

November 2009

Nebraska Statewide Mathematics and Science Partnership Program – Needs Assessment Supplement

Prepared for:
Nebraska Department of Education
301 Centennial Mall South
P.O. Box 94987
Lincoln, NE 68509-4987

Prepared by:
RMC Research Corporation
1512 Larimer Street, Suite 540
Denver, CO 80202

November 2009



**Nebraska Statewide Mathematics and Science Partnership Program –
Needs Assessment Supplement**

November 2009

Prepared for:

**Pat Madsen, Program Coordinator
Jan Handa, Grants Manager
Nebraska Mathematics and Science Partnership
Nebraska Department of Education
301 Centennial Mall South
P.O. Box 94987
Lincoln, NE 68509-4987**

By:

**John Sutton
Lyn Swackhamer
Brandie Ward**

**RMC Research Corporation
1512 Larimer Street, Suite 540
Denver, CO 80202**

November 2009

Acknowledgments

This report was prepared for the Nebraska Department of Education with funds from the U.S. Department of Education, CFDA 84.366B.

For questions about this report, please contact Dr. John T. Sutton at 1-800-922-3636, or e-mail at sutton@rmcdenver.com.

RMC Research Corporation is an Equal Employment Opportunity and Affirmative Action Employer and a Drug-Free Workplace.

Exhibits

Exhibit S1.	Teachers' Ratings of Feeling Prepared to Teach Mathematics by Teacher Certification and Endorsements	2
Exhibit S2.	Teachers' Ratings of Feeling Prepared to Teach Mathematics with the Use of Manipulative Material.....	3
Exhibit S3.	Teachers' Ratings of Feeling Prepared to Teach Mathematics with the Use of Technology Tools	3
Exhibit S4.	Teachers' Ratings of Feeling Prepared to Learn the Processes Involved in Reading and How to Teach Reading in Mathematics	4
Exhibit S5.	Teachers' Ratings of Mathematics Professional Development Needs by Teacher Certification and Endorsements	5
Exhibit S6.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Equivalent Forms of Numbers	7
Exhibit S7.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems.....	7
Exhibit S8.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding Necessary to Apply Coordinate Geometry	8
Exhibit S9.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Right Triangle Trigonometry	8
Exhibit S10.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Geometric Properties to Solve Problems	9
Exhibit S11.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Theoretical Probability to Represent Problems.....	9
Exhibit S12.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Evaluate How Transformations on Data Affect the Measures of Central Tendency and Variability	10
Exhibit S13.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Interpret Data Represented by the Normal Distribution and Formulate Conclusions	10
Exhibit S14.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Calculate Probabilities of Independent Events.....	11
Exhibit S15.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Graph and Interpret Algebraic Relations and Inequalities	11
Exhibit S16.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Solve Problems Involving Equations and Inequalities	12
Exhibit S17.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities.....	12
Exhibit S18.	Teachers' Ratings of Feeling Prepared to Teach Science by Teacher Certification and Endorsements	13

Exhibit S19.	Teachers' Ratings of Feeling Prepared to Manage a Class of Students using Hands-on or Laboratory Activities.....	14
Exhibit S20.	Teachers' Ratings of Feeling Prepared to Lead a Class of Students using Investigative Strategies.....	14
Exhibit S21.	Teachers' Ratings of Feeling Prepared to Take into Account Students' Prior Conceptions about Natural Phenomena when Planning	15
Exhibit S22.	Teachers' Ratings of Feeling Prepared to Know the Major Unifying Concepts of All Sciences.....	15
Exhibit S23.	Teachers' Ratings of Feeling Prepared to Use a Variety of Technological Tools.....	16
Exhibit S24.	Teachers' Ratings of Science Professional Development Needs by Teacher Certification and Endorsements	17
Exhibit S25.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Form and Function.....	18
Exhibit S26.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure of the Atom.....	18
Exhibit S27.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Chemical Reactions.....	19
Exhibit S28.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Conservation of Energy and Increase in Disorder	19
Exhibit S29.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Interactions of Energy and Matter.....	20
Exhibit S30.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Cell.....	20
Exhibit S31.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity	21
Exhibit S32.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Theory of Biological Evolution	21
Exhibit S33.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Interdependence of Organisms	22
Exhibit S34.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Geochemical Cycles	22
Exhibit S35.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Origins of the Earth and the Universe	23
Exhibit S36.	Teacher's Ratings of Feeling Prepared to Teach Mathematics by School Size.....	25
Exhibit S37.	Teachers' Ratings of Feeling Prepared to Teach Mathematics to Students from a Variety of Cultural Backgrounds.....	27
Exhibit S38.	Teachers' Ratings of Feeling Prepared to Teach Mathematics to Students with Limited English Proficiency	27
Exhibit S39.	Teachers' Ratings of Feeling Prepared to Encourage Participation of Females in Mathematics.....	28
Exhibit S40.	Teachers' Ratings of Mathematics Professional Development Needs by School Size.....	28
Exhibit S41.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Relationships between Subsets of Real Numbers.....	30

Exhibit S42.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Equivalent Forms of Numbers	31
Exhibit S43.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems	31
Exhibit S44.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of how to Select and Use Measuring Units, Tools, and/or Technology	32
Exhibit S45.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Convert between Metric and Standard Units of Measurement.....	32
Exhibit S46.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Calculate Perimeter and Area of Two-dimensional Shapes and Surface Area and Volume of Three-dimensional Shapes	33
Exhibit S47.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Create Geometric Models	33
Exhibit S48.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Evaluate Characteristics and Properties of Two- and Three-dimensional Geometric Shapes.....	34
Exhibit S49.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Coordinate Geometry.....	34
Exhibit S50.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Right Triangle Trigonometry	35
Exhibit S51.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Geometric Properties to Solve Problems	35
Exhibit S52.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Theoretical Probability to Represent Problems	36
Exhibit S53.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Evaluate how Transformations on Data Affect the Measures of Central Tendency and Variability	36
Exhibit S54.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Interpret Data Represented by the Normal Distribution and Formulate Conclusions	37
Exhibit S55.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Calculate Probabilities of Independent Events.....	37
Exhibit S56.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Graph and Interpret Algebraic Relations and Inequalities	38
Exhibit S57.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities.....	38
Exhibit S58.	Teachers' Ratings of Feeling Prepared to Teach Science by School Size	39
Exhibit S59.	Teachers' Ratings of Feeling Prepared to Provide Science Instruction that Meets Appropriate Standards	40
Exhibit S60.	Teachers' Ratings of Feeling Prepared to Teach Scientific Inquiry	41

Exhibit S61.	Teachers' Ratings of Feeling Prepared to Manage a Class of Students using Hands-on or Laboratory Activities.....	41
Exhibit S62.	Teachers' Ratings of Feeling Prepared to Take into Account Students' Prior Conceptions about Natural Phenomena when Planning	42
Exhibit S63.	Teachers' Ratings of Feeling Prepared to Know the Major Unifying Concepts of All Sciences	42
Exhibit S64.	Teachers' Ratings of Feeling Prepared to Understand How Students Differ in Their Approaches to Learning	43
Exhibit S65.	Teachers' Ratings of Feeling Prepared to Teach Science to Students from a Variety of Cultural Backgrounds.....	43
Exhibit S66.	Teachers' Ratings of Feeling Prepared to Teach Science to Students with Limited English Proficiency.....	44
Exhibit S67.	Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability Which Impacts Science Learning.....	44
Exhibit S68.	Teachers' Ratings of Feeling Prepared to Encourage Participation of Females and Minorities in Science.....	45
Exhibit S69.	Teachers' Ratings of Feeling Prepared to Provide a Challenging Curriculum	45
Exhibit S70.	Teachers' Ratings of Feeling Prepared to Use a Variety of Assessment Strategies to Inform Practice	46
Exhibit S71.	Teachers' Ratings of Feeling Prepared to Use a Variety of Technological Tools to Enhance Student Learning	46
Exhibit S72.	Teachers' Ratings of Science Professional Development Needs by School Size.....	47
Exhibit S73.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Systems, Order, and Organization	48
Exhibit S74.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure of the Atom.....	49
Exhibit S75.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure and Properties of Matter	49
Exhibit S76.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Chemical Reactions.....	50
Exhibit S77.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Conservation of Energy and Increase in Disorder	50
Exhibit S78.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Cell.....	51
Exhibit S79.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity	51
Exhibit S80.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Theory of Biological Evolution	52
Exhibit S81.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Interdependence of Organisms	52
Exhibit S82.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Matter, Energy, and Organization in Living Systems.....	53
Exhibit S83.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Behavior of Organisms	53
Exhibit S84.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Energy in the Earth System	54

Exhibit S85.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Geochemical Cycles	54
Exhibit S86.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Earth in the Solar System	55
Exhibit S87.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Origins of the Earth and the Universe	55
Exhibit S88.	Teachers' Ratings of Feeling Prepared to Teach Mathematics by Affiliation	58
Exhibit S89.	Teachers' Ratings of Feeling Prepared to Provide Mathematics Instruction that Meets Appropriate Standards.....	59
Exhibit S90.	Teachers' Ratings of Feeling Prepared to Align Standards, Curriculum, Instruction, and Assessment to Enhance Student Mathematics Learning	59
Exhibit S91.	Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability	60
Exhibit S92.	Teachers' Ratings of Mathematics Professional Development Needs by Affiliation.....	61
Exhibit S93.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop an Understanding of Relationships between Subsets of Real Numbers.....	62
Exhibit S94.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop an Understanding of the Equivalent Forms of Numbers	62
Exhibit S95.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems.....	63
Exhibit S96.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Justify Solutions to Mathematical Problems	63
Exhibit S97.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Perform Estimations and Computations of Real Numbers	64
Exhibit S98.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Select and Use Measuring Units, Tools, and/or Technology	64
Exhibit S99.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Convert between Metric and Standard Units of Measurement.....	65
Exhibit S100.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Calculate Perimeter and Area of Two-dimensional Shapes and Surface Area and Volume of Three-dimensional Shapes.....	65
Exhibit S101.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Coordinate Geometry.....	66
Exhibit S102.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Right Triangle Trigonometry	66
Exhibit S103.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Geometric Properties to Solve Problems.....	67
Exhibit S104.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Deductive Reasoning to Arrive at a Conclusion	67

Exhibit S105.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Select a Sampling Technique to Gather Data, Analyze the Resulting Data and Make Inferences	68
Exhibit S106.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Write Equations and Make Predictions from Sets of Data	68
Exhibit S107.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Apply Theoretical Probability to Represent Problems and Make Decisions	69
Exhibit S108.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Evaluate how Transformations on Data Affect the Measures of Central Tendency and Variability	69
Exhibit S109.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Graph and Interpret Algebraic Relations and Inequalities	70
Exhibit S110.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Solve Problems Involving Equations and Inequalities	70
Exhibit S111.	Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities.....	71
Exhibit S112.	Teachers' Ratings of Feeling Prepared to Teach Science by Affiliation.....	72
Exhibit S113.	Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability	73
Exhibit S114.	Teachers' Ratings of Science Professional Development Needs by Affiliation.....	74
Exhibit S115.	Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity	75

Results

Preparedness and Needs Based On Teacher Certification and Endorsements

This section presents an analysis of preparedness and professional development needs in mathematics and science based on three different grouping of respondents. The groupings are defined based on Teacher Certification and Endorsements, and are reported as Early Childhood/Elementary, Middle School, and High School.

On the Needs Assessment Survey, respondents were asked to identify areas of certification or endorsements that they initially received, presently hold, and have interest in obtaining. Based on responses to the presently hold category, mean averages were obtained for both preparedness and professional development needs in mathematics and science. Graphs were developed for areas in which there was a difference between low and high mean ratings of .50 or higher. Each graph contains the mean rating for all three groups, so the reader can compare the rating of preparedness or professional development need across all three groups. A 4-point rating scale was used for preparedness with 1 = Not Adequately Prepared to 4 = Very Well Prepared. Similarly, a 4-point scale was used for professional development needs with 1 = Not a Priority to 4 = High Priority. The graphs are presented in the following order, mathematics preparedness, mathematics professional development needs, science preparedness, and science professional development needs. Each section begins with the table that presents the mean for all items in that area, followed by graphs for each item that had a difference between low and high mean of .50 or higher.

Mathematics Preparedness by Teacher Certification and Endorsements

Exhibit S1. Teachers' Ratings of Feeling Prepared to Teach Mathematics by Teacher Certification and Endorsements

Mathematics Preparedness	High School	Middle Grades	Early/Elementary
	N=152	N=82	N=330
Provide mathematics instruction that meets appropriate standards (district, state, or national.	3.57	3.39	3.40
Teach problem solving strategies.	3.26	3.22	3.16
Teach mathematics with the use of manipulative materials, such as counting blocks, geometric shapes, algebra tiles, and so on.	2.77	3.00	3.30
Teach mathematics with the use of technology tools, such as calculators, graphing calculators, and spreadsheets.	3.07	2.54	2.35
Align standards, curriculum, instruction, and assessment to enhance student mathematics learning.	3.11	3.06	3.08
Sequence (articulation of) mathematics instruction to meet instructional goals across grade levels and courses.	3.01	2.97	2.95
Select and/or adapt instructional materials to implement your written curriculum.	3.16	3.04	3.08
Make appropriate and relevant connections to other areas of mathematics, to other disciplines, and/or real world contexts.	2.99	3.00	3.01
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	2.92	3.05	3.07
Teach mathematics to students from a variety of cultural backgrounds.	2.55	2.72	2.71
Teach mathematics to students who have limited English proficiency.	1.90	2.23	2.10
Teach students who have a learning disability which impacts mathematics learning.	2.29	2.55	2.62
Encourage participation of females in mathematics.	3.43	3.29	3.22
Provide a challenging curriculum for all students you teach.	3.31	3.25	3.14
Learn the processes involved in reading and how to teach reading in mathematics.	2.38	2.76	2.96
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	2.80	2.90	2.89

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S2. Teachers' Ratings of Feeling Prepared to Teach Mathematics with the Use of Manipulative Materials

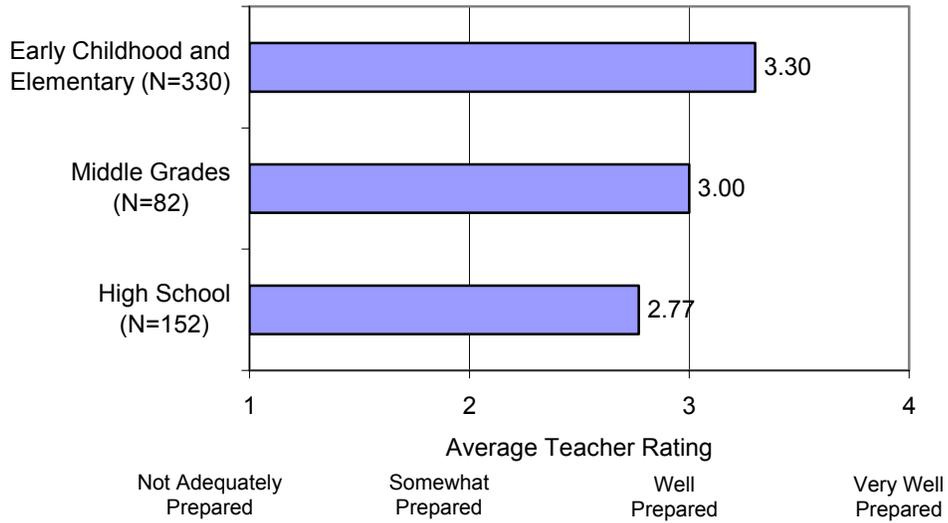


Exhibit S3. Teachers' Ratings of Feeling Prepared to Teach Mathematics with the Use of Technology Tools

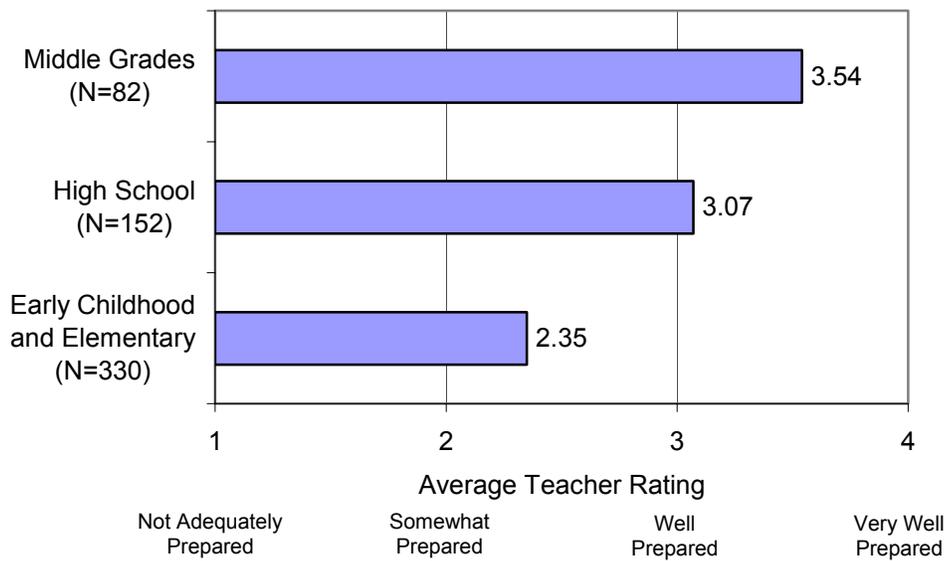


Exhibit S4. Teachers' Ratings of Feeling Prepared to Learn the Processes Involved in Reading and How to Teach Reading in Mathematics

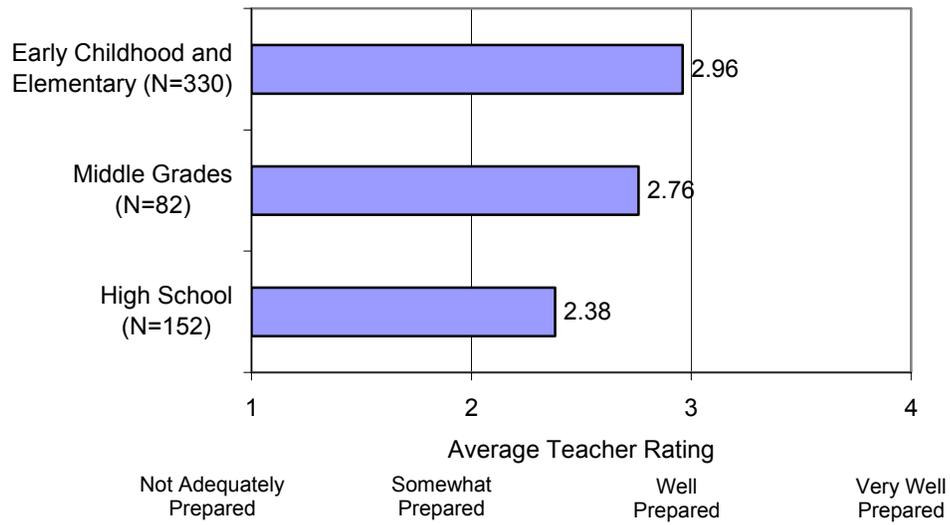


Exhibit S5. Mathematics Professional Development Needs by Teacher Certification and Endorsements

Teachers' Ratings of Mathematics Professional Development Needs by Teacher Certification and Endorsements

Mathematics Professional Development Needs	High School	Middle Grades	Early/ Elementary
	<i>N</i> =152	<i>N</i> =82	<i>N</i> =330
Help students develop ...			
an understanding of relationships between subsets of real numbers.	2.54	2.65	2.52
an understanding of the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.	3.05	3.05	2.38
the ability to solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions decimals, and percents, ratios and proportions.	3.25	3.01	2.39
the skills and depth of understanding to justify solutions to mathematical problems.	3.26	3.29	3.02
the skills and depth of understanding necessary to perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.	3.03	3.27	3.17
the skills and depth of understanding to select and use measuring units, tools, and/or technology and explain the degree of accuracy and precision of measurements.	2.76	3.04	2.98
the skills and depth of understanding to convert between metric and standard units of measurement, given conversion factors.	2.45	2.62	2.27
the skills and depth of understanding to calculate perimeter and area of two-dimensional shapes and surface area and volume of three-dimensional shapes.	2.90	2.92	2.62
the skills and depth of understanding necessary to create geometric models to describe the physical world.	2.87	2.57	2.43
the skills and depth of understanding necessary to evaluate characteristics and properties of two- and three-dimensional geometric shapes.	2.89	2.60	2.47
the skills and depth of understanding necessary to apply coordinate geometry to locate and describe objects algebraically.	2.98	2.54	2.12
the skills and depth of understanding to apply right triangle trigonometry to find length and angle measures.	2.89	2.26	1.80
the skills and dept of understanding to apply geometric properties to solve problems.	2.98	2.36	2.03

Mathematics Professional Development Needs	High School	Middle Grades	Early/ Elementary
Help students develop ...	N=152	N=82	N=330
the skills and depth of understanding to apply deductive reasoning to arrive at a conclusion.	3.12	3.00	2.80
the skills and depth of understanding to select a sampling technique to gather data, analyze the resulting data and make inferences.	2.86	2.81	2.69
the skills and depth of understanding to write equations and make predictions from sets of data.	3.09	3.00	2.61
the skills and depth of understanding to apply theoretical probability to represent problems and make decisions.	2.87	2.70	2.25
the skills and depth of understanding to evaluate how transformations on data affect the measures of central tendency and variability.	2.72	2.21	1.75
the skills and depth of understanding to interpret data represented by the normal distribution and formulate conclusions.	2.71	2.31	2.04
the skills and depth of understanding to calculate probabilities of independent events.	2.78	2.32	2.05
the skills and depth of understanding to graph and interpret algebraic relations and inequalities.	3.08	2.46	2.04
the skills and depth of understanding to solve problems involving equations and inequalities.	3.15	2.78	2.34
the skills and depth of understanding to solve problems involving systems of two equations, and systems of two or more inequalities.	3.07	2.35	1.91
the skills and depth of understanding to solve problems using patterns and functions.	3.05	2.91	2.81

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S6. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Equivalent Forms of Numbers

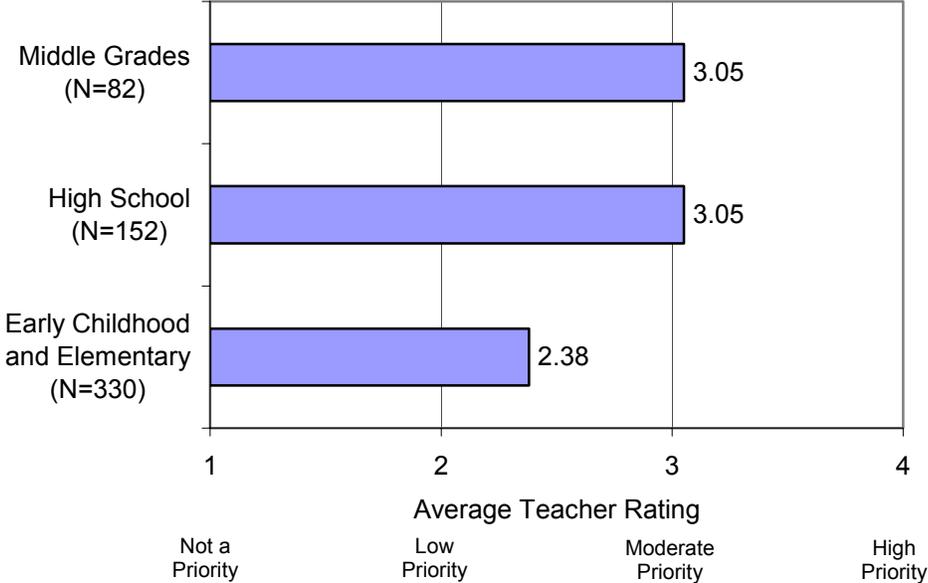


Exhibit S7. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems

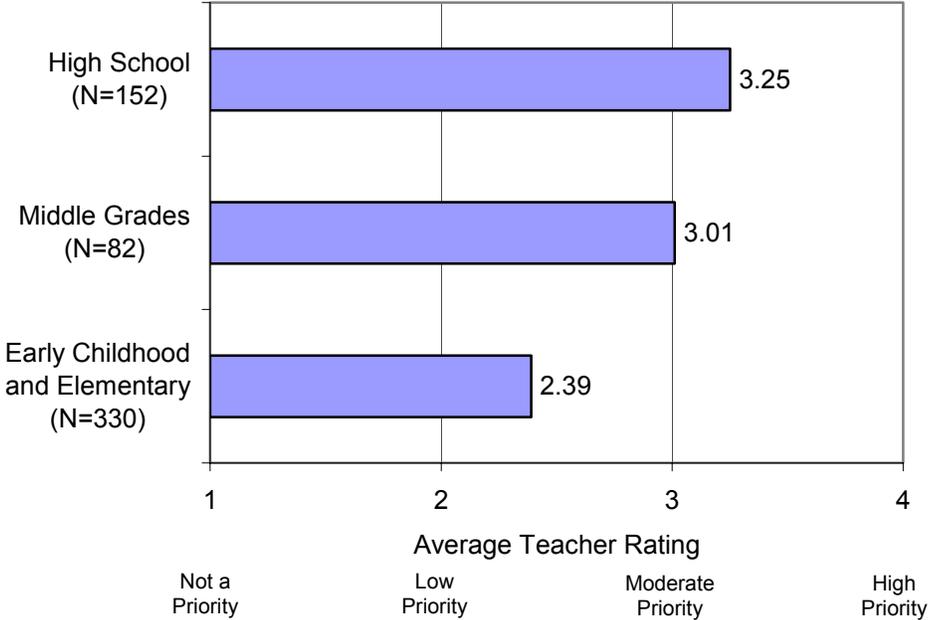


Exhibit S8. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding Necessary to Apply Coordinate Geometry

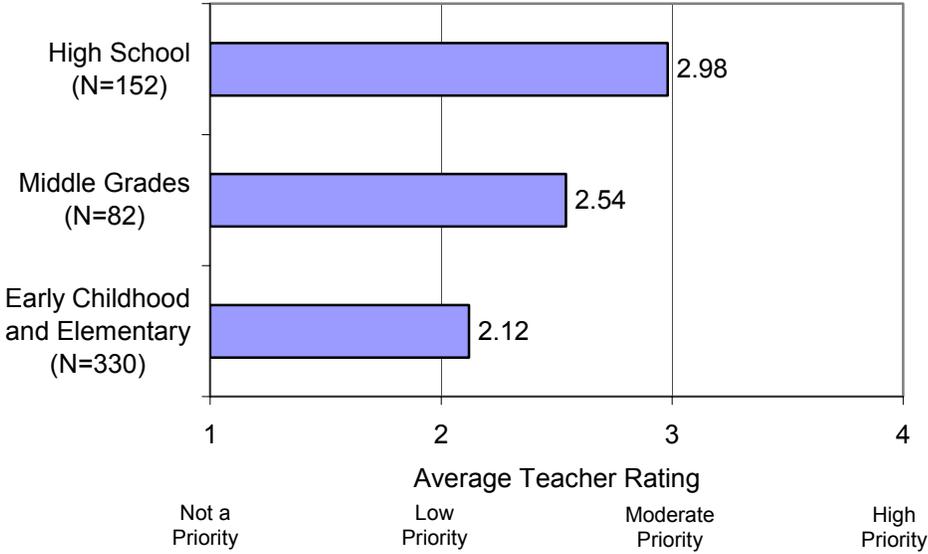


Exhibit S9. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Right Triangle Trigonometry

