

Mathematics Team

2011

The Use of Math Sprint in a Tutorial Program For Sixth Grade Students to Improve End of Grade Test Scores



Undergraduate Research Experience in Ocean, Marine, and Polar Science

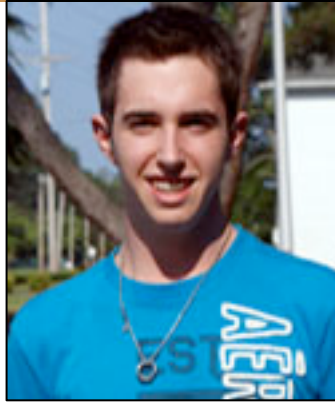
ELIZABETH CITY STATE UNIVERSITY

MAY 23 - JULY 15, 2011

Mathematics Education Team



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Abstract

The Use of the Math Sprint in a Tutorial Program for Sixth Grade Students to Improve End of Grade Test Scores

Key Words: Algebra, Combinatorial Mathematics, Tree Graphs, Estimation, Geometry, Probability, Statistics, Transformations

What is the effect of a math sprint tutorial model on Mathematics achievement of sixth graders at Elizabeth City Middle School in Elizabeth City, North Carolina? A math sprint tutorial process was used during a three-week study with a group of 13 sixth-grade students to increase test scores from the previous 2011 Spring end of grade (EOG) test. The data, gathered from the post-test as a result of the series of tutoring sessions, was compared with the scores from the 2011 Spring EOG. Research studied the improvements made in scores on the North Carolina Mathematics state test.



Introduction

The North Carolina Mathematics Standard Course of Study provides a set of

- Mathematical Competencies
- Organization
 - Number and Operations
 - Measurement
 - Geometry
 - Data Analysis and Probability
 - Algebra



Elizabeth City Middle School

"Home of the Mighty Yellow Jackets"



1066 Northside Road Elizabeth City, NC 27909

Mission: "ECMS": Where Every Child Meets Success

Theme: We are Family

ECMS is a learning institution with highly skilled professionals who place our community children as our top priority. Our administration, classroom teachers, and support staff are committed to making sure that each student is provided with the best possible education because at ECMS: Every Child Meets Success

Website: <http://www.ecpps.k12.nc.us/ECMS/index.html>



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ECMS (cont)

2009-10

Elizabeth City Middle



Elizabeth City Middle

Cynthia Morris, Principal

1066 Northside Road
Elizabeth City, NC 27909 4067
(252) 335-2974

Grades 06-8
Regular School
Traditional Calendar

Elizabeth City-Pasquotank Publ

HIGH STUDENT PERFORMANCE

Performance of Students in Each Grade on the ABCs End-of-Grade Tests

Percentage of Students' Scores At or Above Grade Level

	Grade 6		Grade 7		Grade 8		OVERALL	
	Reading	Math	Reading	Math	Reading	Math	Reading	Math
Our School	71.2%	72.1%	52.4%	63.2%	59.9%	72.5%	61.2%	69.1%
District	69.8%	73.1%	53.3%	63.8%	62.6%	72.3%	62.0%	72.3%
State	75.3%	80.5%	66.8%	80.2%	69.5%	83.9%	70.1%	81.8%

N/A = Fewer than five students



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ECMS (cont)

SCHOOL PROFILE

School Size

The total number of students in this school and the average number of students in schools with similar grade ranges at the district and state levels.

OUR SCHOOL	DISTRICT	STATE
614	632	657

Average Class Size

The average number of students enrolled in a "typical" K-8 classroom.

* Legislation mandates that class sizes for grades 4-12 are not restricted for 2009-10 and 2010-11.

* Due to data entry issues, some class sizes in select schools are unavailable for 2009-10.

