



®

# **TEKS-BASED TUTORIALS**

**Organized by TEKS  
Correlated to TAKS**

# **MATHEMATICS**

## **Grade 7**

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**GRADE 7 TEKS BASED TUTORIALS CORRELATED BY TEKS**  
**Table of Contents and TEKS/TAKS Correlation**  
**Each Tutorial Set Includes Open-Ended Problem(s) w/Transparency**  
**and Multiple-Choice Assessment**

<b>TAKS Objective</b>	<b>Tutorial #-TEKS</b>	<b>DESCRIPTION OF INSTRUCTIONAL TUTORIAL CONTENT</b>
1	01-7.1A	Compare and order positive rational numbers (fractions and decimals)
1	02-7.1A	Compare and order integers and positive rational numbers
1	03-7.1B	Convert between fractions, decimals, and whole numbers
1	04-7.1B	Convert between fractions, decimals, whole numbers, and percents
1	05-7.1C	Represent squares and square roots using geometric models
1	06-7.2A	Represent multiplication and division situations involving fractions and decimals with models
1	07-7.2B	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals
1	08-7.2C	Use models to add, subtract, multiply and divide integers and connect the actions to algorithms
1	09-7.2D	Use division to find unit rates in proportional relationships
1	10-7.2D	Use division to find ratios in proportional relationships
1	11-7.2E	Simplify numerical expressions involving order of operations and exponents
1	12-7.2F	Select and use appropriate operations to solve problems and justify the selections
1	13-7.2G	Determine the reasonableness of a solution to a problem
2	01-7.3A	Estimate and find solutions to application problems involving percent
2	02-7.3B	Estimate and find solutions to application problems involving proportional relationships such as related measurement units
2	03-7.3B	Estimate and find solutions to application problems involving proportional relationships such as unit costs
2	04-7.3B	Estimate and find solutions to application problems involving proportional relationships such as similarity and scaling
2	05-7.4A 7.4B	Generate formulas involving perimeter and area Graph data to demonstrate relationships in familiar concepts such as perimeter and area
2	06-7.4A 7.4B	Generate formulas involving conversions Graph data to demonstrate relationships in familiar concepts such as conversions
2	07-7.4A 7.4B	Generate formulas involving circumference Graph data to demonstrate relationships in familiar concepts such as circumference
2	08-7.4A 7.4B	Generate formulas involving volume Graph data to demonstrate relationships in familiar concepts such as volume
2	09-7.4A 7.4B	Generate formulas involving scaling Graph data to demonstrate relationships in familiar concepts such as scaling
2	10-7.4C	Use words and symbols to describe the relationships between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence
2	11-7.5A	Use concrete models to solve equations

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2	12-7.5B	Formulate problem situations when given a simple equation and formulate an equation when given a problem situation
3	01-7.6A	Use angle measurements to classify pair of angles as complementary or supplementary
3	02-7.6B	Use properties to classify triangles
	03-7.6B	Use properties to classify quadrilaterals
3	04-7.6C	Use properties to classify three-dimensional figures including pyramids and prisms
3	05-7.6C	Use properties to classify three-dimensional figures including cones and cylinders
3	06-7.6D	Use critical attributes to define similarity
3	07-7.7A	Locate and name points on a coordinate plane using ordered pairs of integers
3	08-7.7B	Graph reflections across the horizontal and vertical axis
3	09-7.7B	Graph translations on a coordinate plane
3	10-7.8A	Sketch three-dimensional figures when given the top, side, and front views
3	11-7.8B	Make a net of the surface area of a three-dimensional figure
3	12-7.8C	Use geometric concepts and properties to solve problems in fields such as art and architecture
4	01-7.9A	Estimate measurements and solve application problems involving length (including perimeter) and area of polygons
4	02-7.9A	Estimate measurements and solve application problems involving length (including circumference) and area of other shapes
4	03-7.9B	Connect models for volume of prisms (triangular and rectangular) and cylinders to formulas of prisms (triangular and rectangular) and cylinders
4	04-7.9C	Estimate measurements and solve application problems involving volume of prisms and cylinders
5	01-7.10A	Construct sample spaces for simple or composite experiments
5	02-7.10B	Find the probability of independent events
5	03-7.11A	Select and use an appropriate representation for presenting and displaying relationships among collected data including line graph and bar graph and justify the selection
	7.11B	Make inferences and convincing arguments based on an analysis of given or collected data (line graph and bar graph)
5	04-7.11A	Select & use an appropriate representation for presenting & displaying relationships among collected data including line plot & justify selection
	7.11B	Make inferences and convincing arguments based on an analysis of given or collected data (line plot)
5	05-07.11A	Select & use an appropriate representation for presenting & displaying relationships among collected data including circle graphs & justify selection
	7.11B	Make inferences and convincing arguments based on an analysis of given or collected data (circle graphs)

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5	06-7.11A  7.11B	Select and use a appropriate representation for presenting and displaying relationships among collected data including Venn diagrams and justify the selection  Make inferences and convincing arguments based on an analysis of given or collected data (Venn diagrams)
5	07-7.11A  7.11B	Select and use a appropriate representation for presenting and displaying relationships among collected data including stem and leaf plot and justify the selection  Make inferences and convincing arguments based on an analysis of given or collected data (stem and leaf plot)
5	08-7.12A	Describe a set of data using mean, median, mode, and range
5	09-7.12B	Choose among mean, median, mode, or range to describe a set of data and justify the choice for a particular situation
6	01-7.13A	Identify and apply mathematics to everyday experiences, to activities in and outside of school, and with other disciplines, and with other mathematical topics
6	02-7.13B 7.14A	Use a problem solving model Communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models
6	03-7.13C	Select and develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.
6	04-7.15A	Make conjectures from patterns or sets of examples and nonexamples
6	05-7.15B	Validate conclusions using mathematical properties & relationships

## GRADE 7 MATHEMATICS

**(7.4) Patterns, relationships, and algebraic thinking.** The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to: (C) use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence.

