

Central Dauphin School District

K-12 Mathematics

December 7, 2017

CD Middle School Auditorium



Opening

- Purpose
- RRR
- Eligible Content
- 8 Standards of Math Practice
- Impact of the Standards
- Norms for the evening

2015-2016

- Consistent math benchmarking in Kindergarten through 5th grade
- Analyze benchmark assessments to determine trends
- Began the implementation of guided math
- All 6th grade students took a math benchmark in the spring
- Summer 2016 Training-
 - Kindergarten through 6th grade received training on Data Analysis and Guided Math
 - Kindergarten through 5th grade received training on the 8 Standards of Math Practice (CAIU)

2016-2017 (elementary school)

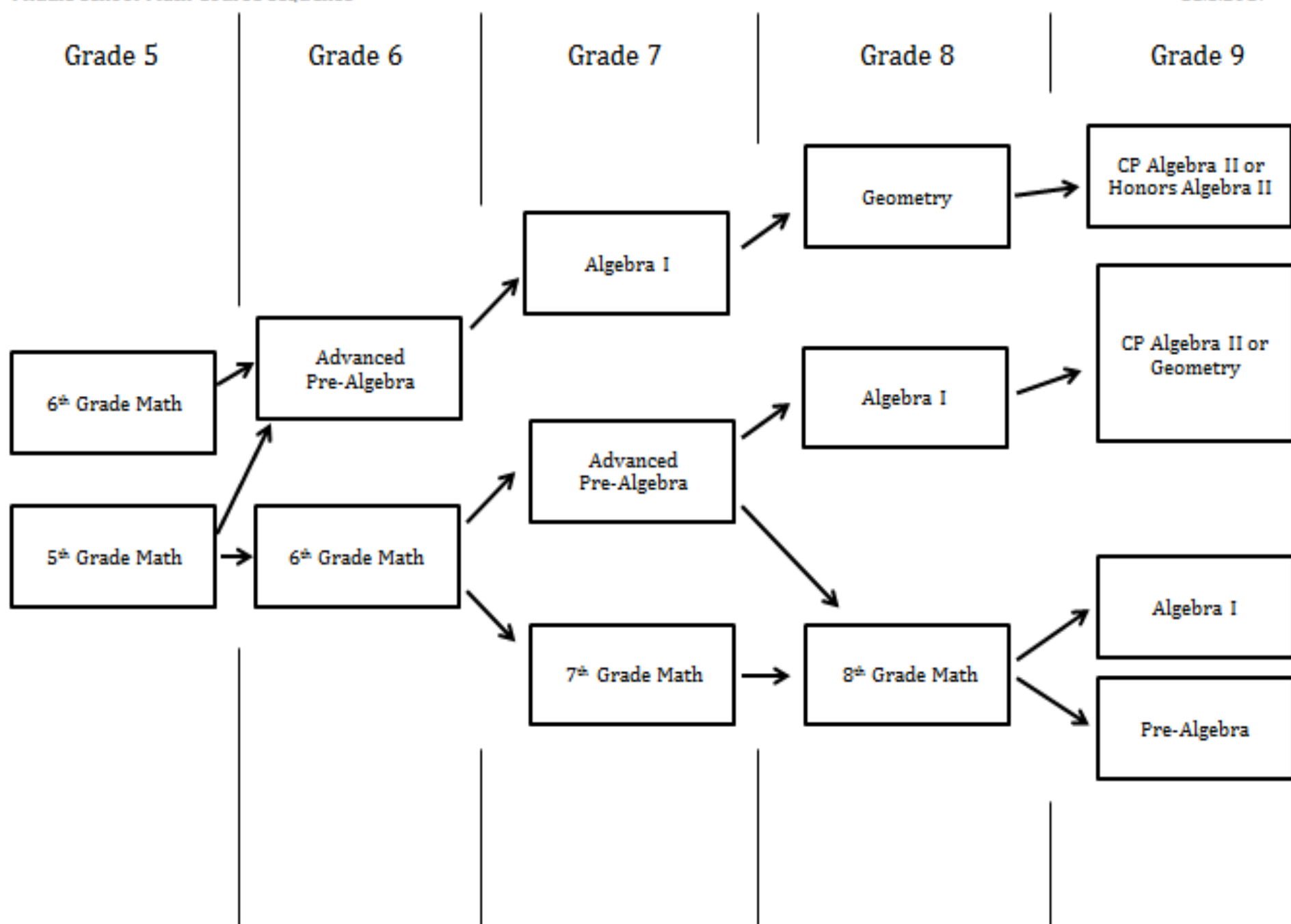
- Began curriculum rewrite in October for Kindergarten through 5th grade
- Prioritized curriculum based on various factors
- Eliminated redundant lessons in Go Math, prioritized mathematical strategies

