

HE'S IRRATIONAL AND HE GOES ON AND ON.

HUGH J. RIFLOW

Counselor

WIFE OF PI

2/8

©2013 Scott Hilburn/Distributed by Universal Uclick

INTEGRATED MATH: AN INTRODUCTION

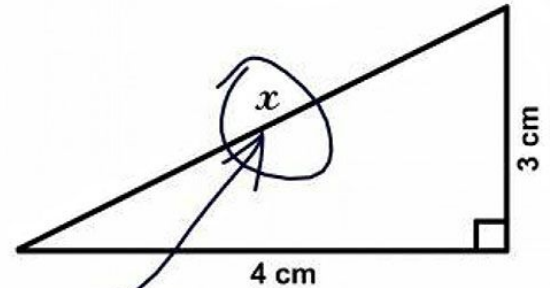
Lincoln Middle School
Coffee
March 9, 2016

WELCOME ACTIVITY

LEARNING OBJECTIVES

- Why integrated mathematics at Lincoln?
- Where else can we find the integrated math program?
- What are the benefits of integrated mathematics?
- What does the new Math sequence look like?
- What is the difference between traditional Math and IM Math?
- What is the difference Grade 8 Math vs Integrated Math I
- How will my child transition from Grade 7 to 8?
- Follow up: Excited about? Apprehensive about? Questions?
- Upcoming Math events

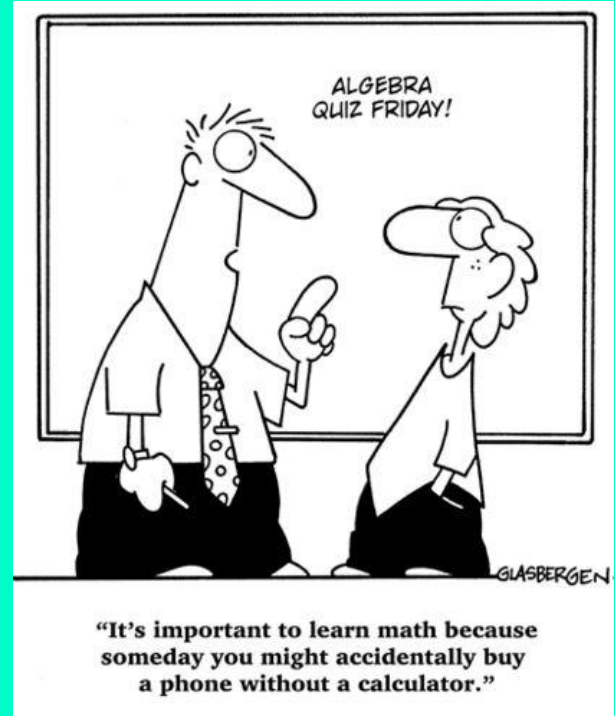
3. Find x .



Here it is

WHY INTEGRATED MATHEMATICS AT LINCOLN?

- Many of our students arrive at Lincoln from Integrated Math programs elsewhere in the world.
- Math at Lincoln is already taught through an integrated approach in the elementary school, the first two years of middle school, and in IBDP Mathematics.
- Integrated Math aligns with IBDP Mathematics.
- Increases access to IBDP Mathematics courses.



INTEGRATED MATH CONTEXT

- Mathematics is a formal body of knowledge defined by axioms and derived theorems.
- School mathematics should reflect that structure and the ways in which mathematical topics intertwine.
- A mathematics curriculum should identify a progression of topics that build on the structure of mathematics
- Nearly every country in the world except the United States uses an integrated math structure in its secondary school mathematics programs.”

Schmidt, 2004

ADDITIONAL BENEFITS TO INTEGRATED APPROACH

- Affords flexibility with the amount of time spent on a particular math topic.
- Students can see connections and build deeper understanding and develop realistic problem solving skills.
- Varying math topics throughout the year makes the class more interesting for students (and teachers!)
- An integrated curriculum increases exposure to core concepts resulting in less time reteaching concepts and increased retainment over the long term.
- Better appreciation of the links between different branches of Mathematics.

