

Detracking Mathematics

From the View of both Administrators
And Teachers in Niles Township District 219

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- David Wartowski
- Bob Williams

Thursday, October 11, 2012
11:00 AM-12:00 PM
Room C142 (Convention Center)

Background Information

Niles Township District 219

- Two high schools with approximately 2,500 students each
- 45.5% White, 7.0% Black, 12.3% Hispanic, 31.2% Asian
- Low income 30.8%
- 92 languages spoken
- Students who speak a language other than English at home 53.7%

Defining Relevant Terms

EXPLORE – An ACT type test typically given to D219 8th graders.

EPAS – A series of tests including EXPLORE(8th), PLAN(9th), and ACT (11th)

High School Readiness – Defined by ACT as a score of 17 on EXPLORE for mathematics

College/Career Readiness – Defined by ACT as a score of 22 on ACT for mathematics

RTI – Response to Intervention: A tiered system to deliver interventions to struggling students

D219 – Niles Township District 219

CCSS – Common Core State Standards

- Course-specific Learning Targets
- Mathematical Practices

Call to ACTION!!!

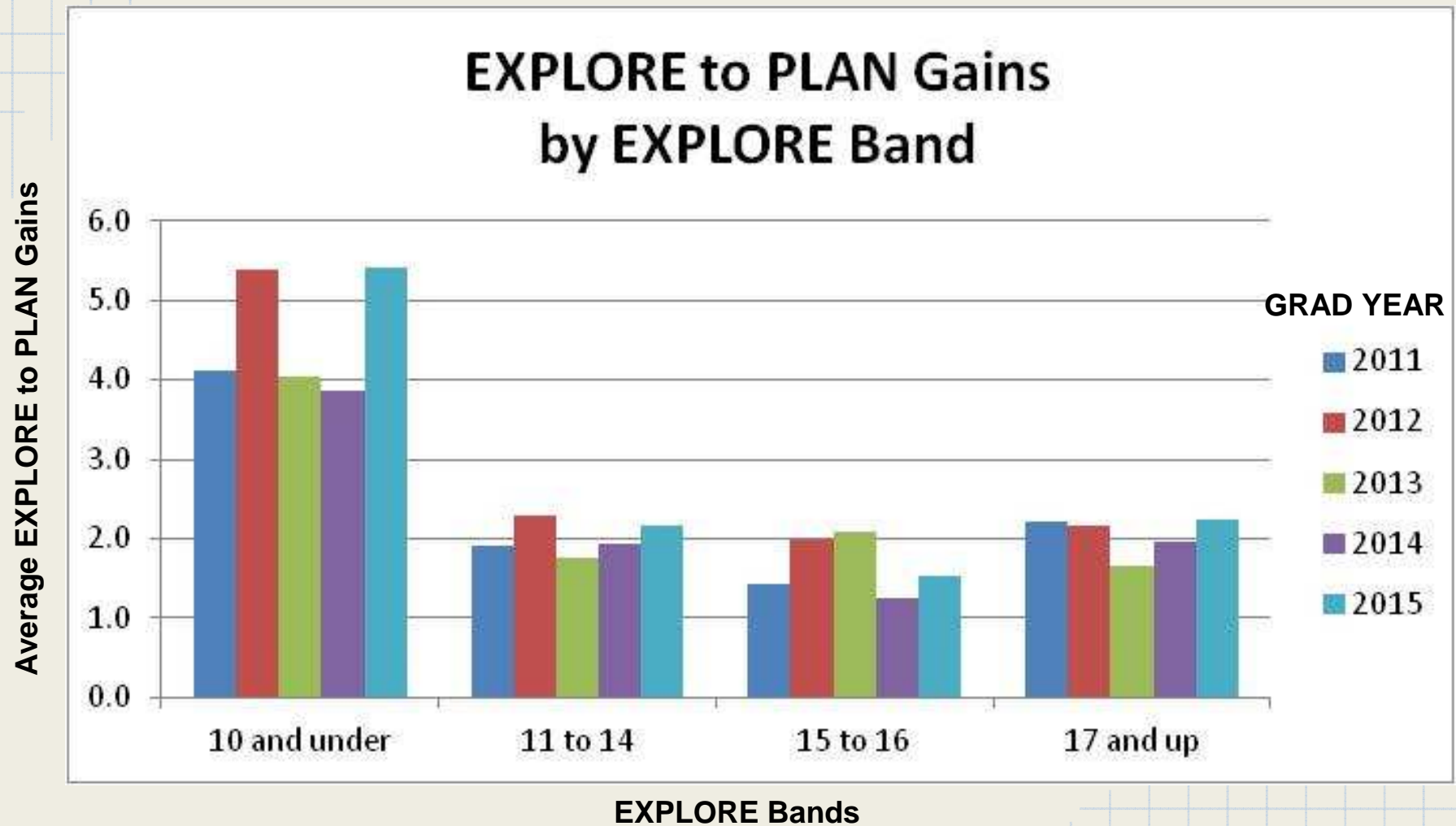
- Only **6%** of the students enrolled in lower-level mathematics in D219 attained college readiness.
- A student who earned a **C in a regular-level math** class was *three times as likely* to attain college readiness as a student who earned an **A in a lower-level math class** (48% vs 16%)
- A student who earned a **D in a regular-level math** was *more likely* to attain college readiness than a student who earned an **A in a lower-level math class** (20% vs 16%)

