

GLOBE ASSESSMENT STRATEGY LINKAGE TABLE – Primary Grades (PreK – 2)

| GLOBE Assessment Strategies <u>Planning investigations</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Primary Grades (PreK-2) (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|--|---|---|
| Students set up a new, appropriate problem/application | *DAP1 - pose questions and gather data about themselves and their surroundings; | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3ab – students asks relevant questions |
| Students design an experiment | *DAP1 - pose questions and gather data about themselves and their surroundings; | Investigating and Solving Problems | 7. Students conduct research on issues and interests | E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students specify measurements/variables to investigate | *M2 - use tools to measure; *M2 - develop common referents for measures to make comparisons and estimates | Investigating and Solving Problems | | E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students pose relevant questions | *DAP1 - pose questions and gather data about themselves and their surroundings; | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E3ab – students asks relevant questions |

*NCTM Standards:

A – Algebra

M – Measurement

Page 1 of 20

Cnx – Connections

NO - Numbers & Operations

Com – Communication

PS - Problem Solving

DAP - Data Analysis & Probability

R – Representation

G – Geometry

RAP - Reasoning & Proof

DRAFT ver 1.0

SRI International Proprietary

GLOBE ASSESSMENT STRATEGY LINKAGE TABLE – Primary Grades (PreK – 2)

| <p align="center">GLOBE Assessment Strategies <u>Taking measurements</u></p> | <p align="center">National Council of Teachers of Mathematics The standards listed below have been identified for Primary Grades (PreK-2) (http://www.nctm.org/)</p> | <p align="center">Third International Math & Science Study Math Standards</p> | <p align="center">National Council of Teachers of English / International Reading Association</p> | <p align="center">New Standards</p> |
|---|--|---|--|---|
| <p>Observations and measurements are accurate and appropriate</p> | <p>*M1 - recognize the attributes of length, volume, weight, area, and time; *M1 - compare and order objects according to these attributes; *M1 - understand how to measure using nonstandard and standard units; *M1 - select an appropriate unit and tool for the attribute being measured.</p> | <p>Using Routine Procedures</p> | <p>8. Students ... gather and synthesize information (to) create and communicate knowledge.</p> | <p>E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader</p> |
| <p>Equipment is used properly</p> | <p>*M2 - measure with multiple copies of units of the same size, such as paper clips laid end to end; *M2 - use repetition of a single unit to measure something larger than the unit, for instance, measuring the length of a room with a single meter stick;</p> | <p>Using Routine Procedures</p> | | <p>E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3ae – confirms understanding by paraphrasing the adult's directions or suggestions</p> |
| <p>Measurement Quality Errors are detected Quality assurance procedures are employed (multiple, repeated readings, re- calibration)</p> | <p>*DAP3 - discuss events related to students' experiences as likely or unlikely</p> | <p>Justifying and Proving (Mathematical Reasoning)</p> | | <p>E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader</p> |

*NCTM Standards:

A – Algebra

M – Measurement

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Cnx – Connections

NO - Numbers & Operations

Com – Communication

PS - Problem Solving

DAP - Data Analysis & Probability

R – Representation

G – Geometry

RAP - Reasoning & Proof

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SRI International Proprietary

GLOBE ASSESSMENT STRATEGY LINKAGE TABLE – Primary Grades (PreK – 2)

| <p align="center">GLOBE Assessment Strategies</p> <p><u>Analyze and compare GLOBE data</u></p> | <p align="center">National Council of Teachers of Mathematics</p> <p>The standards listed below have been identified for Primary Grades (PreK-2) (http://www.nctm.org/)</p> | <p align="center">Third International Math & Science Study Math Standards</p> | <p align="center">National Council of Teachers of English / International Reading Association</p> | <p align="center">New Standards</p> |
|--|---|--|--|---|
| <p>Identify data components</p> | <p>*DAP1 - sort and classify objects according to their attributes and organize data about the objects;</p> <p>*DAP2 - describe parts of the data and the set of data as a whole to determine what the data show.</p> | <p>Knowing</p> | | <p>E2cc – Produces a narrative account that creates an organizing structure</p> |
| <p>Identify similarities and differences</p> | <p>*DAP1 - sort and classify objects according to their attributes and organize data about the objects;</p> | <p>Knowing</p> | | <p>E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject...</p> |
| <p>Use appropriate mathematical procedures</p> | <p>*NO1 - connect number words and numerals to the quantities they represent, using various physical models and representations;</p> <p>*A4 - describe qualitative change, such as a student's growing taller;</p> <p>*A4 - describe quantitative change, such as a student's growing two inches in one year.</p> <p>*PS3 – apply and adapt a variety of appropriate strategies to solve problems</p> <p>*Cnx1 – recognize and apply mathematics in contexts outside of mathematics</p> | <p>Knowing</p> <p>Justifying and Proving (Mathematical Reasoning)</p> | | |

