

A Correlation of
Population Connection Materials

from

Multiplying People, Dividing Resources:
Global Math Activities

to

California State Board of Education
Content Standards

Organized by:

1. Subject

2. Grade

3. Standard

4. Population Connection Activity

Table of Contents

English Language Development

<i>Grades Three Through Five</i>	4
<i>Grades Six Through Eight</i>	4
<i>Grades Nine Through Twelve</i>	5

History and Social Science

<i>Third Grade</i>	7
<i>Eighth Grade</i>	7
<i>Tenth Grade</i>	7
<i>Eleventh Grade</i>	8
<i>Twelfth Grade</i>	8
<i>Grades Nine Through Twelve</i>	8

Language Arts

<i>Third Grade</i>	10
<i>Fourth Grade</i>	10
<i>Sixth Grade</i>	11
<i>Grades Nine Through Ten</i>	11

Mathematics

<i>Third Grade</i>	12
<i>Fourth Grade</i>	12
<i>Fifth Grade</i>	13
<i>Sixth Grade</i>	15
<i>Seventh Grade</i>	19
<i>Grades Eight Through Twelve</i>	21

Science

<i>Second Grade</i>	23
<i>Third Grade</i>	23
<i>Fourth Grade</i>	23
<i>Fifth Grade</i>	24
<i>Sixth Grade: Focus on Earth Sciences</i>	25
<i>Seventh Grade: Focus on Life Sciences</i>	26
<i>Eighth Grade: Focus on Physical Sciences</i>	26
<i>High School:</i>	
<i>Chemistry</i>	27
<i>Biology</i>	27
<i>Investigation and Experimentation</i>	28

English Language Development

Grade Three to Grade Five

(ELD.3-5.Beginning) Listening and Speaking: Comprehension

Answer simple questions with one- to two-word responses.
Everything Counts
Timber!

(ELD.3-5.Early Intermediate) Listening and Speaking: Comprehension

Ask and answer questions by using phrases or simple sentences.
Everything Counts
Timber!

(ELD.3-5.Beginning) Reading: Comprehension

Understand and follow simple one-step directions for classroom activities.
Everything Counts
Timber!

(ELD.3-5.Early Intermediate) Reading: Comprehension

Understand and follow simple two-step directions for classroom activities.
Everything Counts
Timber!

Understand and follow some multiple-step directions for classroom-related activities.
Everything Counts
Timber!

Grade Six to Grade Eight

(ELD.6-8.Beginning) Listening and Speaking: Comprehension

Ask and answer questions by using simple sentences or phrases.
Everything Counts
Measuring a Million
On the Double
The Pop Ecology Files
Power of the Pyramids
The Stork and the Grim Reaper
Timber!
Transportation Tally
What Do You Think?
A World of Difference
World Real Estate

(ELD.6-8.Early Intermediate) Listening and Speaking: Comprehension

Ask and answer questions by using phrases or simple sentences.
All in the Family
Everything Counts

Measuring a Million
On the Double
The Pop Ecology Files
Power of the Pyramids
The Stork and the Grim Reaper
Timber!
Transportation Tally
What Do You Think?
A World of Difference
World Real Estate

(ELD.6-8.Beginning) Reading: Comprehension

Understand and follow simple multiple-step oral directions for classroom or work-related activities.

All in the Family
Every Picture Tells a Story
Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
On the Double
Population Clock
Power of the Pyramids
The Stork and the Grim Reaper
Timber!
Transportation Tally
What Do You Think?
A World of Difference
World Real Estate

Grades Nine to Twelve

(ELD.9-12.Beginning) Listening and Speaking: Comprehension

Ask and answer questions by using simple sentences or phrases.

All in the Family
How Much Space Do We Need?
Power of the Pyramids

(ELD.9-12.Early Intermediate) Listening and Speaking: Comprehension

Ask and answer questions by using phrases or simple sentences.