2016-2017 (elementary school)

- Built in skills to various grade levels in order to address student struggles or begin building background knowledge
 - Statistical concepts (mean, median, mode), money, elapsed time, add/subtract fractions
- Summer 2017 Training-
 - Kindergarten through 5th grade received training in the rewritten curriculum (3rd through 5th received additional training on Eligible Content)

2016-2017 (middle/high school)

- On January 23rd the School Board approved the expansion of the Glencoe series in 6th – 8th grade (including Pre-Algebra)
- 7th and 8th grade curriculum was written
- New math placement protocol was developed for middle school math placement, revised course sequence developed



2016-2017 (middle/high school)

- Curriculum alignment was completed for Algebra I and Geometry
- **Summer 2017 Training-**
 - Math teachers received training in the rewritten curriculum and received additional training on Eligible Content
 - Any teacher who teaches math in 7th – 8th grade and Pre-Algebra (including high school) received training on Math Data Analysis and Guided Math/Differentiation

Middle School

Math Help

- Each Math teacher has scheduled days for Math Help
- Offered daily to all students during Academic Enrichment

Middle School

Math Solutions

- Developed for students that need extra Math instruction during Academic Enrichment
- Students are scheduled for Math Solutions one or two times per cycle
- Scheduled course with open enrollment
- Teachers analyze data to determine which students need the extra support
- Parents are contacted prior to students being enrolled or removed

Middle School

Block Scheduling

- Transition- increase amount of time for math instruction

Meeting the needs of Students

- Targeted intervention groups

Math Help

- Using data to address student needs

Middle School

Edmentum

- Adopted in grades 2-8 (all elementary and middle schools)
- The goal is that all students work in system for a minimum of 30 minutes per week
- Implementation is building specific

IDEAL Plans

- Develop grade level action plans to address needs based on data
 - Measurable goals
 - Evidence-based instructional strategies

High School

Classroom Diagnostic Tools (CDT)

- Tied to Keystones
- Professional development on how use data to drive instruction

9th Grade Math Placements

- Based on multiple data points
- Less reliance on counselor/parent recommendations

High School

Math Help

- Each high school offers free help
- Working on ways to provide smaller groups
- Teacher willingness to work with students before/after school

High School

District Provided Training from Math Solutions

- All Math teachers and principals, multiple sessions, during 2013-2015
- 8 Standards of Math Practice

Constant Curriculum Work

- Teachers working to align tests and curriculum with standards
- Administrators working to ensure curriculum is being taught with consistency & fidelity

8 Standards of Math Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Eligible Content

Eligible content is derived from the Pennsylvania Department of Education website for all tested subjects and grade levels (including Geometry and Algebra II).

Pennsylvania Department of Education- Algebra I

PA Core Standards

CC.2.1.HS.F.1

Apply and extend the properties of exponents to solve problems with rational exponents.

