

## Strategies to Be Proactive, *Not* Reactive, with Challenging Students

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It is not about you - it is about them.

Kahoot.it

### 1. Focus on what the learner will be doing.

- Use the technology available to engage your learners. (kahoot.it)
- Plan for them in your lessons.
- When you are working on your lesson plan, make sure that your focus is always on what the learner will be doing.
- An outstanding lesson will not be successful if the students are not involved.
- Who in the classroom needs to know how to work the problem? – the students
- Who in the “traditional” classroom works the most problems? - the teacher
- What happens when students are not engaged?

### Important components

- Plan your questions.
- Use correct terminology. Avoid “this,” “that,” and “here” in place of the appropriate term.
- Remember, the more time the student spends on a task, the more likely they will be able to master the task.
- Open the lesson immediately with something that will focus their attention on the lesson. (Entry or launch)
- Know the material you are about to teach.
- Use real world examples or applications as often as possible.
- Use cognitive closure.

### Slope

- Show pictures of real world items with slope. Have student talk about them with a partner. Use graph paper to draw the lines they see. Then define mathematically.
- How would this approach fit “Experience before label”?
- Where would you go from here? How would this approach be different than the way you learned about slope?
- What questions would you ask during a lesson like this?
- What types of problems would they work?
- What is an example of closure you could use?
- What would be an appropriate use of technology in this lesson?
- What would the students be doing?

Slope				
Time	Teacher Action	Examples	Description and Questions	Learners Action
8:00 – 8:05	Entry	Show real world pictures of items with slope: ski slope, ladder, slide, access ramp, roof, wall, etc.	Look at the pictures you see. Talk to your partner about you believe they have in common. When they have decided on the answer lead the class discussion.	Turn and talk with a partner. Write down your ideas and answers. Then discuss.
8:05 – 8:15	Provide graph paper and go back through the photos	Make sure vertical, horizontal, positive and negative slopes are included	Use the graph paper to sketch the lines you see. How would you describe the slope?	Students are in pairs working and discussing how to solve the problems.

## 2. Build Connections

- Let them know you are interested in them as people, focus on the person first and their 'label' last.
- Learn names quickly.
- Ask them to write to you on assignments or in journals.
- Write back to them in a letter or journal.
- Listen to them. Really listen.
- Provide Immediate and positive feedback. (not phony praise)
- Connections can help Prevent Problems
- Serious problems we face with students include: suicide, homicide, substance abuse, pregnancy, violence, bullying.
- The two strongest protective factors were found to be emotional attachments to parents and teachers.
- "Positive relationships with teachers were more important than class size, amount of teacher training, classroom rules and school policy." Resnick, et al 1997

### Journaling to Connect

- How can I help you to be more successful?
- What do you like for a teacher to do in the mathematics classroom?
- What don't you like for a teacher to do in the mathematics classroom?
- What was the most difficult problem on the homework and why?
- Tell me something about yourself I don't know but need to know.
- Write a postulate for your life.

### Math Metaphors

- If math were a food, what kind of food would it be?
- If math were weather, what type of weather would it be?
- If math were a building, what kind of building would it be?
- If math were an animal, what animal would it be?

Next, we would take each answer and make it a sentence. If math were \_\_\_\_\_ it would be \_\_\_\_\_ because . . .

Then each student would choose one item and write a paragraph.

### Benefits of Journal Writing

- My students enjoy them.
- Better student-teacher interaction.
- Helps the teacher better understand his or her students.
- Improves writing skills.
- Introduces the idea of technical writing.
- Helps students form views about mathematics.

- Individual diagnosis and evaluation.
- Helps students think about the nature of mathematics, mathematics is more than memorization of rules and procedures.
- Gives weak mathematics students a chance to use a skill area in which they may excel.
- Increases communication.

### 3. Build Classroom Structure

- Make sure the students know what is expected of them when they enter the classroom.
- Have a journal entry or problem of the day or review problem on display. Students should know to start writing.
- Clear desks and get out only the materials needed for class.
- Don't waste time by doing the mechanics, focus on the students and then take care of bookkeeping and other issues.
- Don't get in a hole with reviewing homework.
- Assign homework but be realistic.
- Use homework coupons.

What is the purpose of homework?

- Discuss with a partner some of the parameters that are relevant to homework:
  - *Length*
  - *Differentiation (same point values different problem levels)*
  - *Grading Methods*
  - *Percentage of grade*
  - *How to help students value it*
  - *Feedback*
  - *Know why you do it.*
  - *Help the learners connect homework to learning targets and reflect on errors and learning*

### 4. Be Proactive

- Proactive management – active ahead of time
  - *Reactive management - nag, nag, nag*
- Be consistent
- Set rules and expectations at the start of the year
- Start with meaningful math at the beginning of class
- Notice each student
- Notice each action
- Provide choice
- Avoid power struggles

## 5. Pay attention to Time and Space

- “Time is the most valuable thing a man can spend.” Theophrastus, *from Diogenes Laertius, Lives of Eminent Philosophers* Greek botanist, humorist, & naturalist (372 BC - 287 BC)
  - Make eye contact – talk to the students
  - Active listening – focus, listen, observe, ask questions, and paraphrase answers
- Seating and chair arrangement makes a difference.
  - Quads
  - U
  - Rows
  - Partners

## 6. Build Cooperation

- Teachers need cooperation from everyone.
- More than just stopping disruptive behavior, we want students to start doing what they should be doing.
- Use Cooperative Groups and Teamwork
  - Use worthwhile and well defined tasks
  - Structure your groups in advance - plan
  - Make sure students head to groups with a clear understanding of the expectations of the task
  - Use Question Coupons
  - Use Jigsaw groups

If . . . A tennis ball has a mass of 57 grams

What is the mass of a . . .