All in the Family
Power of the Pyramids
Transportation Tally
A World of Difference
What Do You Think?

(ELD.9-12.Intermediate) Listening and Speaking: Comprehension and Organization and Delivery of Oral Communication

Participate in social conversations with peers and adults on familiar topics by asking and answering questions and soliciting information.

What Do You Think?

(ELD.9-12.Beginning) Reading: Comprehension

Understand and follow simple multiple-step oral directions for classroom or work-related activities.

All in the Family
Every Picture Tells a Story
Global Warming Begins at Home
How Much Space Do We Need?
Power of the Pyramids
Transportation Tally
A World of Difference
What Do You Think?

(ELD.9-12.Beginning) Writing: Penmanship and Organization and Focus

Organize and record information from selected literature and content areas by displaying it on pictures, lists, charts, and tables.

What Do You Think?

History and Social Science

Grade Three

(Social Science.3.4) Students understand the role of rules and laws in our daily lives and the basic structure of the U.S. government.

2. Discuss the importance of public virtue and the role of citizens, including how to participate in a classroom, in the community, and in civic life.

Timber!

(Social Science.3.5) Students demonstrate basic economic reasoning skills and an understanding of the economy of the local region.

1. Describe the ways in which local producers have used and are using natural resources, human resources, and capital resources to produce goods and services in the past and the present.

Timber!

Grade Eight

(Social Science.8.6) Students analyze the divergent paths of the American people from 1800 to the mid-1800s and the challenges they faced, with emphasis on the Northeast.

1. Discuss the influence of industrialization and technological developments on the region, including human modification of the landscape and how physical geography shaped human actions (e.g., growth of cities, deforestation, farming, mineral extraction).

Timber!

Grade Ten

(Social Science.10.3) Students analyze the effects of the Industrial Revolution in England, France, Germany, Japan, and the United States.

2. Examine how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change (e.g., the inventions and discoveries of James Watt, Eli Whitney, Henry Bessemer, Louis Pasteur, Thomas Edison).

Transportation Tally

(Social Science.10.10) Students analyze instances of nation-building in the contemporary world in at least two of the following regions or countries: the Middle East, Africa, Mexico and other parts of Latin America, and China.

1. Understand the challenges in the regions, including their geopolitical, cultural, military, and economic significance and the international relationships in which they are involved.

Power of the Pyramids

A World of Difference

2. Describe the recent history of the regions, including political divisions and systems, key leaders, religious issues, natural features, resources, and population patterns.

Power of the Pyramids

A World of Difference

Grade Eleven

(Social Science.11.5) Students analyze the major political, social, economic, technological, and cultural developments of the 1920s.

7. Discuss the rise of mass production techniques, the growth of cities, the impact of new technologies (e.g., the automobile, electricity), and the resulting prosperity and effect on the American landscape.

Global Warming Begins at Home
Transportation Tally

(Social Science.11.8) Students analyze the economic boom and social transformation of post-World War II America.

7. Describe the effects on society and the economy of technological developments since 1945, including the computer revolution, changes in communication, advances in medicine, and improvements in agricultural technology.

Power of the Pyramids
Transportation Tally

(Social Science.11.11) Students analyze the major social problems and domestic policy issues in contemporary American society.

5. Trace the impact of, need for, and controversies associated with environmental conservation, expansion of the national park system, and the development of environmental protection laws, with particular attention to the interaction between environmental protection advocates and property rights advocates.

What Do You Think?

Grade Twelve

(Social Science.12) Principles of American Democracy

12.2 Students evaluate and take and defend positions on the scope and limits of rights and obligations as democratic citizens, the relationships among them, and how they are secured.

5. Describe the reciprocity between rights and obligations; that is, why enjoyment of one's rights entails respect for the rights of others.

What Do You Think?