College Readiness

Reported by Course Grade and Level

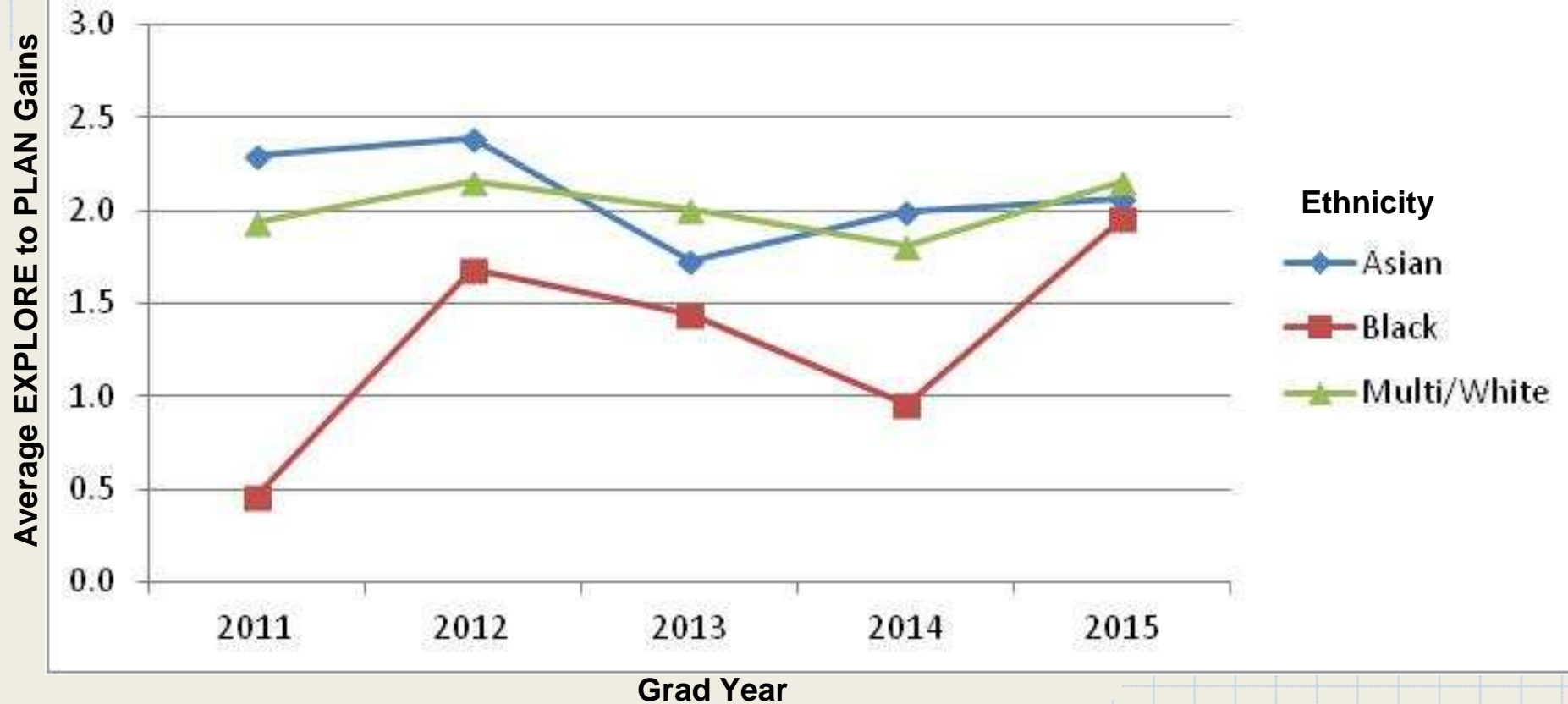
<i>Grade Earned during freshman year ('06-'07)</i>	A	B	C	D	F
College Ready Lower-level courses	16.3%	8.4%	2.9%	1.8%	0.0%
College Ready Regular-level course	76.8%	57.7%	48.3%	19.5%	10.0%

EPAS gain scores



EXPLORE to PLAN Gains

EXPLORE-PLAN Gains (by Race/Ethnicity)

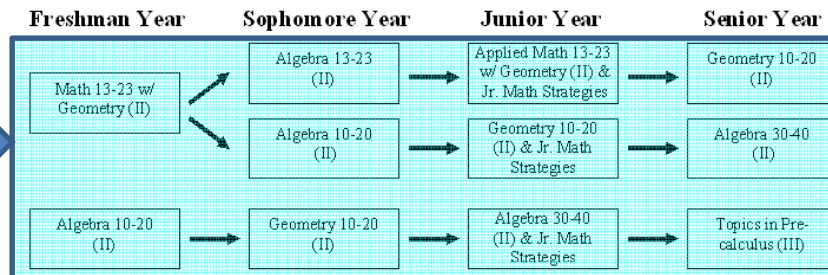


The OLD Course Structure...

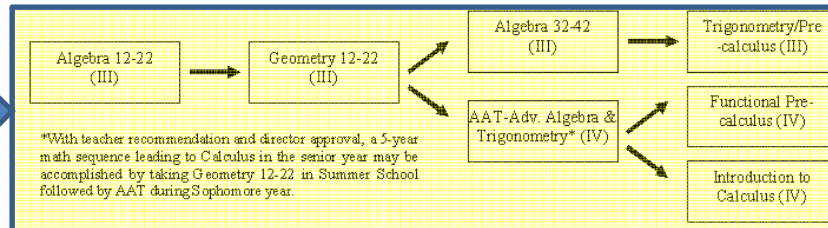
MATHEMATICS PROGRAM SEQUENCES

Pathways illustrate typical movement within a sequence of courses; however, adjustments in sequence can be made to accommodate individual needs.
Grade Weight Level is indicated in parentheses.

