Cornell Notes	Topic/Objective: 6.2 Arithmetic Sequences	Name:
AVID Decades of College Dreams		Class/Period: 4
		Date: 4/14/17

Essential Question: How is an arithmetic sequence special?

Questions:	Notes:
	vocab
	- A sequence is a list of members written in a definite order
	the sequence $\{a_1, a_2, a_3, a_4 \dots a_n \dots\}$
	is denoted $\{a_n\}$
	or $\{a_n\}_{n=1}^{\infty}$
	where $n \in \mathbb{Z}^+$
	a recursive formula allows one to describe a term's value and is dependent upon the value of a previous term
	a general formula for the n^{th} term allows one to find the value of a term without depending on a previous term.

Questions:	Notes:

Examples

Sequence	Recursive Formula	General Formula
$n=$ 1 2 3 4 $\{3, 6, 9, 12, \ldots\}$	$a_n = a_{n-1} + 3$ OR $a_{n+1} = a_n + 3$	$a_n = 3n$
$\{1, 1, 2, 3, 5, 8, \ldots\}$ Fibonacci	$f_1 = 1 \quad f_2 = 2$ $f_n = f_{n-1} + f_{n-2}$	

General Formula

$$F_n = \frac{1}{\sqrt{5}}\left(\frac{1+\sqrt{5}}{2}\right)^{n+1} - \frac{1}{\sqrt{5}}\left(\frac{1-\sqrt{5}}{2}\right)^{n+1}$$

Finding a General Rule for Sequence

Ex) Find a formula for the n^{th} term a_n for the sequence

$$\left\{\frac{3}{5}, \frac{-4}{25}, \frac{5}{125}, \frac{-6}{625}, \frac{7}{3125}, \ldots\right\}$$

(1, 2, 3, 4)

multiplied by $-\frac{1}{5}$ ↑ numerator

Alternating 5^1 5^2 5^3 5^n Sequence

IF a_1 is positive use $(-1)^{n-1}$ or $(-1)^{n+1}$

IF a_1 is negative use $(-1)^n$

$$a_n = (-1)^{n-1}\frac{n+2}{5^n}$$

Questions:	Notes:
	ARITHMETIC SEQUENCES
	An arithmetic sequence, or arithmetic progression, is a sequence in which the terms increase or decrease by a common difference, d.
	Ex) $8, 11, 14, 17, \ldots$ $u_1 = 8$ and $d = 3$
	Ex) $c, 2c, 3c, 4c, \ldots$ $u_1 = 1$ and $d = c$
	FOR ANY ARITHMETIC SEQUENCE $u_{n+1} = u_n + d$ and the GENERAL FORMULA FOR THE nth TERM IS $u_n = u_1 + (n-1)d$
	Ex) In an arithmetic sequence $u_9 = 48$ and $u_{17} = 75$. Find the first term and common difference.
$u_1 =$ $d =$	$u_9 + 3d = u_{17}$ $48 + 3d = 75$ $3d = 27$ $d = 9$
HW 6B p. 166 6C p. 167	$u_9 \quad n \quad d$ $48 = u_1 + (9-1)9$ $48 = u_1 + (8)9$ $48 = u_1 + 72$ $-24 = u_1$