(Social Science.12) Principles of Economics

12.1 Students understand common economic terms and concepts and economic reasoning.

1. Examine the causal relationship between scarcity and the need for choices.

A World of Difference

Grades Nine to Twelve

(Social Science.9-12) Chronological and Spatial Thinking

1. Students compare the present with the past, evaluating the consequences of past events and decisions and determining the lessons that were learned.

Power of the Pyramids
Transportation Tally

2. Students analyze how change happens at different rates at different times; understand that some aspects can change while others remain the same; and understand that change is complicated and affects not only technology and politics but also values and beliefs.

Power of the Pyramids

Transportation Tally

3. Students use a variety of maps and documents to interpret human movement, including major patterns of domestic and international migration, changing environmental preferences and settlement patterns, the frictions that develop between population groups, and the diffusion of ideas, technological innovations, and goods.

World Real Estate

4. Students relate current events to the physical and human characteristics of places and regions.

Transportation Tally

(Social Science.9-12) Historical Interpretation

5. Students analyze human modifications of landscapes and examine the resulting environmental policy issues.

Transportation Tally

A World of Difference

Language Arts

Grade Three

(Language Arts.3) Reading

2.0. Reading Comprehension: Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). The selections in Recommended Readings in Literature, Kindergarten Through Grade Eight illustrate the quality and complexity of the materials to be read by students. In addition to their regular school reading, by grade four, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade three, students make substantial progress toward this goal.

Comprehension and Analysis of Grade-Level-Appropriate Text

- 2.7. Follow simple multiple-step written instructions (e.g., how to assemble a product or play a board game).
Everything Counts
Timber!

(Language Arts.3) Listening and Speaking

1.0. Listening and Speaking Strategies: Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension

- 1.3. Respond to questions with appropriate elaboration.
Everything Counts
Timber!

Grade Four

(Language Arts.4) Written and Oral English Language Conventions

1.0. Written and Oral English Language Conventions: Students write and speak with a command of standard English conventions appropriate to this grade level.

Sentence Structure

- 1.1. Use simple and compound sentences in writing and speaking.
Everything Counts
Timber!

(Language Arts.4) Listening and Speaking

1.0. Listening and Speaking Strategies: Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension

- 1.1. Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.
Everything Counts
Timber!

Grade Six

(Language Arts.6) Listening and Speaking

1.0. Listening and Speaking Strategies: Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Comprehension

1.3. Restate and execute multiple-step oral instructions and directions.

All in the Family

Power of the Pyramids

The Stork and the Grim Reaper

Timber!

What Do You Think?

A World of Difference

World Real Estate

Grades Nine to Ten

(Language Arts.9-10) Listening and Speaking

2.0. Speaking Applications (Genres and Their Characteristics): Students deliver polished formal and extemporaneous presentations that combine the traditional rhetorical strategies of narration, exposition, persuasion, and description. Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.

2.3 Apply appropriate interviewing techniques:

a. Prepare and ask relevant questions.

What Do You Think?

b. Make notes of responses.

What Do You Think?

f. Compile and report responses.

What Do You Think?

Mathematics

Grade Three

(Math.3) Number Sense

2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:

2.1 Find the sum or difference of two whole numbers between 0 and 10,000.

Everything Counts

Timber!

(Math.3) Algebra and Functions

2.0 Students represent simple functional relationships:

2.2 Extend and recognize a linear pattern by its rules (e.g., the number of legs on a given number of horses may be calculated by counting by 4s or by multiplying the number of horses by 4).

Timber!

(Math.3) Measurement and Geometry

1.0 Students choose and use appropriate units and measurement tools to quantify the properties of objects:

1.1 Choose the appropriate tools and units (metric and U.S.) and estimate and measure the length, liquid volume, and weight/mass of given objects.

Measuring a Million

The Stork and the Grim Reaper

(Math.3) Mathematical Reasoning

2.0 Students use strategies, skills, and concepts in finding solutions:

2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

Timber!

2.4 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.

Timber!