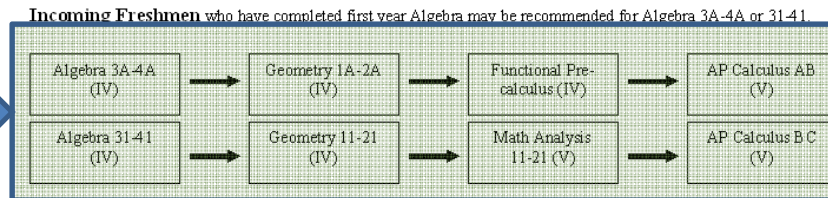
Lower Level Offerings



Regular Level Offerings



Advanced Level Offerings



Electives

Freshman Year

Computer Programming
AP Computer Science

Sophomore Year

Computer Programming
AP Computer Science
Video Game Programming
AP Statistics

Junior Year

Computer Programming
AP Computer Science
Video Game Programming
AP Statistics

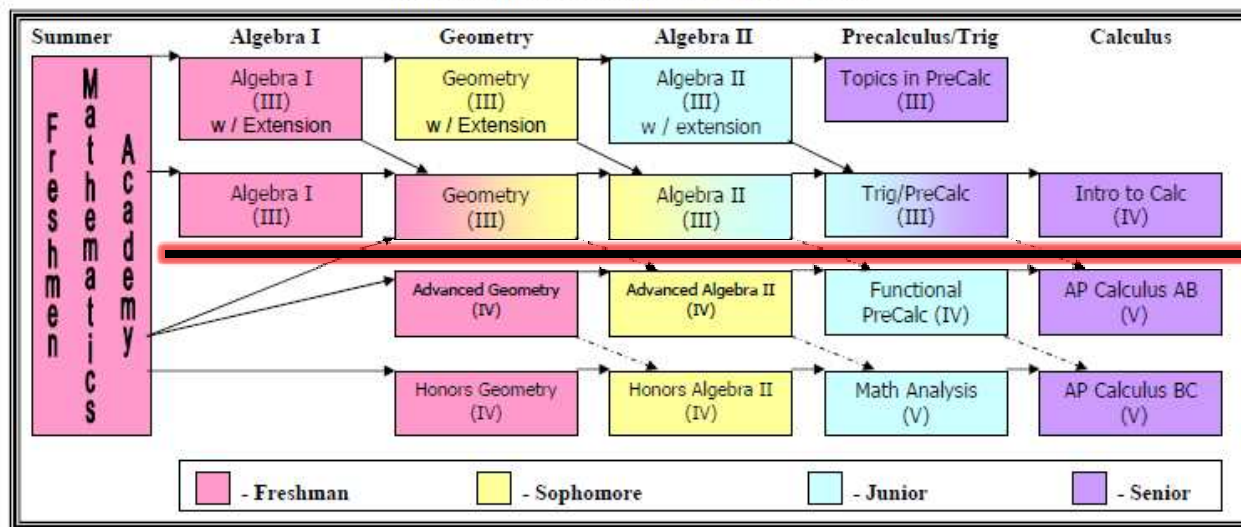
Senior Year

Computer Programming
AP Computer Science
Video Game Programming
AP Statistics
Post Calculus Topics

The NEW Course Structure...

MATHEMATICS PROGRAM COURSE SEQUENCE

Pathways illustrate typical movement within a sequence of courses.
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Regular Level Offerings

