PLC-Embedded Action Research

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Talk Overview

- District 622 PLC Process
- Short term focus: Experimental design
- Long term focus: Student self-assessment

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PLC Structure

- 45 minutes per week outside of school day
- Self-selected
  - 2-5 people
  - Typically teachers with a course in common
- Same building preferred, but not required
- Year-long common goal
- Short term goals each trimester

AP Physics 1 PLC

- Cross-building PLC
  - Met via Google Hangouts
- Worked with Rachel Erickson (rerickson@isd721.org)
- 40 students at Tartan, 25 at North

The Big Questions for PLCs

- What’s working?
- What do we need to improve?
- How do we know?

Our Process: Try Something & See If It Works

- Simplified action research process
- Introduced fall 2015
- Developed by Dan Cahill (dcahill@isd622.org), Staff Development Coordinator & Advisory Staff Development Committee
    - Adapted for Tartan by Rachel Grayson (rgrayson@isd622.org), Tartan Staff Development Chair

Our Process: Try Something & See If It Works

- Complete at least once per trimester
  - Goal: once every 2-3 weeks
- Focus on short-term (trimester-long) goals
- Purposes
  - Be intentional about trying instructional shifts
  - Start conversations about what's working

Our Process: Try Something & See If It Works

- Attempt: Identify something to try
- Assess: Select or develop relevant common assessment
- Analyze: Review data and results
- Act: Plan what's next
  - Often basis for next Try Something cycle

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Experimental Design

How do we prepare students for experimental design problems on the AP Physics 1 exam?

- Used as focus for all three trimesters

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Experimental Design: Assess

Exceeds Expectations	Meets Expectations	Below Expectations
	The procedure includes a list of required materials that could reasonably be found in the classroom	
	The proposed experiment addresses the target question or concept	
	There is a justification for what will be measured	
	Any necessary calculations are explained	
	It is clear the student is familiar with the equipment described	
	The procedure is complete and concise	

Experimental Design: Assess

- 12 points total
  - 2 per line of rubric
- Mastery: 10/12

Experimental Design 1: Attempt

- Attempt: Provide feedback on lab procedure using same rubric for written problems
- Assess: Problem included in written test a few days later

Experimental Design 1: Analyze

	Average Score	% at Mastery
Lab	10.69	75.68%
Test 1	9.24	43.24%

Experimental Design 1: Act

- Students don’t automatically transfer skills from lab to written test
- Students: How do we know what counts as enough detail?

Experimental Design 2: Attempt & Assess

- Attempt: Use another group's procedure
  - Each group writes procedure and collects data
  - Collect 2nd set of data using another group's procedure
  - Results should match within uncertainty
- Assess: Problem included in written test a few days later

Experimental Design 2: Analyze

	Average Score	% at Mastery
Lab	10.69	75.68%
Test 1	9.24	43.24%
Test 2	11.05	89.19%

Experimental Design 2: Act

- Students: working with other group's procedure clarified what is enough detail
- Students: feedback from other group only moderately useful
  - Did not have rubric during activity

Experimental Design 3: Attempt & Assess

- Attempt: Peer grading
  - In-class practice exam using scoring guide
  - No score in gradebook
- Assess: Problem included in written test a few days later

Experimental Design 3: Analyze

	Average Score	% at Mastery
Lab	10.69	75.68%
Test 1	9.24	43.24%
Test 2	11.05	89.19%
Test 3	11.08	91.89%

Experimental Design 3: Act

- Students already familiar with rubric expectations
- Students struggled to provide meaningful feedback
- Ways to improve
  - Earlier in the year when students less familiar with rubric
  - Focus on contrasting strong, weak work rather than scoring specific example

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Self-Assessment

What score do you think you earned for each learning target on this quiz?

CAPM.1 I can draw and interpret diagrams to represent the motion of a system with a constant linear velocity.

Mastery **Partial Mastery** **Developing**

If you believe you are at mastery, what strategies or actions helped? If not, what will you do to improve?

