Concept 16: Arithmetic & Geometric Sequences

START DATE:_____ *(materials are available)* **Assessment Date:**_____ *(date of 1st assessment on this concept)*	**DUE DATE:**_____ *(To stay on pace: should be done by now)* **DEADLINE:**_____ *(on THE LIST if note completed)*	***Pre-Quiz Score = _____/5*** ***Score 5 = Level 4*** ***Score 3,4 = Level 3*** ***Score 0,1,2 = Level 2***

Level 4 Example Question	Level 3 Example Question	Level 2 Example Question
Write an equation for this geometric sequence and find the 10^{th} term of the sequence. 3, 6, 12, 24, 48, …	Write an equation for this arithmetic sequence and find the 30^{th} term of the sequence 3, 9, 15, 21, 27, …	Identify whether these sequences are arithmetic or geometric 1, 3, 9, 27, 81, … 3, 7, 11, 15, 19, …

(C) Level 2

1. INTRODUCTION: Take Notes & Basic Practice

Mr. Sieling's Video	Alternate Video	From Other Source
Videos are on Mr. Sieling's Website	**Videos are on Mr. Sieling's Website**	

2. PRACTICE ACTIVITIES: (Complete at least 2)

IXL Practice	Worksheet
P1 (Alg1) (At least to 90) Score = _____	Level 2: Arithmetic & Geometric Sequences

Buzzmath	Create
Patterns & Sequences	Define arithmetic sequence and/or geometric sequence

3. QUIZ (Level 2)

Schoology Quiz: Level 2 – Arithmetic & Geometric Sequences

Level 2
Quiz Score:

4. REMEDIATION

Correct Mistakes on Quiz and Do Another Practice Activity

Mr. Sieling's Signature _____

(B) Level 3

1. INTRODUCTION: Take Notes & Basic Practice

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2. PRACTICE ACTIVITIES: (Complete at least 2)

IXL Practice	Worksheet
P2 (Alg1) (At least to 80) Score = _____	Level 3: Arithmetic & Geometric Sequences
Buzzmath	**Create**
Sequences: Finding the Next Term	An example of an Arithmetic Sequence including the first 5 terms, equation and explanation

3. QUIZ (Level 3)

Schoology Quiz: Level 3 – Arithmetic & Geometric Sequences

Level 3
Quiz Score:

4. REMEDIATION

Correct Mistakes on Quiz and Do Another Practice Activity

Mr. Sieling's Signature _____

(A) Level 4

1. INTRODUCTION: Take Notes & Basic Practice

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2. PRACTICE ACTIVITIES: (Complete at least 2)

IXL Practice	Worksheet
P6 (Alg1) (at least to 90) Score = _____	Level 4: Arithmetic & Geometric Sequences
Buzzmath	**Create**
Sequences: Using a Formula to Find Terms	An example of a Geometric Sequence Including the first 5 terms, equation and explanation

3. QUIZ (Level 2)

Schoology Quiz: Level 4 – Arithmetic & Geometric Sequences

Level 4
Quiz Score:

4. REMEDIATION

Correct Mistakes on Quiz and Do Another Practice Activity

Mr. Sieling's Signature _____

Notes Level 2:

Concept # _____

Goals:

Identify Arithmetic and Geometric Sequences

Find the next term in an arithmetic sequence

Find the next term in a geometric sequence

Notes:

Big Ideas	Examples/Details

Level 2 Practice:

For each sequence, state if it is arithmetic, geometric, or neither.

1) $-3, -18, -108, -648, -3888, \ldots$

2) $2, 4, 12, 48, 240, \ldots$

3) $-35, 165, 365, 565, 765, \ldots$

4) $-2, 6, -18, 54, -162, \ldots$

5) $-7, 93, 193, 293, 393, \ldots$

6) $8, 14, 20, 26, 32, \ldots$

7) $-1, -2, -6, -24, -120, \ldots$

8) $-18, -12, -6, 0, 6, \ldots$

9) $-2.5, -5, -10, -20, -40, \ldots$

10) $1, 2, 6, 24, 120, \ldots$

Find the next three terms in each sequence.

11) $2, 4, 12, 48, 240, \ldots$

12) $2, 5, 10, 17, 26, \ldots$

13) $1, 9, 25, 49, 81, \ldots$

14) $4, 16, 36, 64, 100, \ldots$

15) $-6, -2, 0, 1, \frac{3}{2}, \ldots$

16) $-9, -7, -4, 0, 5, \ldots$

17) $-2, -4, -12, -48, -240, \ldots$

18) $6, 8, 11, 15, 20, \ldots$

19) $-30, -14, -6, -2, 0, \ldots$

20) $-2, 1, 6, 13, 22, \ldots$

Summary of Identifying Arithmetic & Geometric Sequences

Worksheet Level 2:

