resource
MASH-UP!**



NCDPI Math Wiki

- ❖ <http://maccss.ncdpi.wikispaces.net>
- ❖ Comprehensive resources by grade level including CCSS progressions, major work of the grade, unpacking documents, research, publications, etc.
- ❖ Assessment documents, Lessons for Learning, Practice Standard posters, and so much more!

Common Core Flip Books

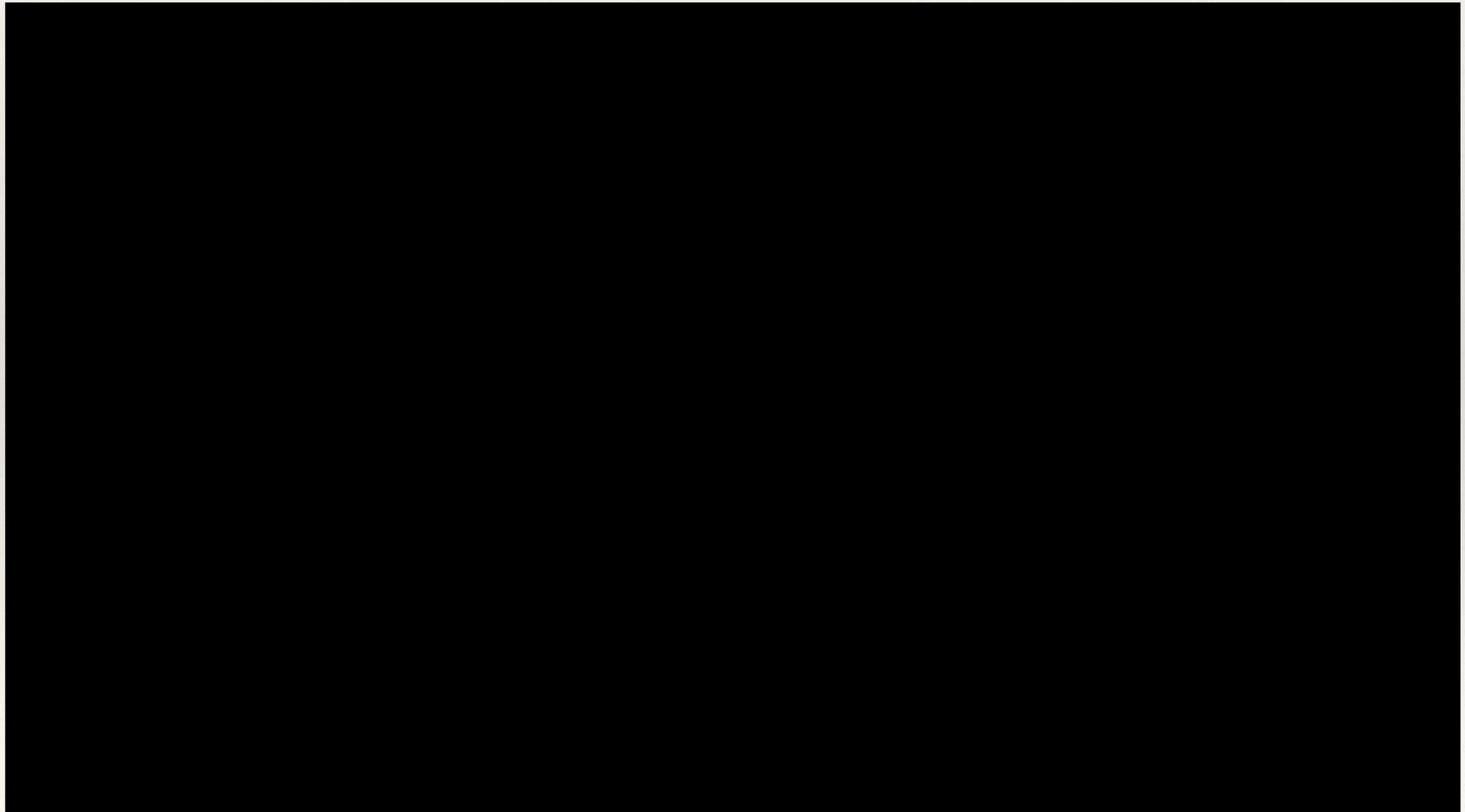
- ❖ <http://www.katm.org/baker/pages/common-core-resources.php>
- ❖ Breaks down the Standards of Mathematical Practice for each grade level with appropriate questions for each
- ❖ Contains **explanations** and **examples** of every standard including **misconceptions!**
- ❖ Includes **instructional strategies** for each standard and more....

