

Title: Repeating and Growing Patterns: Calling All Patterns

Brief Overview:

In this unit, students will utilize problem-solving strategies and reasoning skills in order to analyze patterns. It begins with the primary concept of repeating patterns and continues to include intermediate concepts, such as growing patterns, which are the basis for algebra.

NCTM Content Standards

Algebra: Understand Patterns, Relations, and Functions

- Recognize, describe and extend patterns, such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another
- Analyze how both repeating and growing patterns are generated
- Describe, extend, and make generalizations about geometric and numeric patterns

Grade/Level:

Grades 2/3

Duration/Length:

The unit consists of four 60-minute lessons and one summative assessment.

Student Outcomes:

Students will:

- Identify numeric and nonnumeric patterns
- Describe and extend growing and repeating patterns
- Represent and analyze numeric patterns using skip counting by two's
- Record data on a table
- Organize, interpret, and describe situations mathematically by providing mathematical ideas and evidence in oral and written form

Materials and Resources:

- Hundreds boards (one for each student)
- Overhead hundreds board
- Overhead colored circles for hundreds chart
- Illuminations website (<http://illuminations.nctm.org>)
- Paint (various colors)
- Stamps (various shapes/designs)
- Stamp pads (different colors)
- Sponges

- Cookie cutters
- Poem about even and odd numbers
- One Grain of Rice: A Mathematical Folktale by Demi
- Rice
- Transparencies
- Unifix cubes
- Read Aloud Anthology McGraw Hill Math

Development/Procedures:

Lesson 1

Pre-assessment:

Direct the students to extend a repeating pattern using two terms in the core. Have students describe the repeated pattern.

○ ▲ ○ ▲ ○ ▲ ○ _____, _____, _____

Launch:

Review students' prior knowledge of patterns by asking the following questions:

1. What is a pattern? *A pattern is a sequence or order of objects that repeat or grow.*
2. What are the terms in a pattern? *A term is each place or position in the sequence.*

Then discuss the new terms, patterns and terms.

Students will develop a pattern and explain their pattern to the class.

Teacher Facilitation:

Introduce the term, core of a pattern. Students will explain and identify the core of a pattern from several examples.

Use the following examples:

1. 2,3,4,2,3,4
2. x o x o x o
3. A a B b A a B b

Students should note that the core of a pattern is the part that repeats. Later in the unit, they will be able to distinguish between a repeating and growing pattern using the core for comparison. *A core of a repeating pattern is the shortest string of elements that repeat.*

Student Application:

After reviewing and developing a solid understanding of patterns, students will be assigned to work in small groups of 2-3 students and directed to make and identify their own repeating patterns. Each group will have to present their pattern project to the class.

The groups will be supplied with an envelope with instructions on how to set up the patterns. See Teacher Resource 1.

Embedded Assessment:

Students will present their pattern projects to the class answering the following questions:

1. What is the core? *Students will explain in their own words and point out the core in the pattern.*
2. What happens at the end of the first line? *Students will explain that the core is repeated.*
3. What are the terms of the pattern? *Students will explain in their own words and point out the terms of the pattern.*

Have students complete *Student Resource Sheet 2:Patterns*. Answer key can be found on Teacher Resource 2.

Re-teaching:

Model on chart paper how to create a repeating pattern, identifying the terms of the pattern and the core. Divide students into small groups and have them create another pattern.

Use the following pattern for the modeling activity: ○◇○○◇○○◇○○◇○○◇○

Extension:

Students will solve the following problems using manipulatives or pictures to solve.

1. Justin drew this pattern and repeated it twice, (blue triangle, blue triangle, red hexagon, red square). How many shapes are not blue? 6
2. Lowell drew this pattern and repeated it three times, (blue parallelogram, red parallelogram, green triangle). How many shapes are not red? 8
3. Keon drew this pattern and repeated it five times, (yellow diamond, red trapezoid, red square, red trapezoid). How many red shapes did he use in all? 18
4. Keayra drew this pattern and repeated it twice, (green diamond, orange square, pink square). How many shapes are not green? 6

Lesson 2

Pre-assessment:

Give students 40 unifix cubes each. Assess prior knowledge by asking students, “What are odd numbers? What are even numbers?” Have students put their unifix cubes together to create various numbers, and ask them to identify even and odd numbers based on their shape. For example, to create three, students put two cubes on the base and one on top. To create four, students put two cubes on the base and two on top. Students work to devise their own rule or definition.