Concept # _____

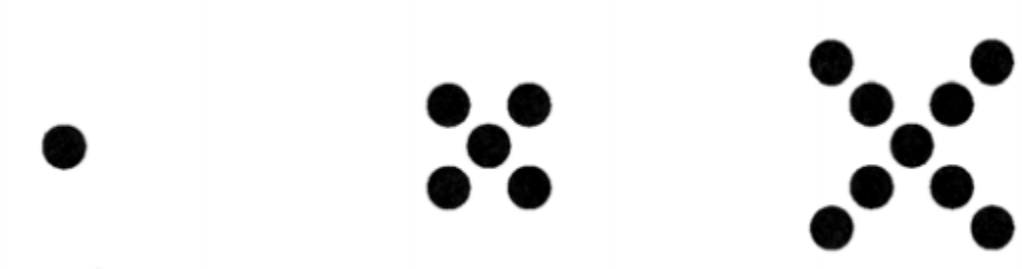
Goals:

Identify Arithmetic and Geometric Sequences

Find the next term in an arithmetic sequence

Find the next term in a geometric sequence

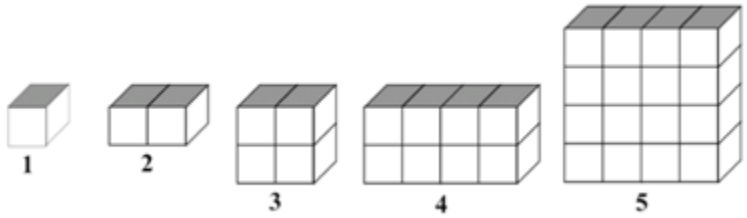
Practice #1



Does this pattern represent an arithmetic or geometric sequence? Explain.

Find how many dots would be in the next figure?

Practice #2



Does this pattern represent an arithmetic or geometric sequence? Explain.

Find how many cubes would be in the next figure?

Practice #3

State whether the sequence is arithmetic or geoemtric. Then find the next three terms in each sequence.

1) 2, 8, 32, 128, 512, ...

2) 3, 12, 48, 192, 768, ...

3) −35, −32, −29, −26, −23, ...

4) −24, −14, −4, 6, 16, ...

5) 3, −9, 27, −81, 243, ...

6) −1, −4, −16, −64, −256, ...

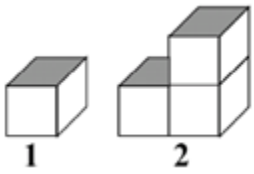
7) 1, 2, 4, 8, 16, ...

8) −12, −3, 6, 15, 24, ...

9) −8, −6, −4, −2, 0, ...

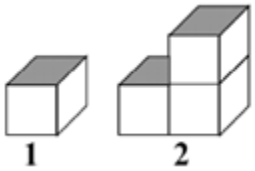
10) 3, 11, 19, 27, 35, ...

Practice #4



Draw the next term if this represents an arithmetic sequence.

Find the number of cubes in the next three figures.



Draw the next term if this represents a geometric sequence.

Find the number of cubes in the next three figures.

Notes Level 3:

Concept # _____

Goals:

Write an equation for an arithmetic sequence

Use an equation to find the Nth term of an arithmetic sequence

Notes:

Big Ideas	Examples/Details

Level 3 Basic Practice:

For each sequence, state if it is arithmetic, geometric, or neither.

1) 0, 6, −6, 18, −30, ...

2) −1, 6, −36, 216, −1296, ...

3) 1, 8, 15, 22, 29, ...

4) −34, −40, −46, −52, −58, ...

5) 18, 27, 36, 45, 54, ...

6) 8, 12, 16, 20, 24, ...

Find the explicit formula and the three terms in the sequence after the last one given.

7) −4, −7, −10, −13, ...

8) −26, −34, −42, −50, ...

9) 23, 32, 41, 50, ...

10) −9, −5, −1, 3, ...

11) −14, 6, 26, 46, ...

12) −21, −51, −81, −111, ...

13) −33, −31, −29, −27, ...

14) 3, −17, −37, −57, ...

15) −1, −11, −21, −31, ...

16) −34, −25, −16, −7, ...

Summary of Writing an Equation for an Arithmetic Sequence

Worksheet Level 3:

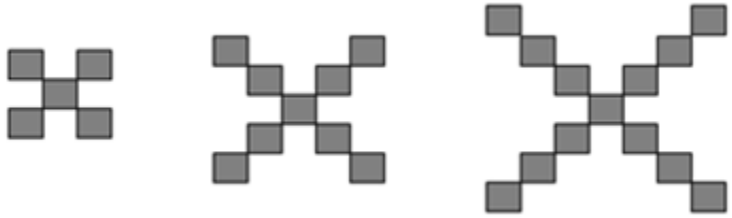
Concept # _____

Goals:

Write an equation for an arithmetic sequence

Use an equation to find the Nth term of an arithmetic sequence

Practice #1



How many squares are being added for each step?