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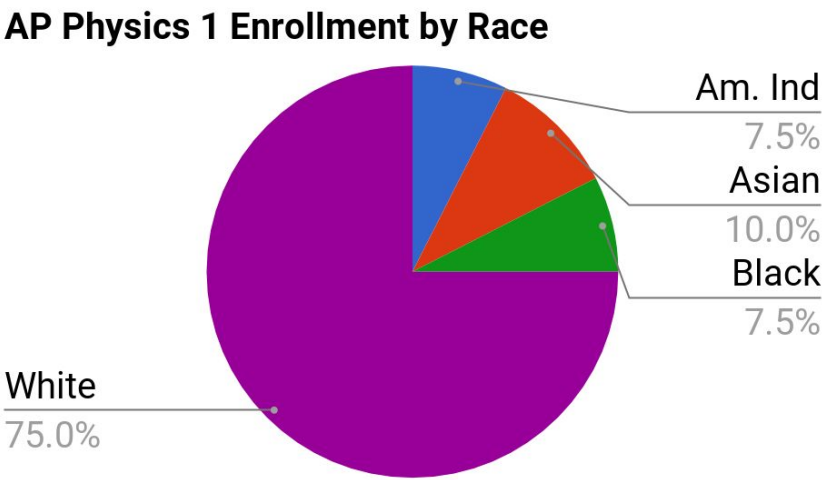
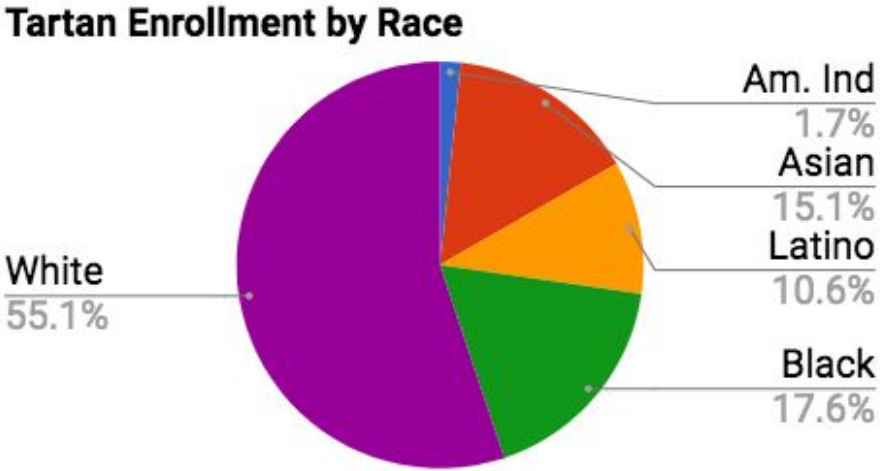
Measurement

- Scoring
  - Mastery = 4
  - Partial Mastery = 3
  - Developing = 2
- Confidence = self-assessment - actual score

Are race and confidence related?





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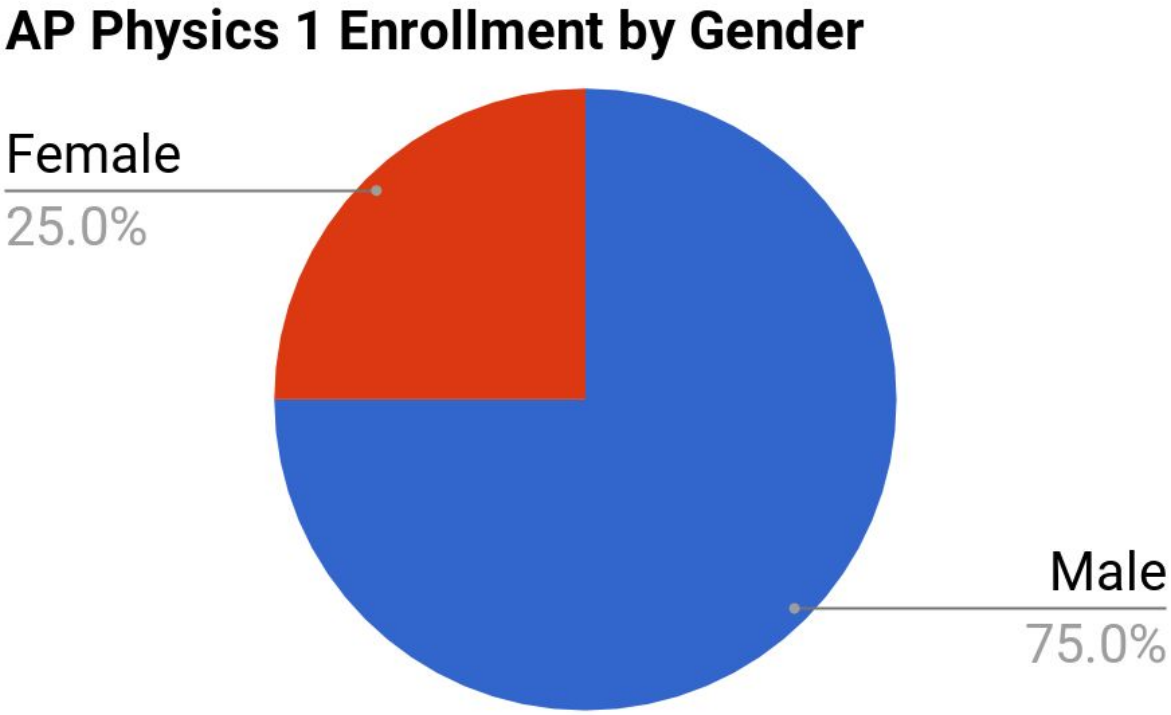
Are race and confidence related?

	Students of Color	White
Ave Confidence	-0.08	0.10
Number of Students	10	30

Are gender and confidence related?



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Are gender and confidence related?

	Male	Female
Ave Confidence	0.06	0.00
Number of Students	30	10

Are gender and confidence related?

	White Male	White Female
Ave Confidence	0.11	0.04
Number of Students	23	7

Questions for 2018-2019

- What are the other implications of patterns in student self-assessments?
- What in the class culture is reinforcing patterns in student self-assessments?
- How can we support all students in developing an accurate perception of their skills?