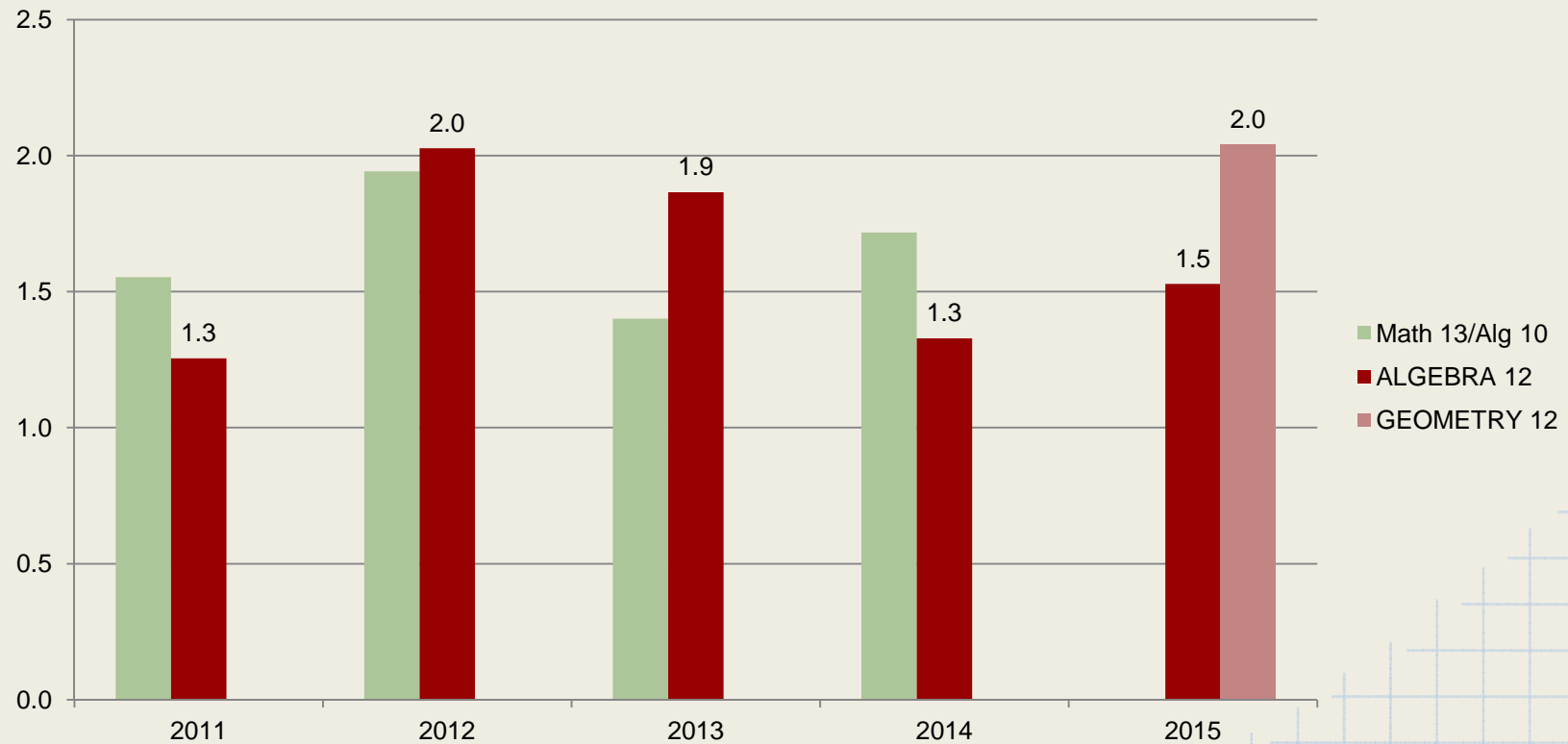
Advanced Level Offerings

MATHEMATICS PROGRAM ELECTIVES

Computer Programming (III)	Students may enroll in this course at anytime.	AP Computer Science A (V)	Students may enroll after completion of algebra (B or better) or teacher rec.	Video Game Programming and Design (V)	Students may enroll after completion of AP Computer Science A and teacher rec.
Advanced Algebra and Trigonometry (IV)	Students may enroll in this course anytime after Algebra 12-22 to move to level IV.	AP Statistics (V)	Students may enroll after completion of 2 nd year algebra course or teacher rec.	Post Calculus Topics (V)	Students may enroll after completion of an AP Calculus course and teacher rec.
		Mathematical Modeling (V)	Students may enroll at anytime with the approval of the Mathematics Director		

Gains by Course: Non-Honors (Freshmen)

EXPLORE to PLAN Gains by Course by Grad Year



Structural Changes (the 1st work)

- Remove Lower Level courses from the course offerings
- Add Supports and Interventions
 - Extension Period
 - Summer Programs
- Allow Advancement (Hattie Effect Size: .72)

The real work...

Classroom Instruction

Instruction: Organic Implications of New Structure

- Differentiated Instruction – In the Classroom
 - Choice
 - Tiered Activates
 - Minimal Direct Instruction
 - Student Ownership of Learning
 - Groups
 - Community of Learning
 - Responsible for each other
 - Responsible for yourself
 - It's OK to try and to be wrong (“You don't know how to do it... yet”)
- Differentiated Instruction – The Curricular Aspects
 - Focus on Mathematical Practices
 - Depth, not Breadth (the “80 percent rule”)
 - Identification of Curricular Themes

Instruction: Organic Implications of New Structure

- Necessary Collaboration
 - Common Formative Assessments
 - Common Targets
 - Curricular Teams
- Interventionist Attitude
 - Identify and Act Early
 - Know that every student can be successful
- Continue with / expand
 - Assessment for Learning
 - Timely, accurate feedback
 - Focus on learning, not point accumulation
 - Common Core Adoption
 - Vertical Alignment
 - Focus on Rigor
 - Focus on Problem Solving
 - Balance of Skills AND Problem Solving

Extension Period

- Clear Exit Criteria
 - Proficiency in Algebra 1
 - Development of Skill Deficits
- General Student Skills: Persistence/Mindset/GRIT
 - SuperMe
- Pre-Teaching
- Community Support/Building & RELATIONSHIPS
- Individualized Skill Building
 - ALEKS
 - STAR MATH (Renaissance Learning)
- Literacy

