

# RIO CONNECTION: JACKSON FOCUS ON MATHEMATICS AND SCIENCE TEACHING

## THREE YEAR SUMMARY REPORT

### THE PARTNERSHIP

Over the past three years, while implementing a math science partnership project with University of Rio Grande faculty Dr. Jacob White and Dr. Rob Hopkins, students and teachers at Jackson City Schools have achieved the following:

- Statistically **significant improvements** in participating teachers' content knowledge scores each year.
- **Improved** third through eighth grade student scores on **Ohio's Student Achievement Assessments** from 2008/2009 (baseline) to 2012/2013.
- Successful **Family Science Nights** in the elementaries and middle school buildings for all three years.
- **Economically disadvantaged** students showed **significant gains on science** content tests from pre- to post-tests each year.

### OHIO ACHIEVEMENT ASSESSMENT RESULTS

Fifth and eighth grade students are tested in science each year. Figures 1 and 2 below show that scores have **improved** over time, with higher percentages of students scoring "proficient" or above. Fifth grade students' scores have shown an **11.2 percentage point increase** since baseline, and eighth grade scores have **increased 10.2 percentage points**.

There has also been an **improvement** in the percentage of students in third through eighth grade scoring "**proficient**" or above on the Ohio Achievement Assessments in mathematics (figure 2). Fifth and eighth grades had the greatest gains, with both showing a 17 percentage point increase from baseline to 2012/2013.

Figure. 1

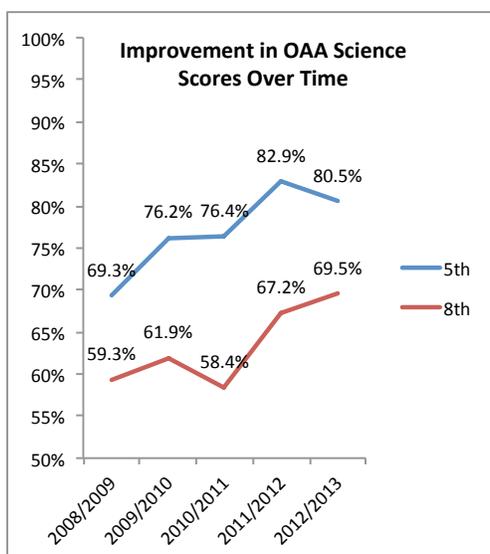
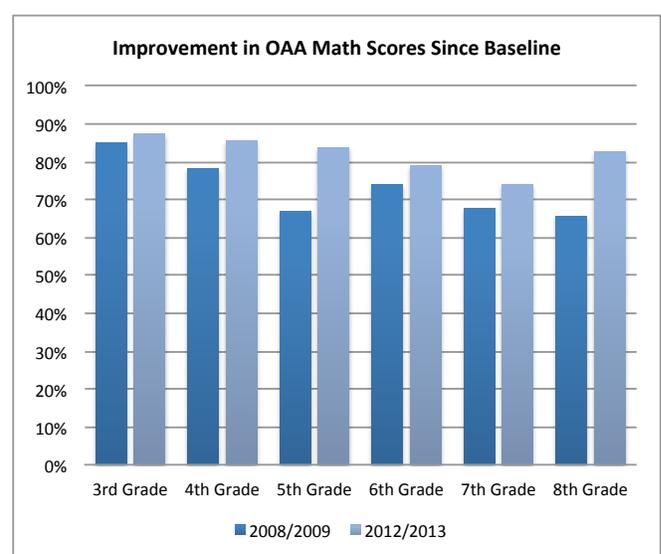


Figure. 2



## TEACHER CONTENT KNOWLEDGE

- All 3<sup>rd</sup> through 8<sup>th</sup> grade **mathematics** and **science** teachers participated in the professional development
- Average of **13** individual **coaching hours** per participating teacher
- Total of **24** workshop days

Each project year, teachers were tested before and after they took part in the professional development. To further evaluate the effect of the experience, a group of teachers from a similar district was given the same post-test each year and compared to Jackson City School teachers. In Years One and Three, elementary teachers showed higher gains than middle school teachers when disaggregated. Since most middle school science teachers in the district had more science content courses in college, this finding is consistent with the research hypothesis.

“The relationship between URG and the JCSD administrative staff has been crucial to the successful implementation of the program.”

*Jackson MSP  
Planning Team Member*

## TEACHER CONTENT KNOWLEDGE ASSESSMENT RESULTS ACROSS YEARS

YEAR ONE
<b>Significant increase</b> in Earth Science and Astronomy/Space Science from pre- to post-test (N=25).
Elementary teachers <b>scored significantly higher</b> at post-test than the comparison district.
YEAR TWO
<b>Significant increase</b> in Physical Science from pre- to post-test (N=18)
<b>Significant increase</b> in Mathematics Assessment from pre- to post-test (N=22).
Although not significant, JCSD teachers had a <b>higher mean</b> at post-test than the comparison district.
YEAR THREE
<b>Significant increase</b> in Life Science Assessment from pre- to post-test (N=19).
Participating teachers scored <b>significantly higher</b> at post-test than the comparison district.