An arithmetic sequence is given in the table below.

Position	1st	2nd	3rd	4th	5th	<i>n</i> th
Value of the Term	3	7	11	15	19	?

- The common difference for this sequence is \_\_\_\_\_. The common difference was determined by \_\_\_\_\_ any term's value from the \_\_\_\_\_ of the next term.
  
- If  $n$  is the position of a number in this arithmetic sequence, write an expression that could be used to find the term in the  $n$ th position.
  
- Write the next four terms of the sequence. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_...
  
- How can I determine if a given number is in this sequence?  
For a number to belong to this sequence, the number increased by \_\_\_\_\_ must be a multiple of \_\_\_\_\_.

Circle the numbers below that would belong to this sequence.

55

78

103

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1. What mathematical concepts and vocabulary do I need to know to be able to work this problem?
  
2. Will the Grade 7 Mathematics Formula Chart be helpful on this problem? Why or why not?
  
3. Would a picture or diagram be helpful on this problem? If so, how?
  
4. What problem-solving strategy or strategies will I use to help solve this problem?
  
5. **Extension (7.4C)** : What is the value of the term in the 14th position of this sequence?

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An arithmetic sequence is given in the table below.

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The common difference was determined by \_\_\_\_\_ any term's value from the \_\_\_\_\_ of the next term.
- If  $n$  is the position of a number in this arithmetic sequence, write an expression that could be used to find the term in the  $n$ th position.
- Write the next four terms of the sequence. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_...
- How can I determine if a given number is in this sequence?  
For a number to belong to this sequence, the number increased by \_\_\_\_\_ must be a multiple of \_\_\_\_\_.

Circle the numbers below that would belong to this sequence.

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## GRADE 7 MATHEMATICS

**(7.4) Patterns, relationships, and algebraic thinking.** The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to: (C) use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence.

Which description shows the relationship between a term and  $n$ , its position in the sequence?

Position	1	2	3	4	5	$n$
Value of Term	5	8	11	14	17	?

- A Add 4 to  $n$
- B Multiply  $n$  by 3 and add 1
- C Multiply  $n$  by 3 and add 2
- D Multiply  $n$  by 6 and subtract 1

Which description shows the relationship between a term and  $n$ , its position in the arithmetic sequence?

Position	1	2	3	4	5	$n$
Value of Term	3.5	4	4.5	5	5.5	?

- A Add 3.5 to  $n$
- B Multiply  $n$  by 0.5 and subtract 5
- C Multiply  $n$  by 2 and add 2.5
- D Multiply  $n$  by 0.5 and add 3

Which of the following sequences have a constant rate of change?

- A {3, 4, 3, 5, 3, ...}
- B {2, 5, 10, 17, 26, ...}
- C {6, 9, 12, 15, 18, ...}
- D {9, 12, 16, 19, 24, ...}

Which expression describes a term in the  $n$ th position of an arithmetic sequence?

Position, $n$	1	2	3	4	5	$n$
Value of Term	3.5	5.5	7.5	9.5	11.5	?

- A  $1.5n + 2$
- B  $3n + 0.5$
- C  $3(n + 0.5)$
- D  $2n + 1.5$

Which arithmetic sequence follows the rule  $(n-1) + 3n$ , where  $n$  is the position in the sequence?

- A {3, 7, 11, 15, ...}
- B {4, 7, 10, 13, 17, ...}
- C {3, 6, 9, 12, 15, ...}
- D {1, 3, 5, 7, 9, ...}

Which sequence follows the rule  $3(n+2)$ , where  $n$  is the position in the sequence?

- A {3, 4, 5, 6, 7, ...}
- B {9, 11, 13, 15, 17, ...}
- C {6, 9, 12, 15, 18, ...}
- D {9, 12, 15, 18, 21, ...}

## GRADE 7 MATHEMATICS

**(7.4) Patterns, relationships, and algebraic thinking.** The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to: (C) use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence.

If  $n$  is the position of a number in this sequence, which expression identifies this pattern?

Position	1st	2nd	3rd	4th	5th	$n$ th
Value of the Term	21	26	31	36	41	?

- A  $n + 20$
- B  $8n - 3$
- C  $5n + 16$
- D  $10(n + 1)$

The following sequence forms a pattern.

0.4, 0.8, 1.2, 1.6, ...

If this pattern continues, which expression could be used to find the tenth term?

- A  $10 \times 0.4$
- B  $10 + 0.4$
- C  $10 \div 0.4$
- D  $10 \times 0.1$

The following sequence forms a pattern.

1, 3, 5, 7, 9, ...

If this pattern continues, which expression can be used to find the 13th term?

- A  $13 + 2$
- B  $13 \times 2$
- C  $2 \times 13 + 1$
- D  $2 \times 13 - 1$

The table below gives the first five terms of an arithmetic sequence.

Position	1st	2nd	3rd	4th	5th	$n$ th
Value of the Term	1	5	9	13	17	?

Which of the following numbers would belong to this sequence?

- A 33
- B 28
- C 42
- D 47

The terms in a sequence is defined by the expression  $3(n + 2)$ , where  $n$  is the position in the sequence. Which of the following is the first four terms of the sequence?

- A 8, 11, 14, 17
- B 10, 13, 16, 19
- C 9, 12, 15, 18
- D 9, 11, 13, 15

The first five terms of an arithmetic sequence is given below.

6, 9, 12, 15, 18, ...

What is the common difference for this sequence?

- A 2
- B 3
- C 6
- D 4