Grade Four

(Math.4) Number Sense

1.0 Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions. Students use the concepts of negative numbers:

1.1 Read and write whole numbers in the millions.

Measuring a Million

On the Double

Population Clock

Power of the Pyramids

1.2 Order and compare whole numbers and decimals to two decimal places.

On the Double

(Math.4) Algebra and Functions

1.0 Students use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences:

1.1 Use letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate an understanding and the use of the concept of a variable).

Everything Counts

(Math.4) Statistics, Data Analysis, and Probability

1.0 Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings:

1.1 Formulate survey questions; systematically collect and represent data on a number line; and coordinate graphs, tables, and charts.

What Do You Think?

A World of Difference

1.3 Interpret one-and two-variable data graphs to answer questions about a situation.

Every Picture Tells a Story

Power of the Pyramids

The Pop Ecology Files

World Real Estate

2.0 Students make predictions for simple probability situations:

2.2 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4; $3/4$).

A World of Difference

(Math.4) Mathematical Reasoning

2.0 Students use strategies, skills, and concepts in finding solutions:

2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

Everything Counts

Population Circle

Timber!

World Real Estate

2.4 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.

Everything Counts

On the Double

Grade Five

(Math.5) Number Sense

2.0 Students perform calculations and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals:

2.1 Add, subtract, multiply, and divide with decimals; add with negative integers; subtract positive integers from negative integers; and verify the reasonableness of the results.

All in the Family

Every Picture Tells a Story

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

On the Double
The Pop Ecology Files
Population Clock
Timber!
Transportation Tally

2.3 Solve simple problems, including ones arising in concrete situations, involving the addition and subtraction of fractions and mixed numbers (like and unlike denominators of 20 or less), and express answers in the simplest form.

The Stork and the Grim Reaper
A World of Difference

(Math.5) Algebra and Functions

1.0 Students use variables in simple expressions, compute the value of the expression for specific values of the variable, and plot and interpret the results:

1.1 Use information taken from a graph or equation to answer questions about a problem situation.

All in the Family
Every Picture Tells a Story
Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
On the Double
The Pop Ecology Files
Power of the Pyramids
Timber!
Transportation Tally
What Do You Think?

1.2 Use a letter to represent an unknown number; write and evaluate simple algebraic expressions in one variable by substitution.

Everything Counts
Global Warming Begins at Home

(Math.5) Measurement and Geometry

1.0 Students understand and compute the volumes and areas of simple objects:

1.3 Understand the concept of volume and use the appropriate units in common measuring systems (i.e., cubic centimeter [cm³], cubic meter [m³], cubic inch [in³], cubic yard [yd³]) to compute the volume of rectangular solids.

How Much Space Do We Need?
Measuring a Million

(Math.5) Statistics, Data Analysis, and Probability

1.0 Students display, analyze, compare, and interpret different data sets, including data sets of different sizes:

1.2 Organize and display single-variable data in appropriate graphs and representations (e.g., histogram, circle graphs) and explain which types of graphs are appropriate for various data sets.

Every Picture Tells a Story
Power of the Pyramids
What Do You Think?
World Real Estate

1.3 Use fractions and percentages to compare data sets of different sizes.

Food for Thought
Power of the Pyramids

A World of Difference

(Math.5) Mathematical Reasoning

2.0 Students use strategies, skills, and concepts in finding solutions:

2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

All in the Family
Every Picture Tells a Story
Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
On the Double
The Pop Ecology Files
Population Riddles
Timber!
Transportation Tally
What Do You Think?
A World of Difference
World Real Estate

2.4 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.

Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
On the Double
People Count
The Pop Ecology Files
Timber!
What Do You Think?
A World of Difference

2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

Everything Counts
The Stork and the Grim Reaper

(Math.5) Mathematical Reasoning

3.0 Students move beyond a particular problem by generalizing to other situations:

3.3 Develop generalizations of the results obtained and apply them in other circumstances.

Global Warming Begins at Home
On the Double
Population Clock
The Pop Ecology Files
Timber!
Transportation Tally
A World of Difference

Grade Six

(Math.6) Number Sense

1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages:

1.2 Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b , a to b , $a:b$).