Launch:

Tell the students that today they will identify patterns in even and odd numbers. Read the poem, "About Feet" by Margaret Hillert. Discuss the poem. Have students tell if the numbers in the poem are even or odd. Students illustrate the numbers with the unifix cubes. Have them identify even and odd numbers based on what the unifix models look like. Copy the following poem on chart paper and have a volunteer read it aloud to the class.

About Feet

*The centipede is not complete
Unless he has one hundred feet.
Spiders must have eight for speed,
And six is what all insects need.*

*Other creatures by the score
Cannot do with less than four.
But two are quite enough, you know,
To take me where I want to go.*

~ Margaret Hillert

Teacher Facilitation:

- Put students in pairs. Give each pair sixty unifix cubes.
- Model how to make a train with four unifix cubes and have them create it.
- Ask students to separate cubes into pairs and ask, "How many pairs do you have? (*two*) How many cubes do you have left over?" (*none*)
- Then have students build a train using eight unifix cubes. Ask the same questions as above and repeat with a train of seven unifix cubes.
- Have students compare the train of seven to the train of eight cubes. Explain that eight cubes separate evenly into pairs. Therefore, eight is an even number. Seven does not separate evenly. Therefore, seven is an odd number.
- Ask students, "Can you separate five evenly into pairs?" Students should show that five cannot be evenly separated. Have students explain whether five is an even or odd number.
- Have students use unifix cubes to create numbers one through fifteen. Students should discuss the patterns that they notice.
- Have students count one to fifteen, pointing to their cubes. Say the odd numbers loudly and the even numbers softly.
- Ask students to make observations about groups of numbers. Lead them to a discussion about the ones and tens place. The ones place determines whether or not a number is even or odd.

Student Application:

Put students in groups of two and give each pair a hundreds chart and a highlighter to highlight even patterns. Make a transparency of the Hundreds Chart (SR2) Students should discuss with their partner any patterns that they notice. They will write their observations in the space under their hundreds chart. As you circulate around the room, take special note of the observations students are making. Ask students to share their observations with the class. Post the hundreds charts around the classroom, organizing them according to the patterns that the students noticed.

Embedded Assessment:

Have students complete the Brief Constructed Response. Preview the scoring rubric prior to the completion of the BCR. (*Refer to Student Resource page 3: Growing Patterns.*)

Re-teaching:

Students will fill in missing numbers on the hundreds chart. Students will then look for patterns on the chart. (*Refer to Student Resource page 4: Missing Numbers.*)

Extension:

Students will solve riddles about even and odd numbers. Then, they will create their own riddle for others to solve. (*Refer to Student Resource page 5: Even and Odd Riddles.*) Answers are on Teacher Resource 3. Students will complete *Resource Page 6: Even and Odd* for homework. Answers can be found on Teacher Resource 4.

Lesson 3**Pre-assessment:**

Students will complete a warm-up activity. Using the hundreds chart, students will create number sentences to obtain even and odd numbers and color them on the hundreds chart. *Please refer to Student Resource page 7: Even and Odd Sums.* Answers can be found on Teacher Resource 5.

Launch:

Ask students to identify the even and odd numbers from the warm-up activity. Using the think-pair-share method, have students (think) about the patterns they notice among the number sentences. Then have them (pair) with another student to discuss what they noticed and then (share) their thoughts with the entire class.

Some possible responses may be: “I noticed that when you add a number to itself, you get an even number, and when you add two different numbers, you get an odd number.”, or “I noticed that when you add two even numbers or two odd numbers, you get an even number and if you add an even and an odd, you get an odd number.”

Teacher Facilitation:

Using the overhead computer screen, preview the site that students will be using. Explain how to manipulate the site.