	OUR SCHOOL	DISTRICT	STATE
Grade 6	20	22	22
Grade 7	20	15	21
Grade 8	17	16	21

Performance of Each Student Group on the ABCs End-of-Grade Tests

Percentage of Students, Grouped by Gender, Ethnicity, and Other Factors, Who Passed BOTH the Reading and Math Tests

	Male	Female	White	Black	Hispanic	Amer. Indian	Asian Pacific Islander	Multi-Racial	E.D.	N.E.D.	L.E.P.	Migrant Students	Students with Disabilities
Our School	53.3%	54.1%	64.4%	39.3%	40.0%	N/A	62.5%	55.0%	44.3%	68.2%	33.3%	N/A	17.9%
# of tests taken	276	333	326	242	10	N/A	8	20	370	239	6	N/A	78
District	54.0%	58.1%	70.2%	40.1%	37.7%	77.8%	75.6%	60.6%	43.0%	74.5%	22.9%	N/A	28.6%
State	64.2%	68.5%	78.7%	47.0%	51.5%	52.6%	77.3%	67.8%	52.1%	82.0%	33.9%	41.8%	34.4%

E.D. = Economically Disadvantaged

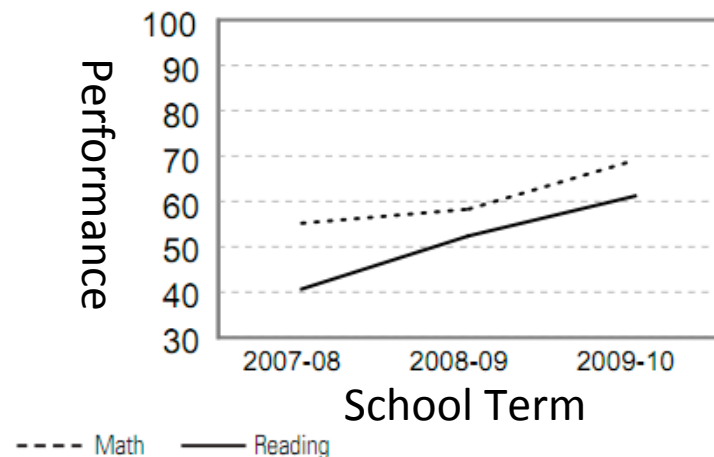
N.E.D. = Not Economically Disadvantaged

L.E.P. = Limited English Proficiency

N/A = Fewer than five students

Three-Year Trend of Student Performance on the ABCs End-of-Grade Reading and Math Tests

Percentage of students at or above grade level for the past three years.



Math Sprint

Facilitator: Dr. Linda Hayden-ECSU

Principles: Completing problems in a timed environment
Receive points for correct answers
Lose points for incorrect answers