Eligible Content

A1.1.1.1.2

Simplify square roots

Pennsylvania Department of Education- Algebra I

Previous Test Question

- Simplify

$$\sqrt{18} = 3\sqrt{2}$$

Keystone Question

An expression is shown below.

$$2\sqrt{51x}$$

Which value of x makes the expression equivalent to $10\sqrt{51}$?

- A. 5
- B. 25
- C. 50
- D. 100

Pennsylvania Department of Education

PA Core Standards

CC.2.1.HS.F.1

Apply and extend the properties of exponents to solve problems with rational exponents.

Eligible Content

A1.1.1.1.1

Compare and/or order any real numbers.

Note: Rational and irrational may be mixed.

Pennsylvania Department of Education- Algebra I

Previous Test Question

Is $x = -1$ a solution to the inequality,

$$3(x - 2)^2 \geq 5 ?$$

Keystone Question

Which of the following inequalities is true for **all** real values of x ?

A. $x^3 \geq x^2$

B. $3x^2 \geq 2x^3$

C. $(2x)^2 \geq 3x^2$

D. $3(x - 2)^2 \geq 3x^2 - 2$

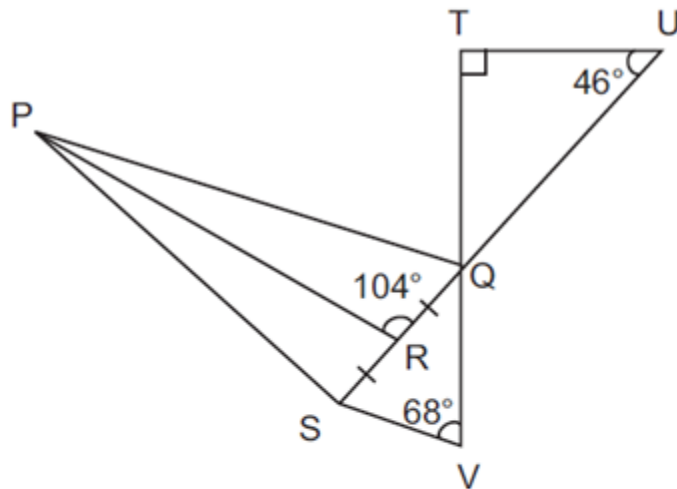
Pennsylvania Department of Education- Geometry

Previous Test Question

Is the triangle isosceles?
Why or why not?



Keystone Question

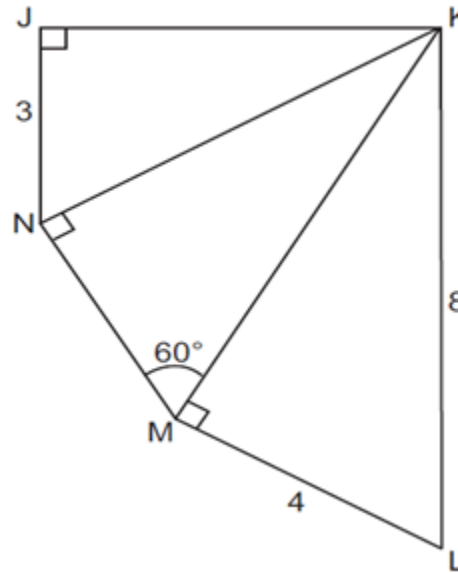


Which of the triangles **must** be isosceles?