Boaler 2014

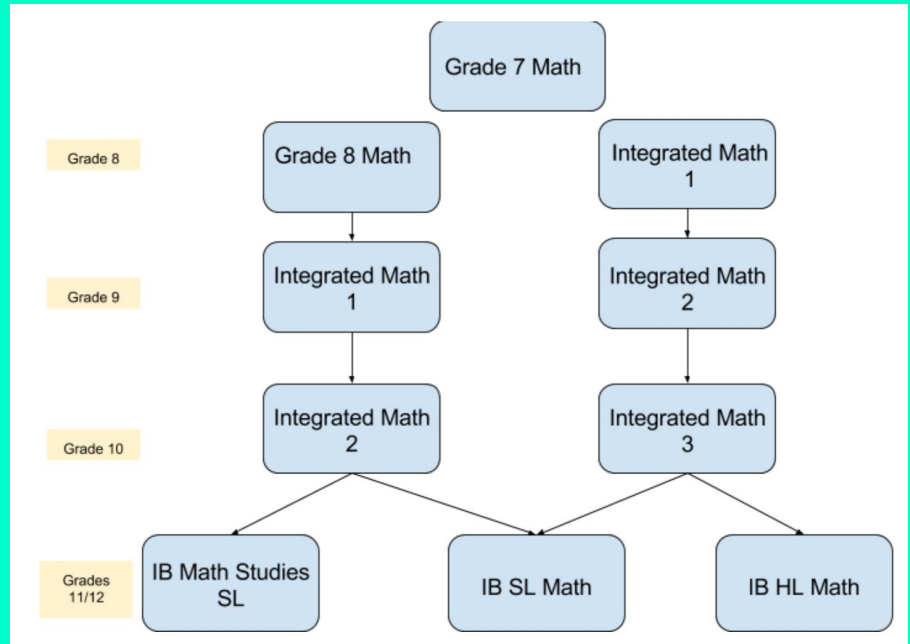
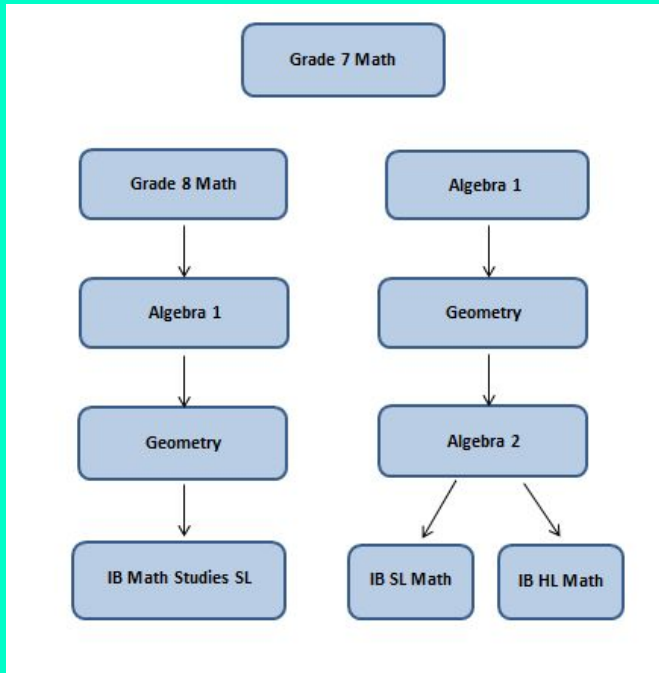


WHAT ARE OTHER INTERNATIONAL SCHOOLS DOING?

- Anglo-American School of Moscow
- Shanghai American School
- International School of Kuala Lumpur
- Canadian Academy, Kobe
- Graded-American School of Sao Paulo
- American International School - Egypt
- American International School of Budapest
- American International School of Johannesburg
- International School of Kenya
- International School Beijing
- Western Academy Beijing
- UNIS New York
- International School of Dusseldorf
- Anglo-American School of Sofia
- American School of Yaounde, Cameroon
- International School of Zagreb
- Copenhagen International School
- International School of Helsinki
- Frankfurt International School
- Yokohama International School
- International School of Luxembourg
- International School of the Hague
- International School of Manilla
- Tokyo International School
- United World College Singapore
- Jakarta International School
- American Embassy School, New Delhi

TRANSITIONING INTO IM

Where your children will go...and how...



BIG IDEAS IN GRADE 6 MATHEMATICS

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems

The Number System

- Divide fractions by fractions.
- Multiply and divide multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations (*introducing Algebra*)

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions

BIG IDEAS IN GRADE 7 MATHEMATICS

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Expressions and Equations (*introducing Algebra*)

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Statistics and Probability

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

BIG IDEAS IN GRADE 8 MATHEMATICS

The Number System

- Know that there are numbers that are not rational, and approximate them by rational numbers (*grade 8*)

Expressions and Equations

- Work with radicals and integer exponents (*grade 8 and Algebra 1*).
- Understand connections between proportional relationships, lines, and linear equations (*grade 8 and Algebra 1*).
- Analyze and solve linear equations/inequalities and pairs of systems of equations (*grade 8 and Algebra 1*).

Functions

- Define, evaluate, and compare functions (*grade 8*).
- Use functions to model relationships between linear and nonlinear quantities (*grade 8 and Algebra 1*).