Motivator: Helps students develop better learning and cooperative skills



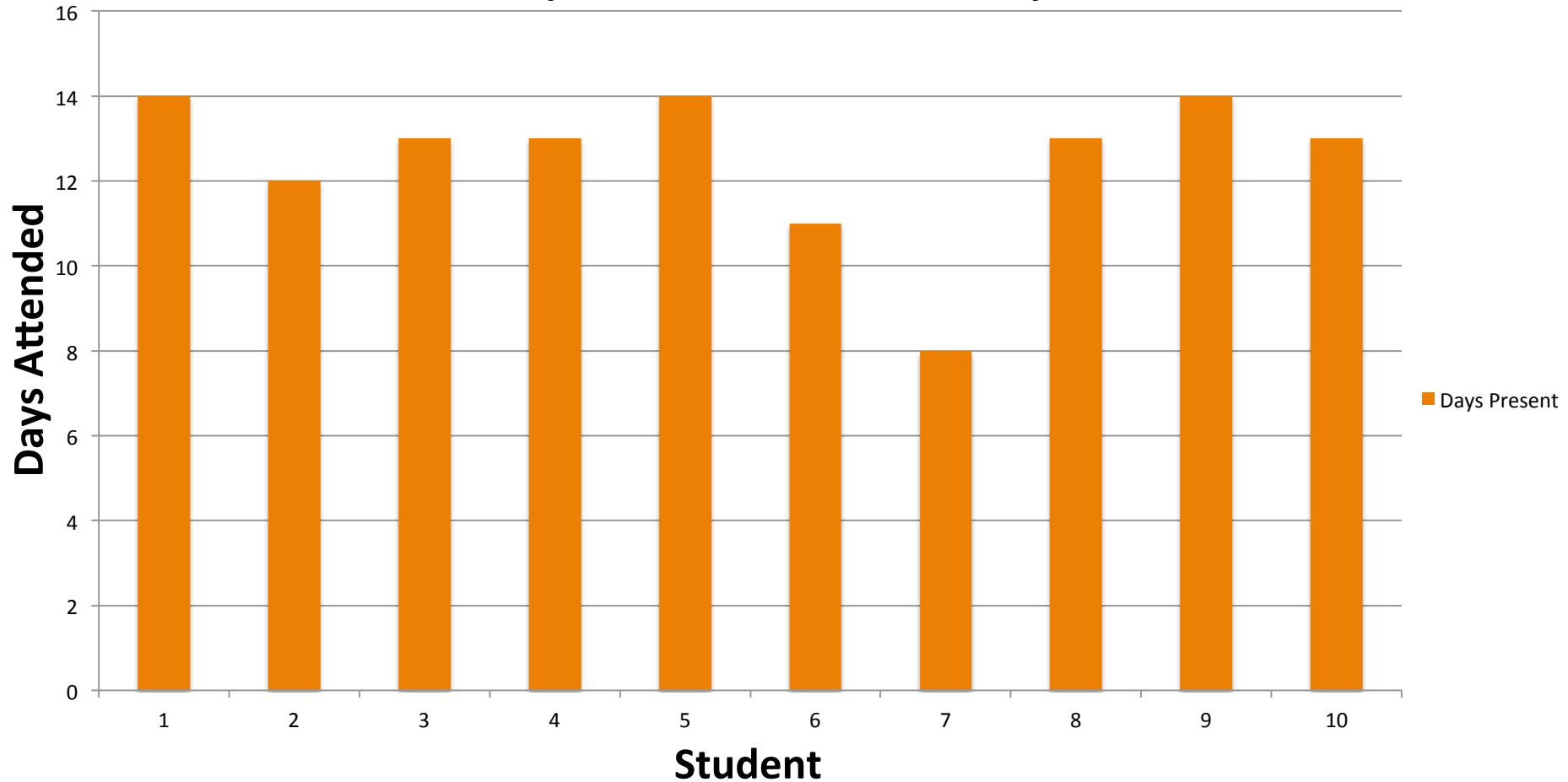
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Attendance

Days Present from June 14 – July 1



Pedagogy

Classroom Management- Teaching Philosophy

- Assertive Discipline (Mr. Elder)
- Preventative Discipline (Mr. Leavy)
- Assertive and Preventative Discipline (Ms. Cartman)



Bloom's Taxonomy

- Benjamin Bloom
- Common Core
- North Carolina Standards of Mathematics
- Metacognitive Processes



Pedagogy

Classroom Alignment

The following is an example of the typical procedure followed for a tutoring session:
(10 am- noon)

Welcome/ Warm- Up

Intro to New Lesson & Practice

10 minute Break

Continue with Lesson & Practice
(Hands-on Activity)

Math Sprint* (only 2 sessions)

15 minute Snack break/ Dismissal



Observations

Problems

- Background Knowledge
- Classroom Challenges
 - Material
 - Attendance
- Class Size



Math Sprint

- Administration: 2 Sessions
 - 1: Week 2
 - 2: Week 3
- Used to motivate students



Math Sprint: How It Works

- Sense of **TEAMWORK** through Competition
- 3 Key Instructors
 - Score Keeper
 - Timer
 - Facilitator



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Math Sprint - Implementation

- Session 1
 - Groups
 - Reward System
 - EOG questions
- Session 2
 - Groups
 - Reward System
 - EOG (short answer)



Data

Data that was analyzed:

- 2011 Spring EOG Score
- Diagnostic Exam Score (raw)
- Released EOG Score (raw)

Diagnostic Exam:

- Developed by the Math Education Team, modeled after EOG exam
- 30 questions (20 calculator, 10 w/o calculator)