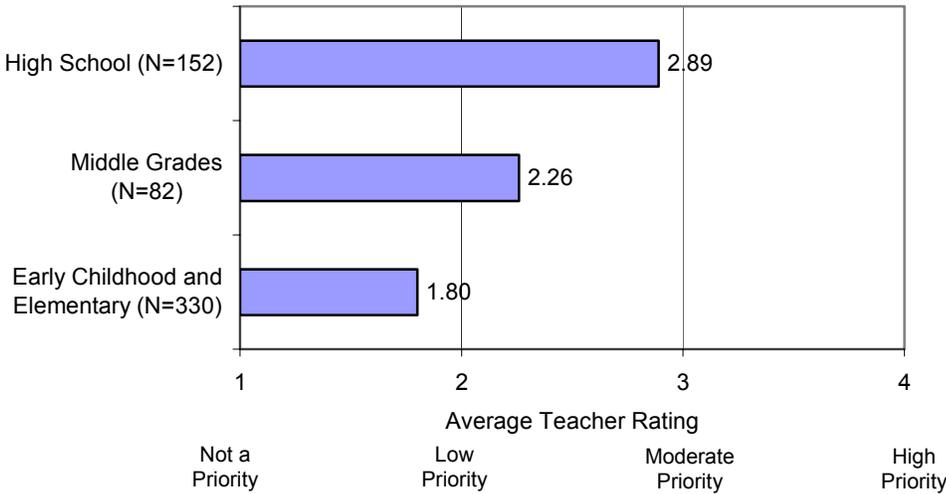


Exhibit S10. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Geometric Properties to Solve Problems

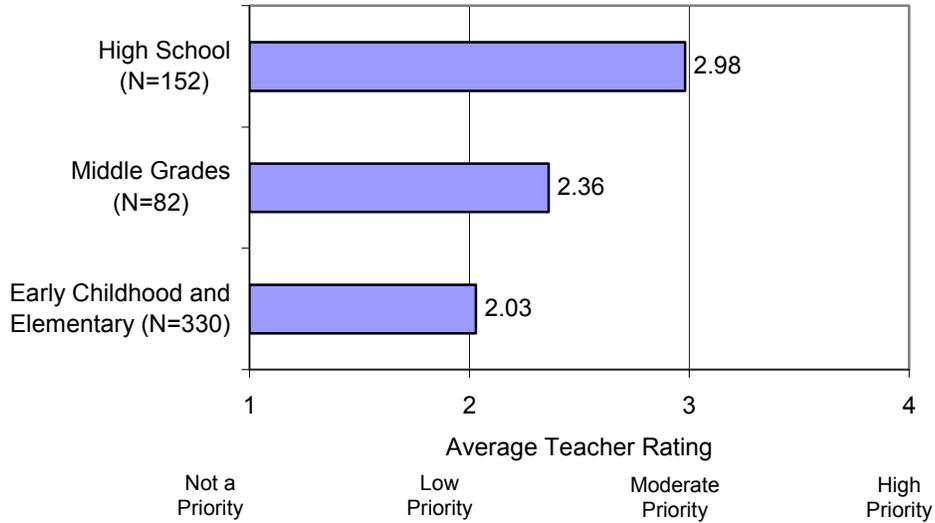


Exhibit S11. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Apply Theoretical Probability to Represent Problems

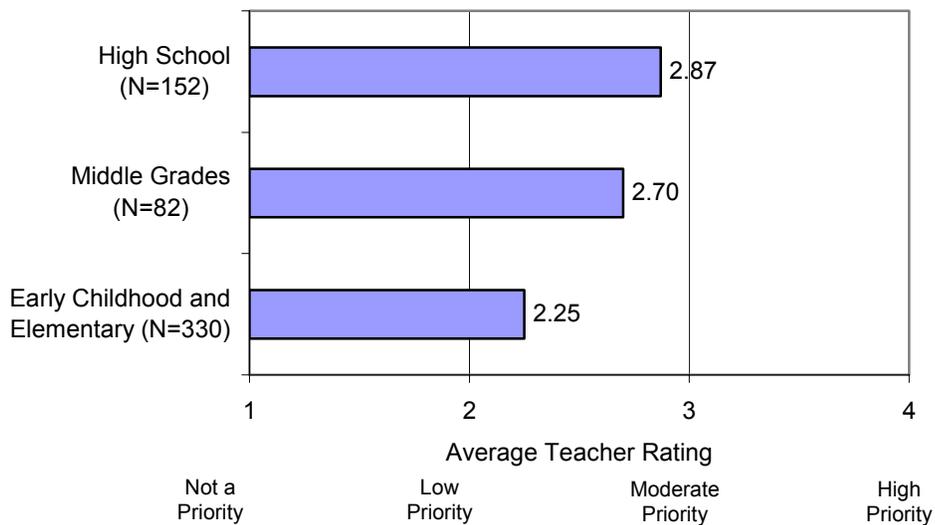


Exhibit S12. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Evaluate How Transformations on Data Affect the Measures of Central Tendency and Variability

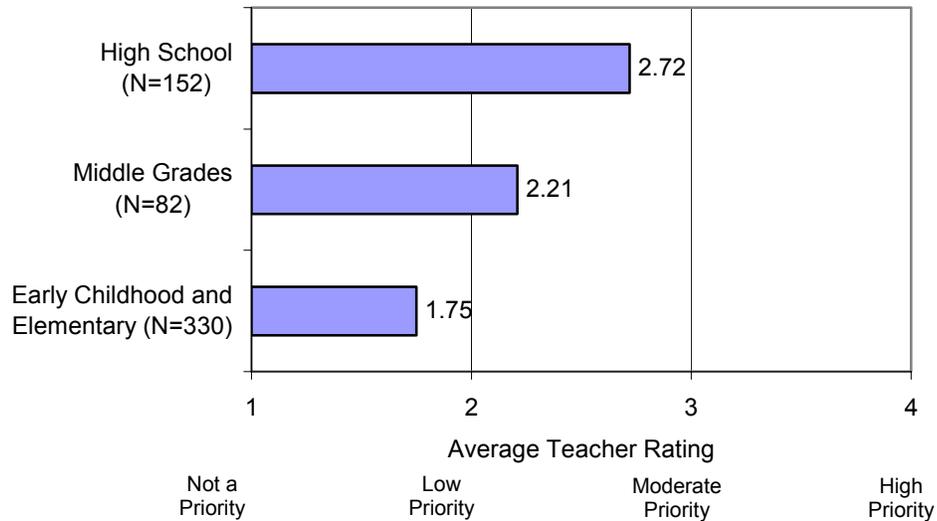


Exhibit S13. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Interpret Data Represented by the Normal Distribution and Formulate Conclusions

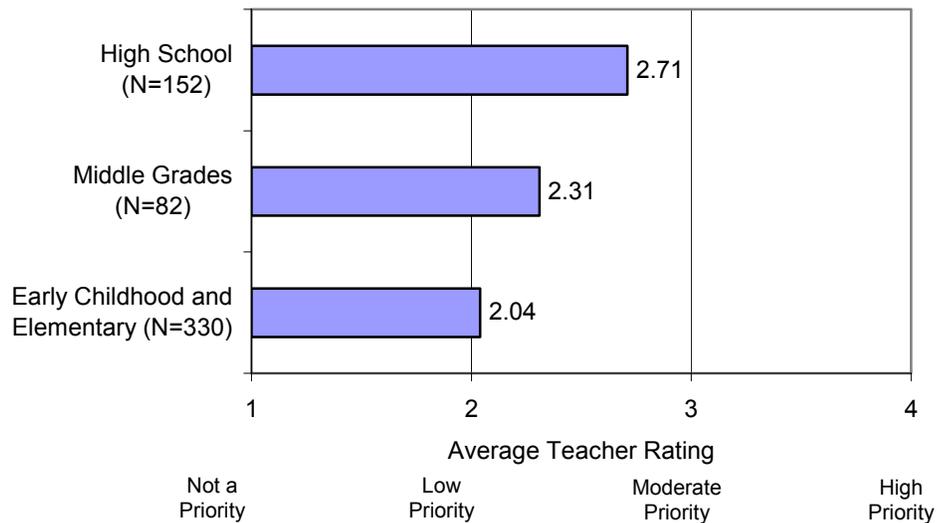


Exhibit S14. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Calculate Probabilities of Independent Events

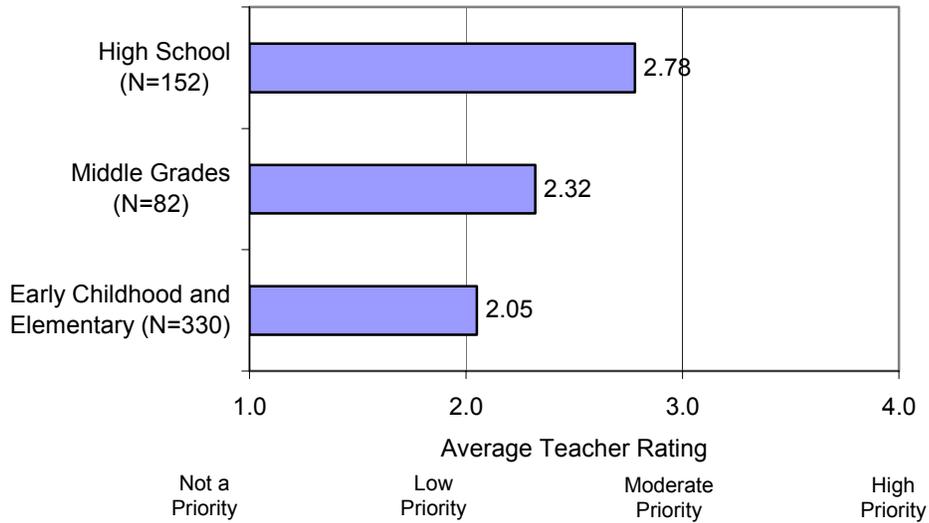


Exhibit S15. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Graph and Interpret Algebraic Relations and Inequalities

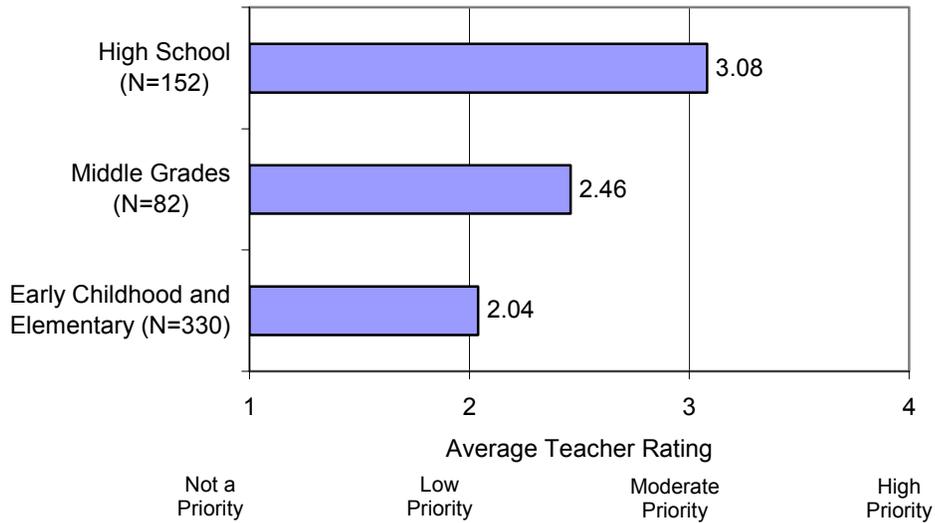


Exhibit S16. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Solve Problems Involving Equations and Inequalities

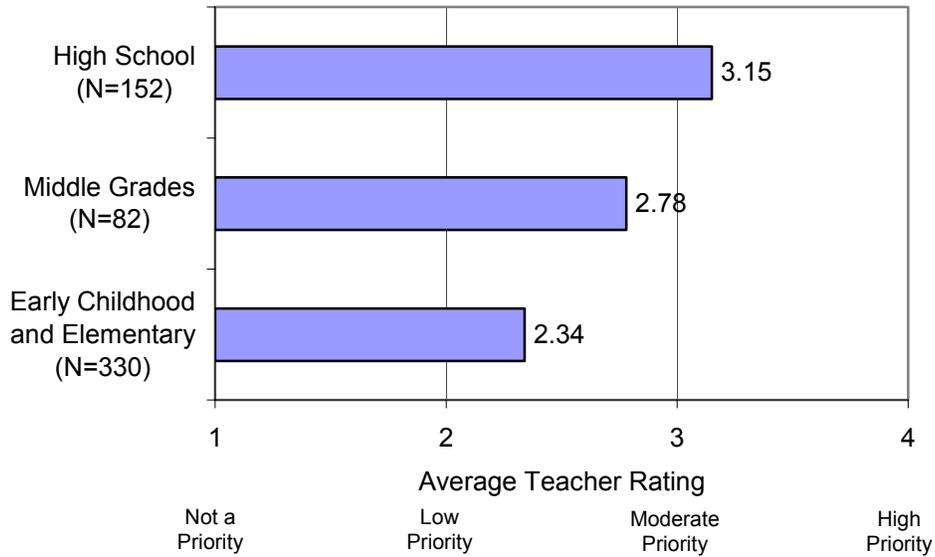
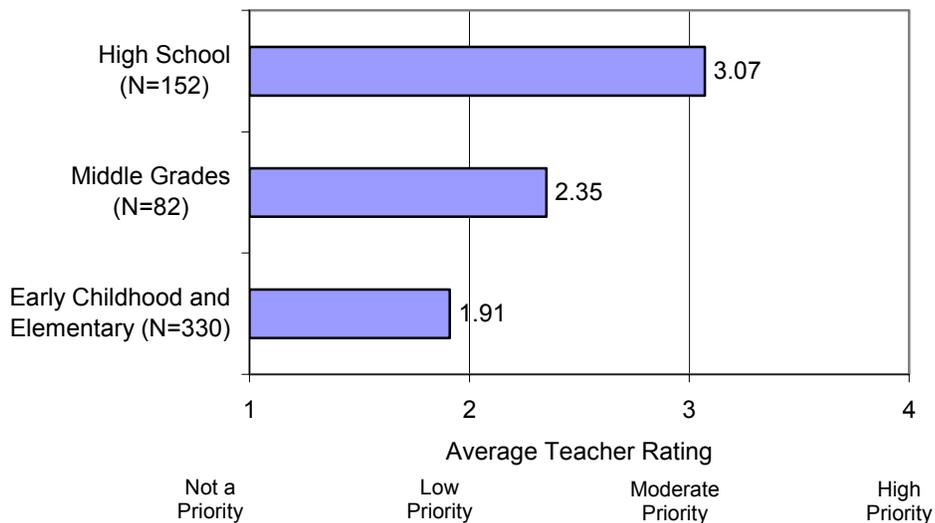


Exhibit S17. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Skills of Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities



Science Preparedness by Teacher Certification and Endorsements

Exhibit S18. Teachers' Ratings of Feeling Prepared to Teach Science by Teacher Certification and Endorsements

Science Preparedness	High School N=134	Middle Grades N=59	Early/ Elementary N=251
Provide science instruction that meets appropriate standards (district, state, or national).	3.47	3.31	3.02
Teach scientific inquiry.	3.28	3.27	2.80
Manage a class of students who are using hands-on or laboratory activities.	3.50	3.18	2.80
Lead a class of students using investigative strategies.	3.29	3.11	2.74
Take into account students' prior conceptions about natural phenomena when planning.	3.03	2.78	2.48
Align standards, curriculum, instruction, and assessment to enhance student science learning.	3.23	3.00	2.88
Sequence (articulation of) science instruction to meet instructional goals across grade levels and course.	3.16	2.98	2.79
Select and/or adapt instructional materials to implement your written curriculum.	3.39	3.15	2.97
Know the major unifying concepts of all sciences and how these concepts relate to other disciplines.	3.28	2.83	2.56
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	3.08	3.09	2.95
Teach science to students from a variety of cultural backgrounds.	2.94	2.87	2.62
Teach science to students who have limited English proficiency.	2.05	2.19	2.13
Teach students who have a learning disability which impacts science learning.	2.54	2.70	2.60
Encourage participation of females and minorities in science.	3.32	3.27	2.99
Provide a challenging curriculum for all students you teach.	3.38	3.15	2.97
Learn the processes involved in reading and how to teach reading in science.	2.74	3.02	3.04
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	3.13	2.94	2.86
Use a variety of technological tools (student response systems, lab interfaces and probes, etc) to enhance student learning.	2.95	2.73	2.45

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S19. Teachers' Ratings of Feeling Prepared to Manage a Class of Students using Hands-on or Laboratory Activities

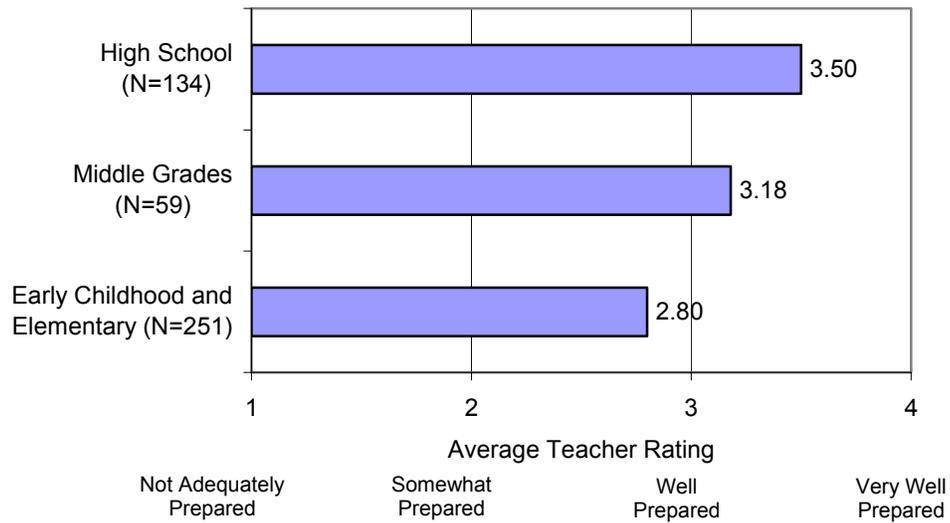


Exhibit S20. Teachers' Ratings of Feeling Prepared to Lead a Class of Students using Investigative Strategies

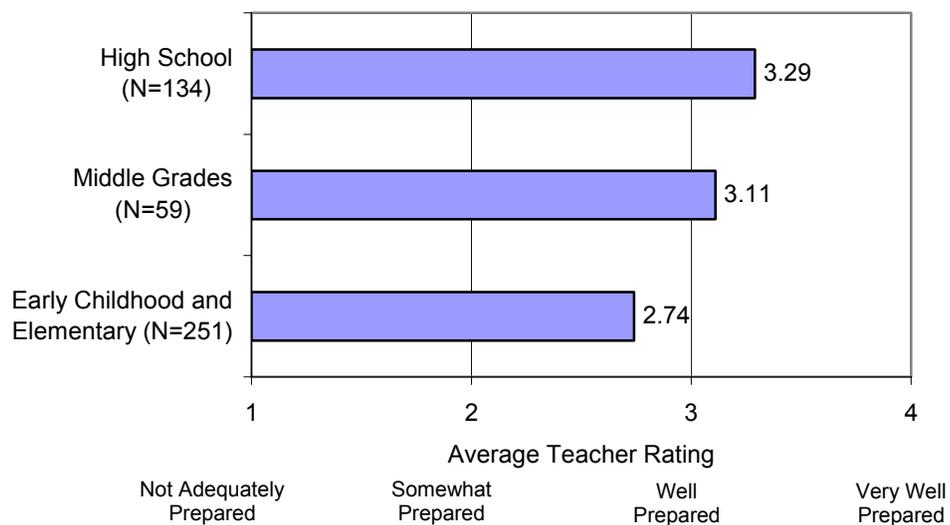


Exhibit S21. Teachers' Ratings of Feeling Prepared to Take into Account Students' Prior Conceptions about Natural Phenomena when Planning

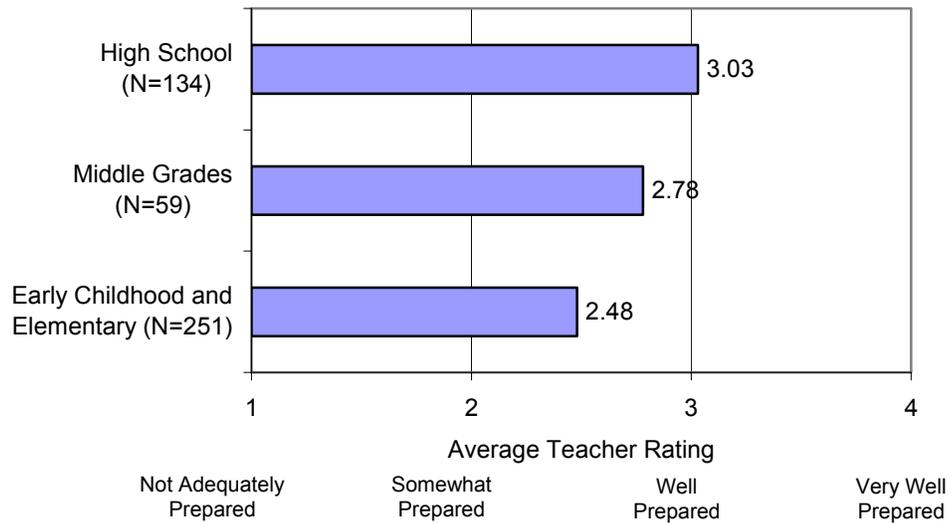


Exhibit S22. Teachers' Ratings of Feeling Prepared to Know the Major Unifying Concepts of All Sciences

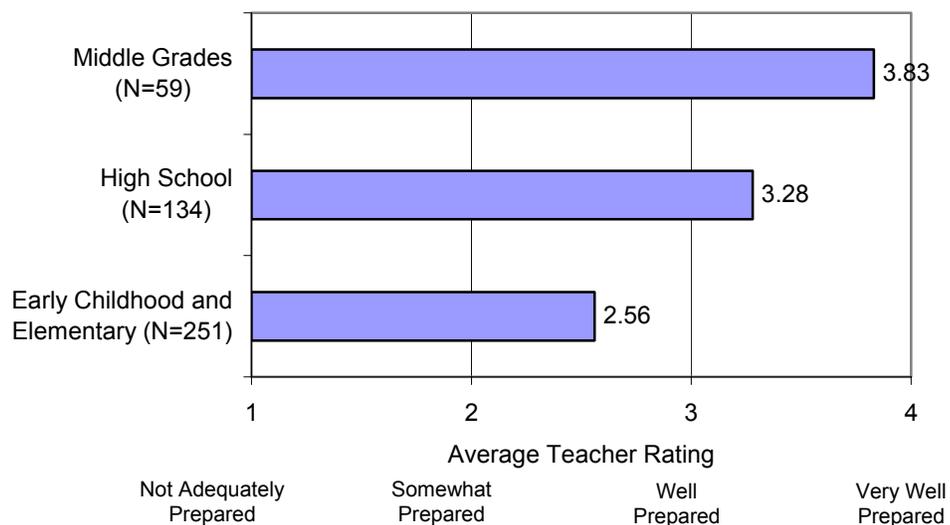
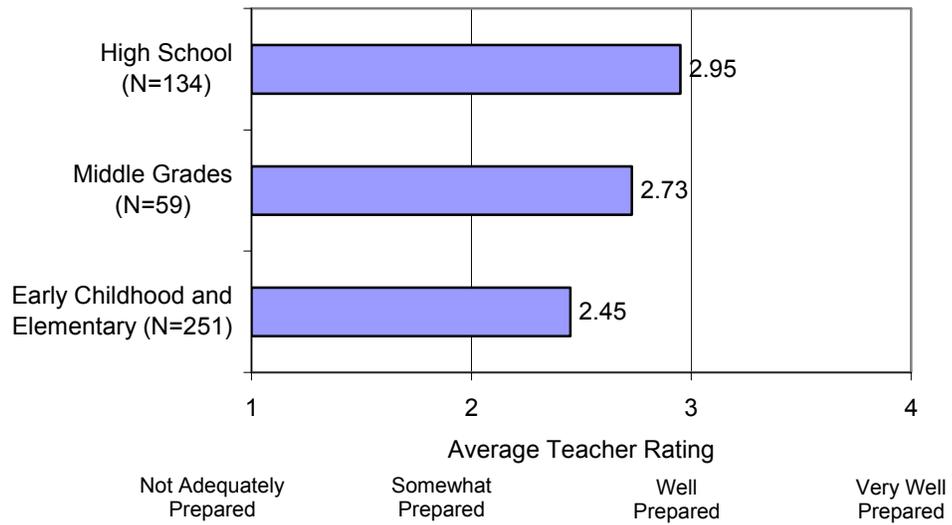


Exhibit S23. Teachers' Ratings of Feeling Prepared to Use a Variety of Technological Tools



Science Professional Development Needs by Teacher Certification and Endorsements

Exhibit S24. Teachers' Ratings of Science Professional Development Needs by Teacher Certification and Endorsements

Science Professional Development Needs	High School N=134	Middle Grades N=59	Early/ Elementary N=251
Help students develop ...			
an understanding of systems, order, and organization.	3.18	3.02	2.97
an understanding of evidence, models, and explanation.	3.26	3.11	2.89
an understanding of change, constancy, and measurement.	3.20	2.98	2.84
an understanding of form and function.	3.14	2.85	2.56
an understanding of change over time.	3.21	3.07	3.05
the abilities needed to do scientific inquiry.	3.51	3.35	3.12
an understanding of the structure of the atom.	3.07	2.51	1.85
an understanding of the structure and properties of matter.	3.10	2.94	2.61
an understanding of chemical reactions.	3.05	2.67	2.23
an understanding of the conservation of energy and increase in disorder.	3.03	2.84	2.35
an understanding of the interactions of energy and matter.	3.09	2.70	2.32
an understanding of the cell.	2.98	2.70	2.23
an understanding of the molecular basis of heredity.	3.00	2.56	1.88
an understanding of the theory of biological evolution.	2.82	2.40	1.73
an understanding of the interdependence of organisms.	3.00	2.75	2.33
an understanding of matter, energy, and organization in living systems.	3.12	3.04	2.68
an understanding of the behavior of organisms.	2.81	2.78	2.50
an understanding of energy in the earth system.	2.98	2.75	2.54
an understanding of geochemical cycles.	2.76	2.39	1.78
a scientific understanding of the earth in the solar system.	2.77	2.85	2.80
a scientific understanding of the origins of the earth and the universe.	2.76	2.64	2.16

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S25. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Form and Function

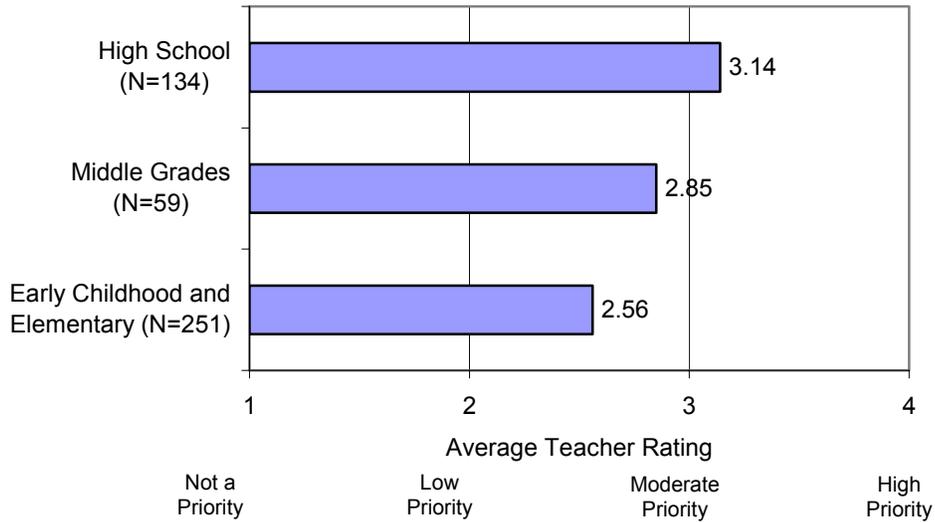


Exhibit S26. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure of the Atom

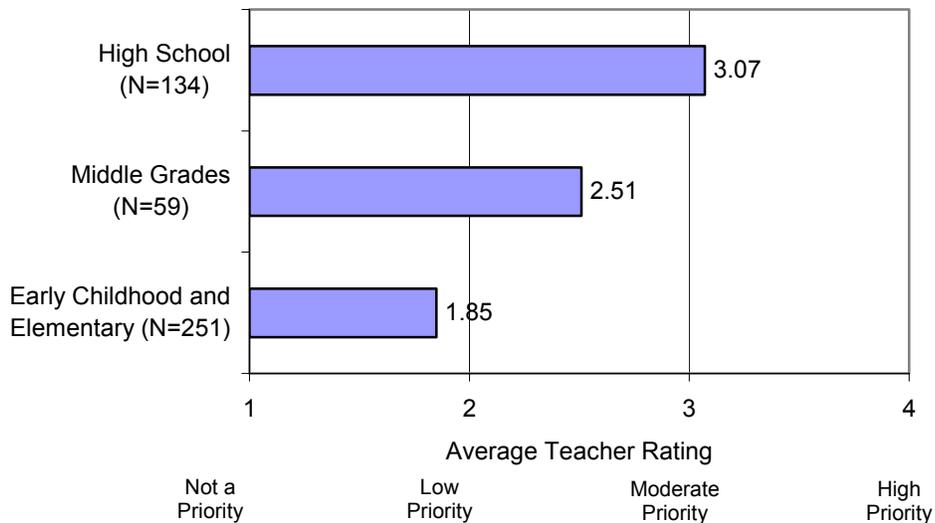


Exhibit S27. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Chemical Reactions

