

## MATHEMATICS – ALGEBRA I

**Subject:** Algebra I

**Academic Standard:** A1.1

**Academic Standard Indicator:** A1.1.4

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Use the laws of exponents for rational exponents.

**Suggestion for Integrating International Content:** Spark student interest in comparing linear versus exponential growth by using this comment from the 19th-century controversial British economist and mathematician, Thomas Malthus: “Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will shew the immensity of the first power in comparison of the second.” Have students consider Malthus' vision of a bleak future for the world and discuss whether he was correct. *Suggested resource:* [http://members.optusnet.com.au/exponentialist/Linear\\_Vs\\_Exponential.htm/](http://members.optusnet.com.au/exponentialist/Linear_Vs_Exponential.htm/).

**Subject:** Algebra I

**Academic Standard:** A1.1

**Academic Standard Indicator:** A1.1.5

**Core Standard:** No

**Standard Description (Academic or Indicator):** Use dimensional (unit) analysis to organize conversions and computations.

**Suggestion for Integrating International Content:** Have students look at population and geographic data for a variety of countries to determine various rates of growth and population density. Have them compare rates in various countries, convert them into different units, and then use these rates to answer questions and to make projections for future levels.

**Subject:** Algebra I

**Academic Standard:** A1.1

**Academic Standard Indicator:** A1.1.5

**Core Standard:** No

**Standard Description (Academic or Indicator):** Use dimensional (unit) analysis to organize conversions and computations.

**Suggestion for Integrating International Content:** Have students use current exchange rates to compare the relative value of international currencies. Then have them examine average working wages in various countries, comparing how much workers are compensated for a given period of work.

*Suggested resource:*

<http://www.oanda.com/currency/converter/>.

**Subject:** Algebra I

**Academic Standard:** A1.3

**Academic Standard Indicator:** A1.3.2

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Interpret a graph representing a given situation.

**Suggestion for Integrating International Content:** Have students use graphs that display greenhouse gas emissions and projections to anchor a discussion of graphic representation. Students can work with various graphs to make interpretations, answer questions related to the graph, and then discuss the implications of future projections. *Suggested resource:* <http://www.epa.gov/>.

**Differentiated Instruction - Highly Able Accommodations:** Have students use tables from various Internet sources to track correlating information. *Example:* Amount of ice that is melting at the polar icecaps. Have students create graphs comparing the two icecaps and draw their own conclusions on the validity of the theory.

**Subject:** Algebra I

**Academic Standard:** A1.3

**Academic Standard Indicator:** A1.3.2

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Interpret a graph representing a given situation.

**Suggestion for Integrating International**

**Content:** Have students look at graphs representing the change in glacial formations around the world over the past few decades. Students could discuss trends in the graph or perhaps write an op-ed piece citing patterns or trends shown by the graph. *Suggested resource:* <http://www.NSIDC.org/>.

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**Subject:** Algebra I

**Academic Standard:** A1.4

**Academic Standard Indicator:** A1.4.1

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Graph a linear equation.

**Suggestion for Integrating International**

**Content:** Have students use trend data related to population growth or other indices in various countries to create linear equations to predict future population levels. Then have them graph the equations and make comparisons.

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**Subject:** Algebra I

**Academic Standard:** A1.4

**Academic Standard Indicator:** A1.4.5

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Write the equation of a line that models a data set and use the equation (or the graph of the equation) to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

**Suggestion for Integrating International**

**Content:** Have students use trend data related to population growth or other indices in various countries to create linear equations to predict future population levels.

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**Subject:** Algebra I

**Academic Standard:** A1.5

**Academic Standard Indicator:** A1.5.1

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Use a graph to estimate the solution of a pair of linear equations in two variables.

**Suggestion for Integrating International**

**Content:** Have students use trend data related to population growth in various countries to create linear equations to predict future population levels. Then have them create graphs of these equations and use the graphs to determine if and when various countries would have equal populations.

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**Subject:** Algebra I

**Academic Standard:** A1.8

**Academic Standard Indicator:** A1.8.1

**Core Standard:** Yes

**Standard Description (Academic or Indicator):** Graph quadratic, cubic, and radical equations.

**Suggestion for Integrating International**

**Content:** Have students use actual data from a variety of arched (parabolic) bridges in various countries to match or create quadratic equations that describe their structures.

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