Data

Released EOG Exam:

- Taken from the North Carolina Department of Education
- Available Online (with full answer key)
- 50 questions (36 calculator, 14 without calculator)

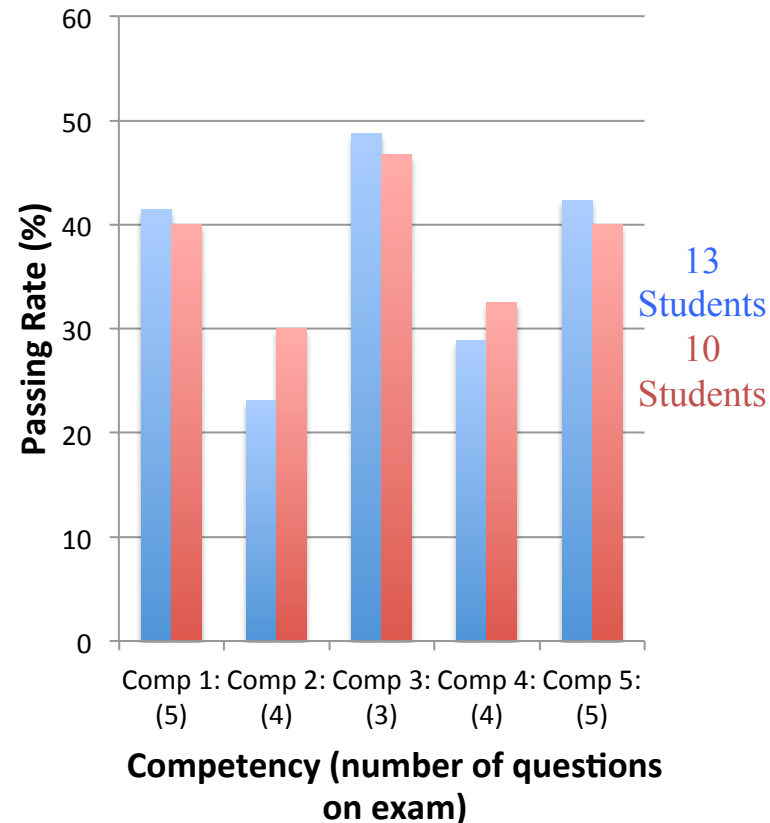
Spring EOG Exam:

- Scaled scores received
- Scores 342 – 350 (level 2)



Results-Diagnostic (6/14/11)

