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| **Stage 1 – Desired Results** |

**Established Goals (Include ACOS standards in this section)**:

* **A1.26** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. [F-IF3]
* **A1.38** Distinguish between situations that can be modeled with linear functions and with exponential functions.\* [F-LE2]

1. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. [F-LE2c]

* **A1.34** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.\* [F-BF2]

**Understandings (Students will understand that …)**:

* A geometric sequence is a sequence in which the ratio of successive terms is a constant r.
* A common ratio is the constant ratio of any term and the previous term, in a geometric sequence.

**Essential Knowledge (Students will know …)**:

* Geometric Sequence
* Common Ratio

**Essential Skills (Students will be able to …)**:

* Recognize and extend geometric sequences.
* Determine the nth term of a geometric sequence.

**Essential Question(s)**:

* What kind of activities might one use geometric sequences for?
  + Bungee jumpers can use geometric sequences to calculate how high they will bounce.

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| **Stage 2 – Assessment Evidence** |

**Performance Task(s)**:

* None

**Other Evidence**:

* None

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| **Stage 3 – Learning Plan** |

**Materials needed for the lesson**:

(Other than pencil/pen, all materials will be provided for the students by the teacher.)

* Pencil/pen
* Paper
* Elmo
* PowerPoint

**Bell ringer (if one is used)**:

* The students will answer eight questions in which they will find the value for the following expressions: 25, 2-5, -3-4, (-3)4, (0.2)3, 7(-4)2, 153, and 12(-0.4)3 (10 min)

**Review of relevant, previously learned information**:

* The review of relevant material will be covered in the bell ringer. The students should already know how to find values of expressions. Knowing how to determine values will prepare the students for the lesson.

**Introductory Activity**:

* None

**Body of the lesson**:

* Lecture over geometric sequences. The teacher will explain what geometric sequences and common ratio are, and how the students could use them. (20-25 min)
  + Students will be given multiple example problems that involve geometric sequences. The teacher will solve an example with the class before having students try an example on their own. Example problems will involve problems where students are given a sequence of numbers, and they have to find the next few numbers in the sequence Example problems will also involve students being given the first term of a sequence and the common ratio, and they will have to find the nth term of the sequence. The examples will include:
    - Find the next three terms in each sequence: 1, 4, 16, 64,… and -9, 3, -1, , - ,….
    - The first term of a geometric sequence is 500 and the common ratio is 0.2. What is the 7th term of the sequence?
    - What is the 9th term of the sequence 2, -6, 18, -54,…?
    - A ball is dropped from a tower. The table shows the heights of the ball’s bounces, which form a geometric sequence. What is the height of the 6th bounce? (The table gives the 1st, 2nd, and 3rd bounces are at heights of 300, 150, and 75)
  + No accommodations are needed for students. (No SPE, ESL, gifted students in the class.)
  + The lesson will incorporate multiple methods for solving problems involving geometric sequences.

**Preview of the next lesson**:

* The teacher will tell the students that in the next lesson they will learn about functions that can help scientists and other people predict future events.

**Related out of class assignment**:

* Homework problems

**Other class announcements or information**:

* None