New and Preservice Teacher Workshop

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#NCTM2015

NCTM Annual Meeting Boston

@NCTM

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Welcome!

- Info cards - Fill out Front & Back
- NCTM is interested in knowing what new teachers and those in training want.
- Prizes will be drawn using info cards!
- Slides emailed to participants.

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New and Preservice Teacher Workshop

David Barnes

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#NCTMHouston

NCTM Regional Conference

Houston

@NCTM

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Session Goals

- Meet others, share, and learn
- Learn strategies for key areas of concern
- Give out Prizes

Want Free Money?

- No, seriously.
- Learn more at www.nctm.org/met

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New Teacher Strand

- Look for NT
- Sessions and Workshops
- Thursday and Friday

New Teacher Celebration

- 4:45 – 5:30 on Friday –
  156 A/B Convention Center

- Food and Fun!

- Bring a friend, friends or a stranger!

Share and Learn

- Share an idea that has worked well for you with a colleague.

- Get an idea from another colleague that has worked for them. Fill it in.

Take Away #1

What teachers say matters

The job of an educator is to teach students to see the vitality in themselves.

Joseph Campbell

You'll go far.

Mrs. Atterbury

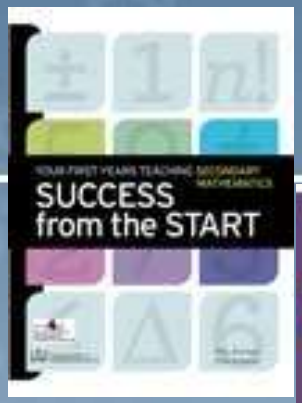
What Kids Say

I’m sorry, I was going to try to be good today, but forgot.

Austin, 2nd Grade

Princess and Tigger

Resources



Success from the Start

- *Elementary School*
- *Middle School & High School*

Empowering the Beginning Teacher of Mathematics Series

- *Elementary School*
- *Middle School*
- *High School*

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Find us on Facebook

Silver Bullet or Plan

- T
- L
- A

Have a Plan

- **T**ry
- **L**earn
- **A**dapt

Discussion Topics

- Planning
- Instruction
- Assessment
- Classroom Organization
- Classroom Management
- Managing Homework
- Questioning Techniques
- Using Technology
- Motivating Students
- Problem Solving
- Group Work
- Parents and Family
- Keeping Your Sanity

Three Questions

- What is the problem?
- What would it look like if the problem was solved?
- What is one thing you could do to move toward a solution?

Planning

- Questions to ask:
  - What do I want? – Be Specific!
  - Do you have a hook?
  - How do you engage?
  - Is there another way?

Planning

- Write it Down!
  - Jot down ideas/notes in your book
  - Recalling a good teaching suggestion from a previous year may be difficult
- Ask, Listen, Decide!

Instruction

- Door Problems!
  - Quick problem when they hit the door
  - Always have an assignment
- Know your content
- Know your audience
- Strategies for learning

Instruction

- If a lesson is going badly
  - –STOP
    - – Regroup with a new approach, or Do something else
    - – Examine what went wrong
    - – Make plans for the next day

Assessment

- Help students learn to explain their reasoning
- Ask "Why?" and questions such as:
  - What did you do first?
  - How could I show that?
  - Then what did you do? Why?
  - I don't understand how you did that. Can you tell me more?

Assessment - Scoring

- Valuing the Process and the Answer
  - Avoid all-or-nothing grading schemes
  - Insist on detailed explanations
  - Reward reasonable efforts and different approaches
  - Use “+2 out of 4” instead of “-2 out of 4”

Classroom Organization

- Help students (and parents) to track their own progress
  - Create assignment sheet for students' notebooks
  - Make class folders where absent students find missed assignments/handouts.

Classroom Management

Classroom Management

http://www.seaforthbaps.org.au/FamiliesandKids

http://www.si.edu/Visit/VisitInfoGroups

managing people and

Classroom Management

http://www.seaforthbaps.org.au/FamiliesandKids

managing people and processes

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Classroom Management

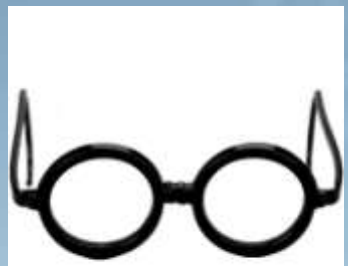
- What do students want?

