

# ROBYN SILBEY PROFESSIONAL DEVELOPMENT

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## NCTM 2014: 3 Proven Strategies for Adding Rigor and Making Math Real

*The shift in job growth requires a shift in learning, which can be accomplished only if we make a corresponding shift in instruction.*

### The Common Core State Standards featuring *the Standards for Mathematical Practice*

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| <ol style="list-style-type: none"><li>1. Make sense of problems and persevere in solving them.</li><li>2. Reason abstractly and quantitatively.</li><li>3. Construct viable arguments and critique the reasoning of others.</li><li>4. Model with mathematics.</li></ol> | <ol style="list-style-type: none"><li>5. Use appropriate tools strategically.</li><li>6. Attend to precision.</li><li>7. Look for and make use of structure.</li><li>8. Look for and express regularity in repeated reasoning.</li></ol> |
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### Assessments: PARCC and SBAC

- PARCC: <http://parconline.org/samples/item-task-prototypes>
- SBAC: <http://sampleitems.smarterbalanced.org/itempreview/sbac/index.htm>

### Three Strategies for Success on the Assessment and Beyond

Strategy 1: Stop “cold” calling one student at a time. Engage and involve all of the students all of the time. *Always* insist on reasoning and proof.

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| <p><b>A</b> Every pupil response with fingers</p> <ul style="list-style-type: none"><li>• What is the difference between 9 and 3?</li><li>• How many digits in the quotient of <math>378 \div 42</math>?</li><li>• What is the slope of the equation <math>y = 3x = 7</math>?</li></ul> <p><b>C</b> Partners: Take turns telling things</p> <ul style="list-style-type: none"><li>• What are some ways to compose 100?</li><li>• What fractions are equivalent to 0.625?</li><li>• What lies between <math>1/2</math> and <math>1/3</math>?</li><li>• Which upper case letters have vertical symmetry?</li></ul> <p><b>E</b> Small group discussions</p> <ul style="list-style-type: none"><li>• What is the most difficult fact to remember and why?</li><li>• Respond to four questions. Each question begins with a different discussion starter.</li></ul> | <p><b>B</b> Every pupil response chanting</p> <ul style="list-style-type: none"><li>• What is the sum of 5 and 7?</li><li>• Which shape has 4 equal sides and 4 right angles?</li><li>• What fractional part of a circle’s diameter is its radius?</li></ul> <p><b>D</b> Tell what your partner said</p> <ul style="list-style-type: none"><li>• How would you paraphrase this problem?</li><li>• How would you solve this problem?</li><li>• How can you tell if your answer makes sense?</li></ul> |
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### Strategy 2: Tap Intrinsic Motivation (Daniel Pink, DRiVE)

Three elements of intrinsic motivation

- Autonomy: “I can learn/do it *my* way.”
- Mastery: “I will be (or I am) good at this!”
- Purpose: “I need and/or want to learn this!”

### Strategy 3: Nurture a Growth Mindset (Mindset, Carol Dweck)

- Extrinsic incentives reinforce intelligence and athleticism...and a *fixed mindset*.
  - “I’m smart. I don’t take risks. If I make a mistake, I feel stupid.”
- Intrinsic motivators reinforce effort, hard work...and a *growth mindset*.
  - “I work hard and continue to improve. Mistakes are markers on the road to success.”