Geometry

- Understand congruence and similarity as well as transformations (*Geometry*).
- Understand and apply the Pythagorean Theorem (*grade 8 and Algebra 1*).
- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres (*Grade 8*).

Statistics and Probability

- Investigate patterns of association in bivariate data (*Grade 8*).

BIG IDEAS IN INTEGRATED MATHEMATICS I

The Number System

- Know that there are numbers that are not rational, and approximate them by rational numbers (*grade 8/Algebra 1*)

Algebra

- Work with radicals and integer exponents (*grade 8/Algebra 1*).
- Analyze and solve linear equations/inequalities and pairs of systems of equations/inequalities (*grade 8/Algebra 1*).
- Polynomial operations such as factoring, expanding, etc (*Algebra 1*).
- Using polynomial identities to solve problems (*Algebra 1*)

Functions

- Define, evaluate, and compare functions (*grade 8 and Algebra 1*) .
- Use functions to model relationships between linear, exponential functions, radical functions (*grade 8/Algebra 1*)

Geometry

- Understand congruence and similarity as well as transformational geometry(*Geometry*).
- Understand and apply the Pythagorean Theorem and Distance Formula (*grade 8/Algebra 1*) .
- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres (*grade 8*)
- Students will examine undefined terms in mathematics (*Geometry*).
- Introduction to proofs and theorems (*Geometry*).

Statistics and Probability

- Interpret linear models in collected data (linear regression) (*Algebra 1*)
- Distinguish between correlation and causation (*Algebra 1*).

DIFFERENCES BETWEEN 8 VS IM1

- **TOPICS:**
 - Exponential Functions
 - Systems of Inequalities
 - Proofs and Theorems
 - Polynomial Identities
 - More in - depth understanding of Exponents and Radicals
 - Distance Formula
- Pace is quicker.
- 12 units of study for IM1 and _____ units of study for grade 8.

TRANSITION FROM 7 TO 8

GRADE 8 MATH OR IM 1

IM 1 CRITERIA:

1. PLACEMENT TEST

- A. ALL STUDENTS WILL TAKE A PLACEMENT TEST ON MAY 23RD OR 24TH
- B. TOPICS: GRADE 7 CONTENT PLUS SOME GRADE 8 CONTENT
- C. AN EMAIL WILL BE SENT OUT AT THE END OF MARCH WITH FURTHER SPECIFICS

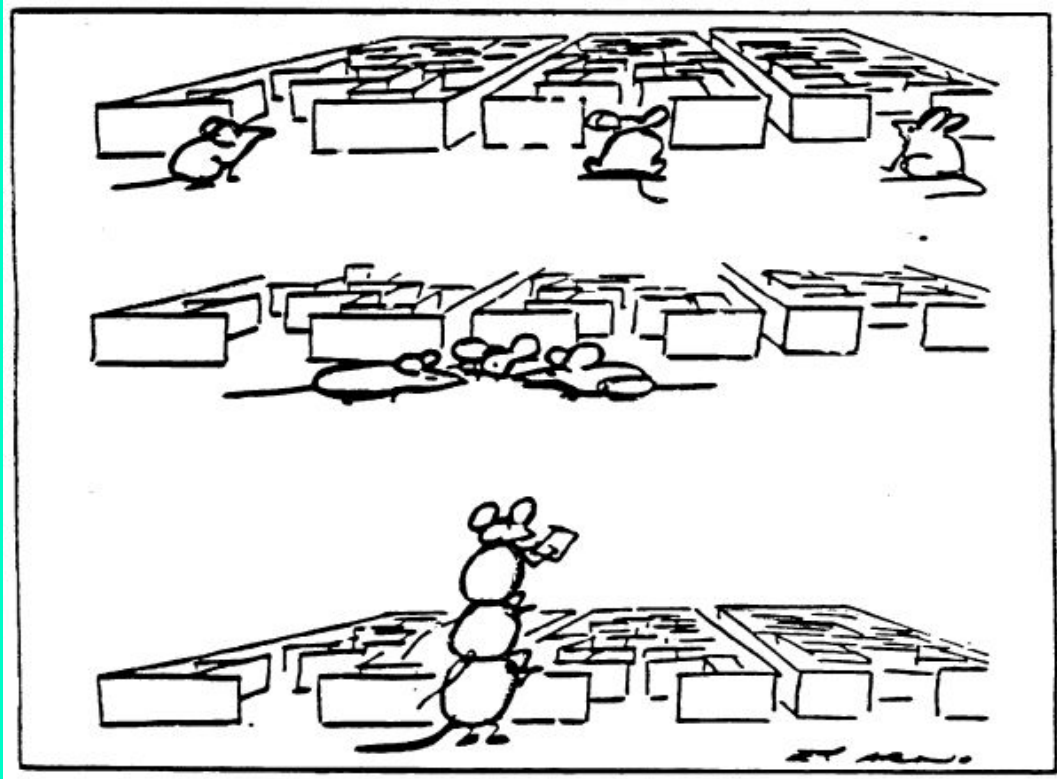
2. TEACHER RECOMMENDATION

- A. STUDENT PROFILE: SELF MOTIVATED, READY TO WORK HARD, STRONG WORK ETHIC, MATURE, CAPABLE OF HANDLING AN INCREASED WORKLOAD, STRONG COMPUTATIONAL AND NUMBER SENSE ABILITIES

