



# Lesson Exemplar for Mathematics



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**IMPLEMENTATION OF THE MATATAG K TO 10 CURRICULUM** 

#### Lesson Exemplar for Mathematics Grade 7 Quarter 2: Lesson 1 (Week 1) SY 2024-2025

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### MATHEMATICS / QUARTER 2 / GRADE 7

I. CURRICULUM CONTE	ENT, STANDARDS, AND LESSON COMPETENCIES
A. Content Standards	The learners should have knowledge and understanding of square roots of perfect squares, cube roots of perfect cubes, and irrational numbers.
B. Performance Standards	By the end of the quarter, the learners are able to determine square roots of perfect squares and cube roots of perfect cubes, and identify irrational numbers. (NA)
C. Learning Competencies and Objectives	<ul> <li>The learners determine the square roots of perfect squares and the cube roots of perfect cubes.</li> <li>1. The learners define perfect square and perfect cube.</li> <li>2. The learners identify perfect squares and perfect cubes.</li> <li>3. The learners define square root and cube root.</li> <li>4. The learners determine the square roots of perfect squares.</li> <li>5. The learners identify irrational numbers involving square roots and cube roots, and their locations on the number line.</li> <li>1. The learners identify irrational numbers.</li> <li>2. The learners identify irrational numbers involving square roots and cube roots.</li> <li>3. The learners identify irrational numbers involving square roots and cube roots.</li> </ul>
D. Content	Perfect square and perfect cube Square root and cube root Irrational numbers (involving square root and cube root)
E. Integration	

### **II. LEARNING RESOURCES**

Department of Education. (2020). Alternative Delivery Mode. Quarter 1-Module 7: Principal Roots and Irrational Numbers. Department of Education. (2020). Alternative Delivery Mode. Quarter 1-Module 8: Estimating Square Roots of Whole Numbers and Plotting

Irrational Numbers

Sipnayan. (2020, October 10). How to Plot Irrational Numbers on the Number Line Part 1 [with English subtitles] [Video]. YouTube. https://www.youtube.com/watch?v=ESGkaZnrwrI

III. TEACHING AND LEA	ARNIN	NG PROCEDURE			NOTES TO TEACHERS	s
A. Activating Prior Knowledge	<b>DAY</b> 1. S	7 1 Short Review	(10 minutes) Lead the students to the	(10 minutes) Lead the students to the concept that the area of the		
		Square	sxs	Area	square is obtained by	-
		s = 1	1 x 1		- multiplying a number (lengt the side of the square) to its	th of self.
		s = 2	2 x 2		Follow up by reviewing the lesson on exponents.	
		s = 3	x		_	
			v			
		s = 4	X		_	
	F	find the volume of each cul	be.	Volume		
		Cube	SXSXS	Volume	Lead the students to the	
			1 x 1 x 1		concept that the volume of	the
		s = 1			cube is obtained by multiply	lying
			2 x 2 x 2		- the number (length of the si of the cube) to itself three times. Follow up by reviewin	ide ng
		s = 2			the lesson on exponents.	

## TO TEACHERS

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	$\begin{array}{ c c c c c c }\hline s = 3 & \underline{x x} & \underline{x} & \underline{x} \\ \hline & & & \\ \hline & & & \\ s = 4 & \underline{x x} & \underline{x} \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline \end{array}$	
B. Establishing Lesson Purpose	1. Lesson Purpose         Perfect square and cube         1. Can you form a square with the given unit squares?         a.       # of unit squares:         b.       # of unit squares:         c.       # of unit squares:         c.       # of unit squares:         d.       # of unit squares:         Can you form a square?       # of unit squares:         d.       # of unit squares:         d.       # of unit squares:         G.       # of unit squares:         d.       # of unit squares:         g.       Which of the four given figures formed a square?	(15 minutes) This activity may be explored using manipulatives (physical or virtual). This may also be given as a whole class activity or discussion as the teacher presents the figure through slides presentation.