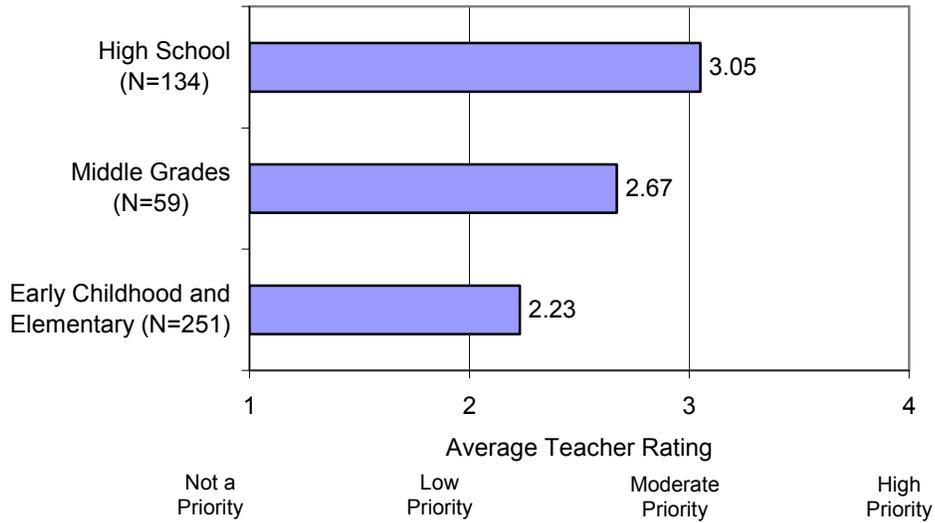


Exhibit S28. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Conservation of Energy and Increase in Disorder

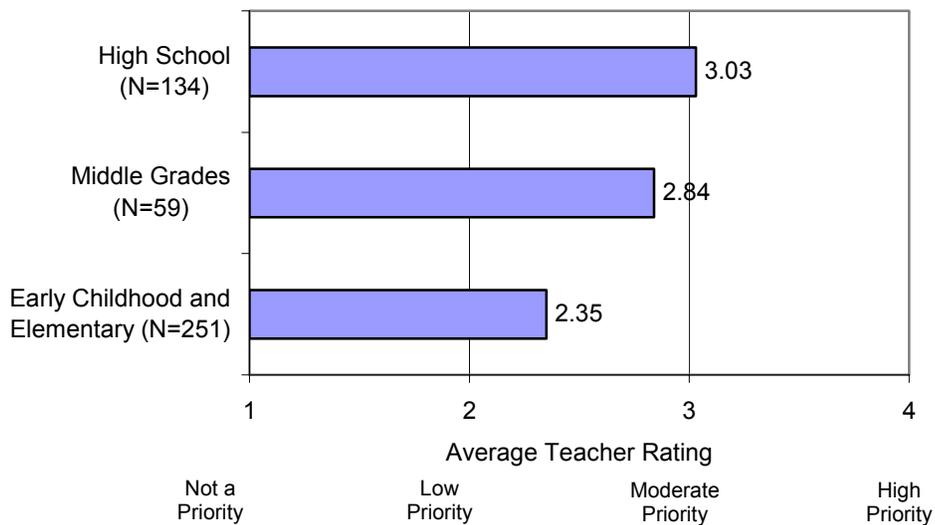


Exhibit S29. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Interactions of Energy and Matter

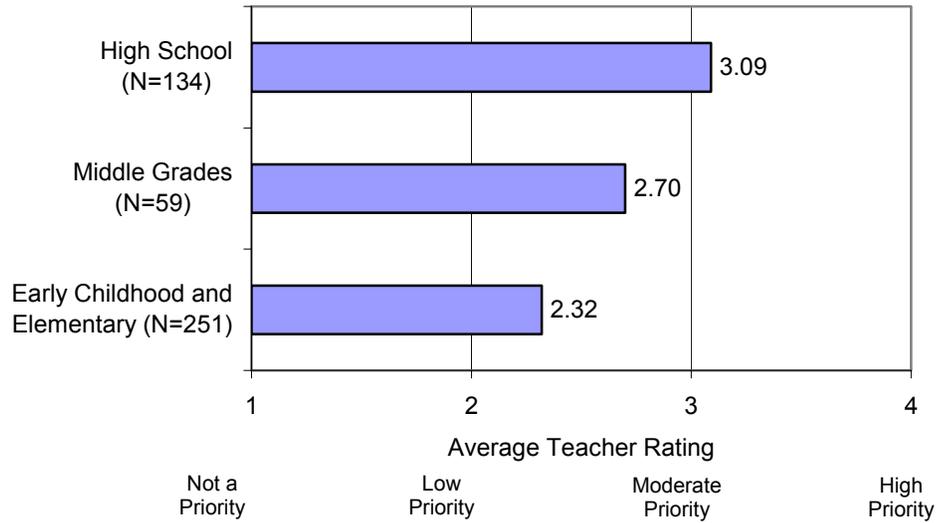


Exhibit S30. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Cell

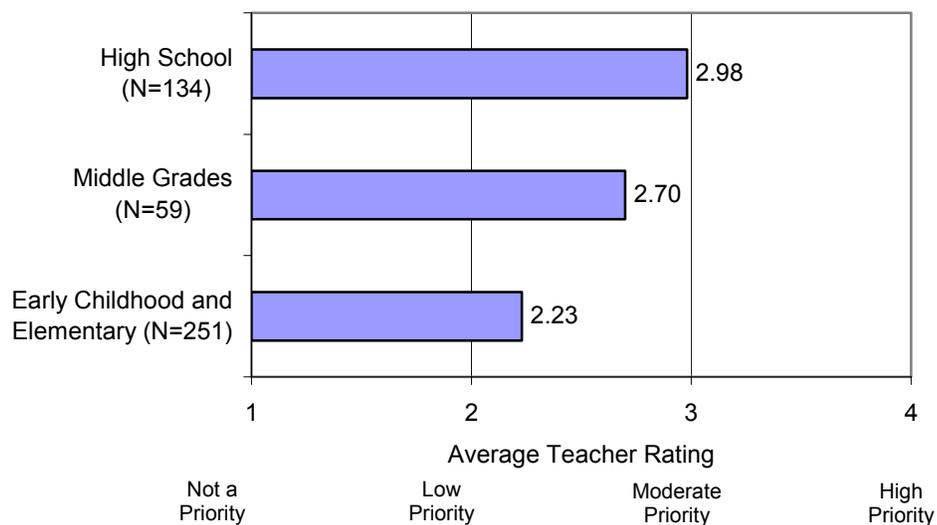


Exhibit S31. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity

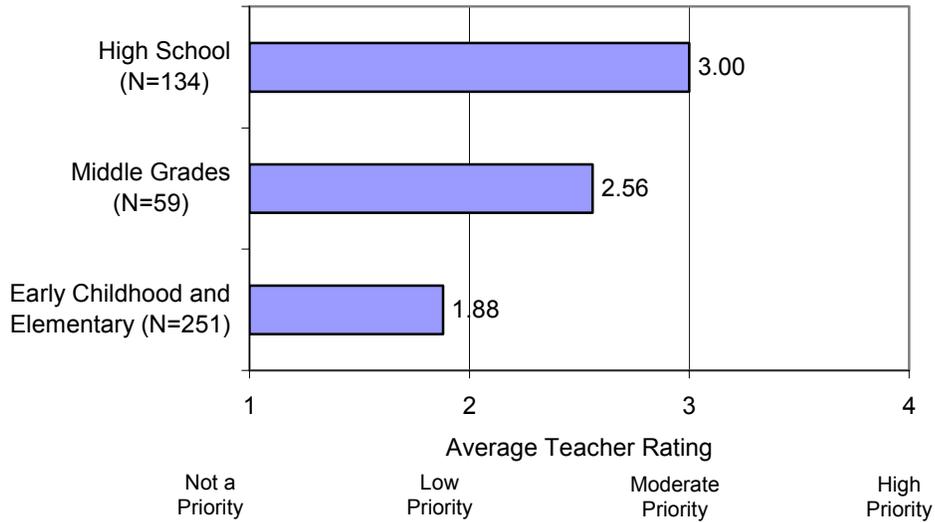


Exhibit S32. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Theory of Biological Evolution

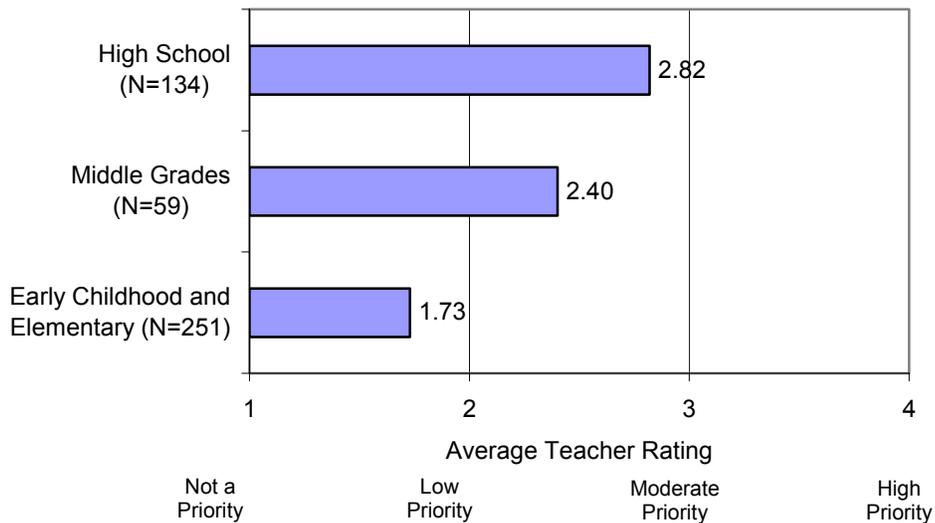


Exhibit S33. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Interdependence of Organisms

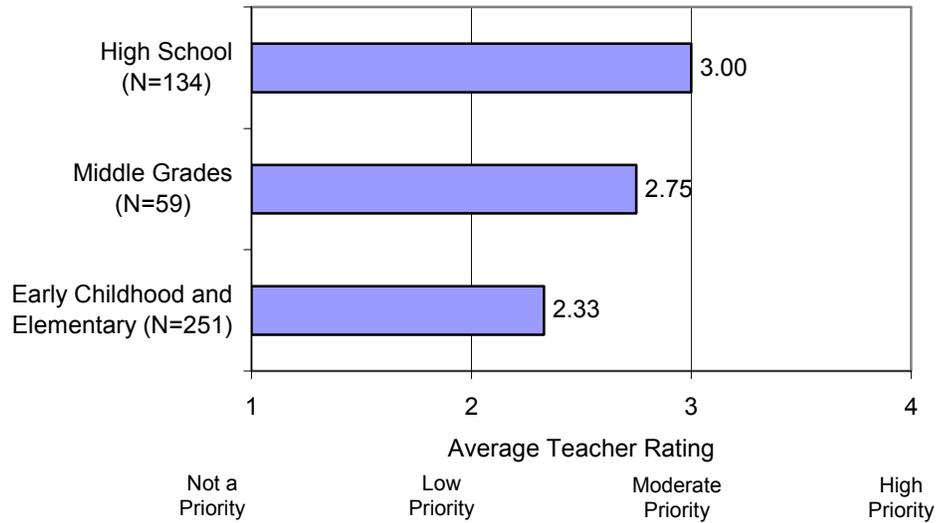


Exhibit S34. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Geochemical Cycles

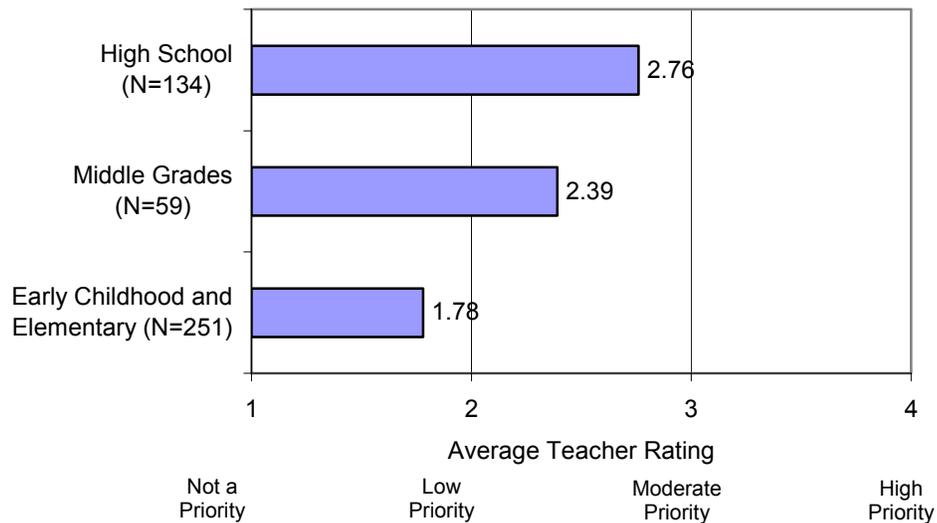
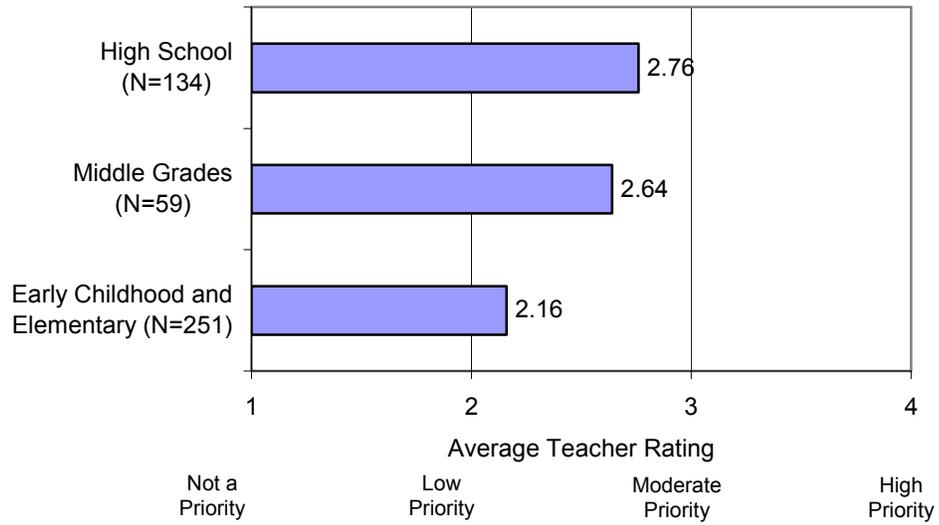


Exhibit S35. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Origins of the Earth and the Universe



Results

Preparedness and Needs Based On School Size

This section presents an analysis of preparedness and professional development needs in mathematics and science based grouping of respondents by school size. The groupings are defined based on multiple school size configurations, and are reported as students in the district, according to the follow: Fewer than 200 students; 201 to 500 students; 501 to 1000 students; 1001 to 1500 students; 1501 to 2000 students; 2001 to 2500 students; 2501 to 3000 students; 3001 to 5000 students; and More than 5000 students.

On the Needs Assessment Survey, respondents were asked to identify the number of students in the school district they where they presently teach. Based on responses, mean averages were obtained for both preparedness and professional development needs in mathematics and science based on school size. Graphs were developed for those areas in which there was a difference between low and high mean ratings of .50 or higher. Each graph contains the mean rating for all respondents based on school size, so the reader can compare the rating of preparedness or professional development need across all size groups for the same item. A 4-point rating scale was used for preparedness with 1 = Not Adequately Prepared to 4 = Very Well Prepared. Similarly, a 4-point scale was used for professional development needs with 1 = Not a Priority to 4 = High Priority. The graphs are presented in the following order, mathematics preparedness, mathematics professional development needs, science preparedness, and science professional development needs.

Mathematics Preparedness by School Size

**Exhibit S36. Teacher’s Ratings of Feeling Prepared to Teach
Mathematics by School Size**

Mathematics Preparedness	Fewer than 200 N=84	201- 500 N=182	501- 1000 N=102	1001- 1500 N=51	1501- 2000 N=46	2001- 2500 N=29	2501- 3000 N=26	3001- 5000 N=52	More than 5000 N=58
Provide mathematics instruction that meets appropriate standards (district, state, or national).	3.33	3.41	3.52	3.40	3.48	3.36	3.21	3.51	3.44
Teach problem solving strategies.	3.17	3.14	3.24	3.22	3.25	3.21	3.04	3.20	3.07
Teach mathematics with the use of manipulative materials, such as counting blocks, geometric shapes, algebra tiles, and so on.	3.01	3.16	3.05	3.22	3.20	3.07	3.21	3.10	3.18
Teach mathematics with the use of technology tools, such as calculators, graphing calculators, and spreadsheets.	2.57	2.62	2.68	2.40	2.49	2.61	2.21	2.51	2.49

Mathematics Preparedness	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Align standards, curriculum, instruction, and assessment to enhance student mathematics learning.	2.89	2.99	3.17	3.16	3.02	3.14	2.71	3.12	3.20
Sequence (articulation of) mathematics instruction to meet instructional goals across grade levels and courses.	2.85	2.81	3.09	2.74	3.00	3.07	2.71	2.92	3.05
Select and/or adapt instructional materials to implement your written curriculum.	2.89	3.03	3.16	3.06	3.09	3.25	2.83	3.22	3.09
Make appropriate and relevant connections to other areas of mathematics, to other disciplines, and/or real world contexts.	2.91	2.97	3.08	3.00	3.09	3.04	2.92	3.04	3.09
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	3.00	2.94	3.02	3.14	3.07	2.93	3.00	3.08	3.07
Teach mathematics to students from a variety of cultural backgrounds.	2.48	2.43	2.59	2.88	2.75	2.68	2.91	2.94	3.04
Teach mathematics to students who have limited English proficiency.	1.73	1.73	2.05	2.24	2.23	2.39	2.27	2.61	2.49
Teach students who have a learning disability which impacts mathematics learning.	2.39	2.47	2.59	2.52	2.58	2.50	2.73	2.80	2.51
Encourage participation of females in mathematics.	3.21	3.24	3.25	3.48	3.18	3.21	3.17	2.98	3.35
Provide a challenging curriculum for all students you teach.	3.17	3.18	3.26	3.23	3.07	3.11	3.05	3.20	3.20
Learn the processes involved in reading and how to teach reading in mathematics.	2.74	2.87	2.71	2.86	2.80	2.96	2.65	2.76	2.60
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	2.78	2.82	2.99	2.94	3.00	2.96	2.70	2.84	2.85

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S37. Teachers' Ratings of Feeling Prepared to Teach Mathematics to Students from a Variety of Cultural Backgrounds

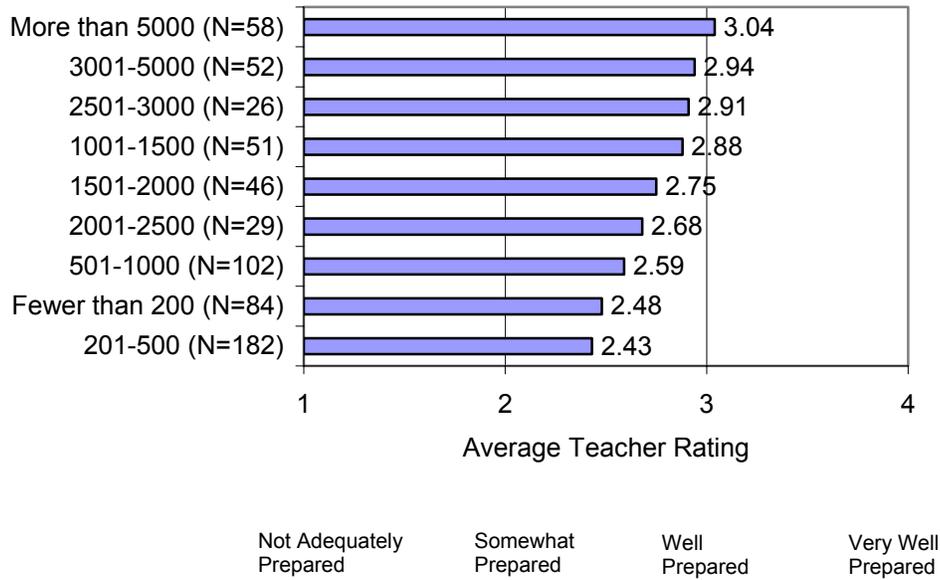


Exhibit S38. Teachers' Ratings of Feeling Prepared to Teach Mathematics to Students with Limited English Proficiency

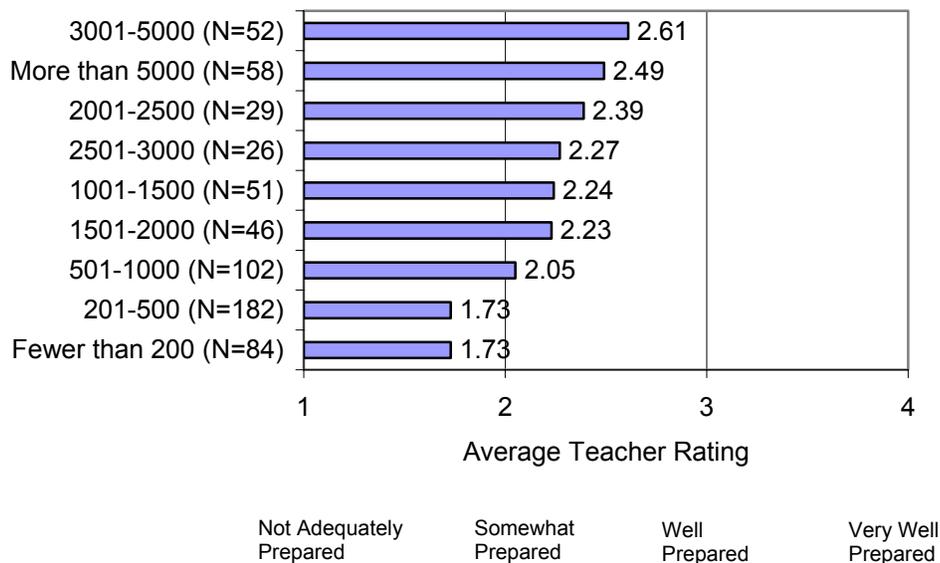
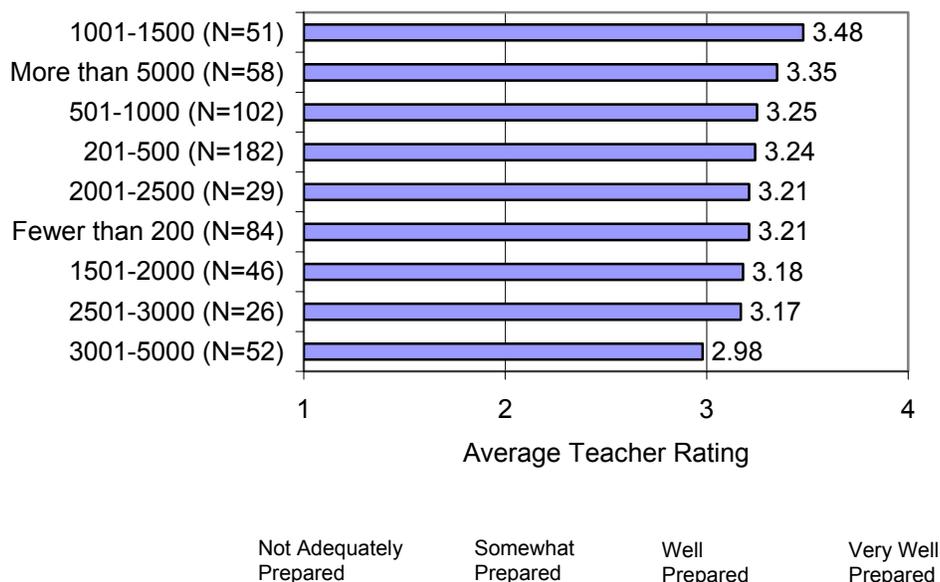


Exhibit S39. Teachers' Ratings of Feeling Prepared to Encourage Participation of Females in Mathematics



Mathematics Professional Development Needs by School Size

Exhibit S40. Teachers' Ratings of Mathematics Professional Development Needs by School Size

Mathematics Professional Development Needs	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Help students develop ...	N=84	N=182	N=102	N=51	N=46	N=29	N=26	N=52	N=58
an understanding of relationships between subsets of real numbers.	2.84	2.50	2.57	2.58	2.66	2.46	2.00	2.35	2.40
an understanding of the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.	3.09	2.52	2.74	2.48	2.59	2.64	2.26	2.47	2.67
the ability to solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions decimals, and percents, ratios and proportions.	3.04	2.71	2.65	2.38	2.53	2.75	2.22	2.53	2.69
the skills and depth of understanding to justify solutions to mathematical problems.	3.31	2.96	3.28	2.94	3.23	2.93	3.04	3.06	3.20

Mathematics Professional Development Needs	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Help students develop the skills and depth of understanding ...	N=84	N=182	N=102	N=51	N=46	N=29	N=26	N=52	N=58
necessary to perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.	3.41	3.01	3.31	3.18	3.23	3.11	3.17	2.96	3.15
to select and use measuring units, tools, and/or technology and explain the degree of accuracy and precision of measurements.	3.24	2.94	3.01	3.00	2.86	2.79	2.96	2.61	2.70
to convert between metric and standard units of measurement, given conversion factors.	2.65	2.47	2.46	2.14	2.28	2.54	2.17	1.90	2.00
to calculate perimeter and area of two-dimensional shapes and surface area and volume of three-dimensional shapes.	3.18	2.67	2.77	2.50	2.88	2.79	2.50	2.57	2.61
the skills and depth of understanding necessary to create geometric models to describe the physical world.	2.81	2.60	2.68	2.61	2.58	2.68	2.27	2.31	2.35
skills and depth of understanding necessary to evaluate characteristics and properties of two- and three-dimensional geometric shapes.	2.94	2.63	2.72	2.50	2.63	2.43	2.35	2.34	2.40
necessary to apply coordinate geometry to locate and describe objects algebraically.	2.79	2.42	2.51	2.42	2.50	2.52	1.91	2.02	2.28
to apply right triangle trigonometry to find length and angle measures.	2.58	2.15	2.25	2.00	2.05	2.29	1.65	1.78	1.96
to apply geometric properties to solve problems.	2.77	2.39	2.56	2.14	2.44	2.39	1.74	2.00	2.11
to apply deductive reasoning to arrive at a conclusion.	3.00	2.84	3.04	2.84	2.95	2.89	2.61	2.53	3.04
to select a sampling technique to gather data, analyze the resulting data and make inferences.	2.87	2.74	2.85	2.76	2.81	2.89	2.52	2.37	2.51
to write equations and make predictions from sets of data.	3.03	2.73	2.81	2.74	2.55	2.75	2.57	2.61	2.73
to apply theoretical probability to represent problems and make decisions.	2.73	2.52	2.49	2.26	2.29	2.70	2.30	2.22	2.32