*NCTM Standards:

A – Algebra

M – Measurement

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Cnx – Connections

NO - Numbers & Operations

Com – Communication

PS - Problem Solving

DAP - Data Analysis & Probability

R – Representation

G – Geometry

RAP - Reasoning & Proof

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SRI International Proprietary

GLOBE ASSESSMENT STRATEGY LINKAGE TABLE – Primary Grades (PreK – 2)

| <p align="center">GLOBE Assessment Strategies <u>Interpret GLOBE data</u></p> | <p align="center">National Council of Teachers of Mathematics The standards listed below have been identified for Primary Grades (PreK-2) (http://www.nctm.org/)</p> | <p align="center">Third International Math & Science Study Math Standards</p> | <p align="center">National Council of Teachers of English / International Reading Association</p> | <p align="center">New Standards</p> |
|--|---|--|---|--|
| <p>Infer patterns, trends</p> | <p>*A1 - sort, classify, and order objects by size, number, and other properties; *A1 - recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another; *A1 - analyze how both repeating and growing patterns are generated.</p> | <p>Justifying and Proving (Mathematical Reasoning)</p> | | <p>E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information</p> |
| <p>Explain data and relationships</p> | <p>*DAP2 - describe parts of the data and the set of data as a whole to determine what the data show. *Com4 – use the language of mathematics to express mathematical ideas precisely</p> | <p>Justifying and Proving (Mathematical Reasoning)</p> | <p>8. Students ... gather and synthesize information (to) create and communicate knowledge.</p> | <p>E1cb – relates new information to prior knowledge and experience E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E3bf – gives reasons in support of opinions expressed</p> |
| <p>Create multiple formats for representing data</p> | <p>*A2 - use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations. *DAP1 - represent data using concrete objects, pictures, and graphs. *R1 – create and use representations to organize, record and communicate mathematical ideas *R3 – use representations to model and interpret physical, social and mathematical phenomena</p> | <p>Using Routine Procedures</p> | <p>7. ... (students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.</p> | <p>E2cc – extends ideas E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E3bg – clarifies, illustrates, or expands on a response ...</p> |

*NCTM Standards:

A – Algebra

M – Measurement

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Cnx – Connections

NO - Numbers & Operations

Com – Communication

PS - Problem Solving

DAP - Data Analysis & Probability

R – Representation

G – Geometry

RAP - Reasoning & Proof

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SRI International Proprietary

GLOBE ASSESSMENT STRATEGY LINKAGE TABLE – Primary Grades (PreK – 2)

| <p align="center">GLOBE Assessment Strategies</p> <p align="center"><u>Communicate</u></p> | <p align="center">National Council of Teachers of Mathematics</p> <p>The standards listed below have been identified for Primary Grades (PreK-2) (http://www.nctm.org/)</p> | <p align="center">Third International Math & Science Study Math Standards</p> | <p align="center">National Council of Teachers of English / International Reading Association</p> | <p align="center">New Standards</p> |
|---|---|--|--|---|
| <p>Compose informal and informal discourse to inform, explain, persuade</p> <p>AND</p> <p>Create and make presentations of key conclusions and findings</p> | <p>*Com1 – organize and consolidate mathematical thinking through communication</p> <p>*Com2 – communicate mathematical thinking coherently and clearly to peers, teachers and others</p> | <p>Communicating</p> | <p>4. Students ... communicate effectively with a variety of audiences and for different purposes.</p> <p>7. ... (students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.</p> <p>12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).</p> | <p>E1ca – restates or summarizes information</p> <p>E1cb – relates new information to prior knowledge and experience</p> <p>E2ad – includes appropriate facts and details</p> <p>E2ae – excludes extraneous and inappropriate information</p> <p>E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject...</p> <p>E1df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader</p> <p>E3c – The student prepares and delivers an individual presentation (characteristics listed)</p> <p>E4b – The student analyzes and subsequently revises work to clarify it or make it more effective ...</p> |