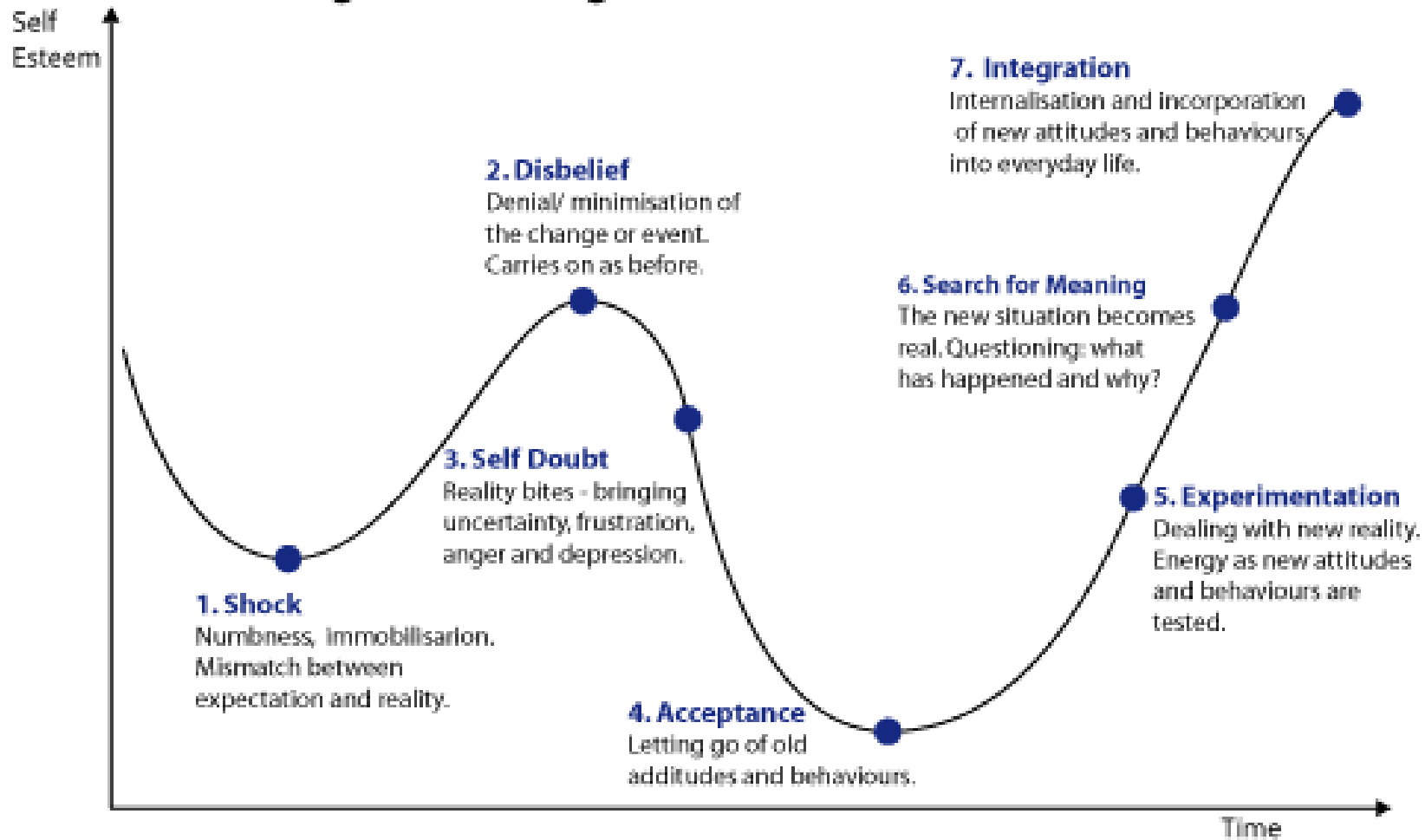
Curricular Leadership

- District-level Vision & Support
- Put Kids First – What’s in the best interest of students?
- Effective Communication
 - Honesty and Integrity
 - Clarity of Purpose & Direction
 - Updates on Progress; Clear Communication Along the Way
 - Inclusion of Multiple Perspectives, Ideas, Concerns, Questions
- Employing a Team
 - The Question Asker
 - The Problem Finder
 - The Solutions Person (often, the “EF Hutton”)
 - The Get-It-Done Personality
 - The Social Glue
- Trust

The PROCESS of change*

- Key Ideas
 - COMMUNICATE, COMMUNICATE, COMMUNICATE
 - “All of us are smarter than any one of us”
 - Seek to understand and address opposing views
 - Be acutely conscious of emotions and of time constraints
- Process (High Level)
 1. Start with Data; Allow conversation
 2. Suggest a solution; be clear
 3. Allow lots of conversation
 4. Alleviate ambiguity: Document the comments, concerns, questions, and answers
 5. Establish measures of success
 6. MAKE THE CHANGE – “Ready, Fire, Aim”
 7. Follow the measures of success – communicate successes & concerns
 8. Adjust as needed – “Ready, Fire, Aim, Fire Again”

The Stages of Change



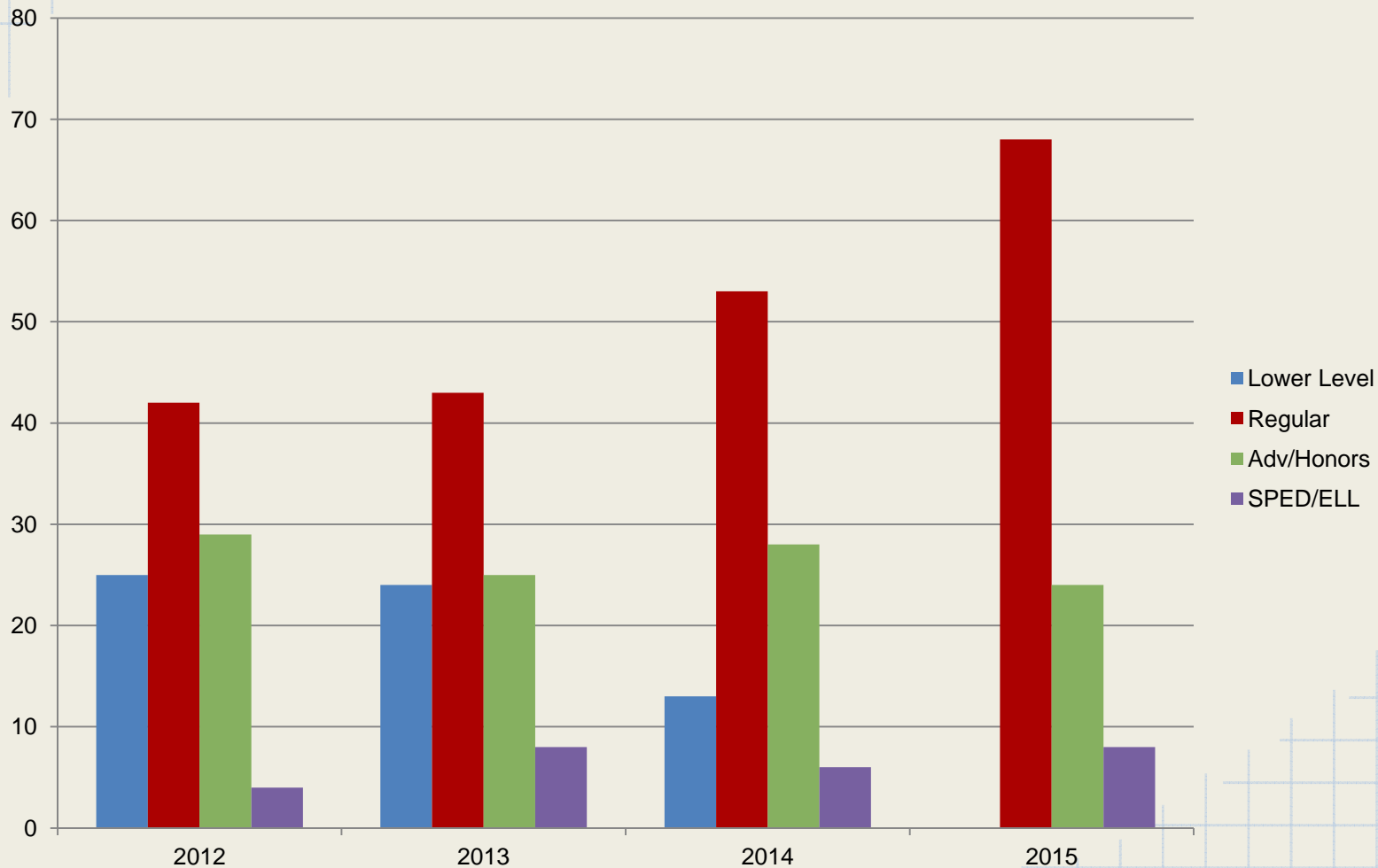
This is a seven-stage adaptation of the five stages of grief identified by Elisabeth Kübler-Ross, an acknowledged expert on *grief and bereavement*.