Mathematics Professional Development Needs	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Help students develop the skills and depth of understanding ...	N=84	N=182	N=102	N=51	N=46	N=29	N=26	N=52	N=58
to evaluate how transformations on data affect the measures of central tendency and variability.	2.29	2.19	2.14	2.12	1.85	2.32	1.65	1.80	1.78
to interpret data represented by the normal distribution and formulate conclusions.	2.49	2.33	2.38	2.38	2.10	2.36	1.83	1.92	2.04
to calculate probabilities of independent events.	2.54	2.30	2.38	2.26	2.14	2.32	1.96	2.00	2.26
to graph and interpret algebraic relations and inequalities.	2.65	2.38	2.45	2.28	2.32	2.36	1.90	1.92	2.31
to solve problems involving equations and inequalities.	2.94	2.56	2.61	2.46	2.57	2.79	2.23	2.44	2.70
to solve problems involving systems of two equations, and systems of two or more inequalities.	2.67	2.28	2.36	2.29	1.98	2.43	2.00	2.14	2.26
to solve problems using patterns and functions.	3.03	2.88	2.80	2.84	2.88	3.00	3.00	2.69	2.80

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S41. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Relationships between Subsets of Real Numbers

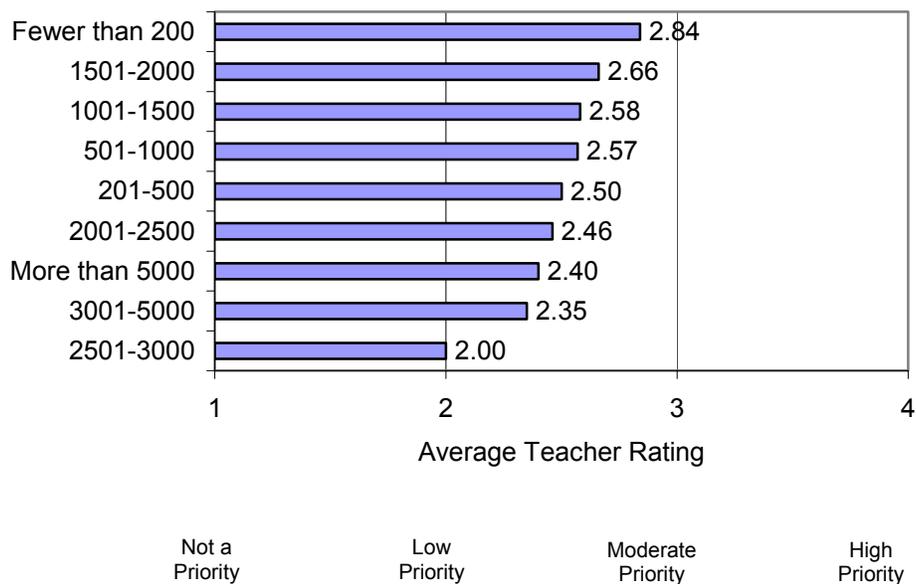


Exhibit S42. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Equivalent Forms of Numbers

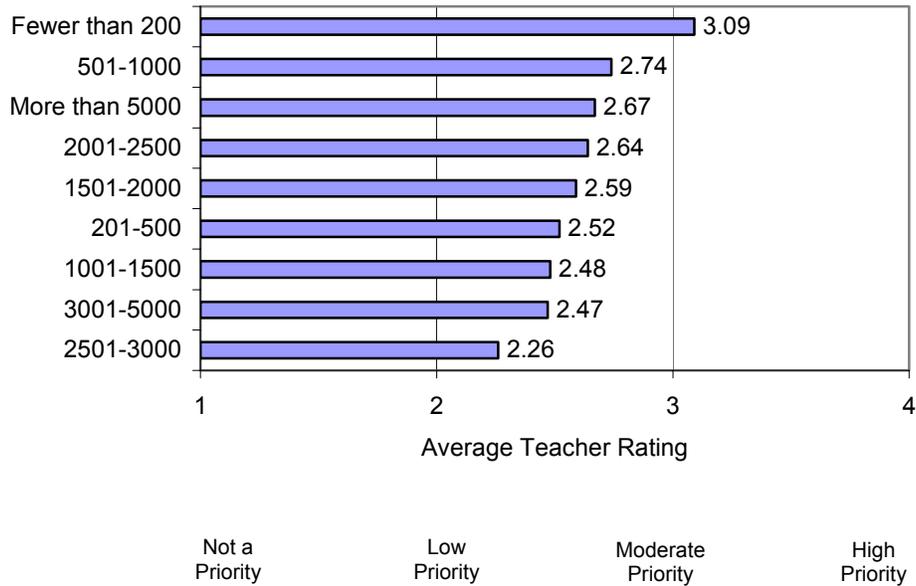


Exhibit S43. Teachers' Ratings of Priority for Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems

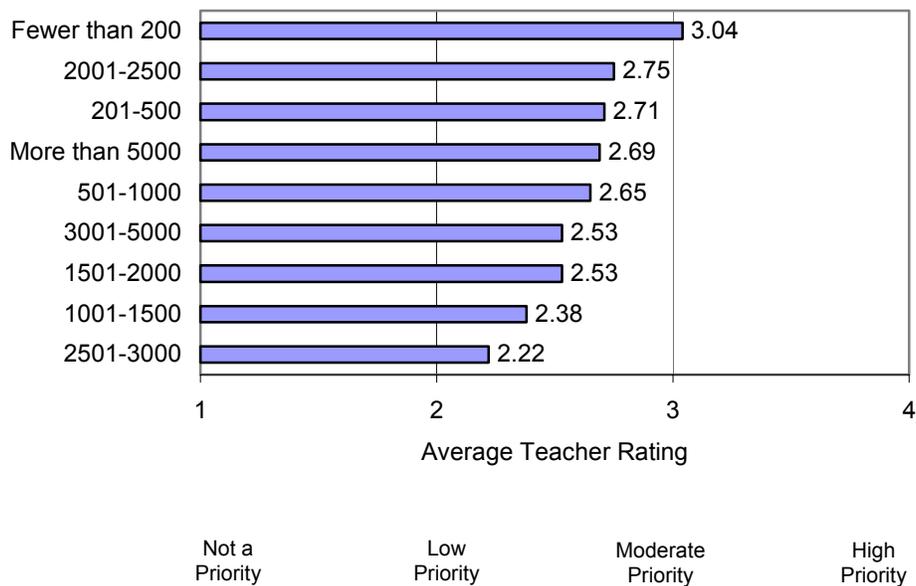


Exhibit S44. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of how to Select and Use Measuring Units, Tools, and/or Technology

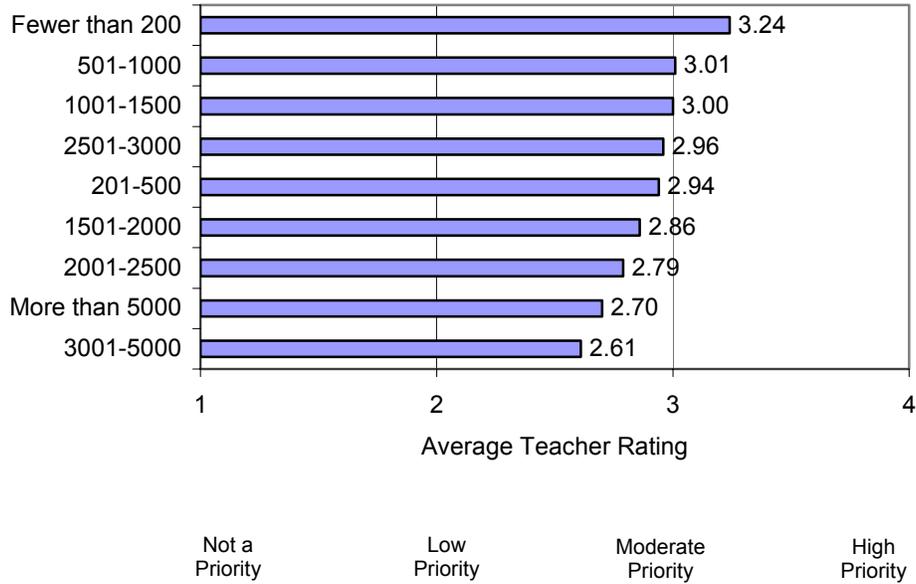


Exhibit S45. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Convert between Metric and Standard Units of Measurement

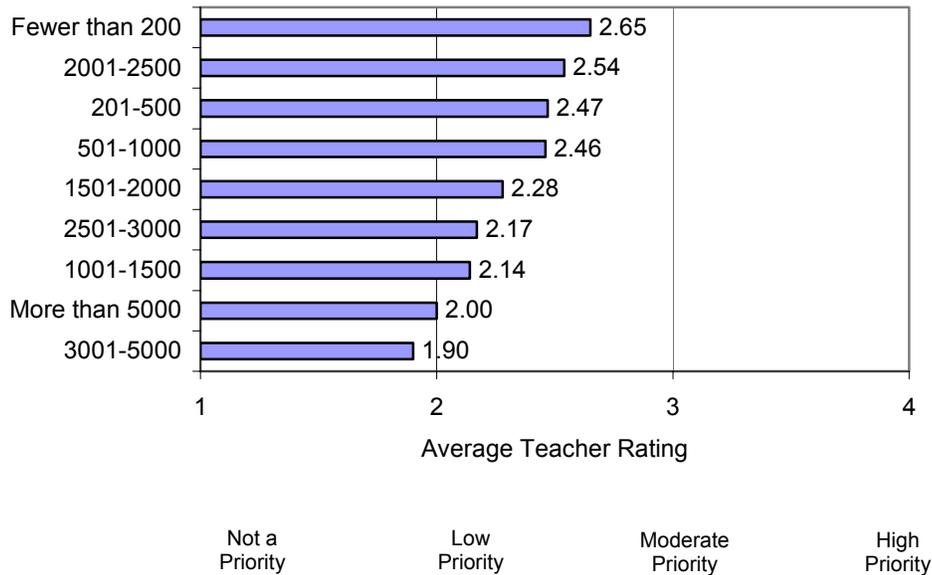


Exhibit S46. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Calculate Perimeter and Area of Two-dimensional Shapes and Surface Area and Volume of Three-dimensional Shapes

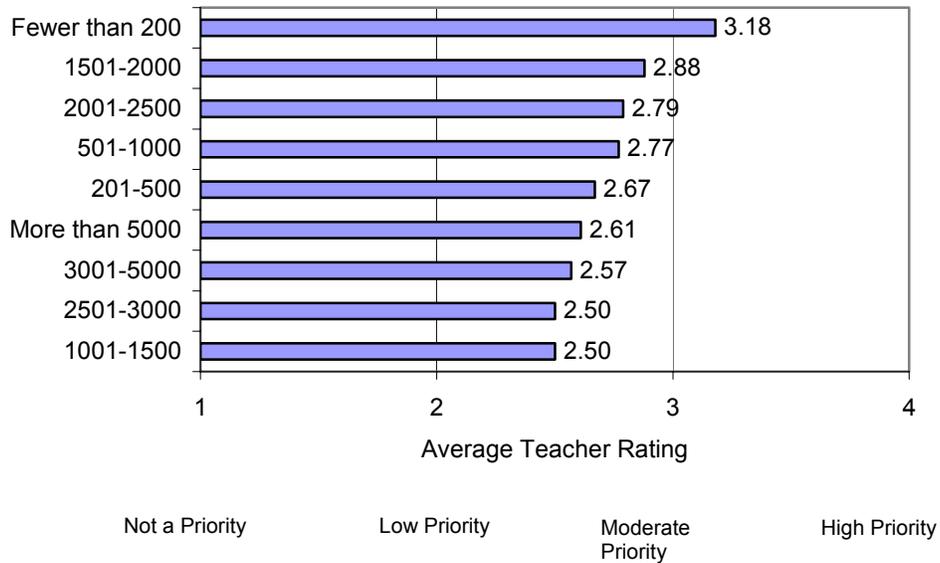


Exhibit S47. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Create Geometric Models

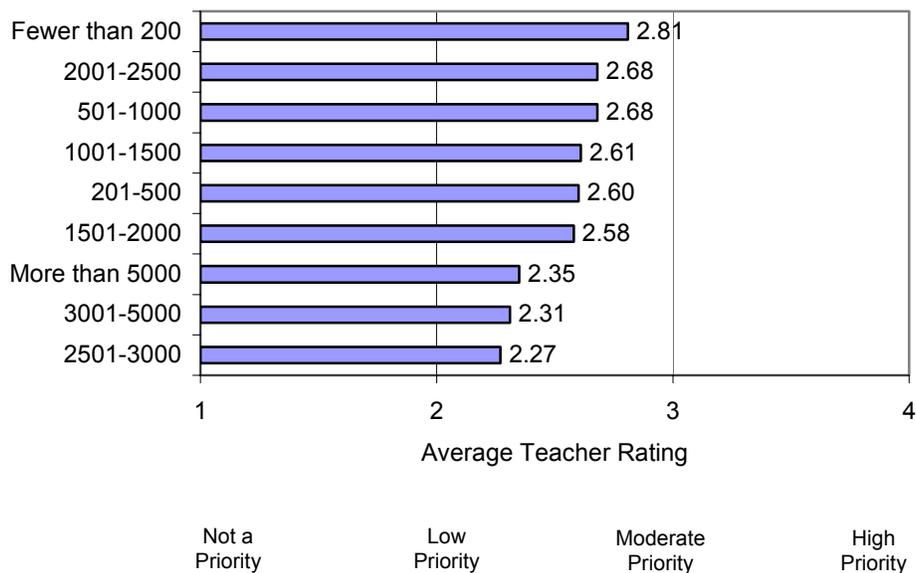


Exhibit S48. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Evaluate Characteristics and Properties of Two- and Three-dimensional Geometric Shapes

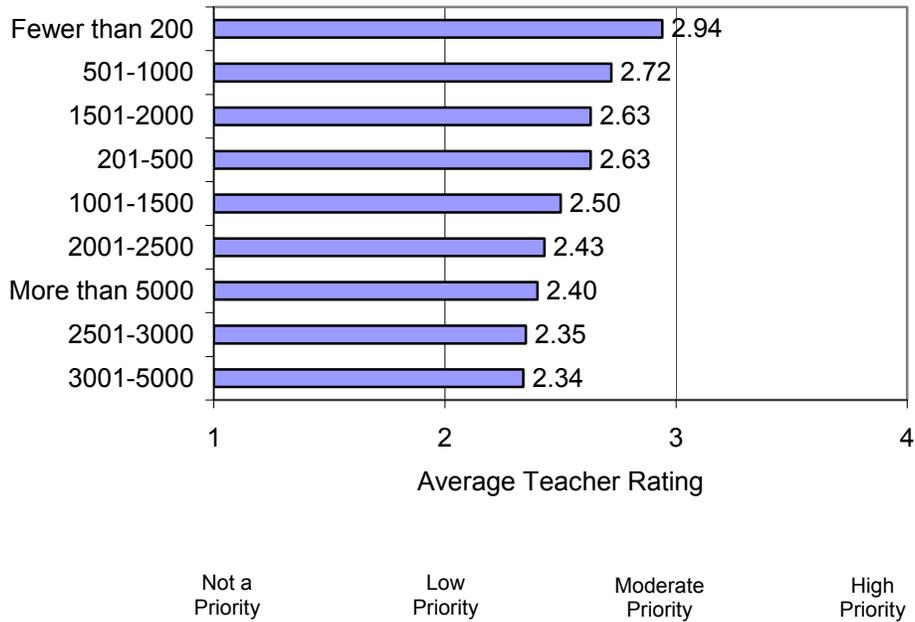


Exhibit S49. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Coordinate Geometry

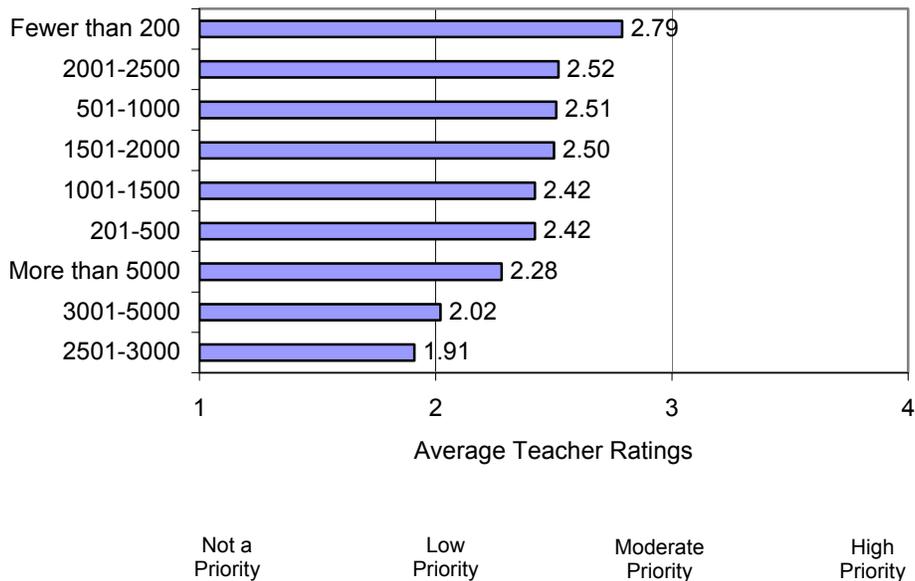


Exhibit S50. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Right Triangle Trigonometry

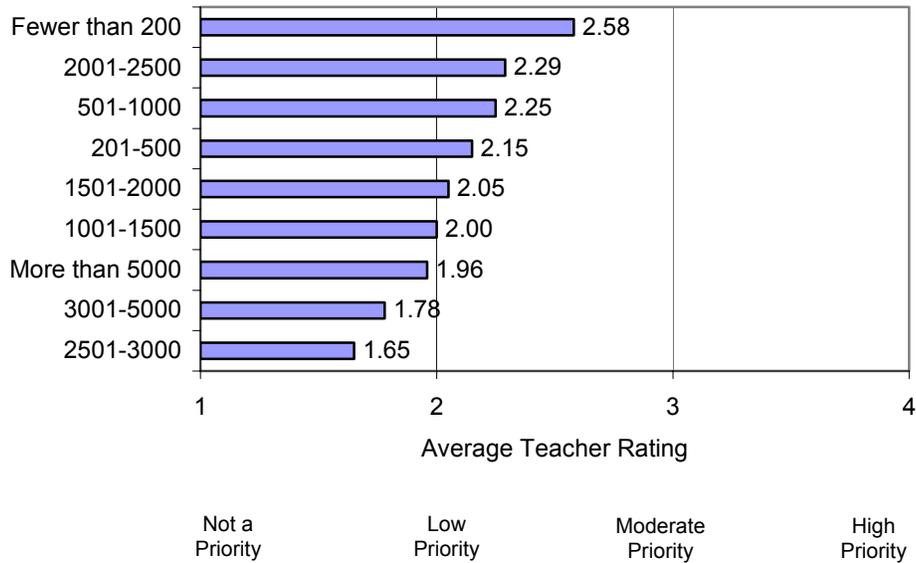


Exhibit S51. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Geometric Properties to Solve Problems

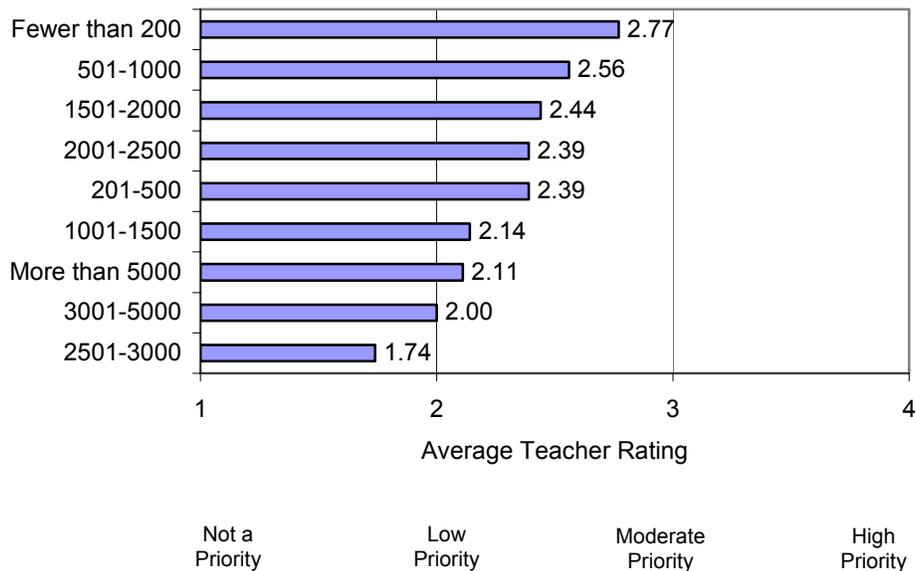


Exhibit S52. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding Necessary to Apply Theoretical Probability to Represent Problems

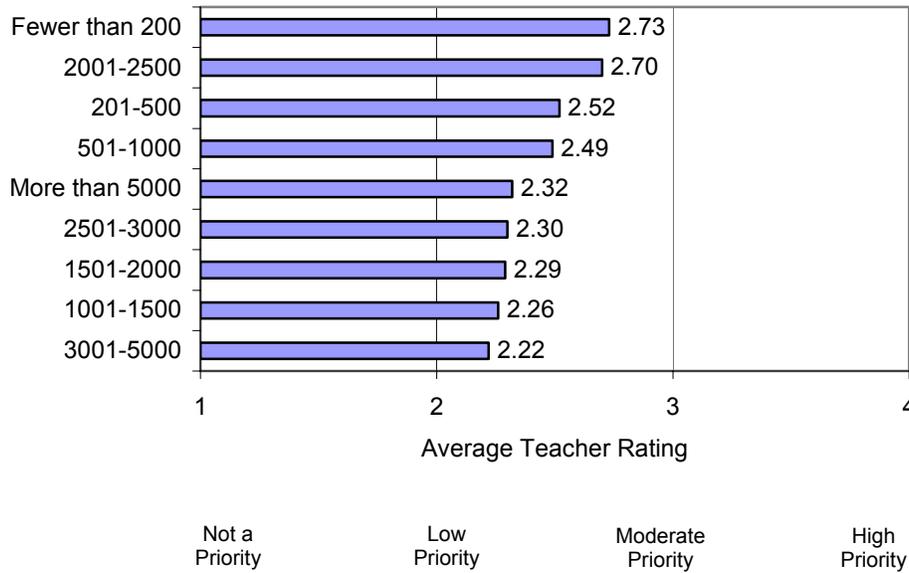


Exhibit S53. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Evaluate how Transformations on Data Affect the Measures of Central Tendency and Variability

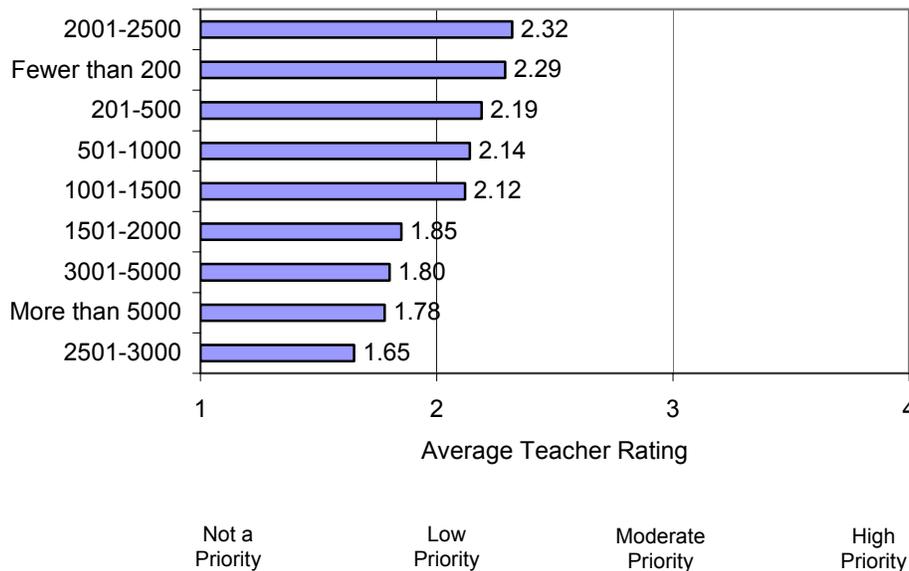


Exhibit S54. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Interpret Data Represented by the Normal Distribution and Formulate Conclusions

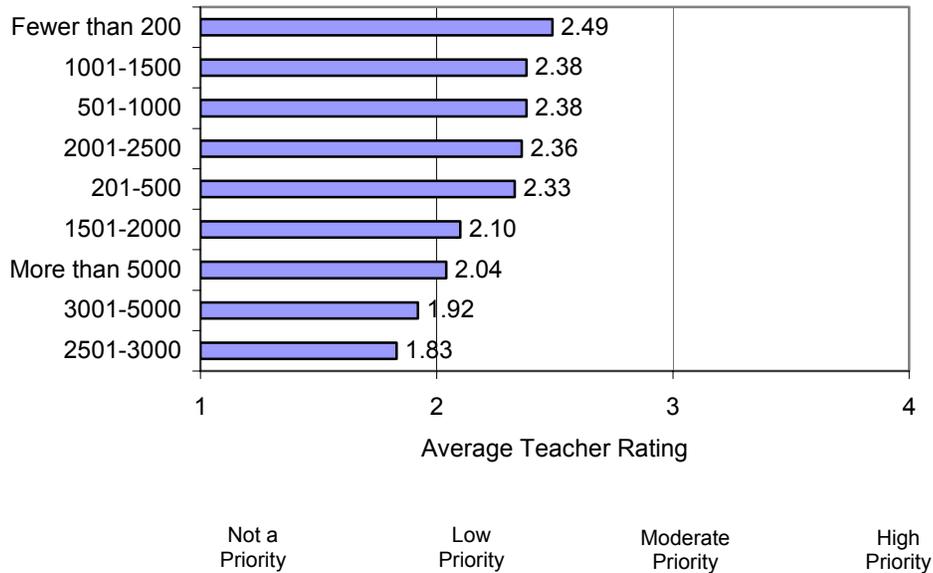


Exhibit S55. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Calculate Probabilities of Independent Events

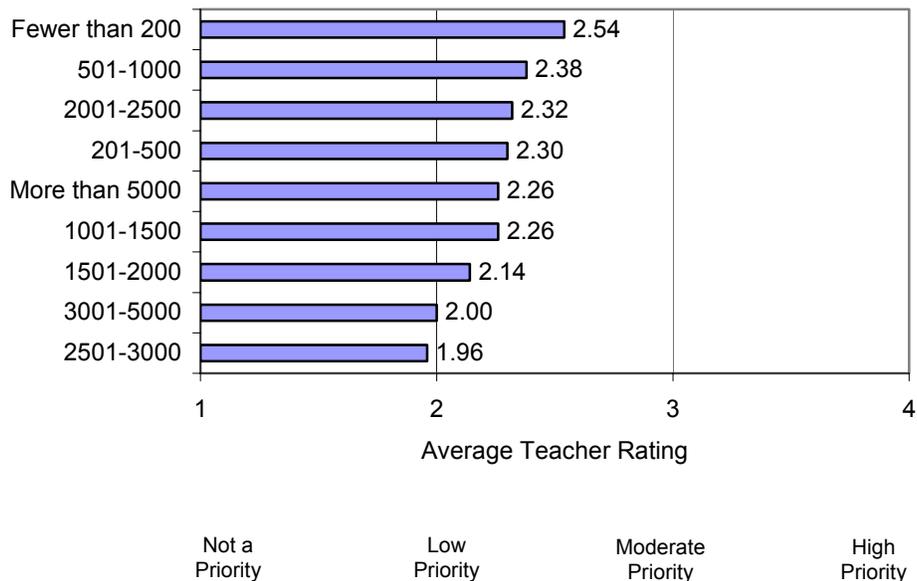


Exhibit S56. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Graph and Interpret Algebraic Relations and Inequalities