*NCTM Standards:

A – Algebra

M – Measurement

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Cnx – Connections

NO - Numbers & Operations

Com – Communication

PS - Problem Solving

DAP - Data Analysis & Probability

R – Representation

G – Geometry

RAP - Reasoning & Proof

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SRI International Proprietary

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Elementary Grades (3-5)

| GLOBE Framework Strategies <u>Planning investigations</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Elementary Grades 3-5 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|--|---|---|
| Students set up a new, appropriate problem/application | *DAP 1 - design investigations to address a question and consider how data-collection methods affect the nature of the data set; | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3ab – students asks relevant questions |
| Students design an experiment | *DAP 1 - design investigations to address a question and consider how data-collection methods affect the nature of the data set; | Investigating and Solving Problems | 7. Students conduct research on issues and ... interests. | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students specify measurements/variables to investigate | *M1 - understand how to measure using nonstandard and standard units; *M1 - select an appropriate unit and tool for the attribute being measured. | Investigating and Solving Problems | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students pose relevant questions | *DAP3 - propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions. | | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E3ab – students asks relevant questions |

*NCTM Standards:
A – Algebra
M – Measurement
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Cnx – Connections
NO - Numbers & Operations

Com – Communication
PS - Problem Solving

DAP - Data Analysis & Probability
R – Representation

G – Geometry
RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Elementary Grades (3-5)

| GLOBE Framework Strategies <u>Taking measurements</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Elementary Grades 3-5 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|--|--|---|--|
| Observations and measurements are accurate and appropriate | *M2 - select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles; *DAP1 - collect data using observations, surveys, and experiments; | Using Routine Procedures | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Equipment is used properly | *M2 - select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles; | Using Routine Procedures | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3ae – confirms understanding by paraphrasing the adult's directions or suggestions |
| Measurement Quality Errors are detected Quality assurance procedures are employed (multiple, repeated readings, re-calibration) | *M1 - understand that measurements are approximations and how differences in units affect precision; *DAP3 - propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions. | Justifying and Proving (Mathematical Reasoning) | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Elementary Grades (3-5)

| GLOBE Framework Strategies <u>Analyze and compare GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Elementary Grades 3-5 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|--|--|--|--|
| Identify data components | *DAP2 - describe parts of the data and the set of data as a whole to determine what the data show. | Knowing | | E2cc – Produces a narrative account that creates an organizing structure |
| Identify similarities and differences | | Knowing | | E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... |
| Use appropriate mathematical procedures | *DAP2 - describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed; *DAP2 - use measures of center, focusing on the median, and understand what each does and does not indicate about the data set; *DAP2 - compare different representations of the same data and evaluate how well each representation shows important aspects of the data. *DAP4 - describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible; *DAP4 - predict the probability of outcomes of simple experiments and test the predictions; *DAP4 - understand that the measure of the likelihood of an event can be represented by a number from 0 to 1. *PS3 – apply and adapt a variety of appropriate strategies to solve problems *Cnx1 – recognize and apply mathematics in contexts outside of mathematics | Knowing Justifying and Proving (Mathematical Reasoning) | | |

*NCTM Standards:
 A – Algebra
 M – Measurement
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Cnx – Connections
 NO - Numbers & Operations