Competency Passing Rate



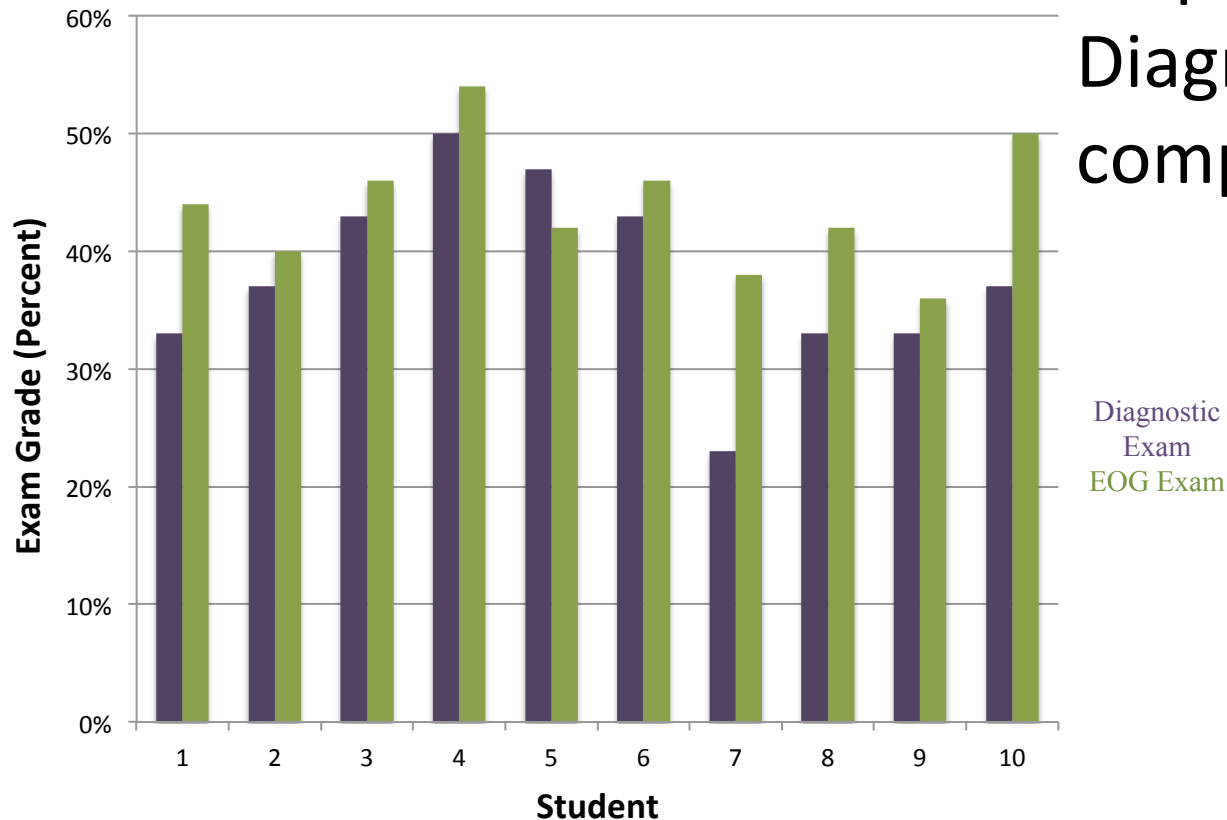
Breakdown of performance of the 5 competencies