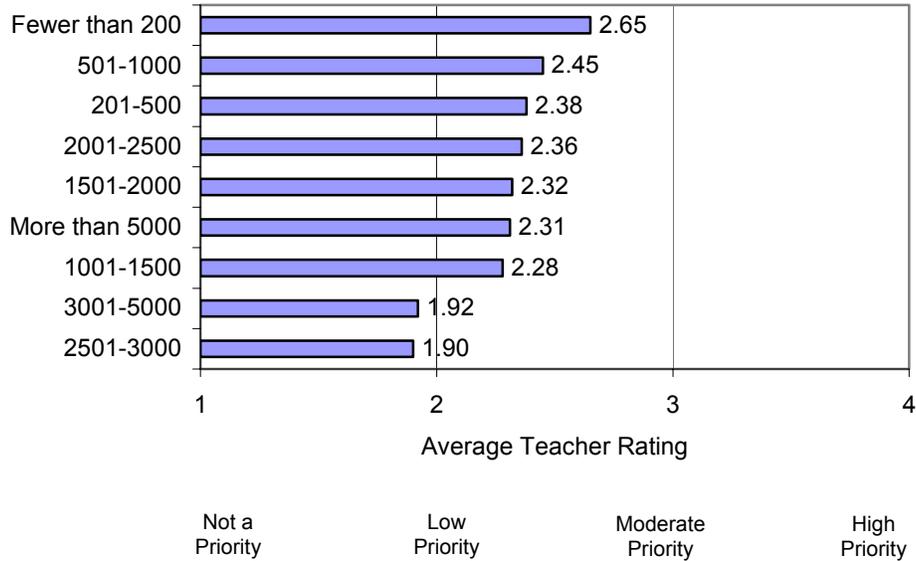
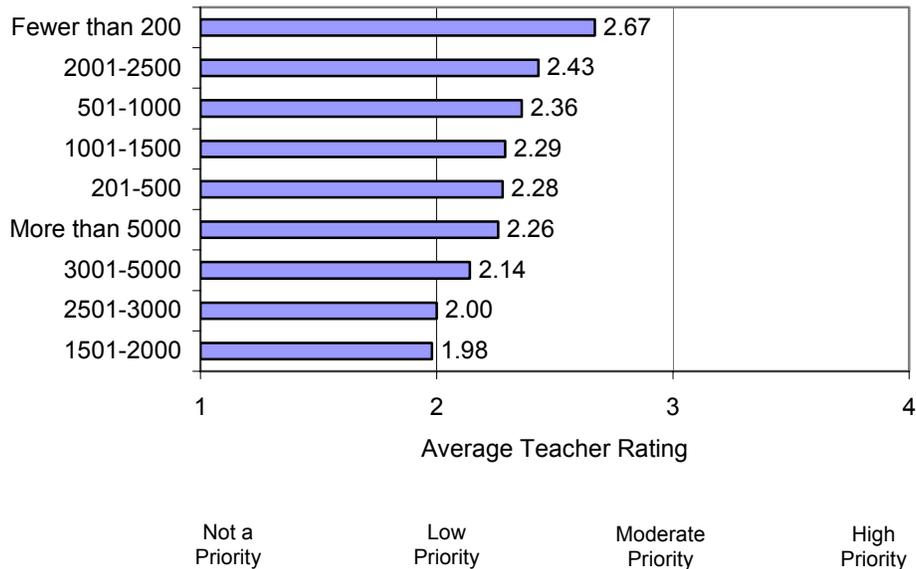


Exhibit S57. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities



Science Preparedness by School Size

Exhibit S58. Teachers' Ratings of Feeling Prepared to Teach Science by School Size

Science Preparedness	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
	<i>N</i> =70	<i>N</i> =151	<i>N</i> =69	<i>N</i> =36	<i>N</i> =30	<i>N</i> =19	<i>N</i> =19	<i>N</i> =38	<i>N</i> =57
Provide science instruction that meets appropriate standards (district, state, or national).	2.94	3.20	3.13	3.34	3.14	3.16	2.71	3.20	3.36
Teach scientific inquiry.	2.91	2.94	2.97	3.17	3.03	2.89	2.41	2.91	3.14
Manage a class of students who are using hands-on or laboratory activities.	3.07	2.97	3.09	3.24	3.00	3.16	2.53	3.20	3.27
Lead a class of students using investigative strategies.	2.91	2.92	2.95	3.11	2.97	3.00	2.65	2.80	3.11
Take into account students' prior conceptions about natural phenomena when planning.	2.68	2.68	2.65	2.86	2.66	2.58	2.24	2.66	2.96
Align standards, curriculum, instruction, and assessment to enhance student science learning.	2.77	2.94	3.13	3.06	2.97	2.89	2.76	3.11	3.14
Sequence (articulation of) science instruction to meet instructional goals across grade levels and course.	2.90	2.86	2.99	3.03	2.90	2.74	2.59	2.89	3.05
Select and/or adapt instructional materials to implement your written curriculum.	2.99	2.99	3.11	3.31	2.97	3.05	2.82	3.31	3.29
Know the major unifying concepts of all sciences and how these concepts relate to other disciplines.	2.70	2.78	2.78	3.00	2.66	2.63	2.24	2.77	3.00
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	3.00	2.94	3.01	3.20	3.00	2.63	2.65	3.23	3.05
Teach science to students from a variety of cultural backgrounds.	2.62	2.48	2.68	3.00	2.66	2.79	2.65	3.06	3.09
Teach science to students who have limited English proficiency.	1.81	1.84	2.27	2.34	2.21	1.95	2.06	2.68	2.55
Teach students who have a learning disability which impacts science learning.	2.46	2.43	2.57	2.83	2.69	2.16	2.25	3.09	2.79

Science Preparedness	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Encourage participation of females and minorities in science.	2.94	3.08	3.18	3.40	2.83	3.11	2.88	3.11	3.34
Provide a challenging curriculum for all students you teach.	3.13	3.08	3.14	3.37	2.89	3.06	2.82	3.20	3.14
Learn the processes involved in reading and how to teach reading in science.	2.88	2.94	3.06	3.00	2.96	2.84	2.65	2.88	3.02
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	2.97	2.86	2.98	3.21	2.90	2.74	2.71	2.94	3.05
Use a variety of technological tools (student response systems, lab interfaces and probes, etc) to enhance student learning.	2.64	2.59	2.60	2.83	2.48	2.68	2.41	2.53	2.91

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S59. Teachers' Ratings of Feeling Prepared to Provide Science Instruction that Meets Appropriate Standards

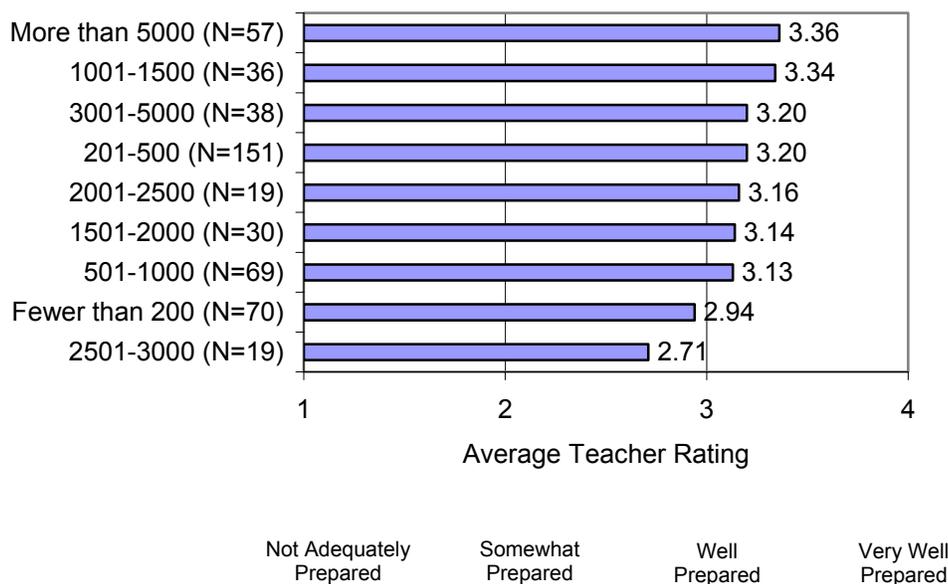


Exhibit S60. Teachers' Ratings of Feeling Prepared to Teach Scientific Inquiry

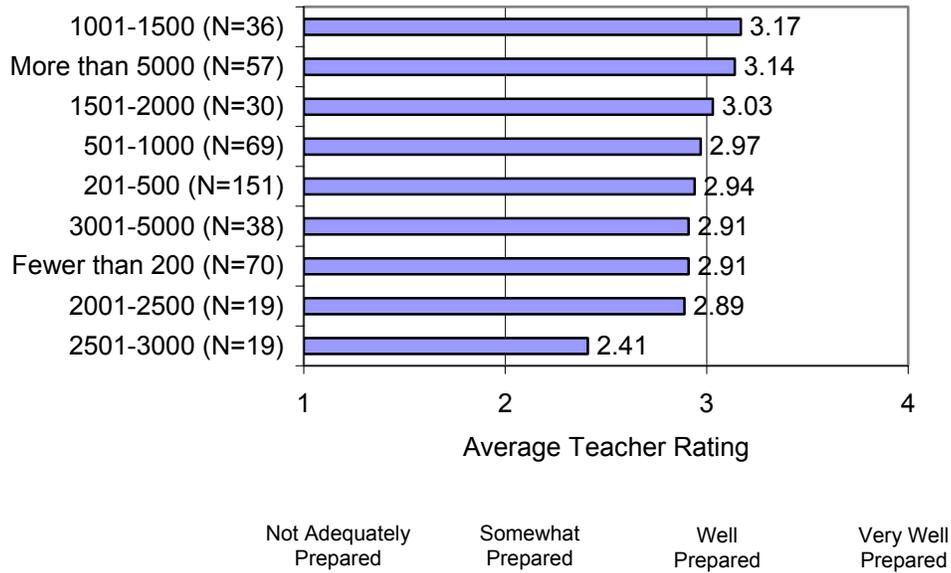


Exhibit S61. Teachers' Ratings of Feeling Prepared to Manage a Class of Students using Hands-on or Laboratory Activities

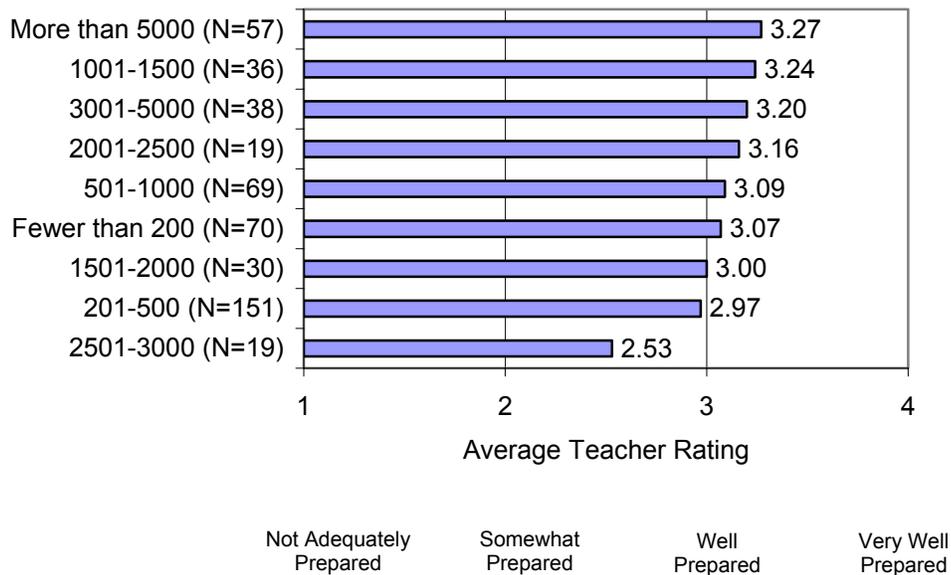


Exhibit S62. Teachers' Ratings of Feeling Prepared to Take into Account Students' Prior Conceptions about Natural Phenomena when Planning

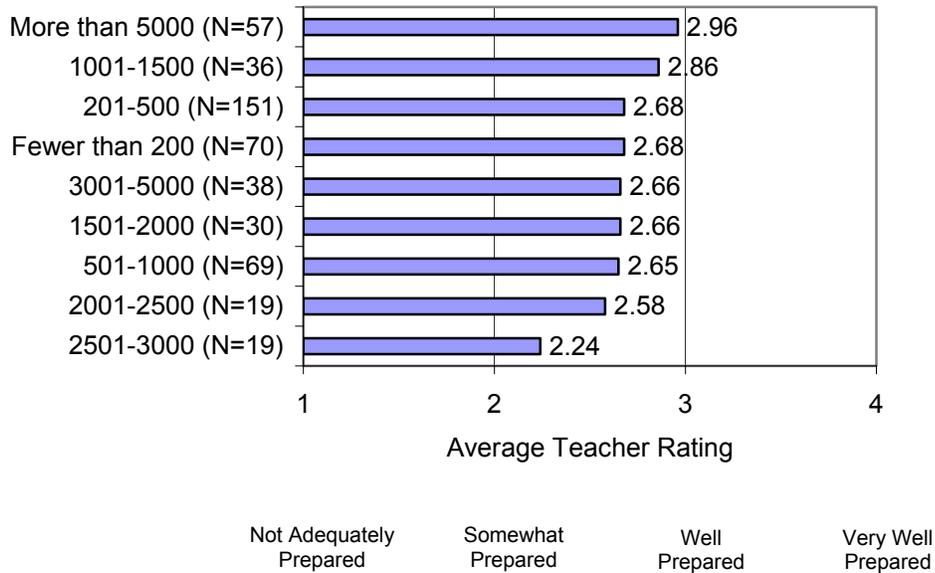


Exhibit S63. Teachers' Ratings of Feeling Prepared to Know the Major Unifying Concepts of All Sciences

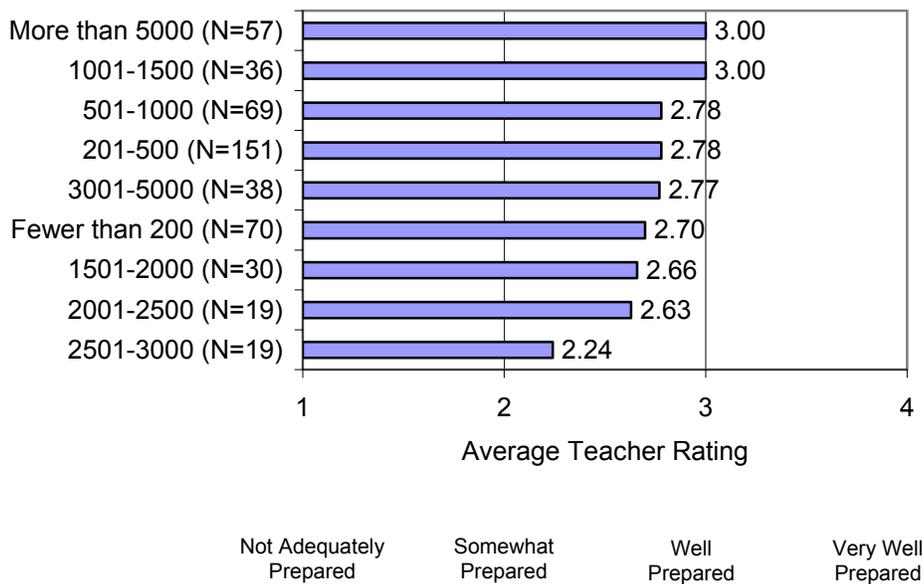


Exhibit S64. Teachers' Ratings of Feeling Prepared to Understand How Students Differ in Their Approaches to Learning

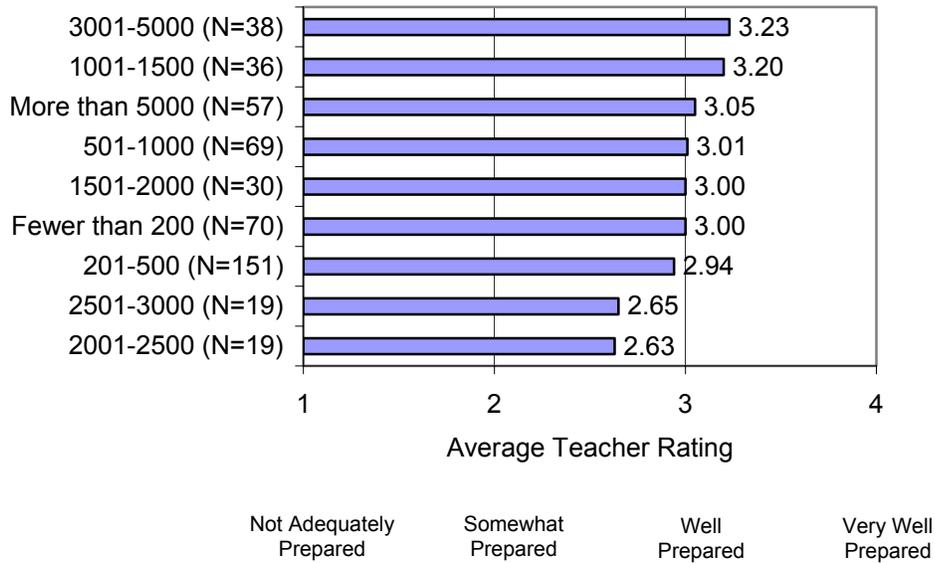


Exhibit S65. Teachers' Ratings of Feeling Prepared to Teach Science to Students from a Variety of Cultural Backgrounds

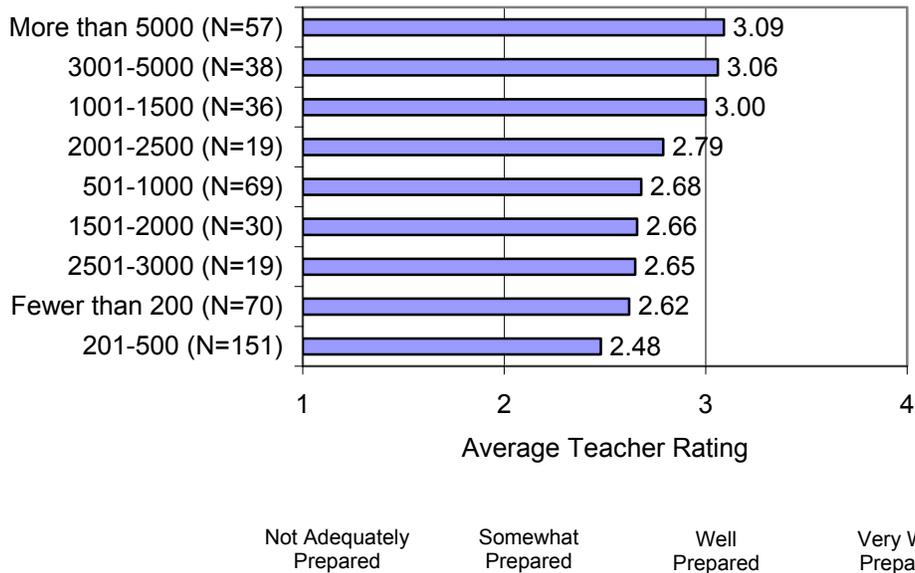


Exhibit S66. Teachers' Ratings of Feeling Prepared to Teach Science to Students with Limited English Proficiency

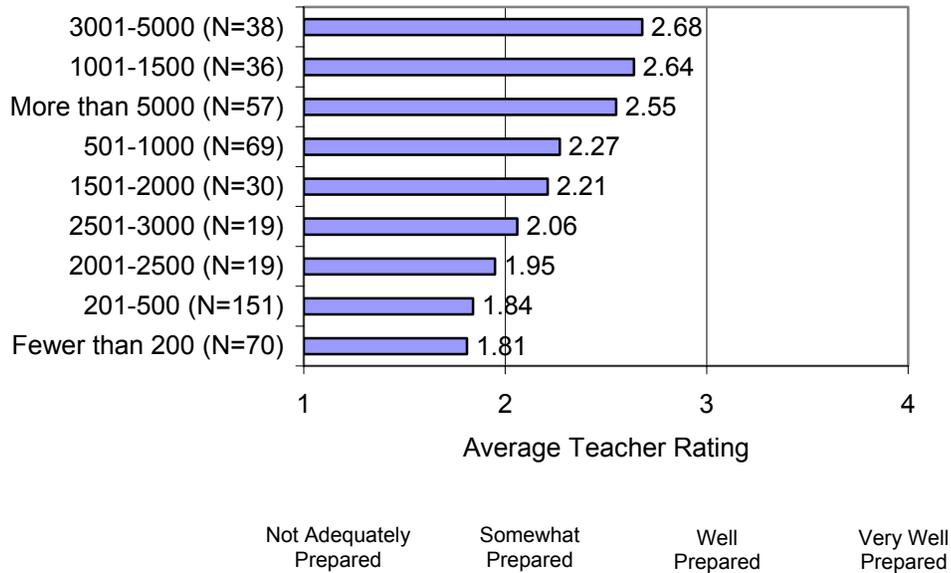


Exhibit S67. Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability Which Impacts Science Learning

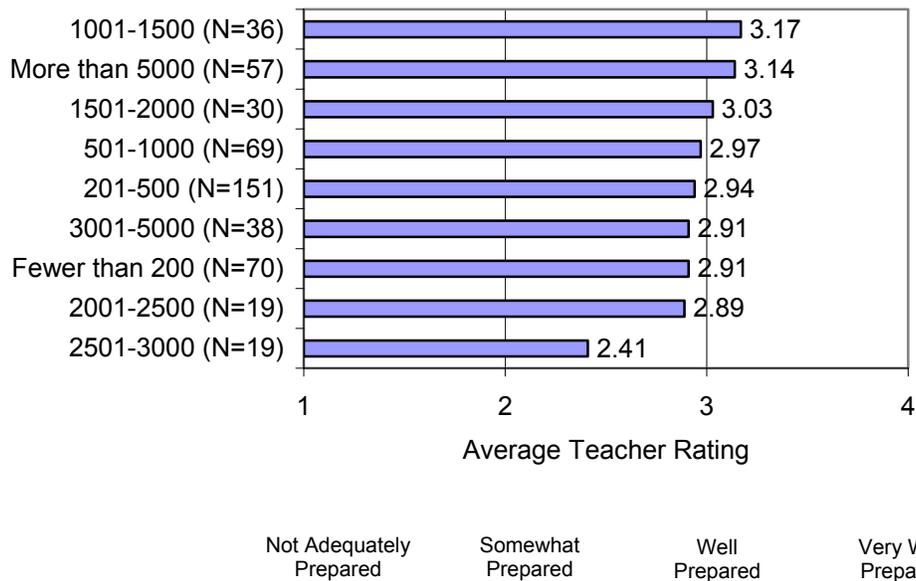


Exhibit S68. Teachers' Ratings of Feeling Prepared to Encourage Participation of Females and Minorities in Science

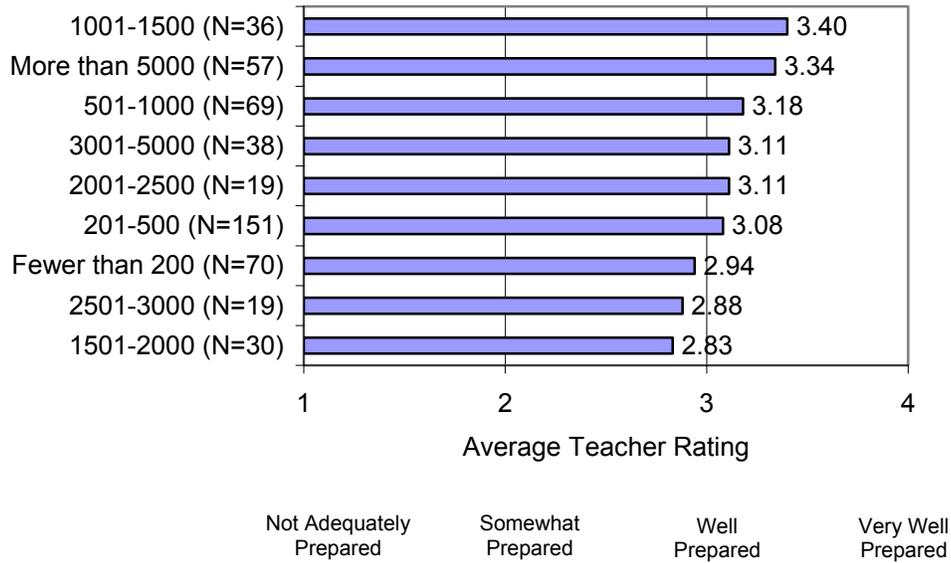


Exhibit S69. Teachers' Ratings of Feeling Prepared to Provide a Challenging Curriculum

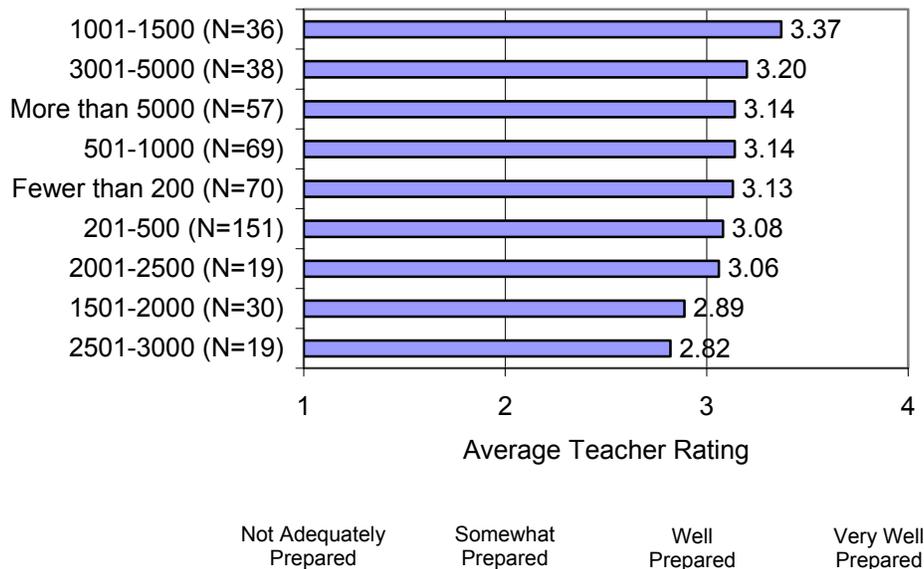


Exhibit S70. Teachers' Ratings of Feeling Prepared to Use a Variety of Assessment Strategies to Inform Practice

