

# BLAST-BC: Lessons to Engage Diverse Learners

Incorporating differentiated instruction into secondary science  
classrooms

Our Charge: Meeting the needs of our students

Developing lessons and units using differentiated instruction to support students with a wide range of ability levels in a variety of school settings.

# Who we are, our schools, what we teach, and our unit/lesson topics

- Calhoun Community High School
  - Charter school alternative education program
  - 140 students
  - Student body ages 16 to 20 from all schools in Calhoun County
- Tara Egnatuk - Physical Science
  - Newton's Laws of Motion
- David Digby - Biology
  - Structure of DNA

# Who we are, our schools, what we teach, and our unit/lesson topics

- Lakeview High School - Battle Creek
  - Suburban - Class A School District
  - Grades 9 - 12
- John Burdette -Physical Science/Physics
  - Newton's Laws and Motion
  - Energy Conservation
- Cristine Crawford -Biology/Anatomy and Physiology
  - Protein Synthesis
- Lisa Mueller -Biology/Advanced Biology
  - Point and Frame Shift Mutations

# Who we are, our schools, what we teach, and our unit/lesson topics

- Parchment High School
  - Public High School
  - Rural - Class C
- Jodie Lugar-McManus - Biology 9-12th
  - Mitosis
- South Hill Academy:
  - Alternative High School in Battle Creek, MI
  - 250 students in grades 9-12
  - 96% free or reduced lunch
- Cathy Baisden - Biology, Geology, Environmental Science, Biochemistry
  - Meiosis

# Why Differentiated Instruction?

- No two students are exactly alike
- Despite this fact, many educators treat students as if they were
- Traditional teachers tend to teach to the middle - losing some and boring others
- We need to engage all students

# Our demonstrations will highlight what we learned about ...

- Classroom management
- Time management
- Logistics
- Implementation concerns and strategies
- Planning concerns and strategies
- How to determine groups/tiers
- How to tier the lessons

# Differentiated Instruction Puts an Emphasis on Active vs Passive Learning

- Active
  - Students participate in the process of learning
  - Students are more independent
  - Students take responsibility for their own learning
- Passive
  - Students attend class
  - Information is presented by the teacher

# Differentiation through Tiered Instruction

- Tiered instruction is a means of teaching one concept and meeting the different learning needs in a group
- Tiered instruction can be:
  - An assignment
  - A lesson
  - A strategy
- Tasks and or resources can vary according to:
  - Learning profile
  - Readiness
  - interest

# Tiered Lesson Goals

## Who benefits

- Struggling learners
- At grade level learners
- Gifted students
- EVERYONE

## Tiered lessons should

- Build understanding
- Challenge students
- Be interesting and engaging
- Be respectful

# Process of Tiering Instruction

- Identify the standard that you are assessing
- Identify the key concept you are going to teach
- Pre-assess students learning
- Using the pre-test data determine which area you will tier
- Determine the type of tiering you will do (readiness, interest, or learning profile)
- Determine the number of tiers you will need

# Sample DI lesson

Brief description of a chemistry gas laws lesson

- Tier 1: Students received all the formulas, definitions, and directions on how to use them...
- Tier 2: Students received the formulas, but had to determine how and when to use them..
- Tier 3: Students had to derive the formulas and were given extra information they needed to sift out.

# Differentiated instruction is not...

- Holding student accountable for different content.
- Watering down the content or expectations.

# Lesson Demonstrations

Lessons learned...

# Sample results from our classes... South Hill

- Out of four sections of biology, class two were randomly chosen to receive the tiered assignments, the remaining two classes were taught through a more traditional lecture style of teaching. (South Hill)
- The two classes taught through differentiated instruction had an average unit score 21 percent higher than the unit taught through a traditional method.
- Test scores averaged 11.7 % higher with the differentiated instruction group.

## DI Group

- "I like being able to work with other students on stuff that makes sense to me"
- "At first I didn't like being in a different tier - I thought that it meant I was slow or something, but then I realized that everyone ended up in tier 1 somewhere in the unit, and I got over the fear. I also think I learned better using this system."