Baseline for curriculum alignment



Results-Diagnostic Exam vs. EOG Exam

Diagnostic Exam vs. EOG Exam

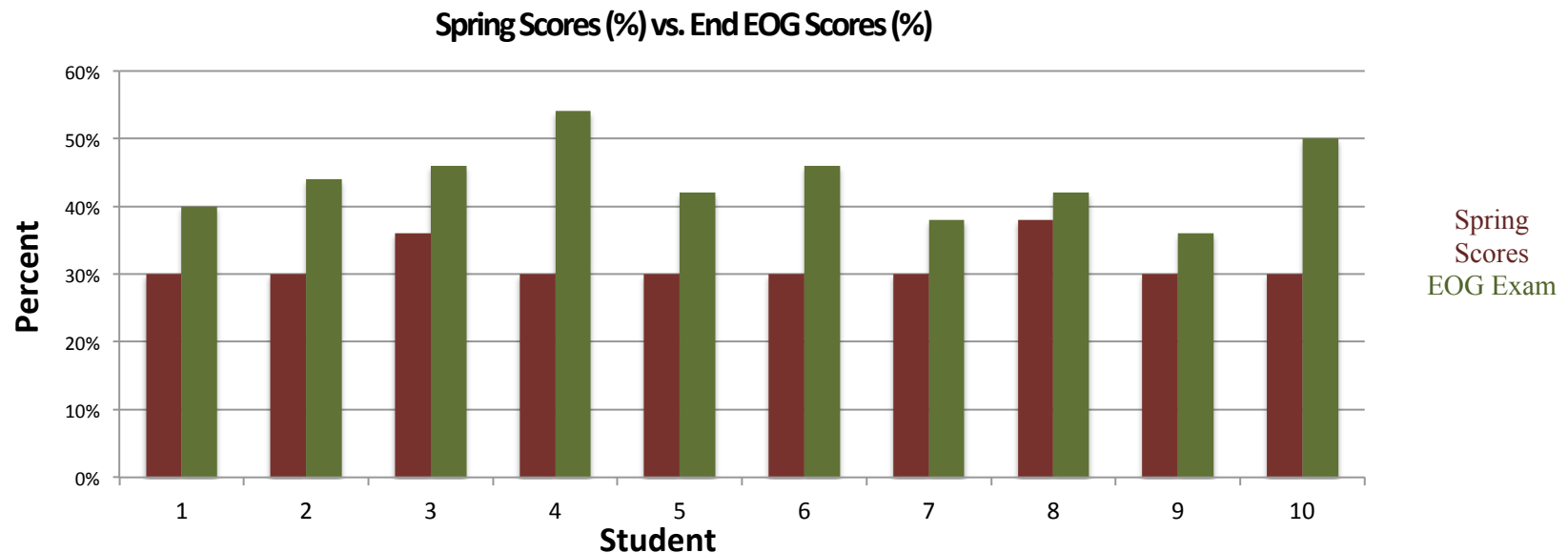


Displays results of
Diagnostic Exam
compared to EOG Exam



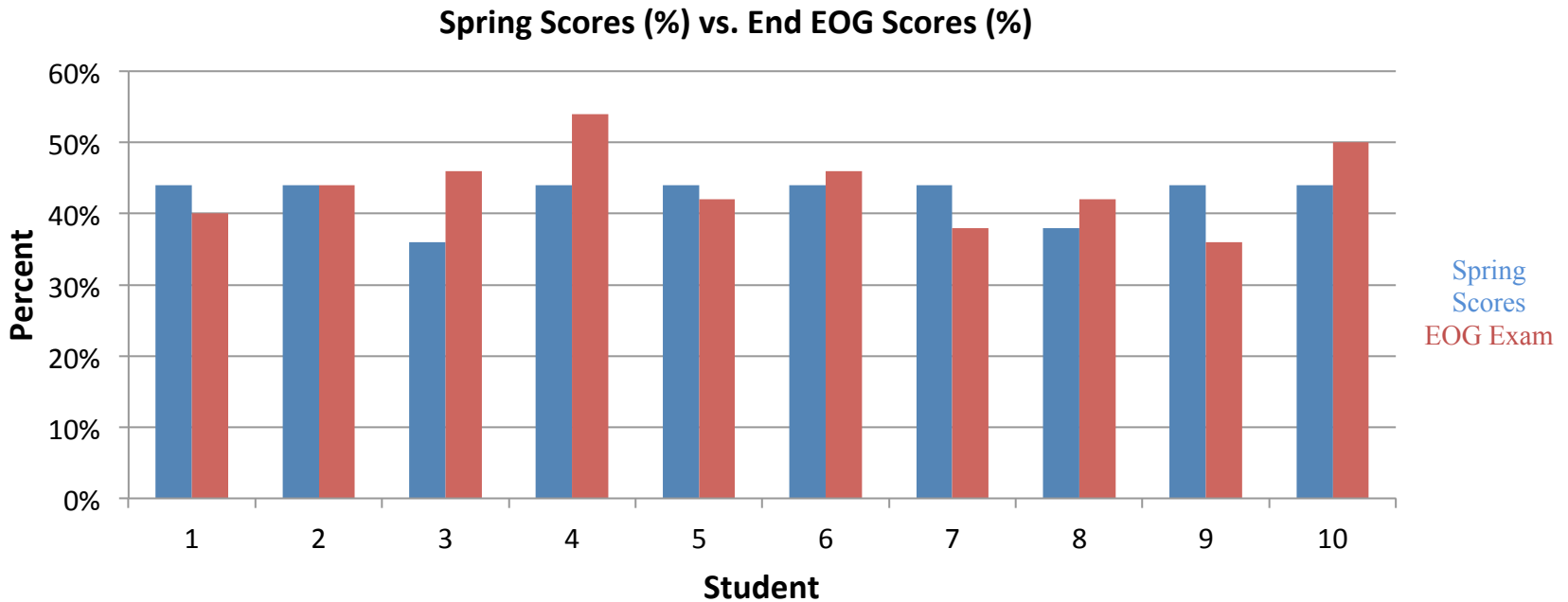
Results-Spring VS. Released EOG

Baseline score of 342 (level 2) was assigned for the students' Spring 2011 scores