How Much Space Do We Need?

Measuring a Million

On the Double

Population Clock

Population Riddles

The Pop Ecology Files

The Stork and the Grim Reaper

Timber!

Transportation Tally

2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:

2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations that use positive and negative integers and combinations of these operations.

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

On the Double

The Pop Ecology Files

Population Clock

Power of the Pyramids

Timber!

Transportation Tally

(Math.6) Algebra and Functions

1.0 Students write verbal expressions and sentences as algebraic expressions and equations; they evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results:

1.1 Write and solve one-step linear equations in one variable.

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

On the Double

The Pop Ecology Files

Population Clock

Power of the Pyramids

Transportation Tally

1.2 Write and evaluate an algebraic expression for a given situation, using up to three variables.

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

On the Double

The Pop Ecology Files

Population Clock

Power of the Pyramids

Transportation Tally

2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions:

2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).

How Much Space Do We Need?

Measuring a Million

(Math.6) Statistics, Data Analysis, and Probability

1.0 Students compute and analyze statistical measurements for data sets:

1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.

What Do You Think?

(Math.6) Algebra and Functions

3.0 Students investigate geometric patterns and describe them algebraically:

3.1 Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = 1/2bh$, $C = \pi d$ - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).

Measuring a Million

3.2 Express in symbolic form simple relationships arising from geometry.

Measuring a Million

(Math.6) Statistics, Data Analysis, and Probability

1.0 Students compute and analyze statistical measurements for data sets:

1.1 Compute the range, mean, median, and mode of data sets.

What Do You Think?

2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:

2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.

Every Picture Tells a Story

Everything Counts

People Count

Power of the Pyramids

What Do You Think?

2.2 Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.

Everything Counts

2.3 Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.

Every Picture Tells a Story

What Do You Think?

World Population Video

2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.

Everything Counts

What Do You Think?

2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.

Everything Counts

What Do You Think?

A World of Difference

3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:

3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).

A World of Difference

(Math.6) Mathematical Reasoning

1.0 Students make decisions about how to approach problems:

1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.

All in the Family

Every Picture Tells a Story

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

Population Clock

Transportation Tally

What Do You Think?

A World of Difference

2.0 Students use strategies, skills, and concepts in finding solutions:

2.4 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

All in the Family

Every Picture Tells a Story

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

The Pop Ecology Files

Population Clock

Power of the Pyramids

The Stork and the Grim Reaper

Timber!

Transportation Tally

What Do You Think?

A World of Difference

2.7 Make precise calculations and check the validity of the results from the context of the problem.

Everything Counts

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

On the Double

Population Clock

Power of the Pyramids

The Stork and the Grim Reaper

Timber!

A World of Difference

Grade Seven

(Math.7) Number Sense

1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms:

1.7 Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.

The Pop Ecology Files

(Math.7) Algebra and Functions

1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:

1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

On the Double

The Pop Ecology Files

Population Clock

Power of the Pyramids

Transportation Tally

1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.

All in the Family

Every Picture Tells a Story

Power of the Pyramids

The Pop Ecology Files

What Do You Think?

(Math.7) Measurement and Geometry

1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:

1.1 Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).

How Much Space Do We Need?

Measuring a Million

The Stork and the Grim Reaper

1.3 Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.

Global Warming Begins at Home

How Much Space Do We Need?

On the Double

Population Clock

The Stork and the Grim Reaper

Transportation Tally

2.0 Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale:

2.1 Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders.

How Much Space Do We Need?

Measuring a Million

(Math.7) Statistics, Data Analysis, and Probability

1.0 Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program:

1.1 Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data.

Every Picture Tells a Story

The Pop Ecology Files

What Do You Think?

1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level).

Every Picture Tells a Story

1.3 Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set.