<ul> <li>SUB-TOPIC 1: Perfect Square and Square Root</li> <li>Explicitation         <ul> <li>When a number n is multiplied by itself, such as when we compute the area of a square, we write n<sup>2</sup> and read it "n squared". The result is called the square of n. That is, if n<sup>2</sup> = m, then m is a square of n and m is a perfect square.</li> </ul> </li> <li>Worked Example         <ul> <li>Example: Complete the following table to show the squares of the whole numbers</li> </ul> </li> </ul>								<b>(20 minutes)</b> All the given activities here may								
n	Number	0	1	2	3	4 5	6	7	8	0	10	11	10	,		be done individually or
	Square	0	1	4	5	+ J	0	· ·	0	9	1	11	12			collaboratively, depending on
	oquaro	0	1			10				0	1					has.
	The num	ber	's in	the s	second	l row ar	e calle	ed <b>pe</b>	rfect	t sç	luare 1	um	bers	•		
<ul> <li>What can you say about the square of negative numbers? Sometimes, we will need to look at the relationship between numbers and their squares in reverse. For example: Because 10<sup>2</sup> = 100, we say 100 is the square of 10. We also say that 10 is the square root of 100. A number whose square is <i>m</i> is called a <b>square root of</b> <i>m</i>. The symbol, √m, is read "the square root of m", where <i>m</i> is called the <b>radicand</b>, and √ is called the <b>radical sign</b>.</li> <li><b>3. Lesson Activity</b></li> </ul>							nd he se he									
	Perfect Square		(a ni	umbe answ	Exj r that er is th	ponentia when mu he numbe	l For ltiplied er in co	m d by i olumn	tself, one)	the		Squa Ro	are ot			
	9					3 x 3						3				
	36					6 x 6	)					6				
	49					'/ x '/										
	121															
	625															
	4/25															
	SUE 1. E 3. I	SUB-TOPIC 1: Per 1. Explicitation When a nu area of a squa square of n. ' square. 2. Worked Exam Example: Con numbers. Number Square The num What can you Sometimes their squares square of 10. ' square is m is The symbolic radicand, and 3. Lesson Activit A. Complete Perfect Square 9 36 49 81 121 625 4/25	SUB-TOPIC 1: Perfet1. ExplicitationWhen a numblearea of a square,square of $n$ . The square of $n$ . The square.2. Worked Example: Example: Completed numbers.Number0Square0Square0The numberWhat can you say Sometimes, wSometimes, wtheir squares in square of 10. We square is $m$ is call The symbol, - radicand, and $\sqrt{1.5}$ 3. Lesson Activity A. Complete the Perfect Square93649811216254/254/25	SUB-TOPIC 1: Perfect So1. ExplicitationWhen a number n area of a square, we we square of n. That is, square.2. Worked Example Example: Complete to numbers.Number 0SquareNumber 01Square01Square01Square01Square01The numbers inWhat can you say abo Sometimes, we will their squares in rever square of 10. We also square is m is called a The symbol, $\sqrt{m}$ , radicand, and $\sqrt{111}$ is c3. Lesson Activity A. Complete the tabPerfect 3693649811216254/25	SUB-TOPIC 1: Perfect Squar1. ExplicitationWhen a number n is area of a square, we writesquare of n. That is, if nsquare of n. That is, if nsquare.2. Worked Example: Complete the fnumbers.Number 0 1 2Square 0 1The numbers in the sWhat can you say about th Sometimes, we will needSometimes, we will needtheir squares in reverse. I square of 10. We also say square is m is called a square The symbol, $\sqrt{m}$ , is r radicand, and $\sqrt{\dots}$ is called3. Lesson Activity A. Complete the table be SquarePerfect (a numbe answ93649811216254/25	SUB-TOPIC 1: Perfect Square and1. 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For example: square of 10. We also say that 10 is the square is m is called a square root of m The symbol, $\sqrt{m}$ , is read "the square aradicand, and $\sqrt{1.5}$ is called the radical s3. Lesson Activity 9A. Complete the table below.9 $3 \times 3$ $36$ 6 $\times 6$ $49$ 9 $3 \times 3$ $36$ 6 $\times 6$ $49$	SUB-TOPIC 1: Perfect Square and Square Rood1. ExplicitationWhen a number n is multiplied by itself area of a square, we write $n^2$ and read it "n square of n. That is, if $n^2 = m$ , then m is a square.2. Worked Example Example: Complete the following table to numbers.Number 0 1 2 3 4 5 6 Square 0 1 1 1 6The numbers in the second row are calledWhat can you say about the square of negative Sometimes, we will need to look at the real their squares in reverse. For example: Becaus square of 10. We also say that 10 is the square square is m is called a square root of m. The symbol, $\sqrt{m}$ , is read "the square radicand, and $\sqrt{\ldots}$ is called the radical sign.3. Lesson Activity Square $9$ $3 \times 3$ $36$ $6 \times 6$ $49$ $7 \times 7$ $81$	SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such area of a square, we write $n^2$ and read it "n square square of n. That is, if $n^2 = m$ , then m is a square square.2. Worked ExampleExample: Complete the following table to show numbers.Number01234567Square0116116116161718191010111213456710111213141515161617181919101010111112121314141515161617181819191919191910101111121213141415151616171818 <th>SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such as area of a square, we write <math>n^2</math> and read it "n squared".square of n. That is, if <math>n^2 = m</math>, then m is a square of square.2. 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A number square is m is called a square root of <math>m</math>.The symbol, <math>\sqrt{m}</math>, is read "the square root of <math>m</math>", where m is caller answer is the number that when multiplied by itself, the square <math>Root</math>Sumetimes, we will need to look at the relationship between number square is <math>n is called a square root of <math>m</math>.The symbol, <math>\sqrt{m}</math>, is read "the square root of <math>100</math>. A number square is <math>m is called a square root of <math>m</math>.The symbol, <math>\sqrt{m}</math>, is read "the square root of <math>m</math>", where m is caller answer is the number in column one)9 <math>3 \times 3</math> <math>3</math>3 <math>3</math>3 <math>4 5 6 7 8 9 10 11 12</math>Generative for the table below.