Com – Communication
 PS - Problem Solving

DAP - Data Analysis & Probability
 R – Representation

G – Geometry
 RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Elementary Grades (3-5)

| GLOBE Framework Strategies <u>Interpret GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Elementary Grades 3-5 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|--|--|---|---|
| Infer patterns, trends | *A1 - describe, extend, and make generalizations about geometric and numeric patterns; *A1 - represent and analyze patterns and functions, using words, tables, and graphs. *DAP1 - sort and classify objects according to their attributes and organize data about the objects; | Justifying and Proving (Mathematical Reasoning) | | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information |
| Explain data and relationships | *DAP3 - propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions. *Com4 – use the language of mathematics to express mathematical ideas precisely | Justifying and Proving (Mathematical Reasoning) | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E1cb – relates new information to prior knowledge and experience E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E3bf – gives reasons in support of opinions expressed |
| Create multiple formats for representing data | *A3 - model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. *DAP1 - represent data using concrete objects, pictures, and graphs. *DAP1 - represent data using tables and graphs such as line plots, bar graphs, and line graphs; *R1 – create and use representations to organize, record and communicate mathematical ideas *R3 – use representations to model and interpret physical, social and mathematical phenomena | Using Routine Procedures | 7. ... (students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience | E1cc – extends ideas E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E3bg – clarifies, illustrates, or expands on a response ... |

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Elementary Grades (3-5)

| GLOBE Framework Strategies <u>Communicate</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Elementary Grades 3-5 (http://www.nctm.org) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|---|--|---|--|
| Compose informal and informal discourse to inform, explain, persuade AND Create and make presentations of key conclusions and findings | *Com1 – organize and consolidate mathematical thinking through communication *Com2 – communicate mathematical thinking coherently and clearly to peers, teachers and others | Communicating | 4. Students ... communicate effectively with a variety of audiences and for different purposes. 7. ... (students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. 12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). | E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3c – The student prepares and delivers an individual presentation (characteristics listed) E4b – The student analyzes and subsequently revises work to clarify it or make it more effective ... |

*NCTM Standards:
 A – Algebra
 M – Measurement
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Cnx – Connections
 NO - Numbers & Operations

Com – Communication
 PS - Problem Solving

DAP - Data Analysis & Probability
 R – Representation

G – Geometry
 RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Middle School (6-8)

| GLOBE Framework Strategies <u>Planning investigations</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Middle School Grades 6-8 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|---|---|--|
| Students set up a new, appropriate problem/application | *DAP1 - formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population; *DAP3 - use conjectures to formulate new questions and plan new studies to answer them. | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students design an experiment | *DAP1 - formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population; | Investigating and Solving Problems | 7. Students conduct research on issues and interests | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students specify measurements/variables to investigate | *A2- develop an initial conceptual understanding of different uses of variables; *M1 - understand both metric and customary systems of measurement; *M2 - use common benchmarks to select appropriate methods for estimating measurements; | Investigating and Solving Problems | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students pose relevant questions | *DAP3 - use conjectures to formulate new questions and plan new studies to answer them. | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information |

*NCTM Standards:
 A – Algebra
 M – Measurement
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Cnx – Connections
 NO - Numbers & Operations

Com – Communication
 PS - Problem Solving

DAP - Data Analysis & Probability
 R – Representation

G – Geometry
 RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Middle School (6-8)

| GLOBE Framework Strategies <u>Taking Measurements</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Middle School Grades 6-8 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|--|---|--|
| Observations and measurements are accurate and appropriate | *M1 - understand both metric and customary systems of measurement; *M1 - understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume. *M2 - use common benchmarks to select appropriate methods for estimating measurements; *M2 - select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision; | Using Routine Procedures | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Equipment is used properly | | Using Routine Procedures | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Measurement Quality Errors are detected Quality assurance procedures are employed (multiple, repeated readings, re-calibration) | | Justifying and Proving (Mathematical Reasoning) | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |

*NCTM Standards:
 A – Algebra
 M – Measurement
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Cnx – Connections
 NO - Numbers & Operations

Com – Communication
 PS - Problem Solving

DAP - Data Analysis & Probability
 R – Representation

G – Geometry
 RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Middle School (6-8)

| GLOBE Framework Strategies <u>Analyze and compare GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Middle School Grades 6-8 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|---|---|---|---|
| Identify data components | | Knowing | | E2cc – Produces a narrative account that creates an organizing structure |
| Identify similarities and differences | *DAP3 - use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken; | Knowing | | E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... |
| Explain reasons for differences | *DAP3 - use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken; *DAP3 - make conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit; *DAP4 - use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations; | Justifying and Proving (Mathematical Reasoning) | | |
| Use appropriate mathematical procedures | *DAP2 - find, use, and interpret measures of center and spread, including mean and interquartile range; *DAP2 - discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatter plots. *PS3 – apply and adapt a variety of appropriate strategies to solve problems *Cnx1 – recognize and apply mathematics in contexts outside of mathematics | Knowing Justifying and Proving (Mathematical Reasoning) | | |