1. First, You must enter in the address, which is <http://illuminations.nctm.org>.
2. Then, you must click on “PreK-2”.
3. Using the mouse, scroll down to example 4-5, which is “Learning about Number Relationships and Properties of Numbers Using Calculators and Hundreds Boards” and click on it.
4. If a computer facility is not available, you could use a calculator and a hundreds chart. You can then manipulate the hundreds chart by entering number sentences into the calculator. Model the activity by giving the students several number sentences to put into the calculator. Discuss the results. Use the following examples:

- $1+1$, $3+1$, $5+1$, $6+1$, $7+1$
- $2+1$, $4+1$, $6+1$, $8+1$, $10+11$

Student Application:

Students will be allowed to put anything into the calculator for the first couple of minutes to become familiar with the site. A few minutes later, pass out a worksheet that they must complete as they explore, which gives them specific number sentences that they must put into the calculator (*Refer to Student Resource page 8: Illuminations*). Answers can be found on Teacher Resource 6.

Embedded Assessment:

When students return to the classroom, discuss what they saw on the computer. Students will then complete a BCR (*Student Resource Page 9: Even and Odd BCR*) about even and odd numbers. Answers can be found on Teacher Resource 7. Briefly discuss the scoring rubric, which would have been discussed in length prior to the unit. They will then complete *Student Resource Page 10: Assessment*. Answers can be found on Teacher Resource 8.

Reteaching:

Revisit even and odd numbers using unifix cubes by having them build the numbers and describing the differences in shapes.

Extension:

Allow students to explore even and odd numbers using two and three digit numbers. They can also explore what happens when you multiply even and odd numbers. Discuss if the same rule applies to multiplication. Ask, “Does an even number times an even number equal an even number? Does an odd number times an odd number give you an odd number? Does an even number times an odd number give you an odd number? Students can explain what they notice.

Lesson 4

Pre-assessment:

To begin today's lesson, students will take out their math journals. In it, they must write down the problem of the day and solve it. In addition to solving the problem, they must indicate how they arrived at the answer. Write the following problem on the board or overhead:

Extend the following pattern: 1,5,9,13, 17,21,25. Give student time to complete the problem of the day and time should be spent going over students' responses and reviewing key terms.

Launch:

Discuss whether or not the problem of the day is a growing or repeating pattern. (The pattern is considered a growing pattern because it does not include a core and the numbers increase.) Students will use unifix cubes to illustrate the above pattern.

Teacher Facilitation:

1. After reviewing the problem of the day, read part of the story, One Grain of Rice by Demi. The story is about a Raja, who asks the people of the villages to give him their rice during the harvest to store in case of a famine. When the famine hits, he hoards the rice for himself while the people starve. Rani outsmarts the Raja by asking him to give her one grain of rice to be doubled everyday for thirty days. He does not realize that by the thirtieth day, he gives her all of his rice storage. Rani distributes the rice to the people and gives some to the raja after he promises never to hoard again. As you read, show how much rice Rani accumulates over the course of five days by placing the rice on the overhead. Stop reading after the fourth day.
2. Arrange the students in groups of three. Pass out the *Student Resource sheet 11: One Grain of Rice* to each student as well as calculators and rice. Answers can be found on Teacher Resource 9.
3. As you model on the overhead, students will fill in the first four days on their table. Tell students to think about the patterns that they notice. After allowing the students think time, ask students to share what they notice.

Student Application:

Students will use the rice to help them complete the worksheet. They may also use the calculators to assist with the calculations. After they finish their charts, they should begin answering the follow-up questions.

Embedded Assessment:

While the students are completing their tables, walk around to observe their progress. Look over their charts to make sure they understand the pattern and are on the right track. Read over their responses to the follow-up questions to make sure they adequately explain the pattern.

Re-teaching:

- Talk about the numbers and discuss how they are increasing.

Extension:

- Students will continue the pattern for 15 days.

Summative Assessment:

Students will complete *Student Resource 12: Summative Assessment*. Answers can be found on Teacher Resource 10.

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Teacher Instructions:

1. Place students in small groups.
2. See attached teacher resource for Student Application for lesson 1
3. Cut out center directions from teacher resource sheet and place each into separate envelopes.
4. Place each envelope at the corresponding center.
5. Select a group leader to read the directions aloud to the group.
6. **Students need to create a pattern with three terms in the core using no more than nine terms in the entire pattern. Underline the core.**

A. Sponge Painting Center

1. Cut out shapes from the sponges using 3 sponges of different colors. Use the following supplies: Rectangular poster, Paint (different colors), 3 sponges, scissors.

