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What is Geometry in Construction?

- Students receive course credit for 2 classes – Geometry and Construction.
- Classes are scheduled back-to-back in a block to facilitate team teaching.
- Both the math and CTE teacher provide instruction for entire block.
- All Geometry TEKS are covered.
- Construction tasks drive program. Math skills are taught “just in time” to address math required for specific tasks/phases of a construction project.
Math Needs Relevance!

The Status Quo isn’t Working

NAEP Scores for 17 Year Olds
CTE and Core Content Integration

It Works!

Research indicates that contextualizing core content through CTE leads to increased student achievement.
Colorado State Test Scores

<table>
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<tr>
<th>School</th>
<th>Score</th>
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<tr>
<td>GiC: Geometry in Construction at Loveland High School (LHS)</td>
<td>629</td>
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<tr>
<td>LHS: Traditionally taught 4-wall geometry classroom at LHS</td>
<td>598</td>
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<tr>
<td>MVHS: Mountain View HS geometry – district arts and Project Lead the Way school</td>
<td>589</td>
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<tr>
<td>TVHS: Thompson Valley HS geometry – district AP high school</td>
<td>571</td>
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<tr>
<td>BHS: Berthoud HS geometry – district math and science high school</td>
<td>609</td>
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Principles of GiC

- We are for ALL kids, not just “Those Kids!”
- Math is **NOT** watered down
- All the Geometry TEKS are covered
- This in **NOT** “trade” math
- CTE tasks drive the curriculum – math is taught as a TOOL to accomplish tasks and solve problems
Professional Development from the TRC

August 4-8, 2014

Hendrickson HS, Pflugerville ISD

$500 per teacher

Teams of Geometry and CTE teachers should attend together

Register at thetrc.org/web/gic2014

Eligible Attendees:
Teams of Texas teachers from high schools who are interested in implementing the Geometry in Construction program. Teacher teams must consist of a geometry teacher and a CTE teacher prepared to teach Construction Technology or a similar CTE course. Participating schools should be interested in collecting longitudinal data about the impact of Geometry in Construction on students.

Description:
GIC is a dual course, aligned to the Geometry TEKS, in which students receive both a math credit and a CTE credit. This weeklong professional development provides teachers with all the instructional materials they need to replicate the GIC program in Texas schools. Presenters will be Scott Burke and Tom Moore, instructors of the original GIC program. Thirty CPE credits will be issued after the event.

Registration:
The cost is $500 per participant. Registration fees cover breakfast, lunch and training materials. Payment is due before the event. Registration for this event will close on Thursday, July 31, 2014. Registration is open to 40 teachers.

Information and Registration:
http://www.thetrc.org/gic2014

Please contact Carol Fletcher at carol.fletcher@austin.utexas.edu for other questions/answers.

The Geometry in Construction training is sponsored by:
Texas Regional Collaboratives at UT-Austin
Texas Education Agency
Fluor Corporation
What is the TRC?
GiC in Pflugerville ISD
Student Demographics

- 23,000 Students in PISD
- 3 High Schools (2,200 avg)
- African American 22%
- White 29%
- Hispanic 39%
- Asian 9%
Decision to Implement

- Increase Relevance in the Classroom
- Project based learning that connects classroom concepts to “Real-World” applications

- Ensure all students are College & Career Ready
- PISD had a void in the Architecture & Construction Career Cluster

- Partner with local business and the community to enhance the learning experience for all
- Continue to lower barriers between business, community, & education
Implementation Timeline

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<td>Renovation Planning</td>
<td>Marketing</td>
<td>Scheduling</td>
<td>Training</td>
<td>Renovations</td>
<td>GIC Program Starts</td>
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Buy-in

- GIC PISD Information Presentation
  - Principals
  - Curriculum Specialists
  - Teachers
  - Math Department Chairs
Planning for Renovation

Selection of classroom/construction space

Challenges
- No existing construction program or space
- Impervious cover restrictions

Solutions
- Use classroom on exterior wall
- Covered workspace
Marketing

Information Sessions:
- Parent night at high schools
- 8th grade students
- Counselors
- Business & Community
  - $57k Grant
Hendrickson High School

- 73 Students (3 Groups)
- 29 Students enrolled in Pre-AP
- 22 Females

Connally High School

- 75 Students (3 Groups)
- 28 Female

Student Schedule Example

- Student A’s Schedule
  - 1<sup>st</sup> Period – Geometry
  - 2<sup>nd</sup> Period – Construction Technology
- Student B’s Schedule
  - 1<sup>st</sup> Period – Construction Technology
  - 2<sup>nd</sup> Period – Geometry

- Double Blocked Course/Program
  - 3 hours every other day
- 1 Credit for Geometry
- 1 Credit for Construction Technology
GIC Training

- One Week GIC Training
- Hands-on Training
- Curriculum Included
Implementation of GIC

- Fall 2012
  - School Starts
  - Business & Community Information Session
  - Advisory Committee Formed

- Project Selection
  - Capstone project was determined after new staff came on-board.
Capstone Project

Cabin Project

- 10’ by 22’
- Kitchen
- Living Area
- Sleeping Space
- Bathroom
Curriculum Alignment

- PISD further aligned GIC to TEKS and added specificity.

Big Idea

Students explore geometric shapes using architectural history as a framework for understanding and grounding. Students find area of two-dimensional figures.

Teams are built and team building exercises are used to promote group work and safety.

Guiding Questions

Knowledge and Skills

G. 1-Geometry × Geometric structure. The student understands the structure of, and relationships within, an axiomatic system.

G.1A-Demonstrate an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems

TEKS Integrations

- CT 1. The student identifies various employment opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:
  - CT 1.1A Identify job opportunities with their accompanying job duties such as carpentry, building maintenance supervisor, architect, and engineer, and
  - CT 1.1B Research careers along with the education, job skills, and experience required to achieve career goals.

- (3) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:
  - (A) Identify the hand tools commonly used by carpenters and describe their uses;
  - (B) Use hand tools in a safe and appropriate manner;
  - (C) State the general safety rules for operating all power tools regardless of type;
  - (D) Identify the portable power tools commonly used by carpenters and describe their uses, and
  - (E) Use portable power tools in a safe and appropriate manner.

Specificities & Examples

- Construction Teacher Focus
  - Characteristics of a team player and a good employee. Use team building activities to build relationships.

- Construction Teacher Notes
  - This is a good time to explore career options and bring in guest speakers.
  - Introduce safety concepts in this bundle, test them in the next.
Things to Celebrate

- Hendrickson EOC Passing Rate
  - Geometry in Construction ~ 97%
  - Traditional Geometry ~ 93%

- Connally EOC Passing Rate
  - Geometry in Construction students increased pass rate by 5% over the previous year’s assessment

- Construction and sale of two 10’ by 22’ cabins
Victorian Cabin (Connally High School)
Rustic Cabin (Hendrickson High School)
Second Year of Implementation

- Added Program at Pflugerville High School
- Each school offers a Pre-AP Section
- Received a $20k grant from city to produce structures for the Parks Department
Learn more about GiC

Visit Pflugerville ISD

If you would like to arrange a visit to PISD to see a GiC class in action, please contact Ryan Merritt, PISD CTE Director, at Ryan.merritt@pfisd.net

Professional Development

For questions regarding professional development, contact Carol Fletcher, Associate Director of the TRC, at carol.fletcher@austin.utexas.edu