</math></math></th> <th>SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such as when we compute the area of a square, we write <math>n^2</math> and read it "n squared". 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Complete the table below.Perfect (a number that when multiplied by itself, the answer is the number in column one)9<math>3 \times 3</math>36<math>6 \times 6</math>49<math>7 \times 7</math>81121122</th>	SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such as area of a square, we write $n^2$ and read it "n squared".square of n. That is, if $n^2 = m$ , then m is a square of square.2. Worked ExampleExample: Complete the following table to show the numbers.Number 012345678Square01116111The numbers in the second row are called perfectWhat can you say about the square of negative number Sometimes, we will need to look at the relationship their squares in reverse. For example: Because $10^2$ = square of 10. We also say that 10 is the square root of square is m is called a square root of m. The symbol, $\sqrt{m}$ , is read "the square root of m" radicand, and $\sqrt{12}$ is called the radical sign.3. Lesson Activity A. 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The symbol, $\sqrt{m}$ , is read "the square root of m", where m radicand, and $\sqrt{1.3}$ is called the radical sign.3. Lesson Activity 9 3 x 3 36 6 6 x 6 49 7 x 7 81 814. Complete the table below.	SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such as when we con area of a square, we write $n^2$ and read it "n squared". The result is square of n. That is, if $n^2 = m$ , then m is a square of n and m is square.2. Worked ExampleExample: Complete the following table to show the squares of numbers.Number01234567891011Square011681The numbers in the second row are called perfect square numlWhat can you say about the square of negative numbers? Sometimes, we will need to look at the relationship between nur their squares in reverse. For example: Because $10^2 = 100$ , we say square of 10. We also say that 10 is the square root of 100. A num square is m is called a square root of m. 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Complete the table below.Perfect Square (a number that when multiplied by itself, the square answer is the number in column one)9 $3 \times 3$ $3$ $3$ $3$ 36 $6 \times 6$ $6$ $49$ 9 $3 \times 3$ $3 \times 3$ $3$ 36 $6 \times 6$ $6$ 49 $7 \times 7$ $81$ $121$ 121121 $121$ 122121123121124121 $121$	SUB-TOPIC 1: Perfect Square and Square Root1. ExplicitationWhen a number n is multiplied by itself, such as when we compute the area of a square, we write $n^2$ and read it "n squared". The result is called the square of n. That is, if $n^2 = m$ , then m is a square of n and m is a perfect square.2. Worked Example Example: Complete the following table to show the squares of the whole numbers.Number 0 1 2 3 4 5 6 7 8 9 10 11 12 Square 0 1 1 16 181Square 0 1 1 1 16 181The numbers in the second row are called perfect square numbers.What can you say about the square of negative numbers? Sometimes, we will need to look at the relationship between numbers and their squares in reverse. 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DAY 2 B. Perfect Square and Square Root. I column: 0, 25, 40, 49, 121, 62	<ul> <li>DAY 2</li> <li>B. Perfect Square and Square Root. Place each number in its appropriate column:</li> <li>0, 25, 40, 49, 121, 625, 8, 18/2, ¼, 27</li> </ul>								
Perfect Square Number	Perfect Square Number     Not Perfect Square Number       Square Root of Perfect Square Numbers								
Square Root of Perfect Square Numbers	Square Root of Perfect Square Numbers								
<ul> <li>Questions for discussion:</li> <li>1. How did you decide which column to</li> <li>2. Were all your answers correct? If no answers were not correct? What will</li> <li>3. How did you compute the square ro</li> </ul>	<ul> <li>Questions for discussion:</li> <li>1. How did you decide which column the given number should be placed in?</li> <li>2. Were all your answers correct? If not, why do you think some of your answers were not correct? What will you do to avoid this error next time?</li> <li>3. How did you compute the square roots of the perfect square numbers?</li> </ul>								
SUB-TOPIC 2: Perfect Cube and Cube Roo	ot	Let the students discuss their answers.							
A perfect cube is a number that is obtended three times. For example, multiplying the Therefore, 8 is a perfect cube. When a number is cubed, we write $n$ called the <b>cube of</b> $n$ . That is, if $n^3 = m$ <b>perfect cube</b> .	1. Explicitation A perfect cube is a number that is obtained by multiplying the same integer three times. For example, multiplying the number 2 three times results in 8. Therefore, 8 is a perfect cube. When a number is cubed, we write $n^3$ and read it " <i>n</i> cubed". The result is called the <b>cube of</b> <i>n</i> . That is, if $n^3 = m$ , then <i>m</i> is a cube of <i>n</i> and <i>m</i> is a <b>perfect cube</b> .								
2. Worked Example Example: Complete the following table	to show the cubes of the following								
integers.									
Number $-5$ $-4$ $-3$ $-2$ $\cdot$ Cube $-125$ $-8$	-1 0 1 2 3 4								
The numbers in the second row are	called <b>perfect cube numbers</b> .								
when a number is cubed, it means to root is reversing the process of cubing a to 5 is cubed, then it is multiplied 3 times: of 125 is 5. This is because 125 is obtain these times	that it is multiplied three times. Cube number. For example, when a number $5 \ge 5 \ge 5$ , which is 125. The cube root ined when the number 5 is multiplied	(15 minutes)							
The symbol for cube root is $\sqrt[3]{100}$ . The <sup>3</sup>	$\sqrt[3]{m}$ is read as "cube root of <i>m</i> ".								