Classroom Management

- What do students want?
  - Valued
  - Respected
  - Recognized and Appreciated
  - Be Truly Successful at Challenging Tasks

Classroom Management

- Model and teach what you want from day 1. Including processes!
- Learn everyone's name. Smile!
- Voice, whisper, the look!
- Everyone wants to be the best. Create yourchallenges.
- How do you feel in your room? Our room?



Check Lists

- Difference between a list and a checklist?
- Create routine
- Don’t forget
- Kids know what is going to happen.
- Pay attention to other things

Classroom Management

- What does it look like in action?
  - Order
  - Respect
  - Engagement
  - Ownership

Homework

Homework

- How much homework to assign?
  - What do you expect from the assignment?
  - What information will it provide you?
  - How many problems to assign? Will 5 work?
  - How long did it take you?
- Homework quizzes

Questioning Techniques

- Use class-centered prompts
  "Think about how you would …?"
- No yes/no or single number questions.
- "Explain to us how you found your solution"
- What would you say if you did know the answer.
- Ask "Why?" a lot!

Which Gray Matter?

- Hexagonal Prism?
- Hard?
- Soft?

Which Gray Matter? Quiz

Which Gray Matter? Quiz

- (14.26 * 2.7 * 4.5 * 0) + 27 = ?

Which Gray Matter? Quiz

- (14.26 * 2.7 * 4.5 * 0) + 27 = ?
- 1/3 + 3/8 + 2/10 = ?

Which Gray Matter? Quiz

- (14.26 * 2.7 * 4.5 * 0) + 27 = ?
- 1/3 + 3/8 + 2/10 = ?
- Square Root of 27 = ?

Using Technology

- Technology is not **the** answer
- Use technology as a tool to make the learning of mathematics richer and better
- Scaffold an investigation with a handout of specific questions versus “Explore”
- Resist having students work individually

Online Resources

- The NCTM Web site—www.nctm.org
  - Organized by elementary, middle, and high school
- NCTM Member's Only—www.nctm.org/members
  - Access to current and archived journals, On-Math, Student Math Notes, and more
- NCTM Standards—standards.nctm.org
  - Full text of *Principles and Standards for School Mathematics*, electronic examples for each grade band

Online Resources

- Illuminations Web site—illuminations.nctm.org
  - Lesson plans for teachers, interactive applets for students, reviewed Web resources
- Reflections Web site—www.nctm.org/reflections
  - Reflect on instructional practices through video clips, lesson plans, and student work
- Figure This! Web site—www.figurethis.org
  - Math challenges for middle school students, information to help families get involved

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- Position Statements

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- MIDDLE SCHOOL
- HIGH SCHOOL
- HIGHER ED
- LEADERS
- FAMILIES

Professional Development Focus of the Year 2006-2007

Show Me the Math: Learning Through Representation

President's Corner

Chat Archive

President's Message

Featured Products

Calendar of Events

3/7/2007
Online Chat With NCTM President

3/14/2007
Pi Day

3/21/2007
Atlanta Annual Meeting & Exposition

New Resources

Results and Interpretation of the 2003 Math Assessment of the NAEP

Using Virtual Manipulatives to Model Computation with Fractions

Focus on Representation

The Representation Standard
Principles & Standards for School Mathematics

The Roles of Representation in School Mathematics
Buy Online

Representation as a Vehicle for Solving and Communication
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Resources from NCTM

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The NCTM Standards

Research Clips and Briefs

NCTM's research clips and briefs distill math education research, making it easier for teachers to link what they do in the classroom to research findings. Find out what the latest research tells us.

Research clips are concise, research-backed statements.
Research briefs summarize a body of research.