- baseball
- ping pong ball
- golf ball
- basketball
- soccer ball

**The mass of a tennis ball is 57 grams.**

	Individual Estimate	Group agreed on Estimate	Altered After Clues	Altered with Computation Clue	Final
<b>Baseball</b>					
<b>Ping Pong Ball</b>					
<b>Golf Ball</b>					
<b>Basketball</b>					
<b>Soccer Ball</b>					

## Peer Tutoring

*Research on class-wide peer tutoring programs where each partner works in both roles has shown achievement at higher levels than without peer tutoring.*

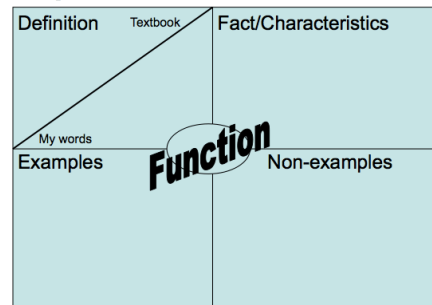
- Teach Responsibility and Self-discipline
  - Self-awareness
    - Help them to recognize their own strengths and weaknesses
  - Self-Efficacy

- Help them set short and long term goals
- Create action plans to reach the goals
- Help them evaluate their progress toward their goals
- Teach them how to use positive self-talk

## 7. Use Graphic Organizers

- Help students learn to take notes and to organize information
- Support thinking and learning
- Provides a visual representation of facts, concepts, and the relationships that link them together
- Help students represent abstract ideas in a more concrete way
- Good for retention and recall of information

**Fruyer Model**



## 8. Implement the Mathematical Practices

- ✓ Same Mathematical Practices K - 12
- ✓ Life skills that are critical for student success
- ✓ Every subject can benefit from students that can demonstrate skill with the practices
- ✓ Simply finding the answer or knowing a definition is not enough, the students must be able to make sense of the mathematics
- ✓ Focus on one every day and say to your students “Today I am looking for evidence that you can demonstrate ....”
- ✓ Then ask the students what they did to demonstrate the practice at the end of class.

Make sense of problems and persevere in solving them.

- ✓ Problem solving is a part of life.
- ✓ Problem solving does not occur in a vacuum. We must reason about some specific content.
- ✓ Every subject area lends itself to the use of problem solving.
- ✓ Problem solving helps students make connections to other parts of mathematics and find some relevance to what they are learning.
- ✓ Better problem solvers are typically better test takers.

Spending money at the game

Explain how you arrived at your answers

**Spending money at the game**


How much does a t-shirt cost?  
How much for a drink?  
Explain how you got your answers.


## 9. Motivate Learning

- Create a need for the content
  - *Games*
  - *Applications of the material*
  - *Interest in the problem*
- Incentive Programs not Bribes
  - *Incentives are planned*
  - *Bribes are reactive*
- Differentiate Assignments
- Teach time- management
  - *Preferred activity time*
  - *Preferred activities should be enrichment opportunities*

## 10. Use formative assessment to inform your teaching

- Evaluate what is valued
  - *Standards*
  - *Concepts*
  - *What they know rather than what they don't*
- Use formative assessments for more than grades
  - *Pretests*
  - *Quizzes and Group quizzes*
  - *Class board work*
  - *Electronic assessment devices*
  - *Seat work*
  - *Traveling Math*
  - *Open ended questions*

$(x + 3)(x + 1)$	Mathematically $x(x+1) + 3(x+1) =$ $x^2 + x + 3x + 3 =$ $x^2 + 4x + 3$
Diagram 	In Words The horizontal axis is $x+3$ and the vertical is $x+1$ . When $x$ is multiplied times $x$ you get $x^2$ and 1 times $x$ is $x$ . You have 4 of those and 1 times 1 is 1 and you have 3.

$\frac{2}{3} \cdot \frac{3}{4}$	Mathematically $\frac{2}{3} \cdot \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$
Pictures or Diagrams 	In Words Vertically the box is divided into fourths and we shade 3 of them. Horizontally divide into 3 parts and shade 2. The overlap is 8 out of 12 squares or $\frac{2}{3}$ .

## Resources

- [What We Know About Mathematics Teaching and Learning, 3rd Edition, 2010 McREL](#)
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- Rutherford, Paula. [Why Didn't I Learn This in College](#). Alexandria: Just ASK Publications, 2002.