Perfect Cube	Expone (a number that when result is the g	Cube Root		
1	1 2	1		
-8	-2 x	-2 x -2	-2	(15 minutes
125				(
-216				
1,000				
1/8				
8/27				
Cube Root of	Perfect Cube Number	s		
Cube Root of	Perfect Cube Number	'S		- 1
Questions for	discussion:			
<b>Questions for</b> 1. How did	<b>discussion:</b> 70u decide which colum	mn the given number sho	ould be placed in	
Questions for 1. How did 2. Were all	<b>discussion:</b> you decide which colu: your answers correct	mn the given number sho ? If not, why do you th	ould be placed in ank some of yo	n?
Questions for 1. How did 2. Were all answers 2. How did	<b>discussion:</b> you decide which colu: your answers correct were not correct? Wha	mn the given number sho ? If not, why do you th t will you do to avoid this	ould be placed in hink some of your servor next time	n? pur e?
Questions for 1. How did 2. Were all answers 3. How did	<b>discussion:</b> you decide which colu: your answers correct were not correct? Wha you compute the cube	mn the given number sho ? If not, why do you th t will you do to avoid this roots of the perfect cube	ould be placed in aink some of yo s error next time numbers?	n? our e?
Questions for 1. How did 2. Were all answers 3. How did DAY 3	<b>discussion:</b> you decide which colu: your answers correct were not correct? Wha you compute the cube	mn the given number sho ? If not, why do you th t will you do to avoid this roots of the perfect cube	ould be placed in hink some of yo s error next time numbers?	n? our e?
Questions for 1. How did 2. Were all answers 3. How did DAY 3 SUB-TOPIC 3: Irr	<b>discussion:</b> you decide which colu: your answers correct were not correct? Wha you compute the cube <b>'ational Numbers</b>	mn the given number sho ? If not, why do you th t will you do to avoid this roots of the perfect cube	ould be placed in aink some of yo s error next time numbers?	n? our e?
Questions for 1. How did 2. Were all answers 3. How did DAY 3 SUB-TOPIC 3: In 1. Explicitation	<b>discussion:</b> you decide which colu: your answers correct were not correct? Wha you compute the cube <b>:ational Numbers</b>	mn the given number sho ? If not, why do you th t will you do to avoid this roots of the perfect cube	ould be placed in hink some of yo s error next time numbers?	n? our e?
Questions for 1. How did 2. Were all answers 3. How did DAY 3 SUB-TOPIC 3: Irr 1. Explicitation Place the follow	<b>discussion:</b> you decide which colu- your answers correct were not correct? Wha you compute the cube <b>:ational Numbers</b> ving numbers in the a $1/2$ , $-3$ , $\sqrt{9}$ , $\sqrt{7}$ , $\sqrt{1}$	mn the given number sho ? If not, why do you th t will you do to avoid this roots of the perfect cube ppropriate columns: $\overline{00}, \sqrt{17}, \sqrt[3]{1}, \sqrt[3]{-8}, \sqrt[3]{9}, \sqrt[3]{1}$	build be placed in hink some of your series of next times numbers? $\overline{2}$	n? our e?