What Do You Think?

(Math.7) Mathematical Reasoning

1.0 Students make decisions about how to approach problems:

1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

Transportation Tally

1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.

All in the Family

Everything Counts

Everything Is Connected

Global Warming Begins at Home

How Much Space Do We Need?

Measuring a Million

Population Clock

Transportation Tally

What Do You Think?

A World of Difference

2.0 Students use strategies, skills, and concepts in finding solutions:

2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.

Population Circle

2.5 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

All in the Family
Every Picture Tells a Story
Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
The Pop Ecology Files
Population Clock
Power of the Pyramids
Stage Stepping
The Stork and the Grim Reaper
Timber!
Transportation Tally
What Do You Think?
A World of Difference

2.8 Make precise calculations and check the validity of the results from the context of the problem.

Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
On the Double
Population Clock
Power of the Pyramids
The Stork and the Grim Reaper
Timber!
A World of Difference

Grades Eight to Twelve

(Math.8-12) Algebra I

10.0 Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.

Global Warming Begins at Home
How Much Space Do We Need?

15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.

All in the Family
Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
On the Double
The Pop Ecology Files
Power of the Pyramids
The Stork and the Grim Reaper
Transportation Tally
World Real Estate

(Math.8-12) Algebra II

19.0 Students use combinations and permutations to compute probabilities.

A World of Difference

(Math.8-12) Geometry

8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

Measuring a Million

(Math.8-12) Probability and Statistics

1.0 Students know the definition of the notion of independent events and can use the rules for addition, multiplication, and complementation to solve for probabilities of particular events in finite sample spaces.

A World of Difference

6.0 Students know the definitions of the mean, median, and mode of a distribution of data and can compute each in particular situations.

What Do You Think?

8.0 Students organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.

All in the Family

Every Picture Tells a Story

The Pop Ecology Files

Power of the Pyramids

Timber!

What Do You Think?

World Real Estate

(Math.8-12) Advanced Placement Probability and Statistics

1.0 Students solve probability problems with finite sample spaces by using the rules for addition, multiplication, and complementation for probability distributions and understand the simplifications that arise with independent events.

A World of Difference

14.0 Students organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line graphs and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.

All in the Family

Every Picture Tells a Story

The Pop Ecology Files

Power of the Pyramids

What Do You Think?

World Real Estate

Science

Grade Two

(Science.2) 3. Earth Sciences. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:

e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.

Timber!

(Science.2) 4. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

a. Make predictions based on observed patterns and not random guessing.

Timber!

g. Follow oral instructions for a scientific investigation.

Timber!

Grade Three

(Science.3) 3. Life Sciences. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

Timber!

(Science.3) 5. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

c. Use numerical data in describing and comparing objects, events, and measurements.

Timber!

d. Predict the outcome of a simple investigation and compare the result with the prediction.

Timber!

e. Collect data in an investigation and analyze those data to develop a logical conclusion.

Timber!

Grade Four

(Science.4) 3. Life Sciences. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

A World of Difference

c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

Timber!

(Science.4) 6. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

b. Measure and estimate the weight, length, or volume of objects.
Measuring a Million

c. Formulate and justify predictions based on cause-and-effect relationships.
Everything Counts
Power of the Pyramids
The Pop Ecology Files
Timber!
A World of Difference

e. Construct and interpret graphs from measurements.
Everything Counts
Power of the Pyramids
What Do You Think?

f. Follow a set of written instructions for a scientific investigation.
Timber!

