

Mathematics for the Criminal Justice Field

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Grant

- Target high enrollment career and technical certificate and degree programs
- A contextualized math course
 - Increase comprehension
 - Increase retention
 - Enhance critical thinking
- We were awarded:
 - \$39425 USD/~35000 Euros/
~30000 British Pounds



Maths for the CJ Field

- Current completion of the gateway course was less than 20%
- Students had to take two 16-week courses in remedial math
- Retention was abyssal
- It just wasn't fun!



Maths for the CJ Field - Goals

- 75% completion of this course
- Remove the barrier of weeks of remediation
- Increase retention to 90%
- Make the maths applicable and FUN!



Gateway Topics

- Equations and Inequalities
- Functions and Graphs
- Polynomial and Rational Functions
- Exponential & Logarithmic Functions
- Systems of Equations/
Matrices



Could it be done?



Maths for the CJ Field

- Worked with Subject Matter Expert in the fields of Emergency Services and Law Enforcement
- Activities needed to be engaging
- Instructor needed to be flexible, open, and available
- “What do you notice?”
“What do you wonder?”



How did I start...

- Dealt with the emotional/feelings about math first
- Created math from a question, a situation, or a picture
- Students need time to struggle, make mistakes, and persevere in problem solving
- Remember it is okay to not have all the answers and work through the problem together
- Have fun and play – using blocks, post-its, manipulatives, etc.



Curriculum examples



The half life of a drug is the amount of time it takes for measured amounts in the bloodstream or urine to decrease by half. The half life for THC is long, because THC is stored in the body's fat cells (THC is highly lipid and not easily dissolved in water). Therefore, the blood plasma and urinary half-life of THC are best estimated at **3 – 4 days after ingestion**. But depending on the quantity of THC ingested and frequency of use, half life may even extend to *10-12 days after ingestion*. Source (<http://drug.addictionblog.org/how-long-does-marijuana-weed-pot-thc-stay-in-your-system/>)

How long will it take for a sample of this substance to decay to 50% of its original amount?
Exponential Growth Model: $A = A_0 e^{kt}$



Meth levels reach peak blood concentration differently depending on mode of administration. The half-life of meth can range greatly, but for all methods of administration the half-life ranges between about 10 and 12 hours. When ingesting meth, peak concentration of methamphetamine occurs in approximately three hours. For smoking and snorting, peak concentration takes between two and three hour. Source

(<http://drug.addictionblog.org/how-long-does-meth-stay-in-your-system/>)

How long will it take for a sample of this substance to decay to 20% of its original amount?

Exponential Growth Model: $A = A_0 e^{kt}$

A =

A_0 =

k =

t =

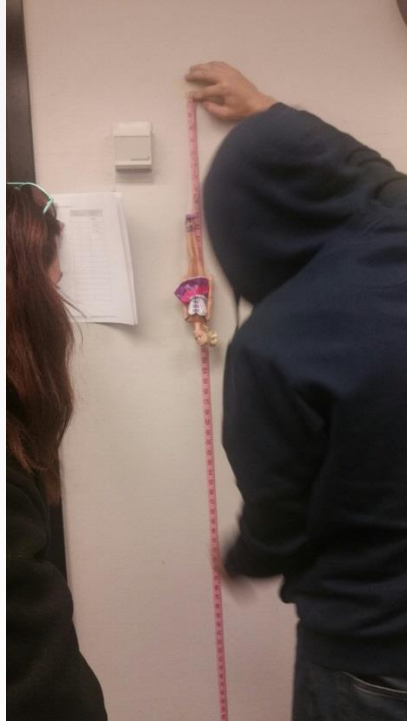


Polynomials

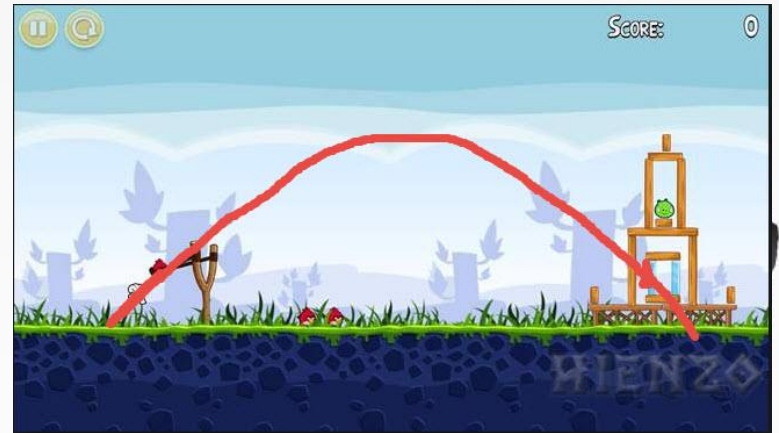
Tailgaters beware: If your car is going 35 miles per hour on dry pavement, your required stopping distance is 160 feet, or the width of a football field. At 65 miles per hour, the distance required is 410 feet or approximately the length of one and one-tenth of a football fields.



Bungee Barbie



Angry Birds



Results

- A total of 17 students enrolled in this class (10 in the Fall and 7 in the Spring)
- College Placement levels
- Feelings about math were low
- Day to Day Class structure
- Final Exam



Good News

- All 17 learners completed this course with a 70% or better!
- Feedback from Surveys
 - “This class saved me”
 - “I didn’t know math was used everyday”
 - “I really can do math”

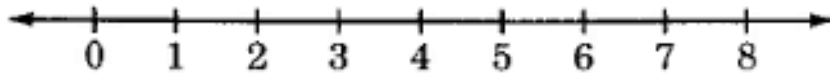


**BUT, we all have that
ONE student....**



But What if...
 $2 + 2 = 12$

- Then $2 + 1 = 11$
- $2 + 0 = 10$
- $1 = 9$
- $0 = 8$
- On a number line – if you take 8 steps on a number line – would you get to zero?



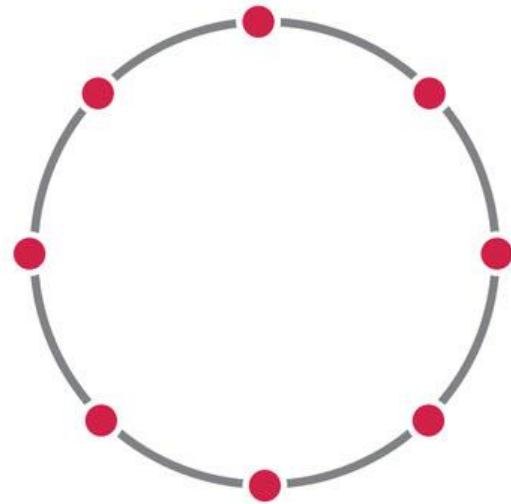
What if it was..

A Number Circle ----

We are just playing
but this is how new
math is created

We are just having
fun and thinking

Number Circles –
Modular Arithmetic



So yes... $2 + 2 = 12$

- Math isn't about following rules –
- It is about being curious
- It is about being brave and not passive in learning
- It is creative
- It is powerful



What I still wonder

Co-hort Model



Co-hort Model

- What is it?
- Does it matter?
- What effect has it had on the students?
- It takes a village



Questions??