Let the students discuss their answers.
<ul> <li>Begin Day 3 with recalling concepts covered in the previous day.</li> <li>(5 minutes) for review (15 minutes) for the activity</li> </ul>
Let student view the video on how to plot irrational numbers involving square roots using this link: <u>www.youtube.com/watch?v=ES</u> <u>GkaZnrwrI</u> .
(10 minutes)

	d. $\sqrt[3]{75}$ <b>3. Lesson Activity</b> Irrational Numbers. A. Estimate the given square root of corresponds to it on the number line A = B 0 = 1 = 2 A = B 0 = 1 = 2 A = B $1 = \sqrt{15}$ 3 = 2 $3 = \sqrt{38}$ 4 = 3 B. Plot the points on a number line. 1 = 7 2 = 7 3 = 7 4 = 7 3 = 7 3 = 7 4 = 7 3 = 7 4 = 7 4 = 7 4 = 7 5 = 7 7 =	or cube root and find the letter that a. $\sqrt{99}$ 5. $\sqrt[3]{388}$ $\sqrt[3]{20}$ $\sqrt{99}$ 5. $\sqrt[3]{388}$	
D. Making Generalizations	5. Point E: $\sqrt[3]{-199}$ <b>•••••••</b> <b>1. Learner's Takeaways</b> A. Define and give an example for each	-+ + + + + + + + + + + + + + + + + + +	(20 minutes) Let the students answer the
	Perfect square Square root	Perfect cube Cube root	questions and then afterward, ask some learners to share their answers.
	Irrational numbers (involving square root and cube root)		
	<ul><li>B. Answer the following questions:</li><li>1. How do you compute the squar</li><li>2. How do you compute the cube</li></ul>	re root of a perfect square? root of a perfect cube?	

<ul> <li>3. How do you plot irrational numbers involving square root and cube root?</li> <li>2. Reflection on Learning Are there any challenges and misconceptions you encountered while studying</li> </ul>
the lesson? What are those?

IV. EVALUATING LEAR	IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION									
IV. EVALUATING LEAR A. Evaluating Learning	DAY 4           1. Formative As           A. Find the s           root if it is           Number           49           121           -27           1/4           9/25           216           -8	E ASSESSMENT AND TEACHEI	R'S REFLECTION s a perfect square. Find its cube Cube Root of the Number if it is a Perfect Cube	NOTES TO TEACHERS Assessment helps teachers gauge how well students understand mathematical concepts and principles. It provides feedback on their comprehension, problem- solving skills, and ability to apply mathematical knowledge. Let students answer all items here individually or collaboratively.						
	324512400B. Solve the 1. Mr. A meter shoul 2. Mrs. S the tw that r	following problems. gra has a square vegetable plot s. If Mr. Agra will put a fence are d be the fencing material that he San Jose has two cubic containe vo has sides that measure 25 cm neasure 18 cm. Will the two cont	which has an area of 144 square ound the vegetable plot, how long e will need? ers of different sizes. The larger of n while the smaller one has sides tainers be enough for 1,000 cubic							

	centimeters of v C. Plot the following nu 1. √17 2. ∛55 2. Homework (Optional)	The teacher may give homework to master the lesson.		
B. Teacher's Remarks	Note observations on any of the following areas:	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and
	strategies explored			problems encountered after utilizing the different strategies,
	materials used			engagement, and other related stuff.
	learner engagement/ interaction			Teachers may also suggest ways to improve the different
	others			activities explored/lesson exemplar.
C. Teacher's Reflection	Reflection guide or prompt ofprinciples behind the What principles and Why did I teach thestudents What roles did my s What did my studenways forward	Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.		

What could I have done differently?         What can I explore in the next lesson?	
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