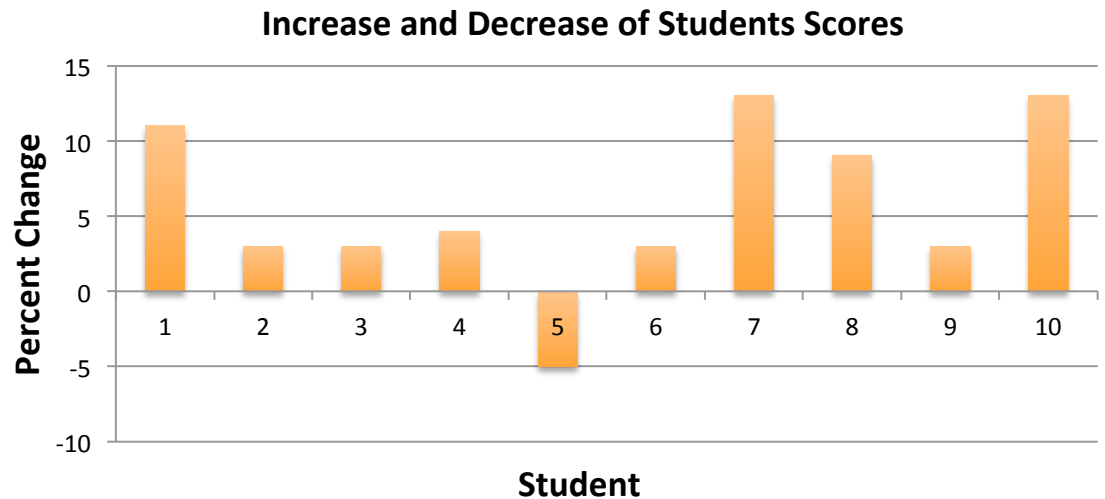
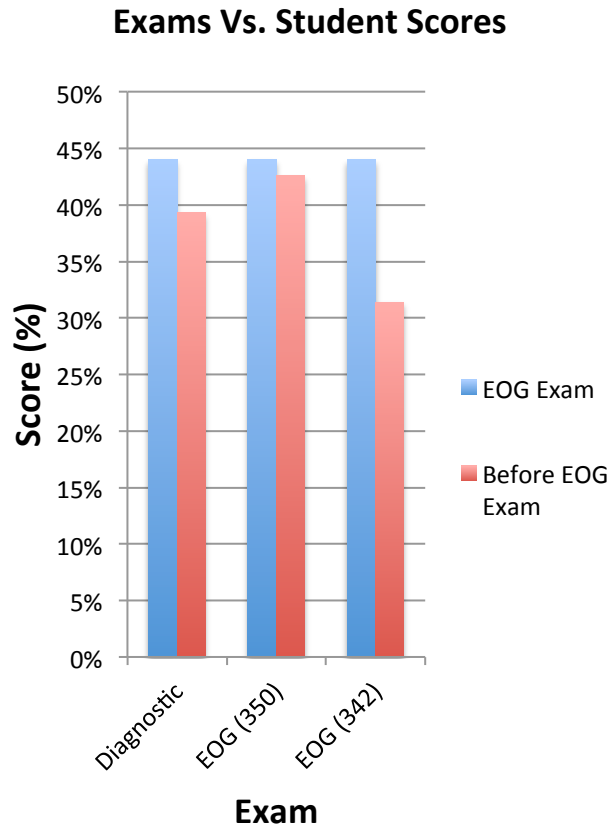
Results-Spring VS. Released EOG

Peak score of 350 (level 2) was assigned
for the students' Spring 2011 scores



Conclusion

- Overall growth through weeks
- Individual Scores
- Attendance
- Math Sprint



Future Work

- A longer period of study (9 weeks)
- Student Population Size (at least 20)
- Requirement: Students' EOG exam scores
- Attendance
- Keep “hands-on” approach with Math Sprint
- Parent Participation



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Questions?



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