Does the NEW Course
Structure work???

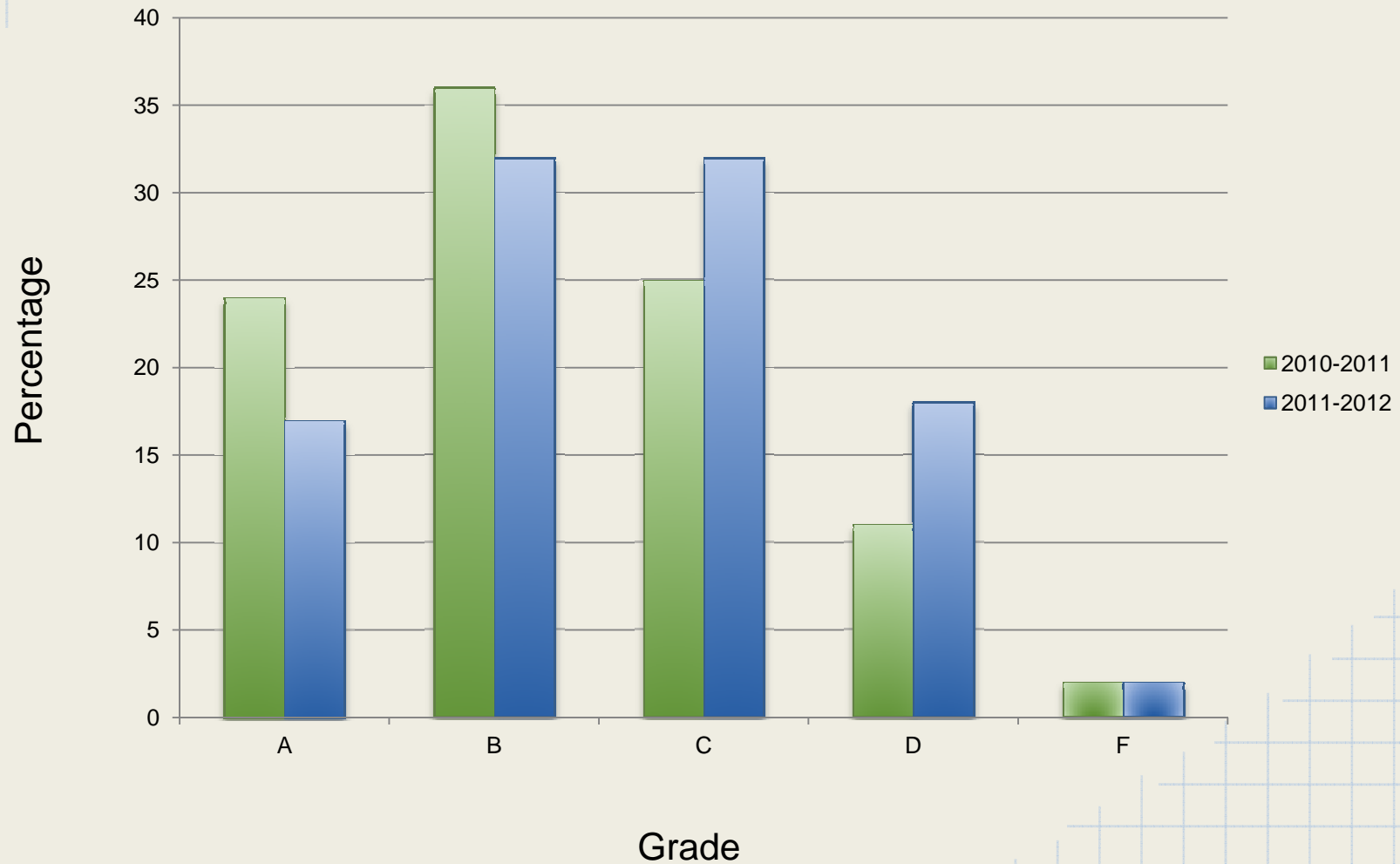
Enrollment by Level

Listed by Percentage of Class



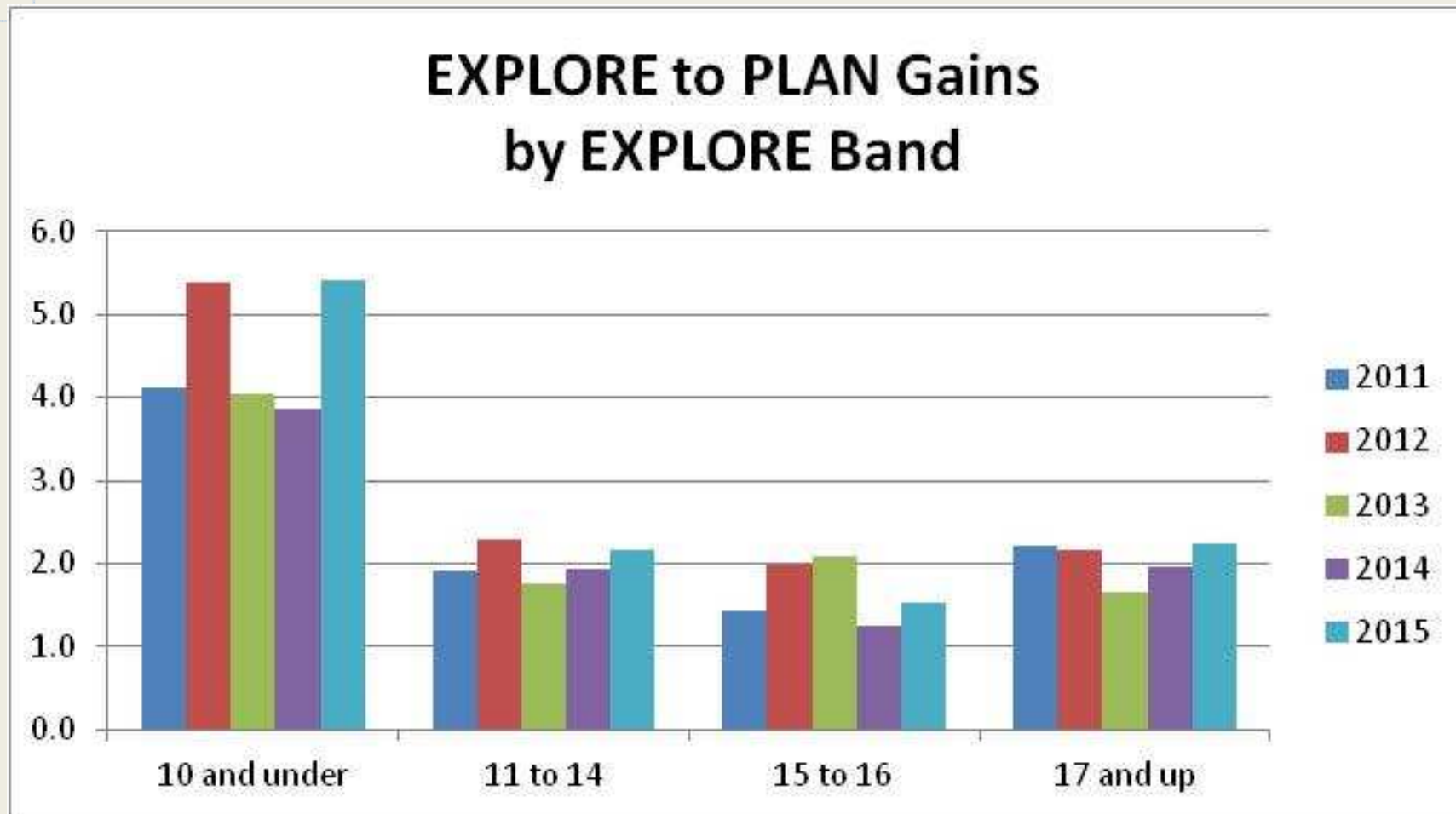
Algebra Grade Distribution

2010-2011 vs. 2011-2012



EPAS gain scores

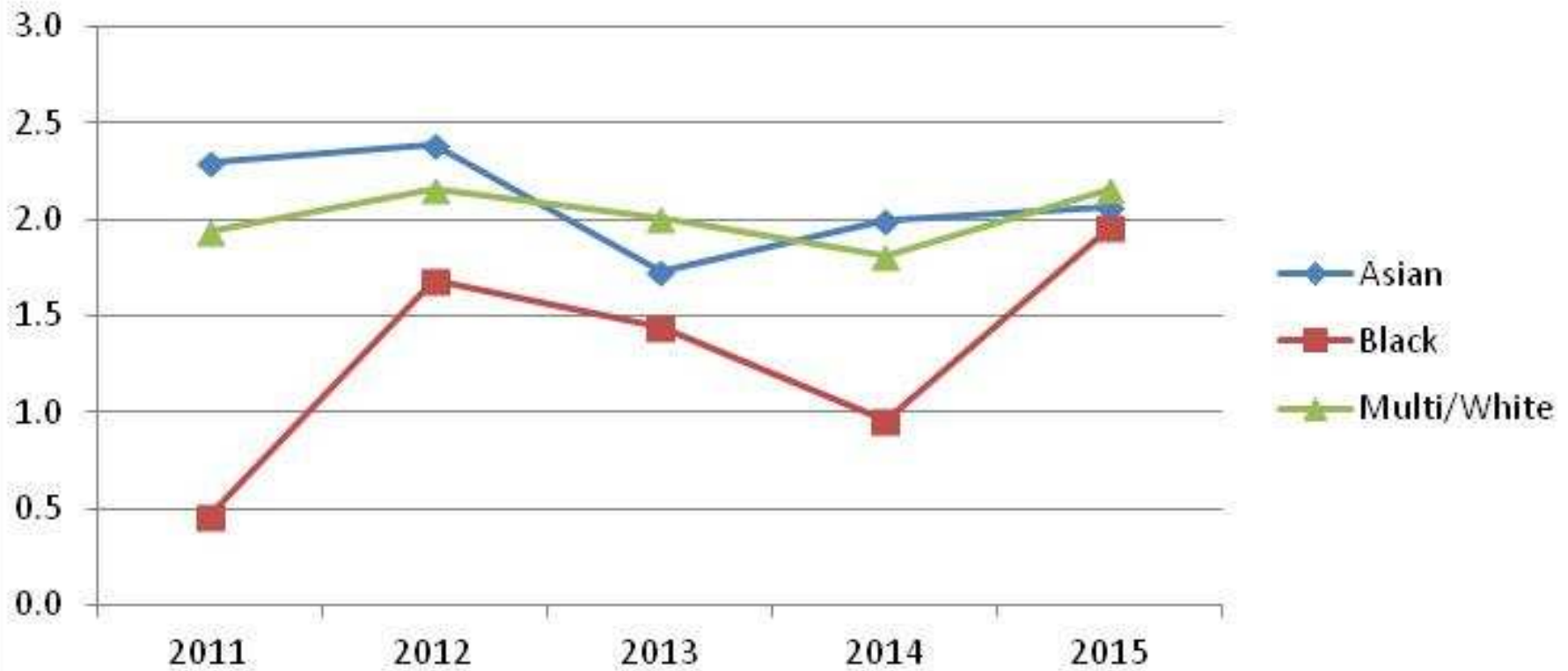
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EXPLORE to PLAN Gains

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EXPLORE-PLAN Gains (by Race/Ethnicity)



Changes in Student Attitudes

REGULAR LEVEL	Regular 2011	Regular 2012	Lower 2011	Lower 2012
I feel confident in my math abilities	76%	89%	89%	70%
The math we learn in class has connections to the real world	57%	74%	70%	Same
Math is more challenging this year than it was last year	83%	74%	73%	Same
My grade in this class is a good reflection of how much I know	56%	67%	76%	52%
I feel I deserve the grade that I have in my math class	57%	72%	80%	Same
I am happy with my grade	44%	67%	68%	28%

Student Perceptions

- “The best part about extension is meeting new people and getting extra help on tests/homework.”
- “ALEKS helps because every time I make a mistake it tells me where is it, in what part, and what I should do for next time.”
- *“ALEKS didn’t help me because it was just really boring.”*
- “Extension helps me because I have my teacher to help me.”
- “Extension helps because when I go to regular math class I am always ready to go.”
- “It’s easier to understand everything in extension.”
- “ALEKS helps me review problems I forgot how to do.”