Common Core Progression Documents

- ❖ <http://ime.math.arizona.edu/progressions/> - Also found on NC DPI Math Wiki
- ❖ Perfect document to LEARN about progression of skills
- ❖ Goes over examples of standards in each Common Core strand
- ❖ See how skills progress across GRADE LEVELS and not just in isolation or tied to ONE grad level



❖ <http://www.learnzillion.com>





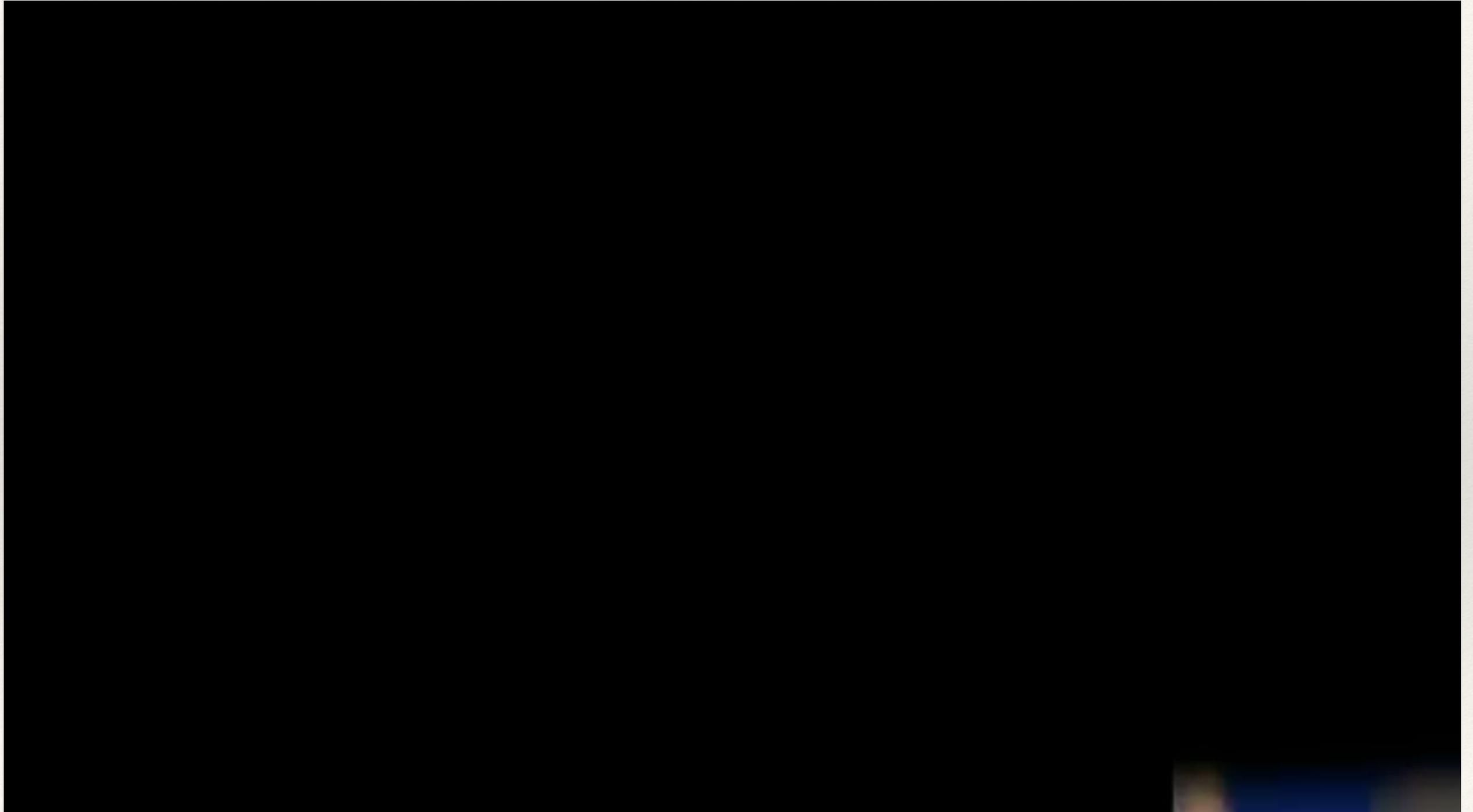
- ❖ <http://www.xtramath.org>
- ❖ Assign to students to practice math fact fluency
- ❖ Great for homework
- ❖ Track progress and mastery - great data!