Grade Five

(Science.5) 6. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

b. Develop a testable question.
What Do You Think?

c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
What Do You Think?

f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
Measuring a Million
The Stork and the Grim Reaper

g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
All in the Family
Every Picture Tells a Story
Everything Counts
How Much Space Do We Need?
On the Double
The Pop Ecology Files
Power of the Pyramids
Timber!
What Do You Think?
A World of Difference
World Real Estate

h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

All in the Family
Every Picture Tells a Story
Global Warming Begins at Home
How Much Space Do We Need?
On the Double
The Pop Ecology Files
Power of the Pyramids
The Stork and the Grim Reaper
Timber!
What Do You Think?
A World of Difference
World Population Video

Grade Six: Focus on Earth Sciences

(Science.6) 5. Ecology (Life Sciences). Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:

e. Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

How Much Space Do We Need?
Timber!
A World of Difference

(Science.6) 6. Resources. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:

a. Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Global Warming Begins at Home
Transportation Tally
The Balance of Nature

b. Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.

Global Warming Begins at Home
Timber!

(Science.6) 7. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

a. Develop a hypothesis.

What Do You Think?

b. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.

Every Picture Tells a Story
Measuring a Million
Timber!

c. Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.

All in the Family
Every Picture Tells a Story
The Pop Ecology Files
Power of the Pyramids
Timber!
What Do You Think?

- d. Communicate the steps and results from an investigation in written reports and oral presentations.

Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
What Do You Think?

Grade Seven: Focus on Life Sciences

(Science.7) 7. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.

Every Picture Tells a Story
Measuring a Million
Timber!

- c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

All in the Family
Everything Counts
What Do You Think?
A World of Difference

- e. Communicate the steps and results from an investigation in written reports and oral presentations.

Everything Counts
Global Warming Begins at Home
How Much Space Do We Need?
Measuring a Million
What Do You Think?

Grade Eight: Focus on Physical Sciences

(Science.8) 5. Reactions. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:

- a. Students know reactant atoms and molecules interact to form products with different chemical properties.
Global Warming Begins at Home

(Science.8) 9. Investigation and Experimentation. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- a. Plan and conduct a scientific investigation to test a hypothesis.
What Do You Think?

e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.

All in the Family
Every Picture Tells a Story
The Pop Ecology Files
Power of the Pyramids
Timber!
What Do You Think?

g. Distinguish between linear and nonlinear relationships on a graph of data.

All in the Family
Every Picture Tells a Story
The Pop Ecology Files
Timber!

Grades Nine to Twelve: Chemistry

2. Chemical Bonds. Biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules. As a basis for understanding this concept:

b. Students know chemical bonds between atoms in molecules such as H₂, CH₄, NH₃, H₂CCH₂, N₂, Cl₂, and many large biological molecules are covalent.

Global Warming Begins at Home

3. Conservation of Matter and Stoichiometry. The conservation of atoms in chemical reactions leads to the principle of conservation of matter and the ability to calculate the mass of products and reactants. As a basis for understanding this concept:

a. Students know how to describe chemical reactions by writing balanced equations.

Global Warming Begins at Home

Grades Nine to Twelve: Biology/Life Sciences

6. Ecology. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:

a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.

A World of Difference

b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.

Global Warming Begins at Home

The Pop Ecology Files

A World of Difference

c. Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death.

All in the Family

On the Double

Population Clock

Power of the Pyramids

The Stork and the Grim Reaper

- e. Students know a vital part of an ecosystem is the stability of its producers and decomposers.
The Stork and the Grim Reaper

Grades Nine to Twelve: Investigation and Experimentation

- 1. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:
 - a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.
 - Every Picture Tells a Story
 - The Pop Ecology Files
 - Power of the Pyramids
 - What Do You Think?
 - d. Formulate explanations by using logic and evidence.
 - Global Warming Begins at Home
 - The Pop Ecology Files
 - Power of the Pyramids
 - l. Analyze situations and solve problems that require combining and applying concepts from more than one area of science.
 - Global Warming Begins at Home
 - How Much Space Do We Need?
 - The Pop Ecology Files
 - m. Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.
 - All in the Family
 - Every Picture Tells a Story
 - Global Warming Begins at Home
 - How Much Space Do We Need?
 - The Pop Ecology Files
 - Power of the Pyramids
 - A World of Difference
 - World Real Estate