- “The best part about extension is being able to get more help when you need it.”

Lessons Learned (a look back)

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- Watch the rigor with everything you've got
- Start with the Targets (Common Core)
- Formative Assessment
 - Create them
 - Use them
- Curricular Structure is Essential
- This cannot be done alone; pool resources
- This is not easy; there aren't a lot of shortcuts
- Kids will step up in the vast majority of cases if we do our job right
- Monitor of all students
 - None will "fall through the cracks"
 - Early intervention
- Have a credit recovery plan
 - No repeat classes
 - Plan must address 2nd semester plan, summer plan and beyond
- Never lose focus on good teaching

Looking Ahead...

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- Identifying and Instructing Non-Cognitive Skills
- What does this look like for Juniors still needing support?
- Further develop the extension period – try, assess, reflect, adjust again
- Assessing Mathematical Practices for all courses
- Goal Focused: 100% of students will be proficient in first-year Algebra by the beginning of Junior Year
- Bolster & Organize our resources in both
 - Quantity: have all available for teachers on our internal websites), and
 - Quality: course-level themes, tasks, 80% rule enforcement

Relevant Reading

- **Books**

- John Kotter: Leading Change
- Paul Tough: How Children Succeed
- Mike Schmoker: Focus
- Robert Marzano: Classroom Instruction that Work
- Charlotte Danielson: Framework for Teacher Evaluation