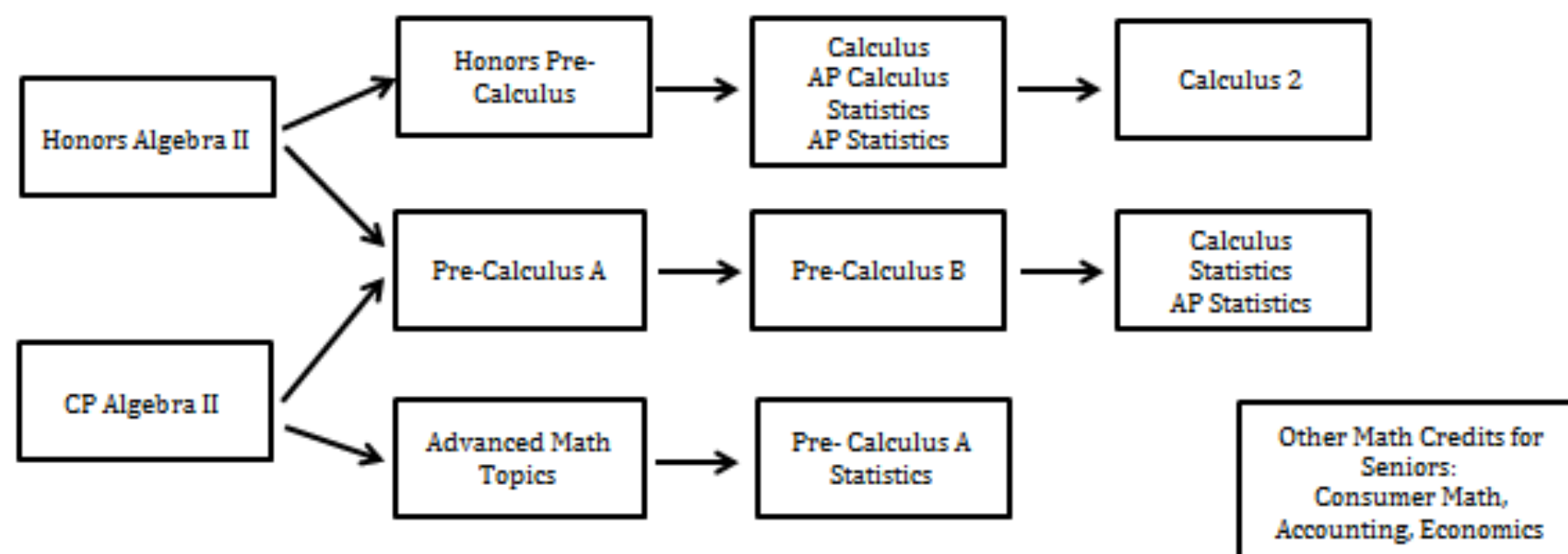
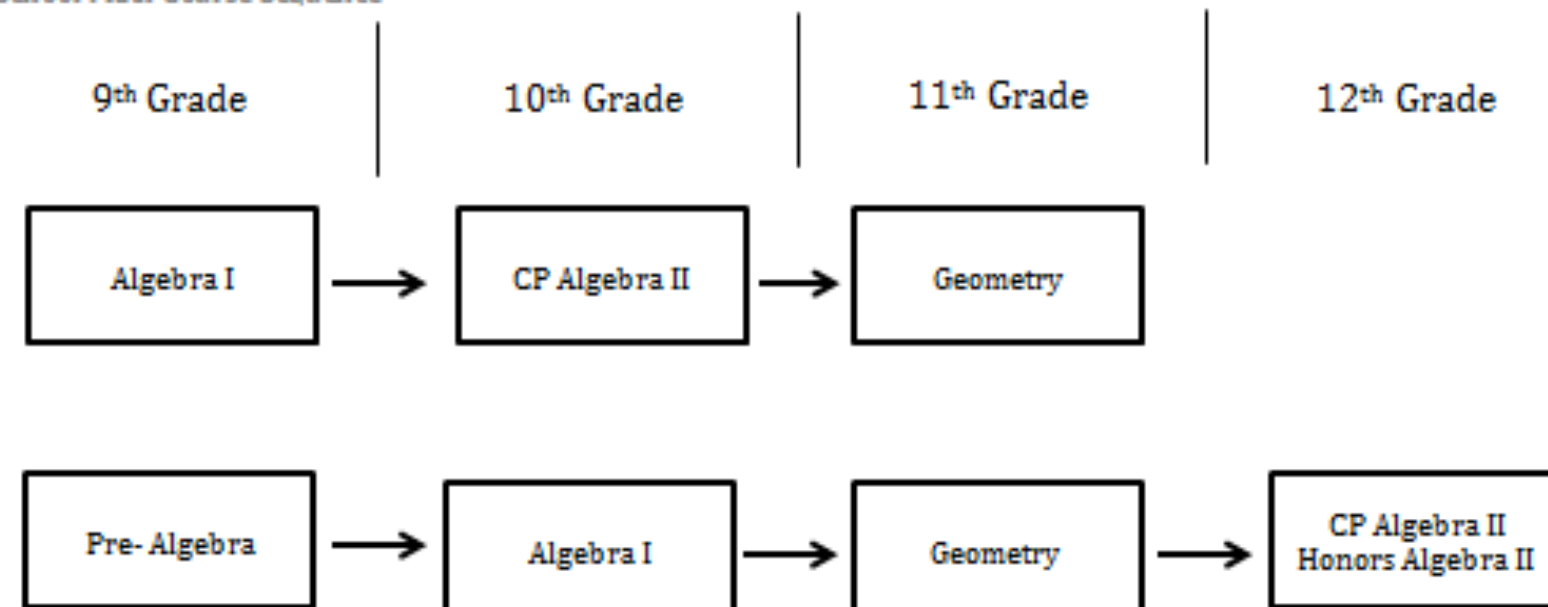
- A. $\triangle SPR$
- B. $\triangle SPQ$
- C. $\triangle QTU$
- D. $\triangle SQV$