Effective Instruction

Features of effective instruction for developing students' skill and conceptual understanding of number

Research clip (PDF, 38KB)
Research brief (PDF, 83KB)

Students with Difficulties

Effective strategies for teaching students with difficulties in math

Research clip (PDF, 35KB)
Research brief (PDF, 78KB)

Characteristics of students with learning difficulties in math

Research clip (PDF, 35KB)

Calendar Problems from *Mathematics Teacher*

Select Number of Problems

○ 5 ◉ 10 ○ 15 ○ 20 ○ 31

Select Topics

- ☑ Algebra (339)
- ☐ Calculus/Precalculus (30)
- ☐ Connections/Applications (6)
- ☐ Discrete Mathematics (38)
- ☐ Combinatorics (41)
- ☐ Functions (28)
- ☐ Geometry/Measurement (248)
- ☐ Spatial Sense (35)
- ☐ Modeling (16)
- ☑ Number/Computation (251)
- ☐ Number System (23)
- ☐ Number Theory (115)
- ☐ Patterns (53)
- ☐ Probability (60)
- ☐ Problem Solving/Reasoning (185)
- ☐ Representation (2)
- ☐ Statistics/Data Analysis (26)
- ☐ Trigonometry (14)

Submit

Problems:

1	During a basketball game, Jenny made 60 percent of her free throws and Ellen made 75 percent of her free throws. If,

Math Challenge #14 BATTLING AVERAGES

Who's on first today?

Figure This! Math Challenges for Families

Figure This!

In May 1999, two National League baseball players, Joe McEwing of the St. Louis Cardinals and Mike Lieberthal of the Philadelphia Phillies, each had the batting averages shown below.

Player	Bats	Hits	Batting Average
M. Lieberthal	132	45	.341
J. McEwing	132	45	.341

Suppose McEwing then batted .800 (4 hits in 5 at bats), and Lieberthal was perfect (3 hits in 3 at bats). Which player now has the higher batting average? Are you surprised?

Hint?

An average is a tool for helping us understand and compare sets of numbers. Sports, medicine, and insurance are three of the many fields that use averages.

Math Challenge 14 Answer
BATTING AVERAGE

Figure This! Math Challenges for Families

Answer:
McEwing has the higher batting average.

Complete Solution:
Both players had 45 hits in 132 at bats. Then, with the statistics from the next at bats, **McEwing's average is 49 ÷ 137, or about .358** while **Lieberthal's batting average is 48 ÷ 135, or about .356**.

One way to make sense of this unexpected result is to imagine that McEwing gets 3 hits in his first 3 at bats while Lieberthal also gets 3 hits in 3 at bats. Then the pair is still tied. During McEwing's last 2 at bats, he gets 1 hit. This average of 1 for 2, or .500 is better than his current average, so his batting average goes up.

Player	At Bats	Hits	Batting Average	Next At Bats	Next Hits	New Average
M. Lieberthal	132	45	45 ÷ 132 = .341	3	3	48 ÷ 135 = .356
J. McEwing	132	45	45 ÷ 132 = .341	5	4	49 ÷ 137 = .358

Motivating Students

Motivating Students

- Simpler is not more engaging (more boring) – find the sweet spot.
- Start with what is important! – Day 1
- Find the magic in your students!
- Value Hard Work! Value Insights! Value Creativity! Value Persistence.

Problem Solving

- Don’t make Problem Solving the first thing to go
- Give time to struggle
- Give specific hints
- Celebrate elegant and unique solutions
- Engage Parents! – Parent – Teacher Night – Weekly problems to work on

Problem Solving

Non-problem solving mode

1. 14 + 29
2. 8 + 35
3. 15 + 29

Problem-solving mode

1. Find two consecutive numbers whose sum is 43.
2. Find two counting numbers whose sum is 43 and whose ones digit differs by 3.
3. Find two numbers whose sum is 44 and one of whose addends is 14 more than the other.

Group Work

- Find the right task – Complex enough to need working together
- Identify and teach roles to students
- Hold all students accountable for the work of the group
- Watch, listen and then interact with groups as they work

Parents and Families

- Build Parents as Allies
  - Brag to parents within the first 4 weeks.
  - Ask them to work with you
  - Keep in touch

Parents and Families

- Parents can learn!
  Don't just tell parents, show them!
  - Help students to engage their parents
  - Family math night where parents and students work on math together
  - Give parents ways to help their children

Keeping Your Sanity

- Do not work alone – communicate with colleagues, interact with others online, attend meetings
- Find a mentor
- Learn to say “No”
- Make a mistake?
  - Apologize if you need to. Move on.
  - Don’t beat yourself up.

Keeping Your Sanity

Laugh

&

Enjoy

11Q – Q

- Thank you for attending the session and for all you'll do as a teacher.
- This is the best job on earth!
- Stand up straight!
  Hold your head high!
  Look people in the eye and announce proudly,
  "I am a teacher!"

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