## STUDENT CONTENT KNOWLEDGE

At the beginning and end of each year, students of participating teachers were given content knowledge tests comprised of items from the National Assessment of Educational Progress (NAEP), or the MOSART (Misconceptions-Oriented Standards-Based Assessment Resources for Teachers) Assessment. Students from a comparison district were also pre- and post-tested.

## Highlights of Student Success Across Years on Content Tests

### YEAR ONE

6<sup>th</sup> grade science content gains were significantly higher than the comparison district.

Economically disadvantaged 4<sup>th</sup> graders showed significantly higher gains than the comparison district.

### YEAR TWO

4<sup>th</sup> grade science content gains were significantly higher than the comparison district.

From pre- to post-test, 5<sup>th</sup> and 6<sup>th</sup> graders showed significant improvement in math content.

Economically disadvantaged 4<sup>th</sup> graders showed significant improvement in science, and both 5<sup>th</sup> and 6<sup>th</sup> grade students showed significant improvement in math.

### YEAR THREE

4<sup>th</sup> graders scored significantly higher at post-test than the comparison district.

Economically disadvantaged 4<sup>th</sup> and 6<sup>th</sup> graders showed significant gains from pre- to post-test in science.

## WHAT MADE RIO CONNECTION A SUCCESS?

Many aspects of Rio Connection: Jackson Focus on Mathematics and Science Teaching made it among the most successful of Math-Science Partnerships and Improving Teacher Quality programs evaluated by the Voinovich School:

- Administrative involvement and buy-in
  - Administrator interviews show **strong support** for the program, including involvement in planning and a needs assessment, as well as providing substitute teachers
  - There was administrator presence at select professional development workshop days, showing support for teachers
- Teacher satisfaction
  - Each year, data from focus group discussions and surveys show that teachers have been overall **very satisfied** with the professional development.
  - In Year One, **81%** of survey respondents agreed or strongly agreed that the experience **improved** their **teaching style** and **instructional techniques**.
  - In Year Three, **87%** of teachers said the facilitators or presenters provided **useful information** for their current grade level.

## Rio Connection: Jackson Focus on Mathematics and Science Teaching Professional Development Topics

✓ What is Inquiry and Why Do It?

✓ Common Core Standards

✓ Connecting Other Subjects to Inquiry

✓ Genetic Diversity and Natural Selection

✓ Ecological Adaptations and Ecosystem Processes

✓ Role of climate

✓ Data Organization and Representation

✓ Journey to Earth's Interior

✓ Chemical Changes of Matter

✓ Genetic Diversity and Natural Selection

✓ Evolution and the Tree of Life

✓ Density and the Particle Model

✓ Variation About the Mean

✓ Earth's Solid Membrane – Soil

✓ Modern Cell Theory

✓ Cells-The Chemical Factories of Life

## JCSD FAMILY SCIENCE NIGHTS

Each year, coaches, teachers and administrators at Jackson Middle School and each of the elementary schools planned a Family Science Night. Science Nights were well attended and feedback from teachers, administrators, and parents or caregivers was extremely positive. Every year, the events overall as well as the events as learning experiences averaged nearly the highest rating of “10” on parent surveys.

## CONCLUSIONS

Rio Connection: Jackson Focus on Mathematics and Science Teaching is a three-year Math Science Partnership among the University of Rio Grande, The Gallia Vinton Educational Service Center and Jackson City School District. The purpose of the partnership is to connect K-12 teachers with math and science faculty at nearby colleges and universities in order to facilitate ongoing, high-quality professional development in the math and science content areas required by Ohio’s Academic Content Standards. The University of Rio Grande approached the Jackson City School District about this opportunity, and a needs assessment was conducted before the start of Year One. Student performance and teacher/administrator input reinforced the need for professional development and was used to tailor the series to the needs of the district.

- ✓ Each of the principals interviewed in Year Three agree that there will be a continued focus on science beyond the life of the grant.
- ✓ Support from the administration and cooperation between the district and URG helped to make each year of the project a success.
- ✓ Teachers showed gains in content knowledge every year.
- ✓ Improvements on Student Achievement Tests can be seen from baseline.
- ✓ Teachers report that the program may have been more applicable for elementary teachers than middle school teachers, but this is to be expected considering that many middle school teachers have 7<sup>th</sup>-12<sup>th</sup> grade licensure and therefore have had more content coursework.

**“I think it was great that you had this. It was very interesting and educational.”**

*-Year 1  
Parent Comment  
on Science Night*

**“Wonderful experience for the kids and family.”**

*-Year 3  
Parent Comment  
on Science Night*



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