B. Playdough Center

1. Cut out shapes using three different cookie cutters. Use the following supplies: Playdough (3 different colors), Cookie Cutters, Rectangular Poster

C. Rubber Stamp and Ink Pad Center

1. Use three different stamps and ink pads to create a pattern. Use the following supplies: Rubber stamps, Ink pads, Rectangular poster.

Name _____

Date _____

Patterns: SR1

1. Make a pattern with a core that has only two terms on the blanks below using two different colors and shapes.

_____, _____, _____, _____, _____, _____, _____, _____

2. Continue the following pattern you see below.

▲ • ■ ▲ • ■ ▲ • ■ _____, _____, _____

3. Choose the next four terms from the choices below.

▲ • ▲ • _____, _____, _____, _____

a. • ▼ ▼ •

b. ▲ ▲ • •

c. ▲ • ▲ •

d. • • ▲ ▲

4. What is a repeating pattern? Describe it using the words, core and term, in your explanation.

Patterns Answer Key

1. Make a pattern with a core that has only two terms on the blanks below using two different colors and shapes. (*Answers may vary*)



____, _____, _____, _____, _____, _____, _____, _____

2. Continue the following pattern you see below. (▲ • ■)



3. Choose the next four terms from the choices below. C



a. • ▼▼•

b. ▲▲••

c. ▲•▲•

d. ••▲▲

4. What is a repeating pattern? Describe it using the words, core and term, in your explanation. (*Answers may vary*)

A repeating pattern is a sequence of objects that repeats. It consists of a core that has several terms that happen over and over again.

HUNDRED CHART

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Growing Patterns
Brief Constructed Response

7, 9, 11, 13, _____, _____, _____, _____

Part A

Complete the above pattern.

Part B

Use what you know about growing patterns to explain why your answer is correct. Use numbers, pictures, and/or words in your explanation.

Missing Numbers

1	2	3		5	6	7	8	9	10
11				15		17		1	20
	22	23	24		26	27	28	29	
31				35		37	38		40
	42	43	44		46	47	48		50
51	52		54	55		57		59	60
61	62		64	65		67		69	70
71		73		75	76		78	79	80
	82		84	85		87	88		90
91		93	94	95	96	97	98		100

Name _____

Date _____

Even or Odd Riddles

Directions: Use what you know about even and odd numbers to solve the following riddles.

1. I am an even number. If you double me, the sum is between 14 and 19. What number am I?

2. I am an odd number. If you double me, the total is between 9 and 13. What number am I?

3. I am greater than 20. You get me by counting by 2's. The sum of my digits is 6. What number am I? Am I even or odd?

Directions: Write your own riddle. Have a partner solve it.

Even or Odd Riddles Answer Key

Directions: Use what you know about even and odd numbers to solve the following riddles.

1. I am an even number. If you double me, the sum is between 14 and 19. What number am I? *8*

2. I am an odd number. If you double me, the total is between 9 and 13. What number am I? *5*

3. I am greater than 20. You get me by counting by 2's. The sum of my digits is 6. I am less than 30. What number am I? Am I even or odd? *24, even*

Directions: Write your own riddle. Have a partner solve it. (*Answers may vary*)

Name _____

Date _____

Homework - Lesson 2

Directions: Complete the patterns below. Write if the numbers are even or odd.

1. 11, 13, 15, _____, _____, _____, _____ _____

2. 12, 14, 16, _____, _____, _____, _____ _____

3. 15, 17, 19, _____, _____, _____, _____ _____

4. 22, 24, 26, _____, _____, _____, _____ _____

5. 31, 41, 51, _____, _____, _____, _____ _____

Can you divide an odd number into two equal groups? Draw a picture to illustrate your answer.

Homework - Lesson 2 Answer Key

Directions: Complete the patterns below. Write if the numbers are even or odd.

1. 11, 13, 15, _____, _____, _____, _____ 17, 19, 21, 23 odd

2. 12, 14, 16, _____, _____, _____, _____ 18, 20, 22, 24 even

3. 15, 17, 19, _____, _____, _____, _____ 21, 23, 25, 27 odd

4. 22, 24, 26, _____, _____, _____, _____ 28, 30, 32, 34 even

5. 31, 41, 51, _____, _____, _____, _____ 61, 71, 81, 91 odd

Can you divide an odd number into two equal groups? Draw a picture to illustrate your answer. (*Pictures may vary*)

You cannot divide an odd number into two equal groups because there would be one left over.