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Cnx – Connections
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GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Middle School (6-8)

| GLOBE Framework Strategies <u>Interpret GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Middle School Grades 6-8 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|---|--|---|--|
| Infer patterns, trends | *A1 - represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules; | Justifying and Proving (Mathematical Reasoning) | | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information |
| Explain data and relationships | *DAP2 - discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatter plots. *Com4 – use the language of mathematics to express mathematical ideas precisely | Justifying and Proving (Mathematical Reasoning) | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E1cb – relates new information to prior knowledge and experience E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E2e – produces a persuasive essay that (d) includes appropriate information and arguments (e) excludes information and arguments that are irrelevant (g) supports arguments with detailed evidence |
| Create multiple formats for representing data | *A1 - represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules; *A1 - relate and compare different forms of representation for a relationship; *A2-2 explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope; *A3 - model and solve contextualized problems using various representations, such as graphs, tables, and equations. *DAP1 - select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots. *R1 – create and use representations to organize, record and communicate mathematical ideas *R3 – use representations to model and interpret physical, social and mathematical phenomena | Using Routine Procedures | 7. ...(students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. | E1cc – extends ideas E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E3bg – clarifies, illustrates, or expands on a response ... |

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GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – Middle School (6-8)

| GLOBE Framework Strategies <u>Communicate</u> | National Council of Teachers of Mathematics The standards listed below have been identified for Middle School Grades 6-8 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|--|--|---|--|
| Compose informal and informal discourse to inform, explain, persuade AND Create and make presentations of key conclusions and findings | *Com1 – organize and consolidate mathematical thinking through communication *Com2 – communicate mathematical thinking coherently and clearly to peers, teachers and others | Communicating | 4. Students ... communicate effectively with a variety of audiences and for different purposes. 7. ... (students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. 12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). | E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader E3c – The student prepares and delivers an individual presentation (characteristics listed) E4b – The student analyzes and subsequently revises work to clarify it or make it more effective ... |

*NCTM Standards:
 A – Algebra
 M – Measurement
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Cnx – Connections
 NO - Numbers & Operations

Com – Communication
 PS - Problem Solving

DAP - Data Analysis & Probability
 R – Representation

G – Geometry
 RAP - Reasoning & Proof

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – High School (9 – 12)

| GLOBE Framework Strategies <u>Planning investigations</u> | National Council of Teachers of Mathematics The standards listed below have been identified for High School Grades 9-12 (http://www.nctm.org) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|--|---|--|
| Students set up a new, appropriate problem/application | *DAP1 - know the characteristics of well-designed studies, including the role of randomization in surveys and experiments; | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students design an experiment | *DAP1 - know the characteristics of well-designed studies, including the role of randomization in surveys and experiments; | Investigating and Solving Problems | 7. Students conduct research on issues and interests | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students specify measurements/variables to investigate | *DAP1 - understand the meaning of measurement data and categorical data, of univariate and bivariate data, and of the term variable; | Investigating and Solving Problems | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Students pose relevant questions | | Investigating and Solving Problems | 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. | E1cd – makes connections to related topics or information E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information |

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GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – High School (9 – 12)

| GLOBE Framework Strategies Taking Measurements | National Council of Teachers of Mathematics The standards listed below have been identified for High School Grades 9-12 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|---|---|--|---|--|
| Observations and measurements are accurate and appropriate | *NO3 - judge the reasonableness of numerical computations and their results. | Using Routine Procedures | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Equipment is used properly | | Using Routine Procedures | | E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |
| Measurement Quality Errors are detected Quality assurance procedures are employed (multiple, repeated readings, re-calibration) | *NO3 - judge the reasonableness of numerical computations and their results. *M1 - make decisions about units and scales that are appropriate for problem situations involving measurement. *M2 - analyze precision, accuracy, and approximate error in measurement situations; *M2 - use unit analysis to check measurement computations. *M2 - apply informal concepts of successive approximation, upper and lower bounds, and limit in measurement situations; *DAP3 - use simulations to explore the variability of sample statistics from a known population sampling distributions; *DAP3 - understand how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal inference; | Justifying and Proving (Mathematical Reasoning) | | E7ac – critiques functional documents ... (with an) awareness of possible reader misunderstanding E2df – creates a narrative procedure that anticipates problems, mistakes, and misunderstandings that might arise for the reader |

GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – High School (9 – 12)

| GLOBE Framework Strategies <u>Analyze and compare GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for High School Grades 9-12 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|--|--|---|---|
| Identify data components | *DAP1 - compute basic statistics and understand the distinction between a statistic and a parameter. | Knowing | | E2cc – Produces a narrative account that creates an organizing structure |
| Identify similarities and differences | | Knowing | | E1ca – restates or summarizes information E1cb – relates new information to prior knowledge and experience E2ae – excludes extraneous and inappropriate information E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... |
| Explain reasons for differences | *NO3 - judge the reasonableness of numerical computations and their results. *A3 - draw reasonable conclusions about a situation being modeled. *DAP1 - understand the differences among various kinds of studies and which types of inferences can legitimately be drawn from each; | Justifying and Proving (Mathematical Reasoning) | 8. Students ... gather and synthesize information (to) create and communicate knowledge | E6bb – utilizes and recognizes the power of logical arguments |
| Use appropriate mathematical procedures | *A2 - use symbolic algebra to represent and explain mathematical relationships; *A4 - approximate and interpret rates of change from graphical and numerical data. *G1 - use trigonometric relationships to determine lengths and angle measures. *G2 - use Cartesian coordinates and other coordinate systems, such as navigational, polar, or spherical systems, to analyze geometric situations; *G4 - Use visualization, spatial reasoning, and geometric modeling to solve problems *PS3 – apply and adapt a variety of appropriate strategies to solve problems *Cnx1 – recognize and apply mathematics in contexts outside of mathematics | Knowing Justifying and Proving (Mathematical Reasoning) | | |

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GLOBE FRAMEWORK STRATEGY LINKAGE TABLE – High School (9 – 12)

| GLOBE Framework Strategies <u>Interpret GLOBE data</u> | National Council of Teachers of Mathematics The standards listed below have been identified for High School Grades 9-12 (http://www.nctm.org/) | Third International Math & Science Study Math Standards | National Council of Teachers of English / International Reading Association | New Standards |
|--|--|--|---|--|
| Infer patterns, trends | *A1 - generalize patterns using explicitly defined and recursively defined functions; *A4 - approximate and interpret rates of change from graphical and numerical data. *DAP2 - recognize how linear transformations of univariate data affect shape, center, and spread; *DAP2 - identify trends in bivariate data and find functions that model the data or transform the data so that they can be modeled. | Justifying and Proving (Mathematical Reasoning) | | E2ad – includes appropriate facts and details E2ae – excludes extraneous and inappropriate information |
| Explain data and relationships | *NO1 - use number-theory arguments to justify relationships involving whole numbers *Com4 – use the language of mathematics to express mathematical ideas precisely | Justifying and Proving (Mathematical Reasoning) | | E1cb – relates new information to prior knowledge and experience E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E2e – produces a persuasive essay that (d) includes appropriate information and arguments (e) excludes information and arguments that are irrelevant (g) supports arguments with detailed evidence |
| Create multiple formats for representing data | *A2 - use symbolic algebra to represent and explain mathematical relationships; *DAP2 - for univariate measurement data, be able to display the distribution, describe its shape, and select and calculate summary statistics; *DAP2 - for bivariate measurement data, be able to display a scatter plot, describe its shape, and determine regression coefficients, regression equations, and correlation coefficients using technological tools; *DAP2 - display and discuss bivariate data where at least one variable is categorical; *R1 – create and use representations to organize, record and communicate mathematical ideas *R3 – use representations to model and interpret physical, social and mathematical phenomena | Using Routine Procedures | 7. ...(students) gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. | E1cc – extends ideas E2af – uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject... E2e – produces a persuasive essay that (h) uses a range of strategies to elaborate and persuade such as definitions, descriptions, illustrations, examples from evidence, and anecdotes E3bg – clarifies, illustrates, or expands on a response ... |

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