Question Type

In the diagram shown below, $\triangle JKN \sim \triangle NKM \sim \triangle MKL$.



- A. What is the length, in units, of \overline{NK} ?
- B. What is the length, in units, of \overline{NM} ? Show your work. Explain your reasoning.
- C. Prove that the measure of $\angle JKL$ is 90° .



Algebra I

If there were topics in Algebra I that were not Eligible Content, they were removed and added as Eligible Content for Algebra II.

Example: Quadratic Formula

Algebra II

- Course is preparing students for SAT's .
- The level of questioning that is reflected in the Pennsylvania Department of Education reflects the style of questioning on the SAT exams.

Performance Task Info

Superintendent for the Day Performance Task

- Article:
 - Enwemeka, Z. (2015, January). Now An MIT Student, His Snow Day Calculator Is Still Turning Out Predictions.
<http://www.wbur.org/news/2015/01/28/snow-day-calculator-mit>
- Task:
 - Use inequalities to determine :1-hr delay, 2-hr delay or closing

OnStar Operator Performance Task

- Locate accident scene using ordered pair to send paramedics and police
- Wrong location=Wrongful Death Lawsuit

Close Reading Info

Article: Glydon, N. (2014, Mar). Medicine and Math.

<http://mathcentral.uregina.ca/beyond/articles/medicine/med1.html>

- Activating Strategy
 - Stevens Johnson Syndrome
 - inflammatory disorder of skin caused by an overdose of medication
 - reasons why mathematics for nurses and doctors is important
- TDA
 - Writing an essay on how the mathematical background of doctor could affect patient confidence.

2017-2018

- Grades K-5, 7-8, Algebra I, Geometry:
Implementing updated and aligned curriculum
- Updating unit assessments to match curriculum
- Grade 6- Curriculum rewrite in progress
- Ongoing and continued support of Guided Math
- All CDSD teachers will receive training in differentiation starting in Spring of 2018

2017-2018

- Diving deeper into math data analysis to address building level, grade level, classroom level, and individual student needs
- Elementary buildings are developing action plans to address consistent fact fluency practice
- Research based protocols will be put in place to address fact fluency needs
- 13 CDSD teachers are participating in the Math Coaching Project through Penn State and the Lincoln Intermediate Unit

Closing

- Proactive vs. Reactive Approach
- Changes require transition time

Q&A

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