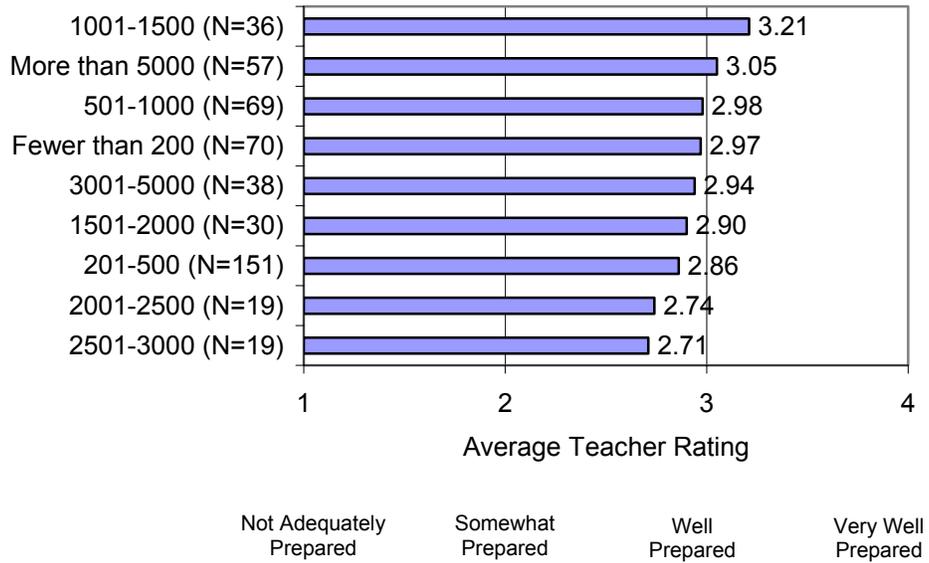
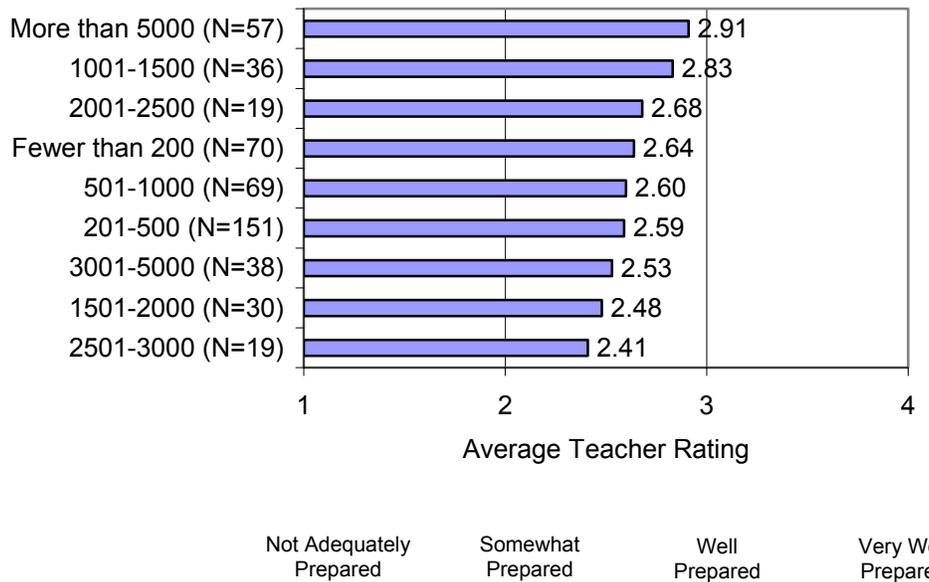


Exhibit S71. Teachers' Ratings of Feeling Prepared to Use a Variety of Technological Tools to Enhance Student Learning



Science Professional Development Needs by School Size

Exhibit S72. Teachers' Ratings of Science Professional Development Needs by School Size

Science Professional Development Needs	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Help students develop ...	N=70	N=151	N=69	N=36	N=30	N=19	N=19	N=38	N=57
an understanding of systems, order, and organization.	3.07	3.06	3.03	3.20	3.07	2.68	2.59	3.14	2.84
an understanding of evidence, models, and explanation.	3.00	3.04	3.13	3.09	3.00	2.84	2.82	2.83	3.00
an understanding of change, constancy, and measurement.	3.07	2.93	2.93	2.97	2.80	2.78	2.65	3.03	3.07
an understanding of form and function.	2.71	2.84	2.97	2.89	2.36	2.68	2.35	2.71	2.75
an understanding of change over time.	3.10	3.14	3.15	3.09	2.70	2.84	2.88	3.11	3.18
the abilities needed to do scientific inquiry.	3.23	3.20	3.28	3.43	3.03	3.22	3.12	3.23	3.35
an understanding of the structure of the atom.	2.62	2.37	2.24	2.24	1.75	2.16	2.00	2.29	2.43
an understanding of the structure and properties of matter.	3.04	2.78	2.66	2.77	2.59	2.68	2.53	3.77	2.93
an understanding of chemical reactions.	2.75	2.57	2.35	2.63	2.24	2.37	2.12	2.49	2.67
an understanding of the conservation of energy and increase in disorder.	2.75	2.61	2.39	2.69	2.10	2.42	2.29	2.54	2.82
an understanding of the interactions of energy and matter.	2.77	2.64	2.52	2.53	2.24	2.37	2.31	2.46	2.79
an understanding of the cell.	2.85	2.64	2.47	2.51	2.10	2.05	2.00	2.41	2.40
an understanding of the molecular basis of heredity.	2.59	2.38	2.22	2.29	1.66	2.00	1.17	1.94	2.35
an understanding of the theory of biological evolution.	2.29	2.25	2.18	2.14	1.72	1.68	1.65	1.83	2.25
an understanding of the interdependence of organisms.	2.72	2.64	2.60	2.69	2.21	1.84	2.29	2.37	2.67
an understanding of matter, energy, and organization in living systems.	3.03	2.87	2.80	2.63	2.66	2.26	2.41	2.91	2.89
an understanding of the behavior of organisms.	2.88	2.74	2.67	2.66	2.28	2.00	2.06	2.51	2.53
an understanding of energy in the earth system.	2.84	2.73	2.69	2.69	2.62	2.26	2.47	2.85	2.60

Science Professional Development Needs	Fewer than 200	201-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-5000	More than 5000
Help students develop ...	N=70	N=151	N=69	N=36	N=30	N=19	N=19	N=38	N=57
an understanding of geochemical cycles.	2.42	2.24	2.19	2.17	1.79	1.79	1.76	1.91	2.12
a scientific understanding of the earth in the solar system.	3.03	2.86	2.73	2.77	2.77	2.42	2.59	2.77	2.54
a scientific understanding of the origins of the earth and the universe.	2.58	2.50	2.36	2.29	2.37	1.68	2.44	2.29	2.48

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S73. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Systems, Order, and Organization

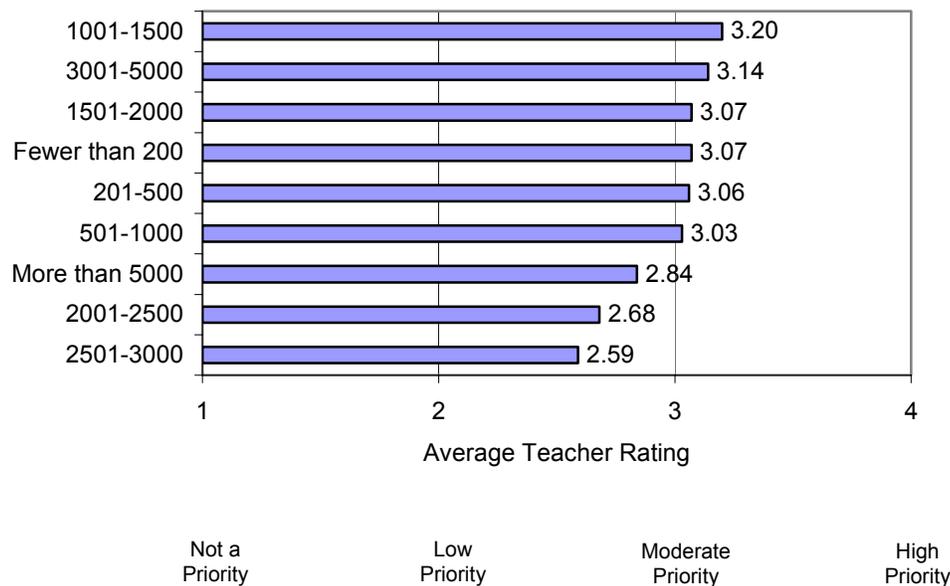


Exhibit S74. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure of the Atom

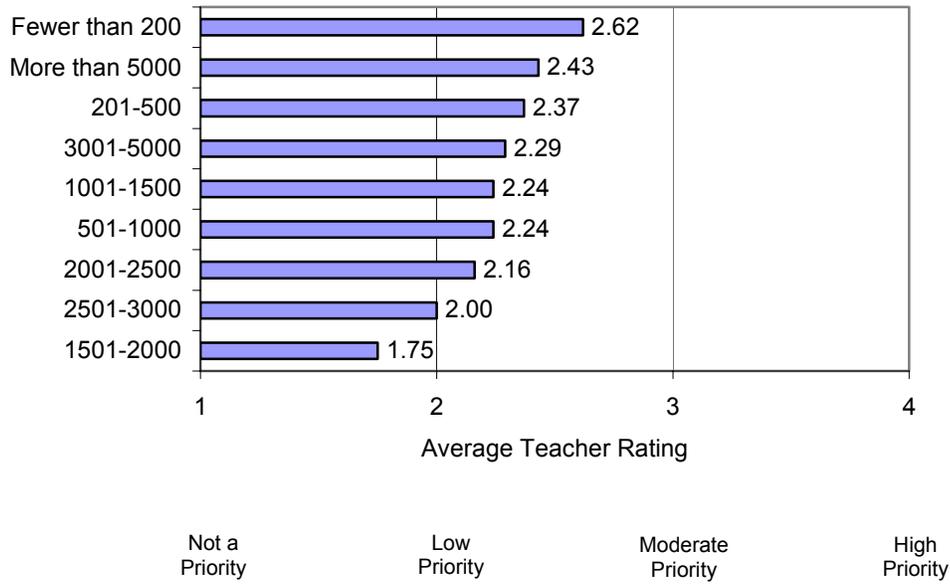


Exhibit S75. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Structure and Properties of Matter

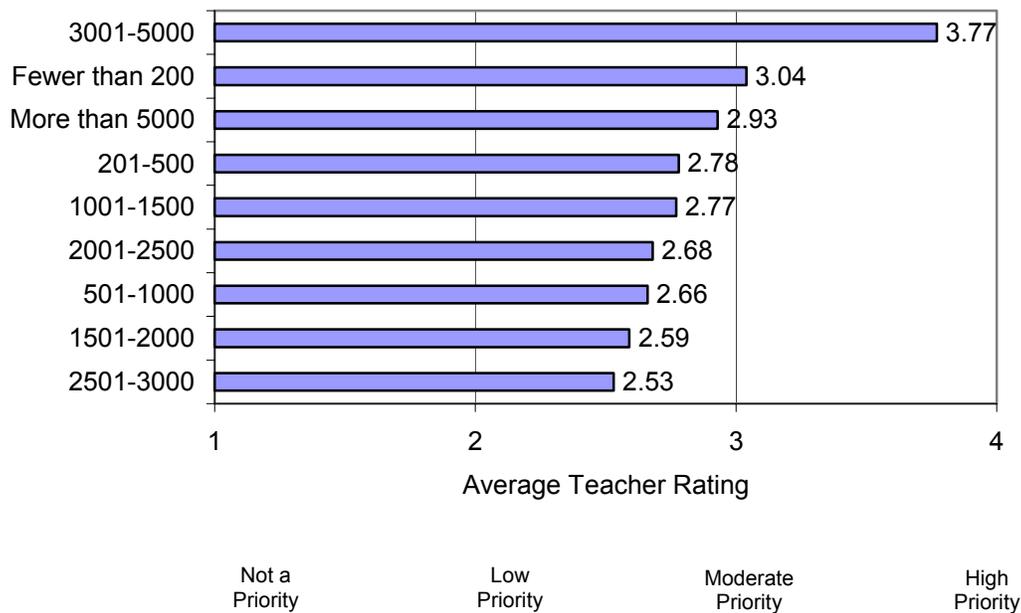


Exhibit S76. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Chemical Reactions

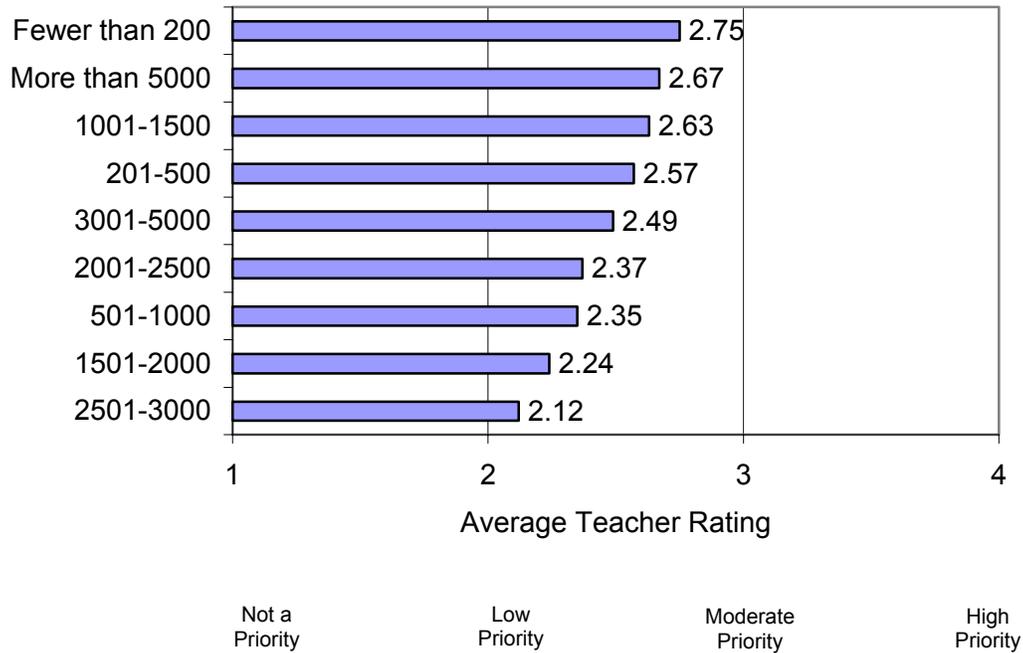


Exhibit S77. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Conservation of Energy and Increase in Disorder

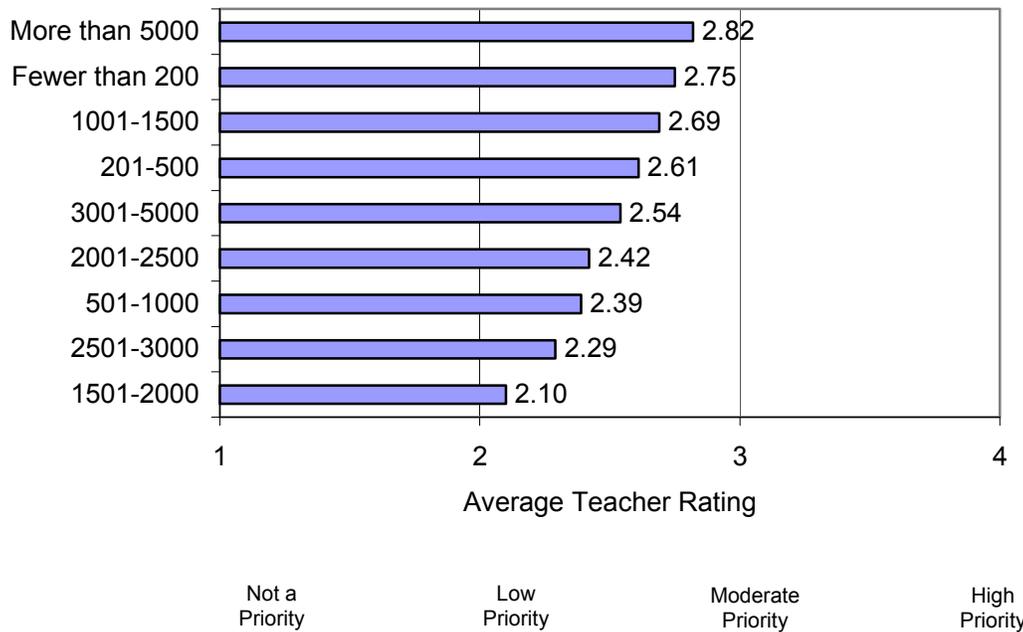


Exhibit S78. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Cell

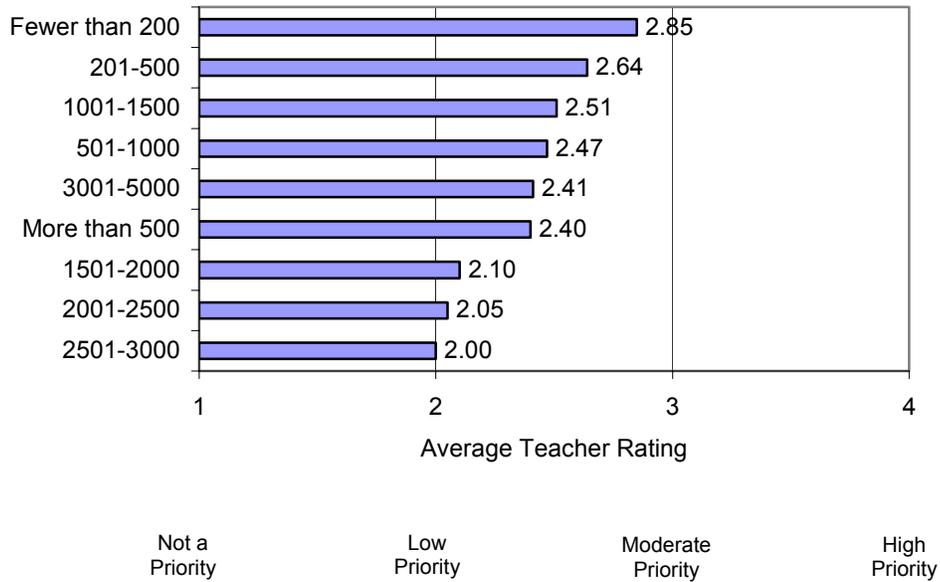


Exhibit S79. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity

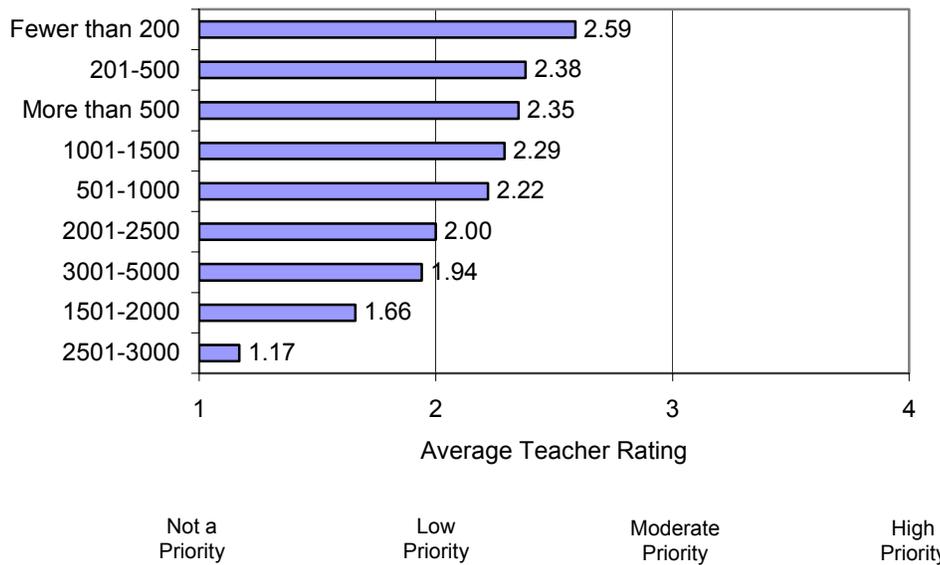


Exhibit S80. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Theory of Biological Evolution

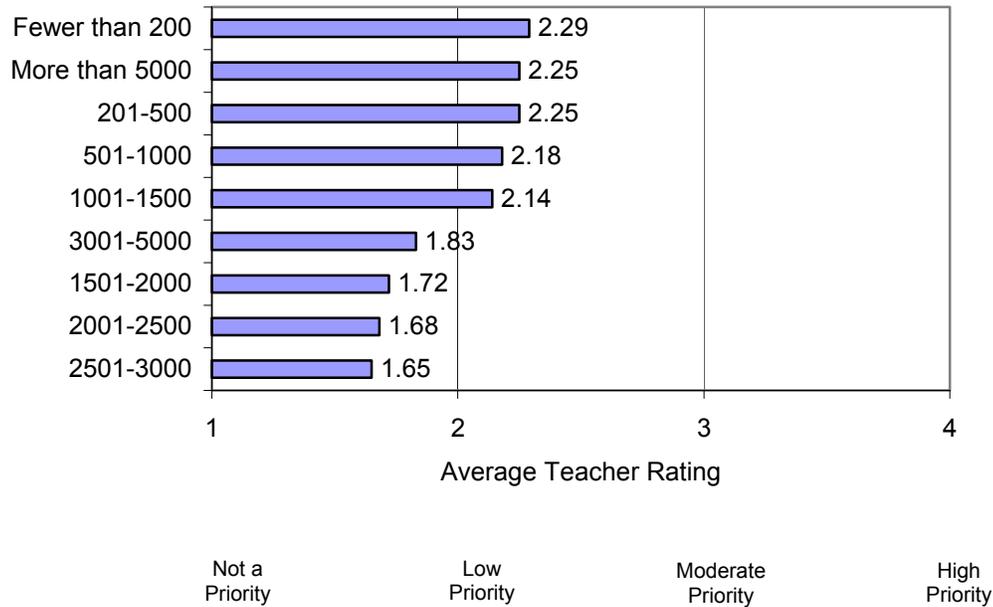


Exhibit S81. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Interdependence of Organisms

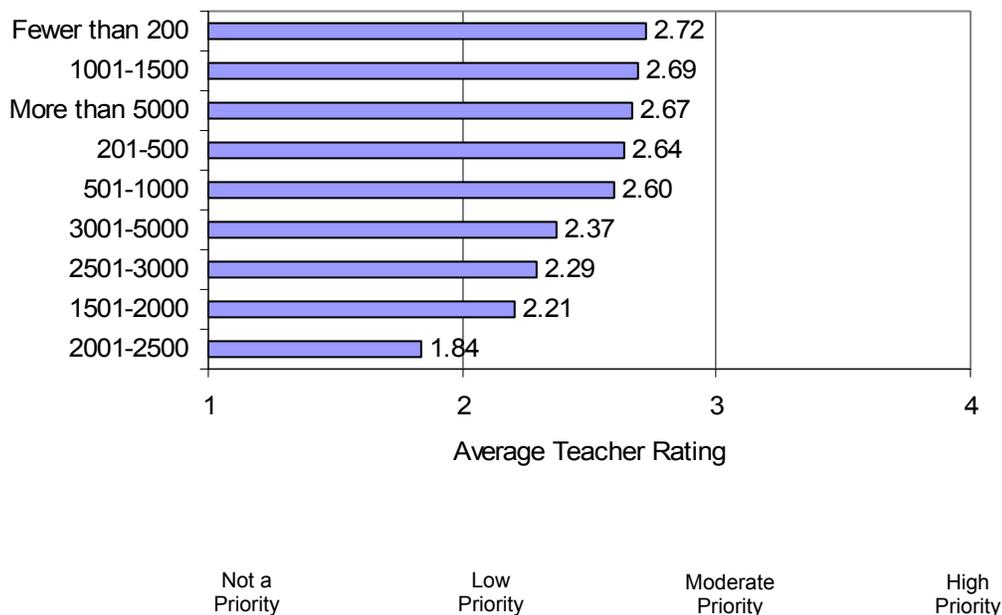


Exhibit S82. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Matter, Energy, and Organization in Living Systems

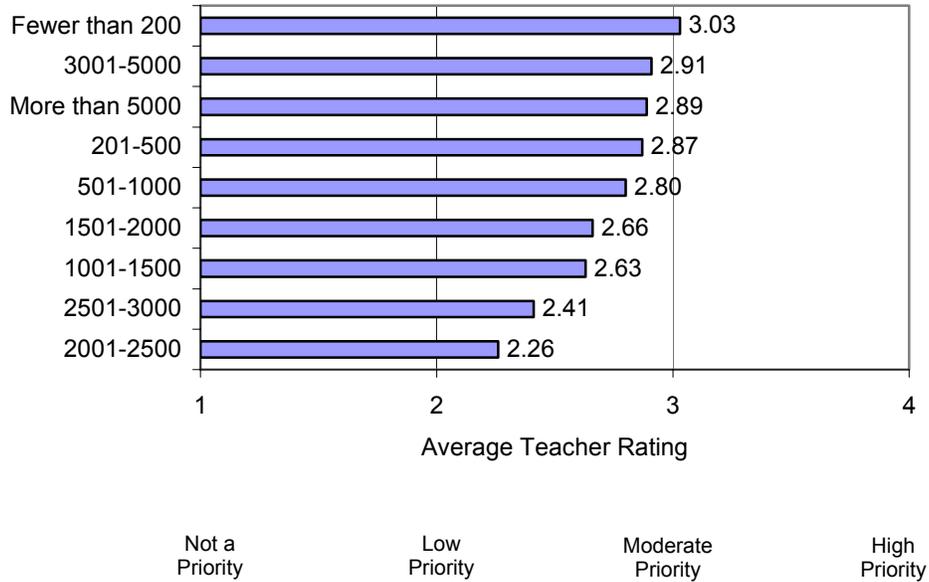


Exhibit S83. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Behavior of Organisms

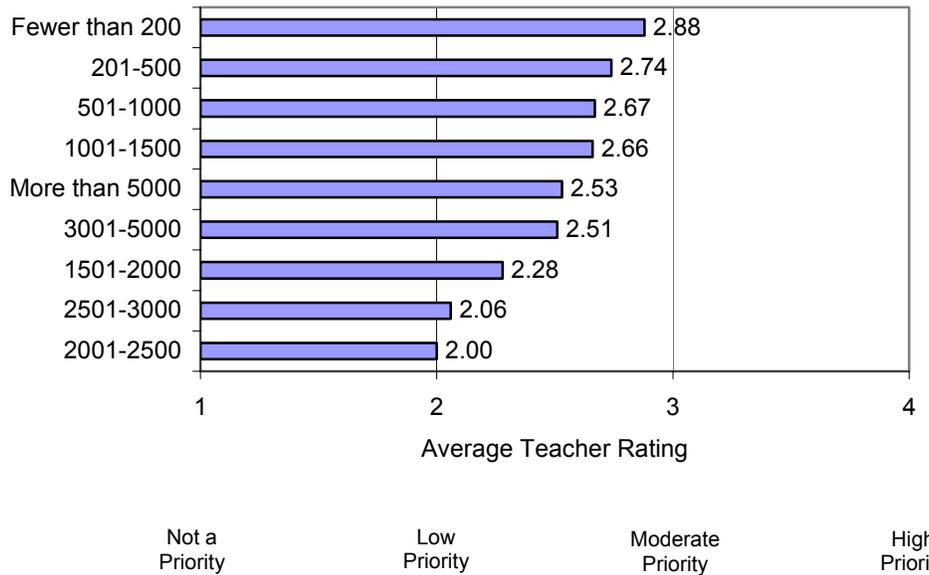


Exhibit S84. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Energy in the Earth System

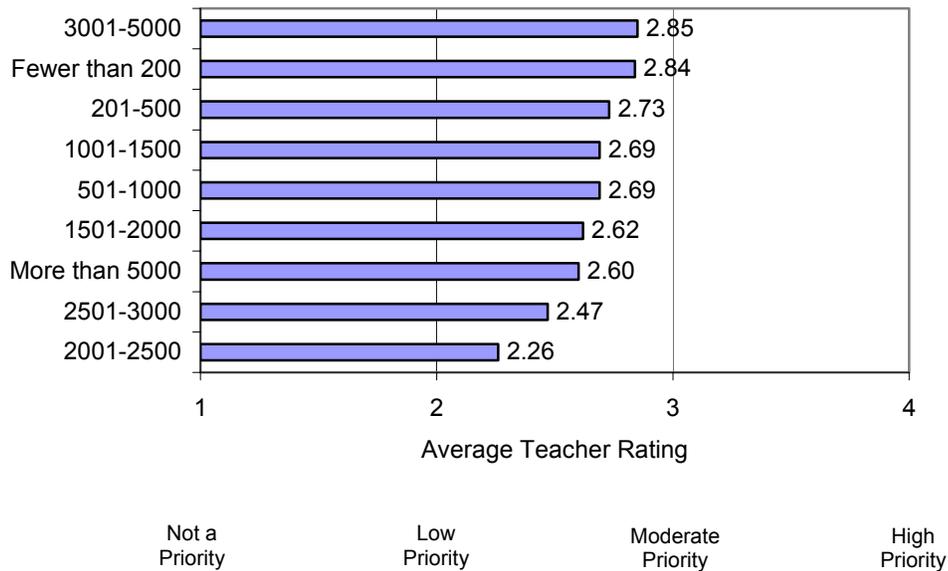


Exhibit S85. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Geochemical Cycles