## Traditional Group

- "What happened to the way we use to do things, can we go back?" - **our entire school is required to differentiate out lessons so this was a new learning strategy for our students.**
- "I was bored during half of the things we did, cant we go back to having different color folders so we can work on something more challenging"
- " I don't get this unit at all"
- "Even Mr. \_\_\_\_\_, challenges us more than this did - what happened, and when are we going back?"

# Comments from Lakeview students

- It made learning the content easier and it motivates you to try harder.
- It gave me a chance to work with people at my level, so I felt comfortable to ask questions and work together.
- I liked it because we were all working together to understand the stuff and we were on the same page.

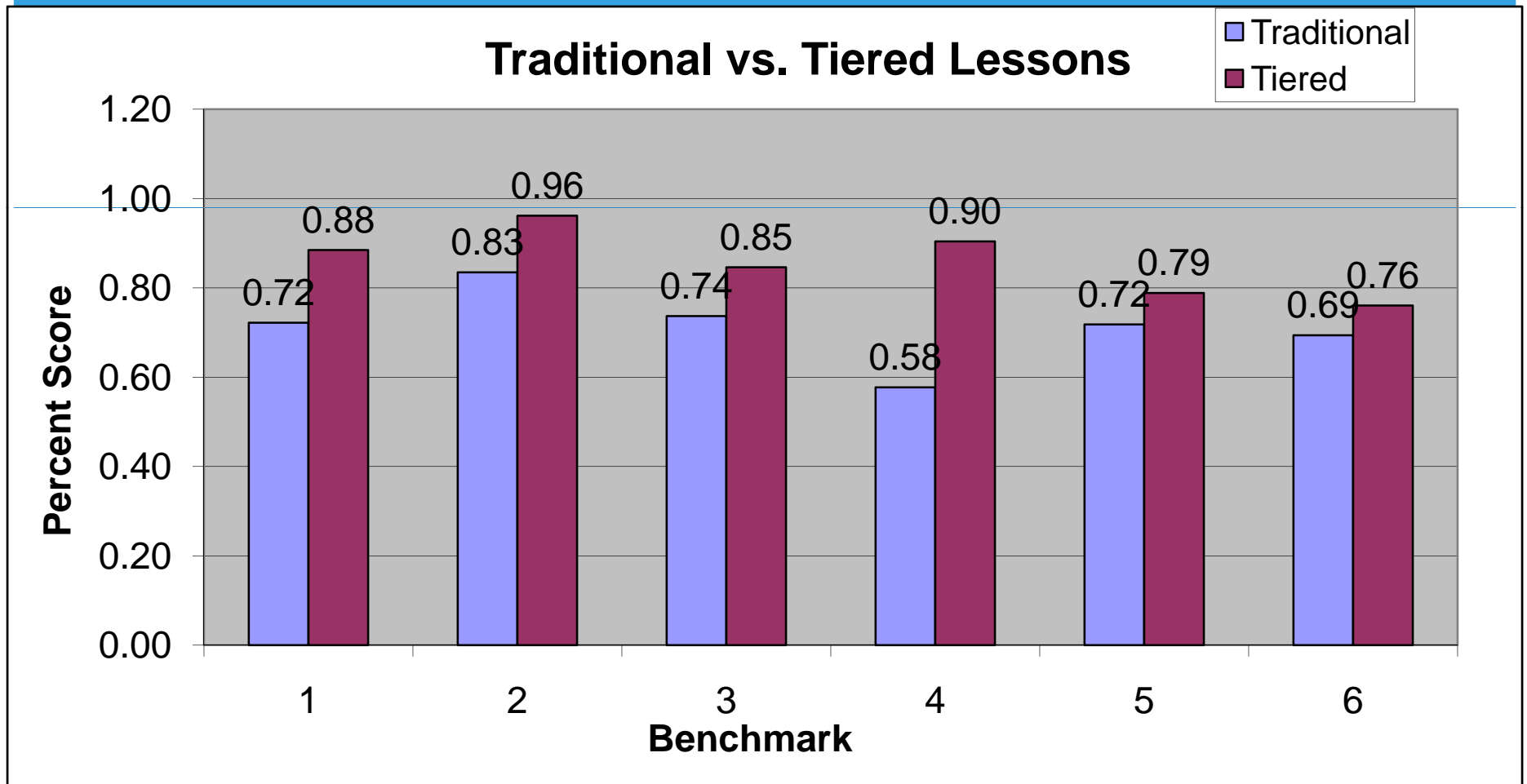
Did you like the change of being in smaller group tasks rather than traditional methods of teaching the same to all? Explain

- Yes it was great to work with students at my same learning level and my teacher moved around between our small groups to make sure we understanding the concepts.
- Yes, I loved being challenged!