How many squares were in "term 0?"

How many squares will be in the next term?

Write an expression to represent this arithmetic sequence.

Practice #2

Draw a pattern that represents an arithmetic expression with a rate of change = 3.

Expression:

Drawings:

Term 1	Term 2	Term 3

Practice #3

Determine if the sequence is arithmetic. If it is, find the 52nd term and the explicit formula.

1) 8, 16, 24, 32, ...

2) −24, −14, −4, 6, ...

3) 23, 28, 33, 38, ...

4) −26, −28, −30, −32, ...

5) 37, 39, 41, 43, ...

6) 8, −1, −10, −19, ...

7) 37, −163, −363, −563, ...

8) −8, 2, 12, 22, ...

9) 37, 17, −3, −23, ...

10) 12, 8, 4, 0, ...

Notes Level 4:

Concept # _____

Goals:

Write an equation for a geometric sequence

Use an equation to find the Nth term of a geometric sequence

Notes:

Big Ideas	Examples/Details

Basic Practice:

For each sequence, state if it is arithmetic, geometric, or neither.

1) 2.5, 10, 40, 160, 640, ...

2) 20, 50, 80, 110, 140, ...

3) −24, −16, −8, 0, 8, ...

4) 1, 3, 9, 27, 81, ...

Write the expression for each arithmetic sequence.

5) 36, 39, 42, 45, ...

6) −21, 79, 179, 279, ...

7) 23, 53, 83, 113, ...

8) −33, −23, −13, −3, ...

Find the explicit formula and the three terms in the sequence after the last one given.

9) −2, −4, −8, −16, ...

10) −1, −5, −25, −125, ...

11) 4, 8, 16, 32, ...

12) −1, −4, −16, −64, ...

13) 2, −8, 32, −128, ...

14) 1, 6, 36, 216, ...

Summary of Writing an Expression for a Geometric Sequence

Worksheet Level 4:

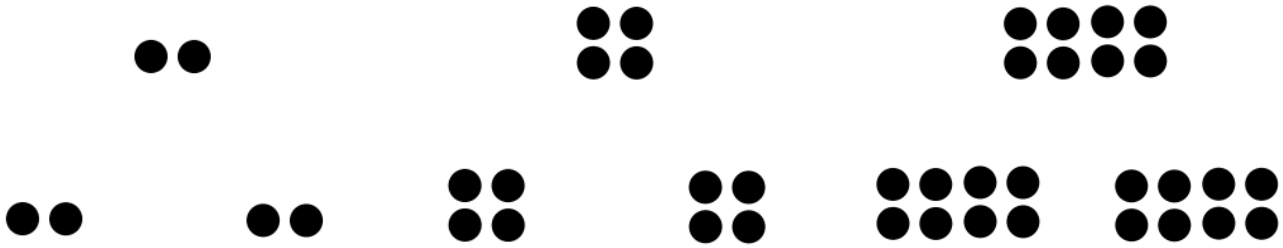
Concept # _____

Goals:

Write an equation for a geometric sequence

Use an equation to find the Nth term of a geometric sequence

Practice #1



Term 1 Term 2 Term 3

Explain what is happening in each step?

How many circles were in "term 0?"

How many circles will be in the next term?

Write an expression to represent this geometric sequence.

Practice #2

Draw a pattern that represents an geometric expression with a growth factor = 3.

Expression:

Drawings:

Term 1	Term 2	Term 3

Practice #4

For each sequence, state if it is arithmetic, geometric, or neither.

1) $-4, -20, -100, -500, -2500, \ldots$

2) $-23, -3, 17, 37, 57, \ldots$

3) $4, 9, 14, 19, 24, \ldots$

4) $-4, -16, -64, -256, -1024, \ldots$

State whether the sequence is arithmetic or geometric. Write an expression for the sequence. Find the 10th term of the sequence.

5) $-32, -22, -12, -2, 8, \ldots$

6) $32, 42, 52, 62, 72, \ldots$

7) $1, -2, 4, -8, 16, \ldots$

8) $-4, 20, -100, 500, -2500, \ldots$

9) $1, 5, 25, 125, 625, \ldots$

10) $0.5, 1, 2, 4, 8, \ldots$

11) $16, 18, 20, 22, 24, \ldots$

12) $-4, -24, -144, -864, -5184, \ldots$

13) $2, 8, 32, 128, 512, \ldots$

14) $1, 2, 4, 8, 16, \ldots$

Given the explicit formula for a geometric sequence find the 8th term.

15) $a_n = 2^{n-1}$

16) $a_n = -2 \cdot (-2)^{n-1}$

17) $a_n = 2 \cdot 2^{n-1}$

18) $a_n = 2 \cdot (-3)^{n-1}$

19) $a_n = -3 \cdot 2^{n-1}$

20) $a_n = -4 \cdot (-2)^{n-1}$