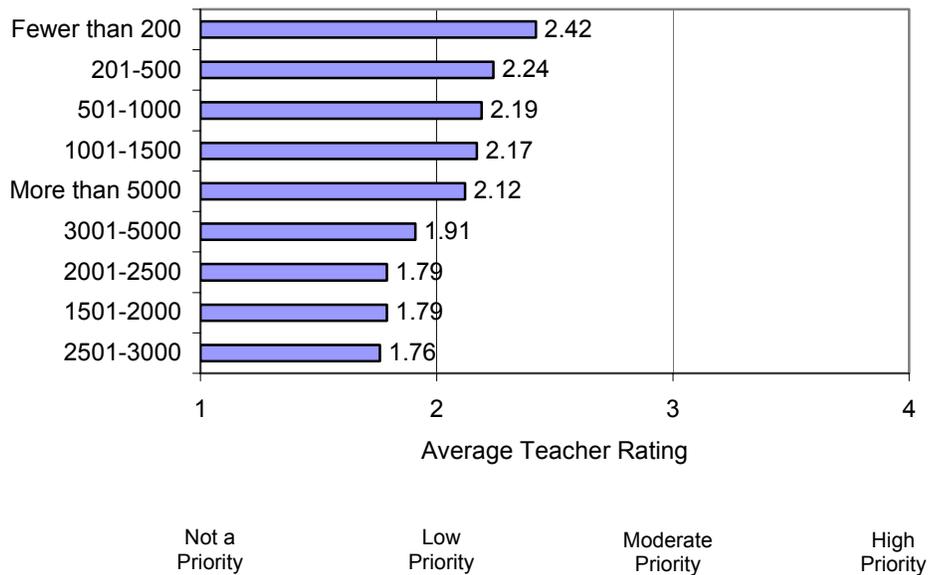


Exhibit S86. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of Earth in the Solar System

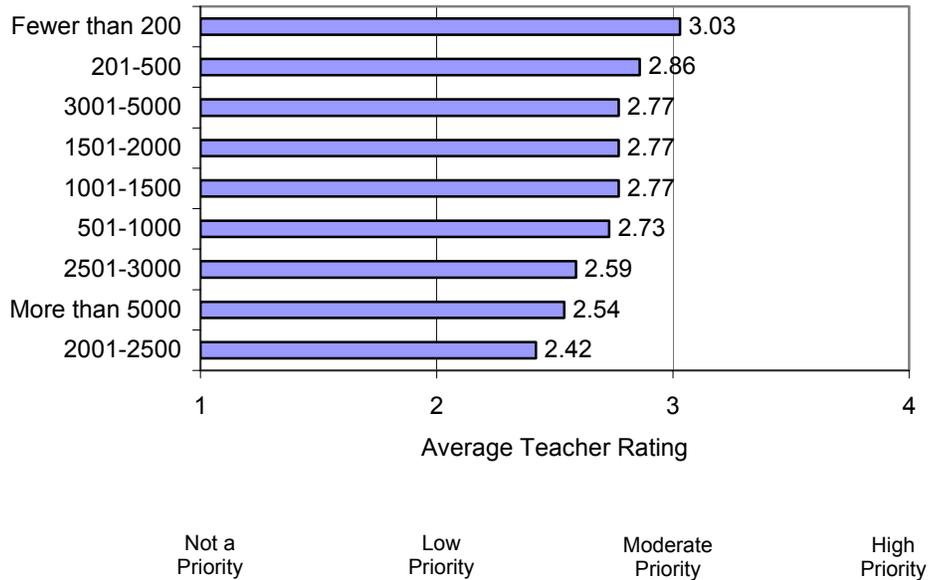
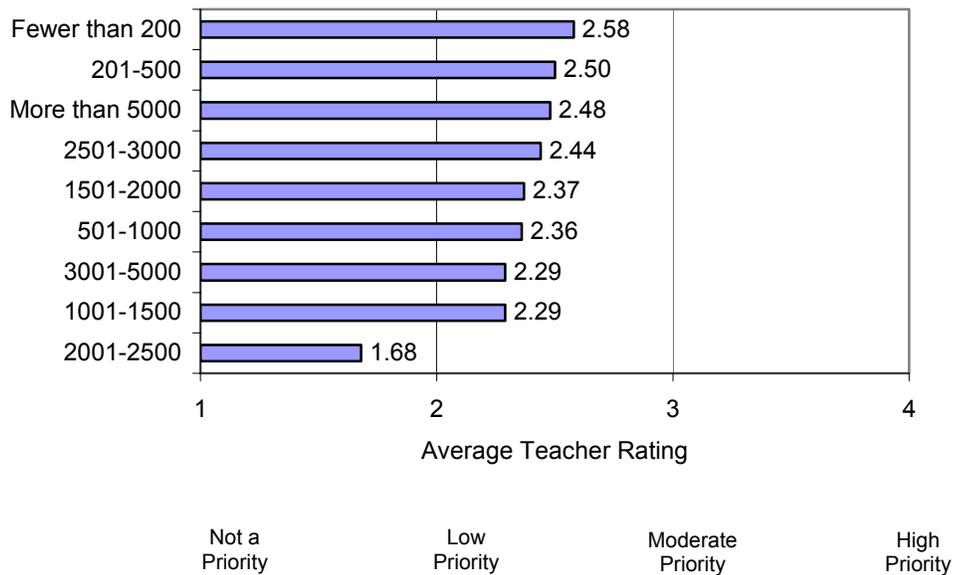


Exhibit S87. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Origins of the Earth and the Universe



Results

Preparedness and Needs Based On Public or Non-Public Affiliation

This section presents an analysis of preparedness and professional development needs in mathematics and science based on grouping of respondents by affiliation to Public or Non-Public school.

On the Needs Assessment Survey, respondents were asked to identify whether they taught in a public or non-public school. Based on responses, mean averages were obtained for both preparedness and professional development needs in mathematics and science based on affiliation. However, only 17 respondents indicated affiliation with non-public schools, so results should be interpreted with caution.

Graphs were developed for those areas in which there was a difference between low and high mean ratings of .50 or higher. Each graph contains the mean rating for all respondents based on affiliation, so the reader can compare the rating of preparedness or professional development need across both groups for the same item. A 4-point rating scale was used for preparedness with 1 = Not Adequately Prepared to 4 = Very Well Prepared. Similarly, a 4-point scale was used for professional development needs with 1 = Not a Priority to 4 = High Priority. The graphs are presented in the following order, mathematics preparedness, mathematics professional development needs, science preparedness, and science professional development needs.

Mathematics Preparedness by Affiliation

Exhibit S88. Teachers' Ratings of Feeling Prepared to Teach Mathematics by Affiliation

Mathematics Preparedness	Public	Non-Public
	N=276	N=10
Provide mathematics instruction that meets appropriate standards (district, state, or national).	3.38	2.70
Teach problem solving strategies.	3.17	3.00
Teach mathematics with the use of manipulative materials, such as counting blocks, geometric shapes, algebra tiles, and so on.	3.32	3.00
Teach mathematics with the use of technology tools, such as calculators, graphing calculators, and spreadsheets.	2.36	2.11
Align standards, curriculum, instruction, and assessment to enhance student mathematics learning.	3.04	2.30
Sequence (articulation of) mathematics instruction to meet instructional goals across grade levels and courses.	2.87	2.70
Select and/or adapt instructional materials to implement your written curriculum.	3.02	2.90
Make appropriate and relevant connections to other areas of mathematics, to other disciplines, and/or real world contexts.	3.00	2.90
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	3.06	2.80
Teach mathematics to students from a variety of cultural backgrounds.	2.68	2.20
Teach mathematics to students who have limited English proficiency.	2.11	1.67
Teach students who have a learning disability which impacts mathematics learning.	2.60	2.00
Encourage participation of females in mathematics.	3.16	3.20
Provide a challenging curriculum for all students you teach.	3.09	3.20
Learn the processes involved in reading and how to teach reading in mathematics.	2.96	3.00
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	2.88	2.56

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S89. Teachers' Ratings of Feeling Prepared to Provide Mathematics Instruction that Meets Appropriate Standards

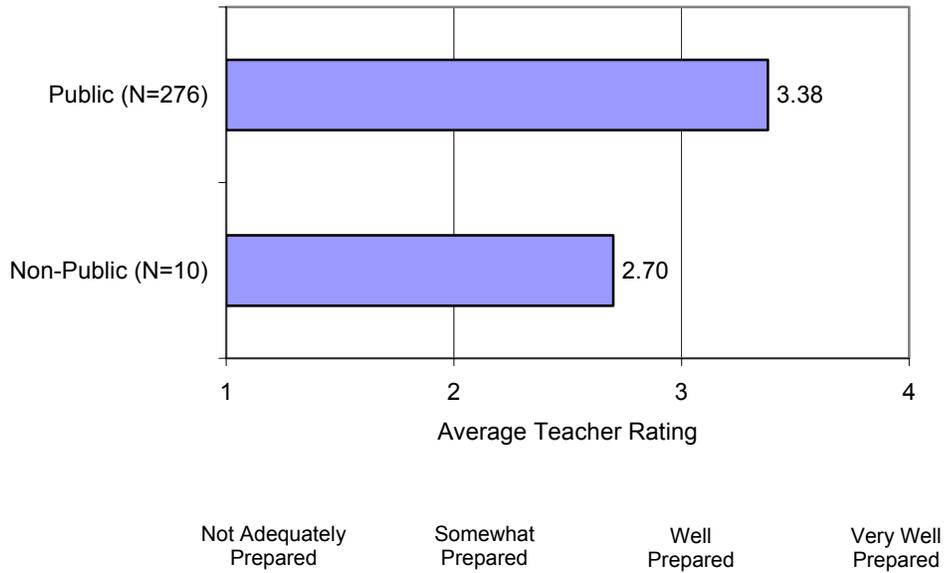


Exhibit S90. Teachers' Ratings of Feeling Prepared to Align Standards, Curriculum, Instruction, and Assessment to Enhance Student Mathematics Learning

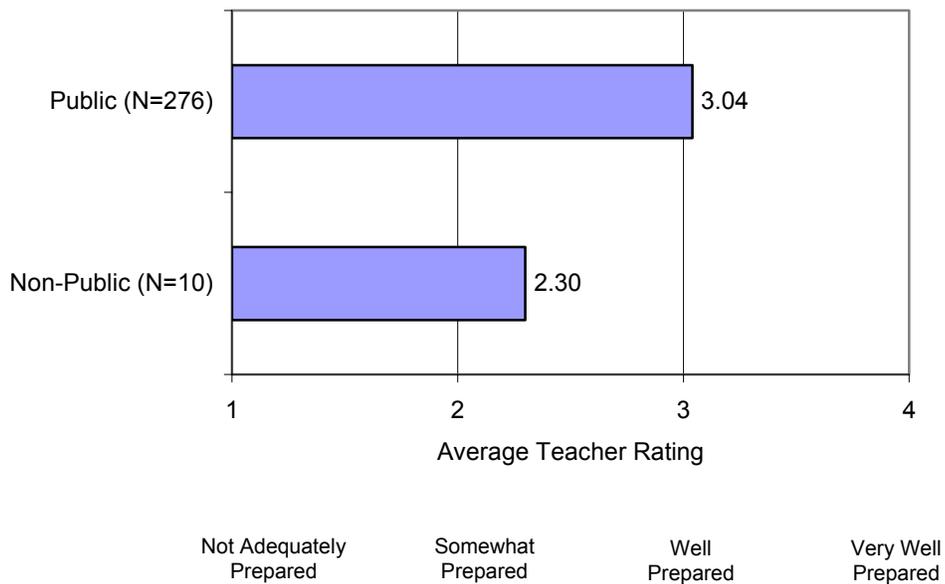
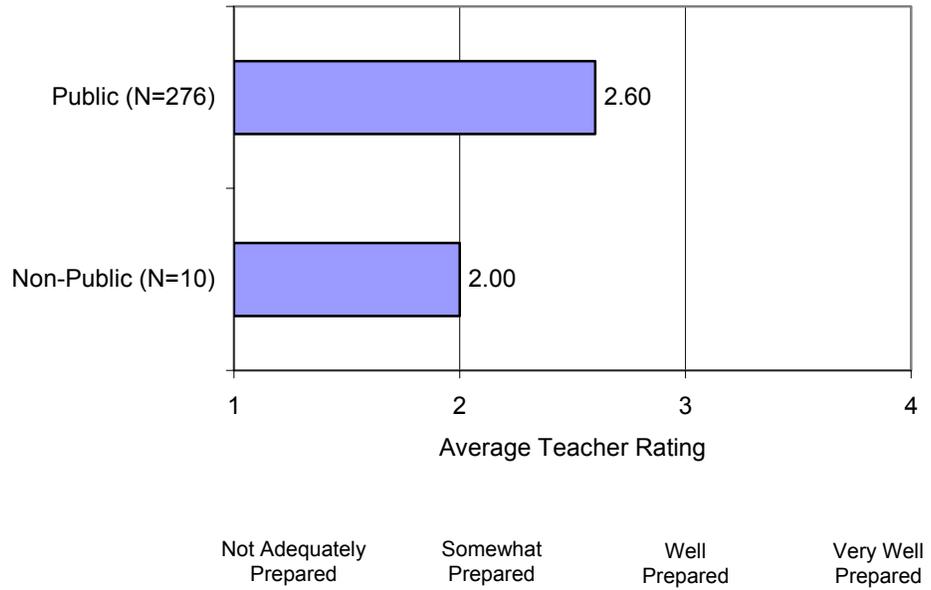


Exhibit S91. Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability



Mathematics Professional Development Needs by Affiliation

Exhibit S92. Teachers' Ratings of Mathematics Professional Development Needs by Affiliation

Mathematics Professional Development Needs	Public N=276	Non-Public N=10
Help students develop ...		
an understanding of relationships between subsets of real numbers.	2.42	3.22
an understanding of the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.	2.27	3.44
the ability to solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions decimals, and percents, ratios and proportions.	2.27	3.11
Help students develop the skills and depth of understanding ...		
to justify solutions to mathematical problems.	3.01	3.56
necessary to perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.	3.15	3.67
to select and use measuring units, tools, and/or technology and explain the degree of accuracy and precision of measurements.	2.95	3.75
to convert between metric and standard units of measurement, given conversion factors.	2.20	2.89
to calculate perimeter and area of two-dimensional shapes and surface area and volume of three-dimensional shapes.	2.54	3.22
necessary to create geometric models to describe the physical world.	2.44	2.78
necessary to evaluate characteristics and properties of two- and three-dimensional geometric shapes.	2.48	2.56
necessary to apply coordinate geometry to locate and describe objects algebraically.	2.01	2.56
to apply right triangle trigonometry to find length and angle measures.	1.74	2.78
to apply geometric properties to solve problems.	2.00	2.78
to apply deductive reasoning to arrive at a conclusion.	2.77	3.44
select a sampling technique to gather data, analyze the resulting data and make inferences.	2.74	3.33
to write equations and make predictions from sets of data.	2.57	3.44
to apply theoretical probability to represent problems and make decisions.	2.17	2.78
to evaluate how transformations on data affect the measures of central tendency and variability.	1.72	2.33
to interpret data represented by the normal distribution and formulate conclusions.	1.99	2.11
to calculate probabilities of independent events.	1.98	2.22
to graph and interpret algebraic relations and inequalities.	1.92	2.78
to solve problems involving equations and inequalities.	2.32	3.00
to solve problems involving systems of two equations, and systems of two or more inequalities.	1.88	2.22
to solve problems using patterns and functions.	2.78	2.89

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S93. Teachers' Ratings of Priority of Professional Development on Helping Students Develop an Understanding of Relationships between Subsets of Real Numbers

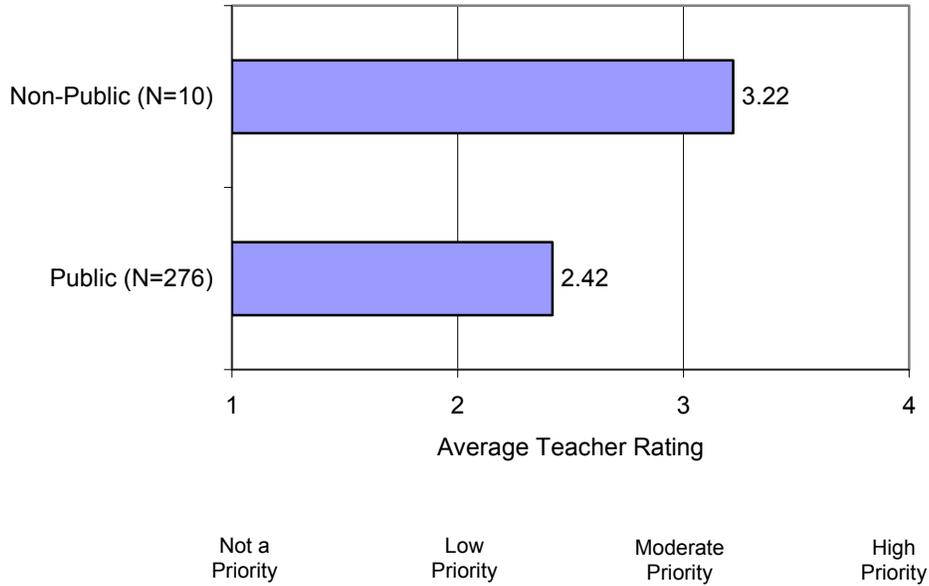


Exhibit S94. Teachers' Ratings of Priority of Professional Development on Helping Students Develop an Understanding of the Equivalent Forms of Numbers

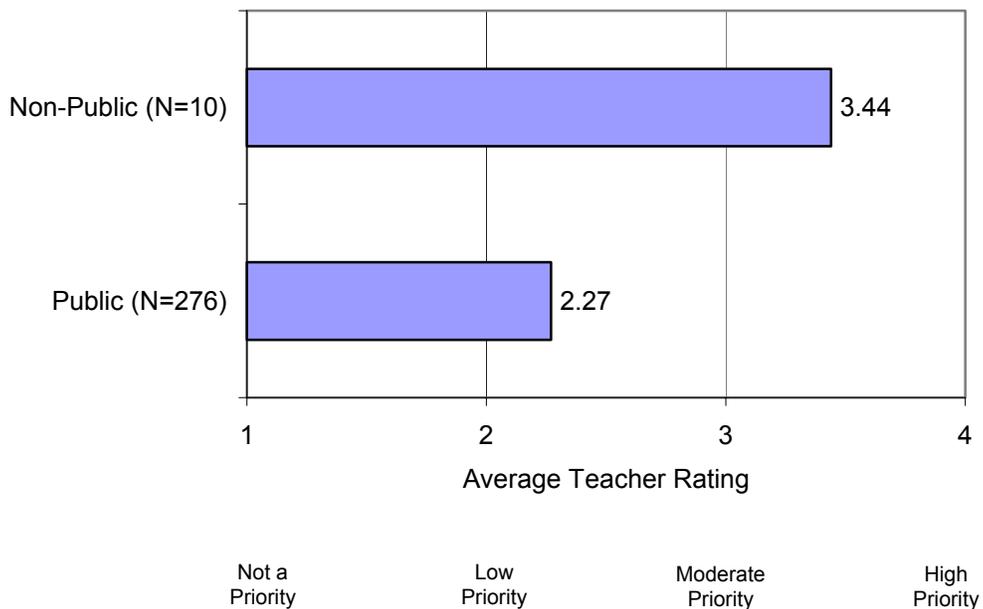


Exhibit S95. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Ability to Solve Theoretical and Applied Problems

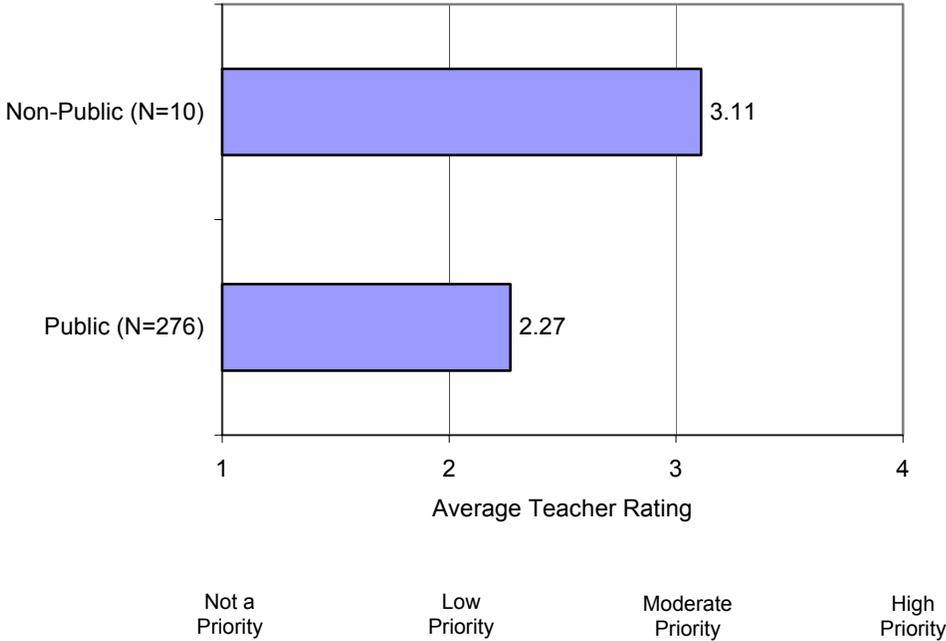


Exhibit S96. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Justify Solutions to Mathematical Problems

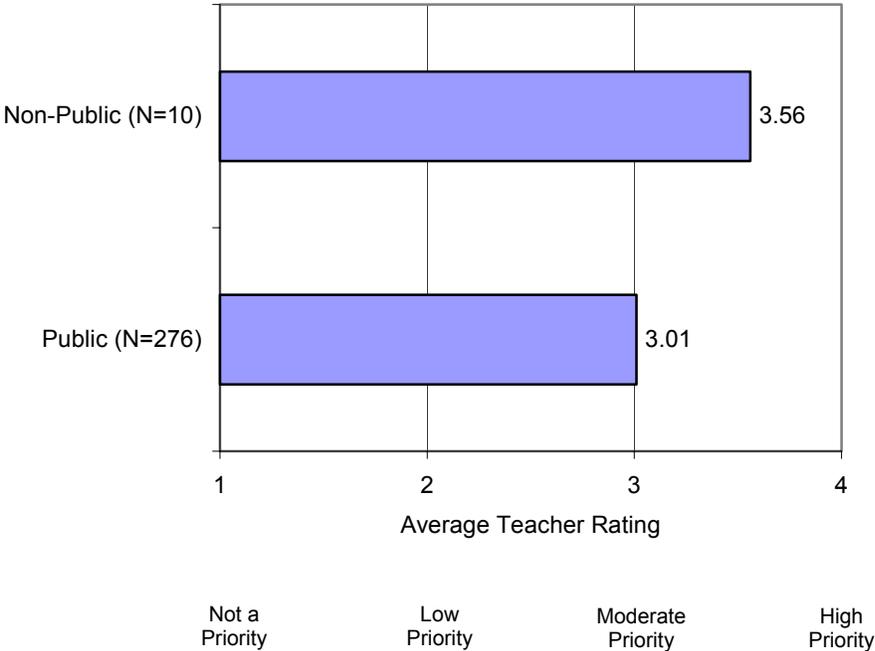


Exhibit S97. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Perform Estimations and Computations of Real Numbers

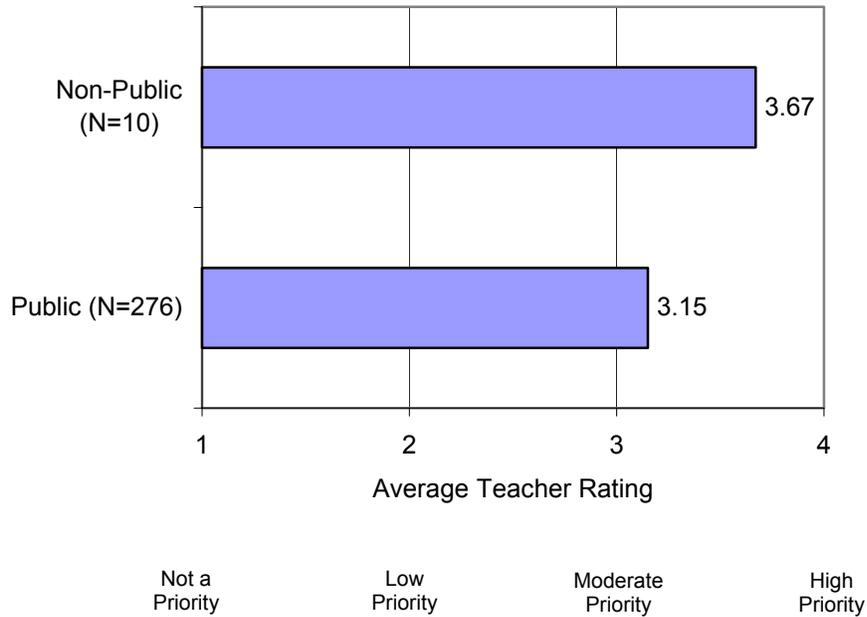


Exhibit S98. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Select and Use Measuring Units, Tools, and/or Technology

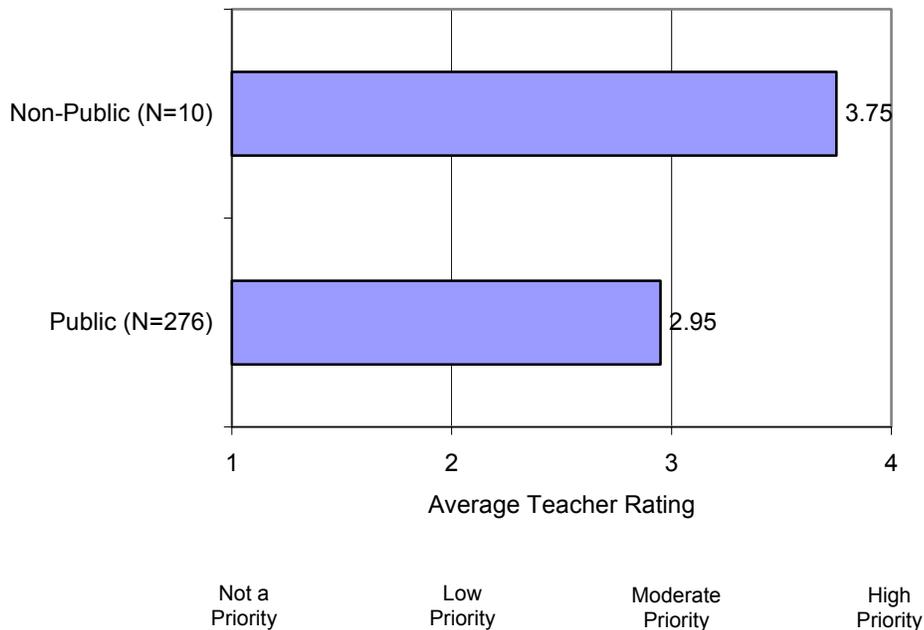


Exhibit S99. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Convert between Metric and Standard Units of Measurement