Do you believe you have a better understanding of the main objective of the lesson?

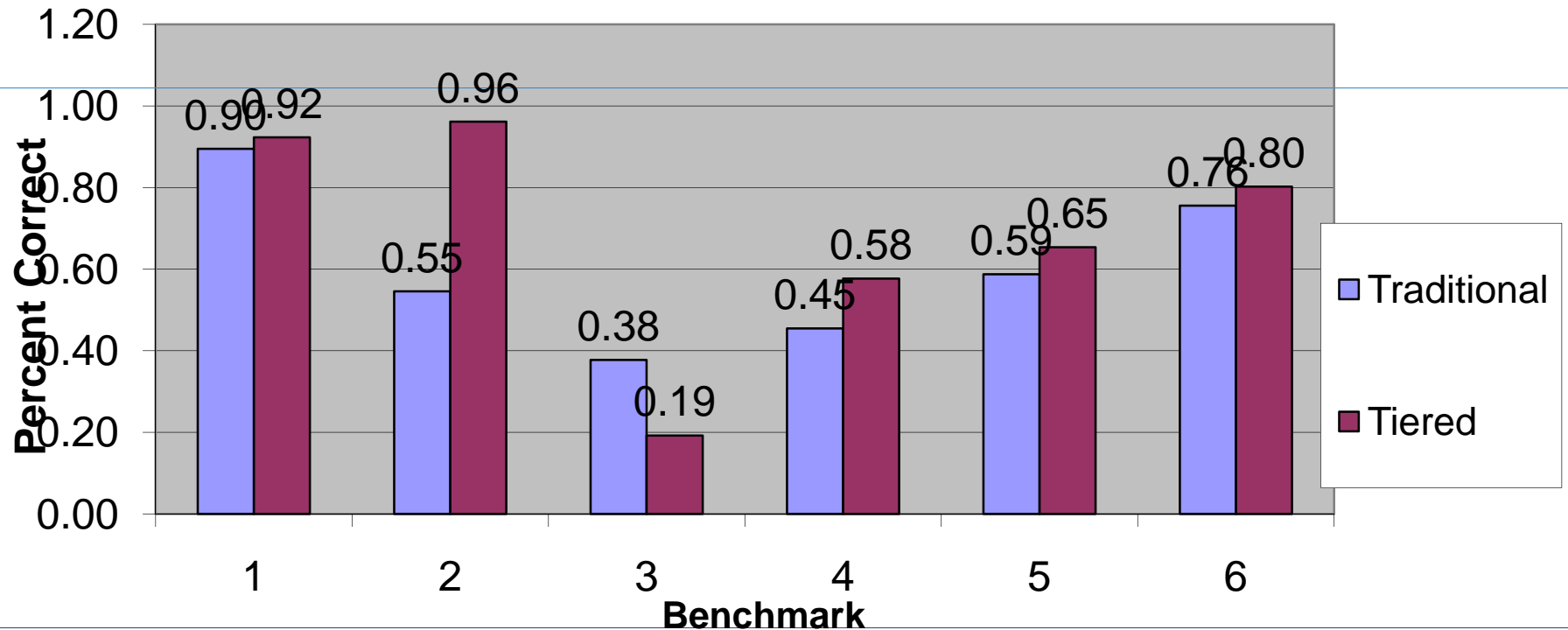
- I liked asking more questions when I didn't have to do it in front of the whole class
- I worked hard in the smaller groups and felt important in knowing the answers.

# Forces Test Data - Lakeview



# Energy Test Data - Lakeview

## Tiered vs. Traditional Lesson Performance



# What you will find on the CD...

- Lesson plans for each of the units
  - Life Science
    - Mitosis
    - Meiosis
    - Structure of DNA
    - Protein Synthesis
    - Point and Frame Shift Mutations
  - Physical Science
    - Newton's Laws and Motion
    - Energy Conservation
- Additional resources
  - Websites
  - Book suggestions