- Carol Ann Tomlinson Leading and Managing a Differentiated Classroom

- **NCTM Publications:**

- "Finding What Works",
- "Administrator's Guide: How to Interpret the Common Core State Standards to Improve Mathematics Education",
- "Developing Essential Understanding of Functions", and
- "Developing Mathematical Understanding through Representations"

- **Online**

- Dan Meyer's 3-Acts

What works...

- Upfront Work
 - Designing Units around the CCSS
 - Writing Benchmark Test and Common Final Exams
 - Finding Quality Resources
- True Collaboration
 - Team Time
 - Commitment to a Common Goal

What works...

- Quality Differentiated Instruction
 - Many opportunities for remediation and work above and beyond
 - Students are the Navigators of their own Learning
- Focus on Mathematical Practices
 - Problem based instead of skill based
 - Value thinking instead of just an answer

What works...

- Relationships with Students
 - Extension students can't fall through the cracks as easily
 - All students must "buy in"
- Classroom Environment
 - Learning is the ultimate goal – grading and class procedures must reflect this
 - The student is in control and the teacher provides opportunity
- Parental Involvement
 - The parents must also "buy in"
 - Communicating clearly and often

What works...

- CCSS (Common Core State Standards)
- Technology
 - ALEKS
 - STAR
- RTI Supports
 - Individualized Math Support
 - Constant Tracking (STAR, Benchmark Exams, ALEKS)
 - Team-based problem solving for individual kids
 - Team-based, continuous improvement of quality curriculum