The Quantile[®] Framework for Mathematics
Linking assessment with mathematics instruction

- ❖ <http://www.quantiles.com>
- ❖ Math equivalent of LEXILE score measuring math readiness
- ❖ Use the Math Skills Database to look at specific skills by standard or key-word and find resources related to those skills including pre-requisite skill.
- ❖ Quantile Teacher Assistant allows you to put in a Quantile range for your class (you can estimate if you want) that shows you what skills your class should be ready for along with supplemental skills and concepts.

Beyond resources.....It's an amazing time
to be a math teacher...



Problem-based Lesson Resources

- ❖ Under SES Math Wiki - Elementary (or MS / HS) Resources
- ❖ Dan Meyer Three Act Tasks - Dan Meyer Blog
- ❖ Robert Kaplinsky Problem Based Lessons
- ❖ Emergent Math Curriculum Maps
- ❖ Mathalicious



- ❖ Under SES Math Wiki - Elementary (or MS / HS) Resources or opencurriculum.org/browse/common-core/mathematics/
- ❖ Find great problem based lessons, exercises, illustrations
- ❖ Includes content from Dan Meyer, Robert Kaplinsky, Mathalicious, Khan Academy, Illustrative Math, etc.
- ❖ Navigate by Common Core Standard

The Best Resource?

- ❖ All these sites I've shown you can provide lessons, videos, problems, exercises, illustrates and much, much more....
- ❖ But, the best resource is.....

 **Frank Furter** @DrFNFurter · 7 May 2009
So, come up to the lab,

  3.3K  2.7K  

 **Frank Furter** @DrFNFurter · 7 May 2009
and see what's on the slab!

  3.3K  2.8K  

 **Frank Furter** @DrFNFurter · 7 May 2009
I see you shiver with antici ...

  66K  35K  

 **Frank Furter** @DrFNFurter · May 7
... pation.

  68K  37K  

You!!!



- There is NO silver bullet.
- No one resource works for all kids.
- Use data to determine student needs
- Choose resources and programs based on those needs and how your kids learn

Sometimes, lessons don't come from websites, curriculum maps, programs or books though.....

The Warehouse



Engage your students.....

- Just shut up!
- Don't lecture....facilitate...
- Have STUDENTS generate the questions and lead discussion...



- Use their interest in problem solving and surprises.....

Focus more on meta-cognitive thinking and problem solving rather than fill, kill, and drill.....(101qs.com)

Twitter - Tap in to the world....

Follow us on Twitter:

@SESMath

@MathFoundations

@BockJustin



Final Example of Real-Time Formative Assessment

The Kahoot! logo is centered on a background of a 4x4 grid of colored squares. The top-left two columns are orange, the top-right two columns are light blue, the bottom-left two columns are yellow, and the bottom-right two columns are green. The word "Kahoot!" is written in a white, bold, sans-serif font with a slight shadow effect.

Kahoot!

Thank you!

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