Mathematics High School – Algebra I

Instructional Unit Title: Power to the Variable

The teacher may provide a context of simple geometric growth (e.g., a rabbit population or cell growth) that doubles or triples so that students can explore how the pattern grows, recognize the growth is nonlinear and represent the growth using a model.

The teacher may provide a situation of exponential decay so that students can explore how to model a decaying geometric sequence.

The teacher may provide a variety of sequences in the form of tables, graphs, equations, and contexts so that students can distinguish between geometric and arithmetic sequences and connect them to multiple representations.

The teacher may provide an example of two financial institutions, one that gives simple interest and one that gives compound interest, so that students can explore which type of function models these situations.

The teacher may provide examples of linear and exponential functions so that students can explore rates of change (over equal intervals) for each type of function in order to develop a proof about the general equations, y=ax+b or $y=ab^x$.



The teacher may provide an students can practice rewriting exponential exponents.

The teacher may provide examples of linear, quadratic and exponential growth so that student can explore and observe the differences in growth for exponential functions versus polynomial functions.

The teacher may provide situations such as population growth or decline, so that students can investigate how parameters affect models for equations of the form, y = mx+b and $y = ab^x$.

example of a population that doubles every month so that functions using properties of

PERFORMANCE ASSESSMENT: You are a scientist who works at Mauna Loa observatory in Hawaii who measures CO₂ concentration in the atmosphere. You have data from the last 50 years (<u>http://www.esrl.noaa.gov/gmd/ccgg/trends/</u>#mlo full). You are presenting to the governor about your data, including a prediction about what the CO₂ level will be in Hawaii in the year 2050. In order to create your prediction you will need to determine if it should be modeled by a linear or exponential function based on the rate of growth.

This unit was authored by a team of Colorado educators. The unit is intended to support teachers, schools, and districts as they make their own local decisions around the best instructional plans and practices for all students. To see the entire instructional unit sample with possible learning experiences, resources, differentiation, and assessments visit http://www.cde.state.co.us/standardsandinstruction/instructionalunitsamples.

Colorado Teacher-Authored Instructional Unit Sample Storyboard