3. STUDENT HAS MAINTAINED AN A- IN GRADE 7 MATHEMATICS

4. MAP SCORE

- A. MINIMUM SCORE OF 85TH PERCENTILE AT THE END OF GRADE 7.



WE ARE ALL IN THIS TOGETHER

JEFF VORACEK

MIDDLE SCHOOL PRINCIPAL

JEFF.VORACEK@LINCOLN.EDU.AR

TONY BELLEW

LEARNING COACH

TONY.BELLEW@LINCOLN.EDU.AR

DAN STRAFFON

MIDDLE SCHOOL MATHS TEACHER

DAN.STRAFFON@LINCOLN.EDU.AR

KIRSTEN BALDWIN

MIDDLE SCHOOL MATHS TEACHER

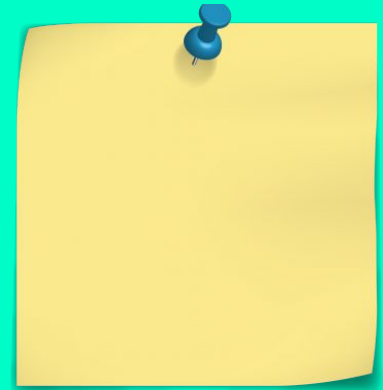
KIRSTEN.BALDWIN@LINCOLN.EDU.AR

WHAT EXCITES YOU ABOUT THIS? WHAT'S THE UPSIDE?

WHAT DO YOU FIND WORRISOME ABOUT THIS IDEA? WHAT'S THE DOWNSIDE?

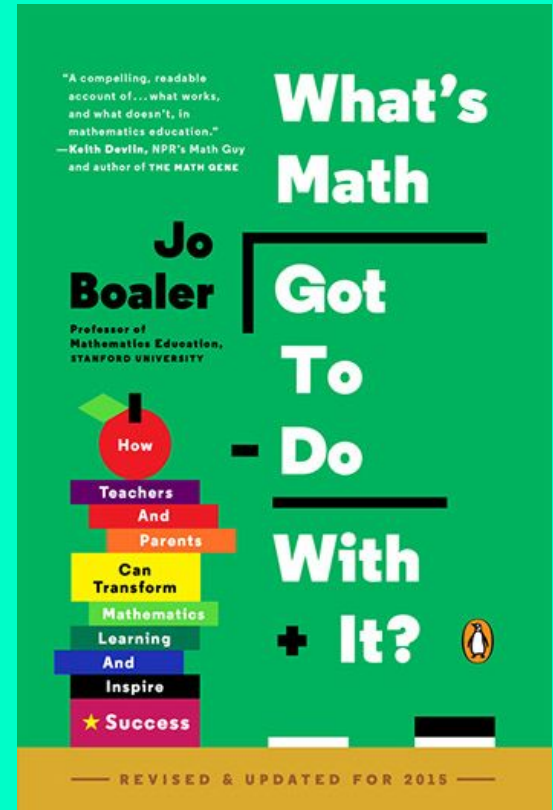
WHAT ELSE DO YOU NEED TO KNOW OR FIND OUT ABOUT THIS IDEA? WHAT ADDITIONAL INFORMATION WOULD HELP YOU TO EVALUATE THINGS?

WHIS IS YOUR CURRENT STANCE OR OPINION ON THIS IDEA?



UPCOMING EVENTS:

- GRADE 5 TO GRADE 6 MATH TRANSITION - APRIL 13TH
- GRADE 7 PLACEMENT TEST - MAY 23/24*
- BOOK STUDY - "WHAT'S MATH GOT TO DO WITH IT?" - JO BOALER



RESOURCES

- [Middle School and High School Streaming and Syllabi](#)
- [What's Math Got To Do With It?: How Parents and Teachers Can Help Children Learn to Love Their Least Favorite Subject](#) Jo Boaler
- [Mindset: The New Psychology of Success](#) Carol Dweck
- ["A Vision for Mathematics"](#) - William H Schmidt ASCD. 2010.
- [How to Learn Math: For Students Stanford Online EDUC115-S](#)
- [Mr Meyer's Math Blog](#)