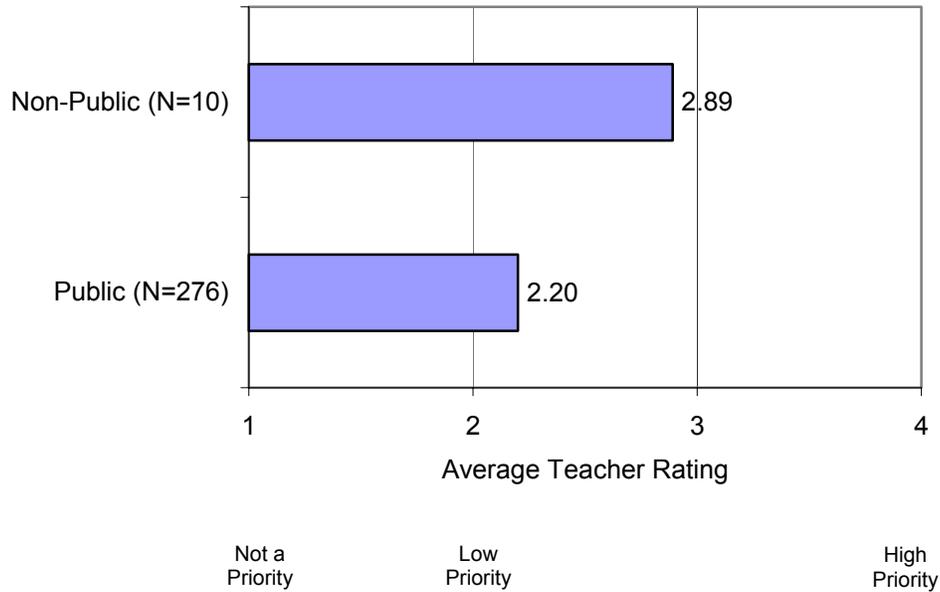


Exhibit S100. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Calculate Perimeter and Area of Two-dimensional Shapes and Surface Area and Volume of Three-dimensional Shapes

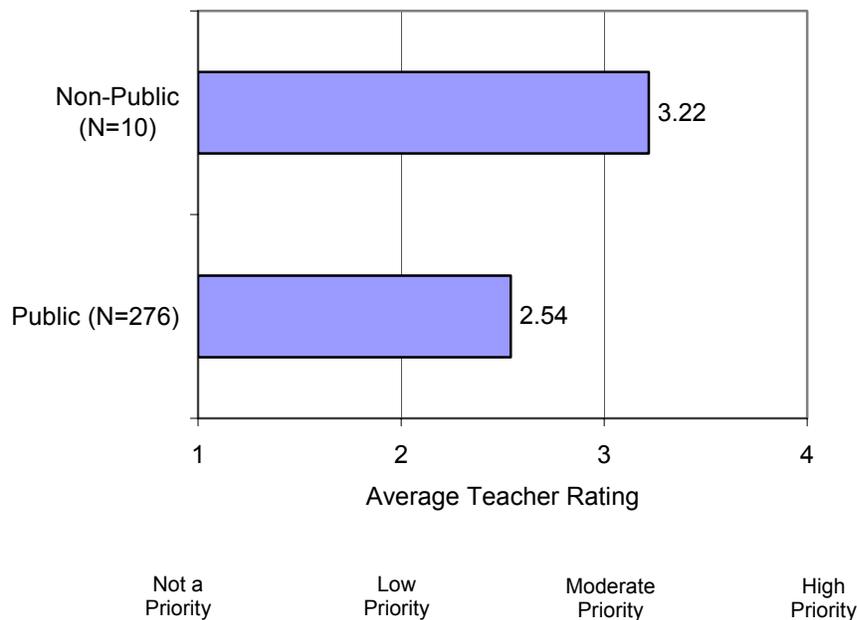


Exhibit S101. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Coordinate Geometry

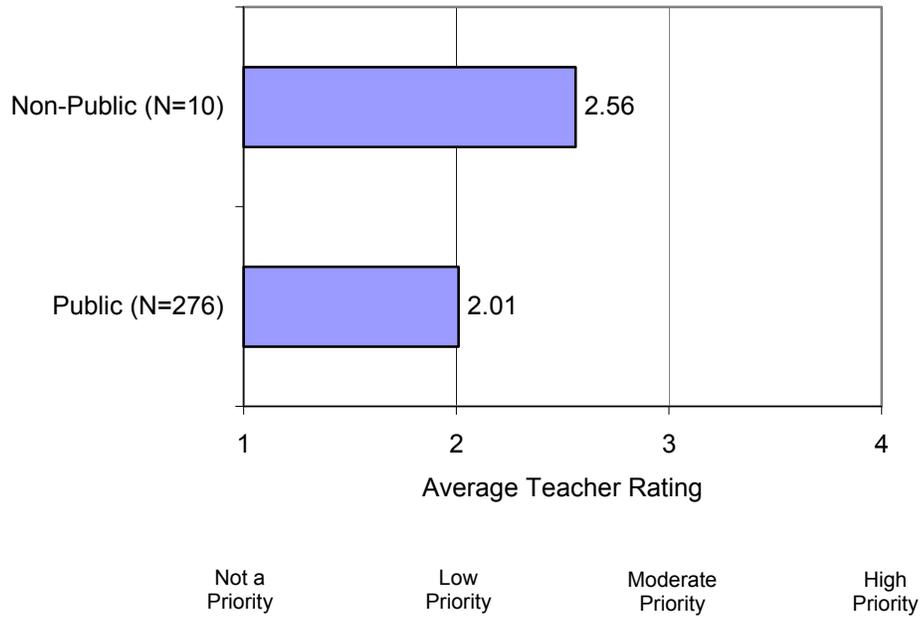


Exhibit S102. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Right Triangle Trigonometry

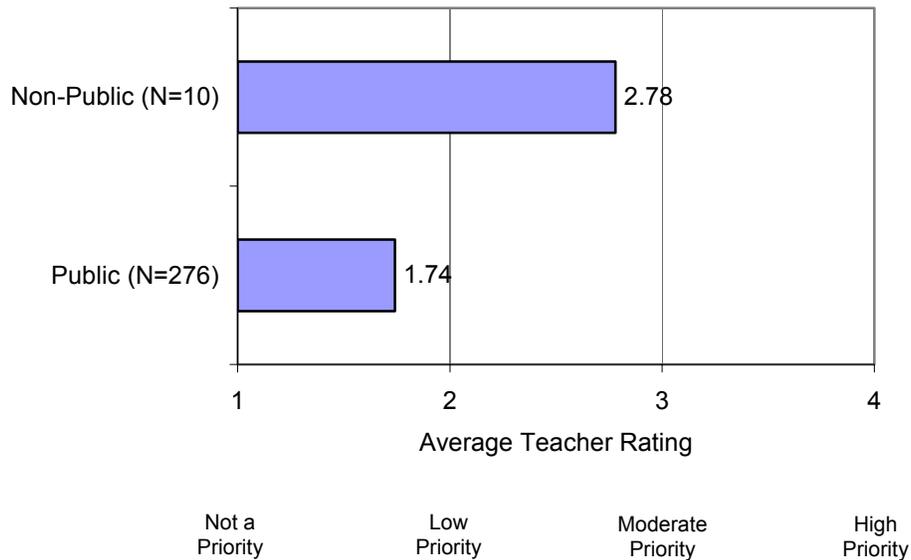


Exhibit S103. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Geometric Properties to Solve Problems

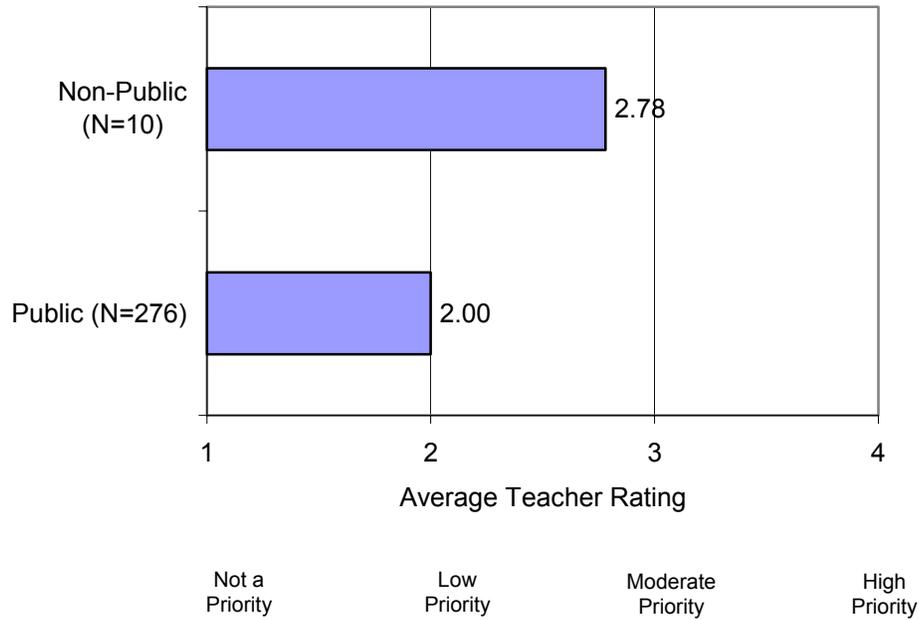


Exhibit S104. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding Necessary to Apply Deductive Reasoning to Arrive at a Conclusion

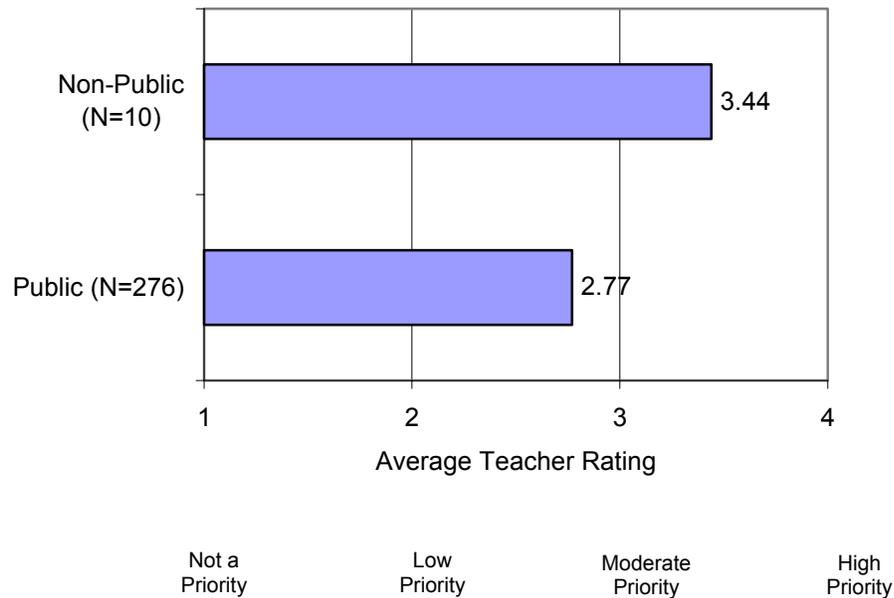


Exhibit S105. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Select a Sampling Technique to Gather Data, Analyze the Resulting Data and Make Inferences

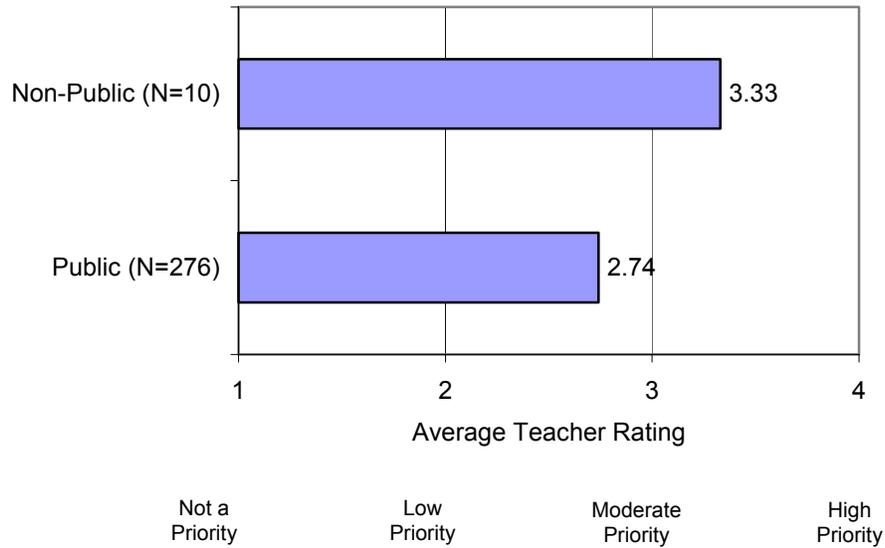


Exhibit S106. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Write Equations and Make Predictions from Sets of Data

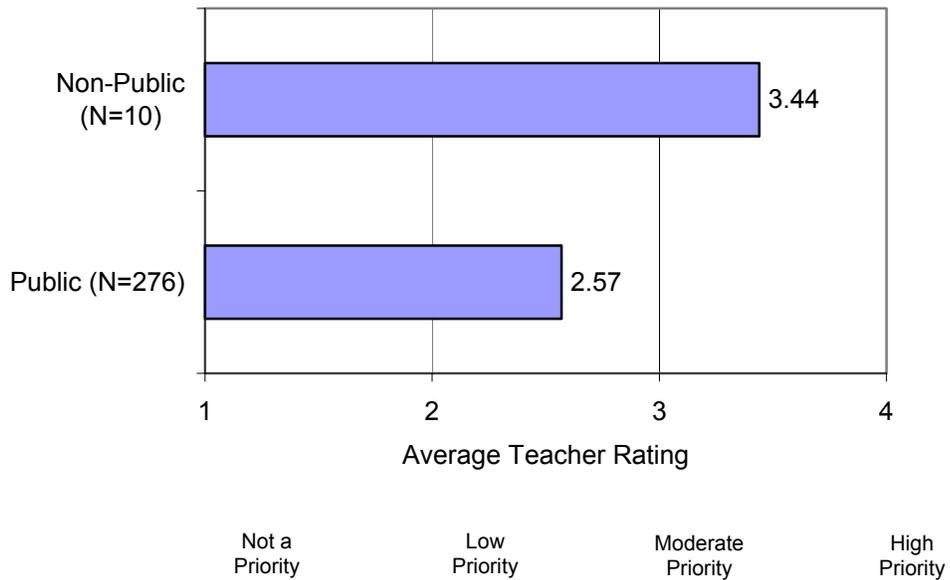


Exhibit S107. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Apply Theoretical Probability to Represent Problems and Make Decisions

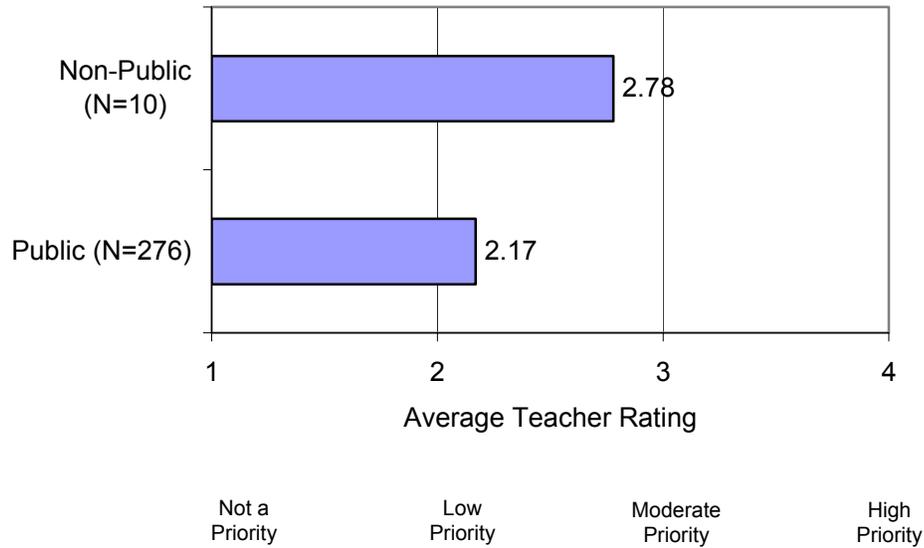


Exhibit S108. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Evaluate how Transformations on Data Affect the Measures of Central Tendency and Variability

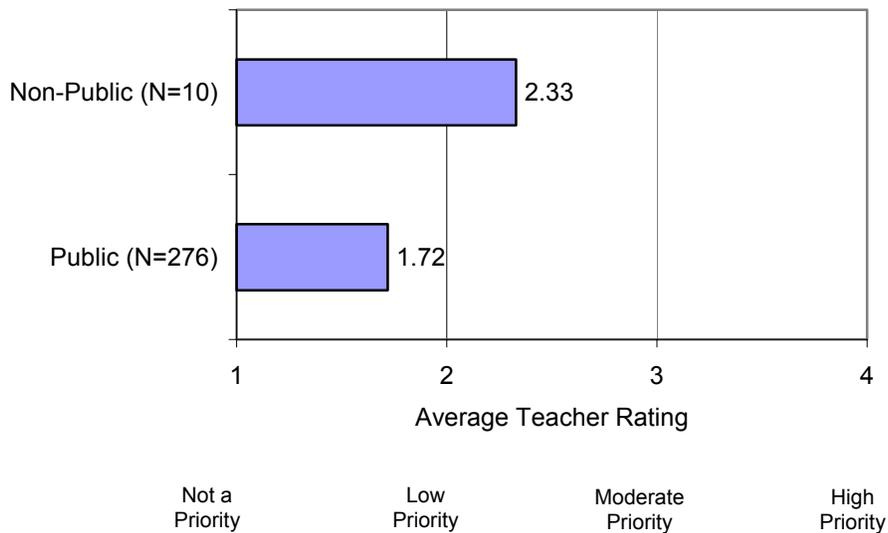


Exhibit S109. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Graph and Interpret Algebraic Relations and Inequalities

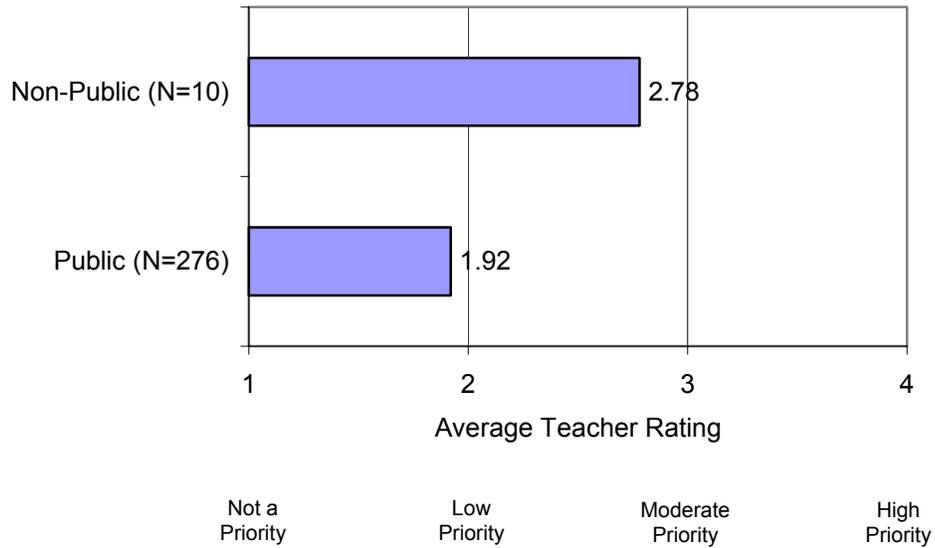


Exhibit S110. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Solve Problems Involving Equations and Inequalities

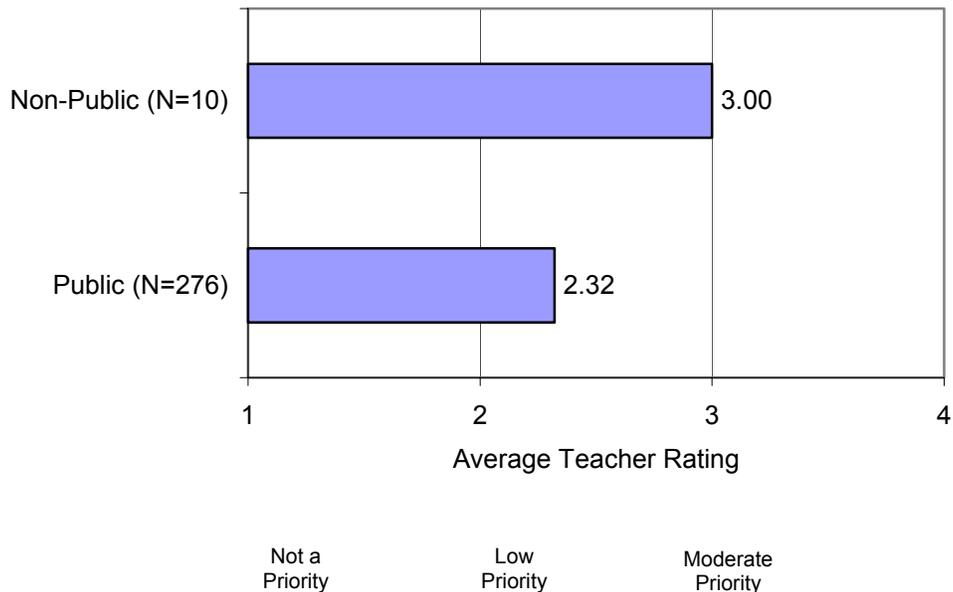
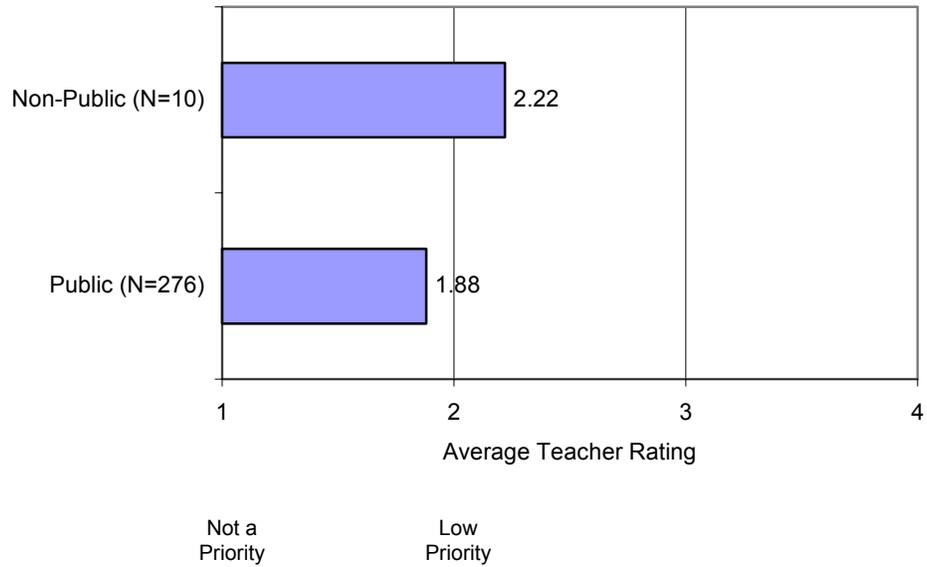


Exhibit S111. Teachers' Ratings of Priority of Professional Development on Helping Students Develop the Understanding to Solve Problems Involving Systems of Two Equations, and Systems of Two or More Inequalities



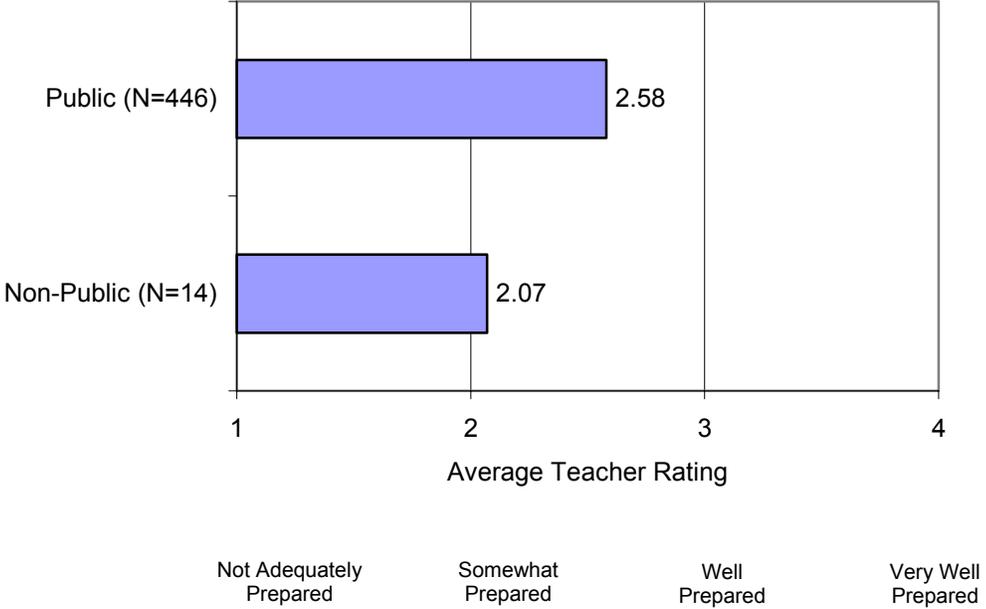
Science Preparedness by Affiliation

Exhibit S112. Teachers' Ratings of Feeling Prepared to Teach Science by Affiliation

Science Preparedness	Public N=446	Non-Public N=14
Provide science instruction that meets appropriate standards (district, state, or national).	3.17	2.79
Teach scientific inquiry.	2.97	2.64
Manage a class of students who are using hands-on or laboratory activities.	3.05	2.79
Lead a class of students using investigative strategies.	2.95	2.64
Take into account students' prior conceptions about natural phenomena when planning.	2.69	2.64
Align standards, curriculum, instruction, and assessment to enhance student science learning.	2.98	2.71
Sequence (articulation of) science instruction to meet instructional goals across grade levels and course.	2.91	3.00
Select and/or adapt instructional materials to implement your written curriculum.	3.08	3.07
Know the major unifying concepts of all sciences and how these concepts relate to other disciplines.	2.75	3.07
Understand how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.	2.98	2.93
Teach science to students from a variety of cultural backgrounds.	2.72	2.29
Teach science to students who have limited English proficiency.	2.12	1.71
Teach students who have a learning disability which impacts science learning.	2.58	2.07
Encourage participation of females and minorities in science.	3.10	3.00
Provide a challenging curriculum for all students you teach.	3.11	3.07
Learn the processes involved in reading and how to teach reading in science.	2.95	2.86
Use a variety of assessment strategies (including objective and open-ended formats) to inform practice.	2.93	2.79
Use a variety of technological tools (student response systems, lab interfaces and probes, etc) to enhance student learning.	2.62	2.64

Note. Responses were rated on a 4-point scale where 1 = Not Adequately Prepared, 2 = Somewhat Prepared, 3 = Well Prepared, and 4 = Very Well Prepared.

Exhibit S113. Teachers' Ratings of Feeling Prepared to Teach Students with a Learning Disability



Science Professional Development Needs by Affiliation

Exhibit S114. Teachers' Ratings of Science Professional Development Needs by Affiliation

Science Professional Development Needs	Public N=446	Non-Public N=14
Help students develop ...		
an understanding of systems, order, and organization.	3.00	3.21
an understanding of evidence, models, and explanation.	2.98	3.07
an understanding of change, constancy, and measurement.	2.92	3.07
an understanding of form and function.	2.74	2.93
an understanding of change over time.	3.08	3.00
the abilities needed to do scientific inquiry.	3.22	3.29
an understanding of the structure of the atom.	2.26	2.50
an understanding of the structure and properties of matter.	2.74	3.14
an understanding of chemical reactions.	2.46	2.54
an understanding of the conservation of energy and increase in disorder.	2.53	2.73
an understanding of the interactions of energy and matter.	2.54	3.00
an understanding of the cell.	2.45	2.93
an understanding of the molecular basis of heredity.	2.19	2.93
an understanding of the theory of biological evolution.	2.09	2.00
an understanding of the interdependence of organisms.	2.51	2.64
an understanding of matter, energy, and organization in living systems.	2.77	2.93
an understanding of the behavior of organisms.	2.58	2.86
an understanding of energy in the earth system.	2.66	2.71
an understanding of geochemical cycles.	2.09	2.14
a scientific understanding of the earth in the solar system.	2.76	2.71
a scientific understanding of the origins of the earth and the universe.	2.36	2.71

Note. Responses were rated on a 4-point scale where 1 = Not a Priority, 2 = Low Priority, 3 = Moderate Priority, and 4 = High Priority.

Exhibit S115. Teachers' Ratings of Priority for Professional Development on Helping Students Develop an Understanding of the Molecular Basis of Heredity