Name _____

Date _____

Even and Odd Sum

Directions: Solve the following problems and color the sum on the hundreds chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1. $4+4 = \underline{\quad}$ (yellow)

2. $3+3 = \underline{\quad}$ (yellow)

3. $6+6 = \underline{\quad}$ (yellow)

4. $2+2 = \underline{\quad}$ (yellow)

5. $5+4 = \underline{\quad}$ (light green)

6. $6+9 = \underline{\quad}$ (light green)

7. $7+2 = \underline{\quad}$ (light green)

7. $3+4 = \underline{\quad}$ (light green)

Explain what you notice on your hundreds chart.

Name _____ Answer Key _____

Date _____

Even and Odd Sum

Directions: Solve the following problems and color the sum on the hundreds chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1. $4+4 = \underline{8}$ (yellow)

2. $3+3 = \underline{6}$ (yellow)

3. $6+6 = \underline{12}$ (yellow)

4. $2+2 = \underline{4}$ (yellow)

5. $5+6 = \underline{11}$ (light green)

6. $6+9 = \underline{15}$ (light green)

7. $7+2 = \underline{9}$ (light green)

8. $3+4 = \underline{7}$ (light green)

Explain what you notice on your hundreds chart.

I noticed that if you add an even number with an even number, you get an even number. If you add an even number and an odd number or an odd number with an odd number, you get an odd number.

Name _____

Date _____

Illuminations

Directions: Enter the following number sentences into the online calculator and respond to the follow-up questions.

1. $1+1$
2. $2+2$
3. $3+3$
4. $4+4$
5. $1+2$
6. $3+4$
7. $4+5$

A. An even number plus an even number equals what? _____

B. An odd number plus an odd number equals what? _____

C. An odd number plus an even number equals what? _____

D. Draw a picture to illustrate your answers to A-C in the space below.

Illuminations Answer Key

Directions: Enter the following number sentences into the online calculator and respond to the follow-up questions.

1. $1+1$
2. $2+2$
3. $3+3$
4. $4+4$
5. $1+2$
6. $3+4$
7. $4+5$

- A. An even number plus an even number equals what? *An even number*
- B. An odd number plus an odd number equals what? *An even number*
- C. An odd number plus an even number equals what? *An odd number*
- D. Draw a picture to illustrate your answers to A-C in the space below.
Pictures may vary

Even and Odd
Brief Constructed Response

$2+2$ gives you an even sum, and $1+1$ gives you an even sum.

Part A

Will $4+3$ give you an even or odd sum?

Part B

Use what you know about even and odd numbers to explain why your answer is correct. Use number, pictures, and/or words in your explanation.

Brief Constructed Response Answer Key

$2+2$ gives you an even sum, and $1+1$ gives you an even sum.

Part A

Will $4+3$ give you an even or odd sum?

It would give you an odd sum.

Part B

Use what you know about even and odd numbers to explain why your answer is correct. Use number, pictures, and/or words in your explanation.

(Answers may vary)

Name _____

Date _____

Summative Assessment

Part I: Vocabulary

Directions: Choose the best definition for the following terms.

- | | |
|----------------------|--|
| 1. pattern | A. a place or position in the sequence |
| 2. repeating pattern | B. the group of terms that repeat |
| 3. term | C. 3, 5, 7, 9 |
| 4. core | D. a sequence or order of objects that repeats or grows |
| 5. odd numbers | E. 2, 4, 6, 8 |
| 6. even numbers | F. a sequence of objects that increases |
| 7. growing pattern | G. a sequence of objects that contains a core that repeats |

Part II: Fill-in-the-blank

Directions: Complete the following:

1. Make a pattern on the blanks below using two terms of different colors in the core. Repeat the pattern for the next 6 terms.

_____, _____, _____, _____, _____, _____, _____, _____,

2. Continue the following pattern you see below. Underline the core.

● ■ ▲ ● ■ ▲ ● ■ _____, _____, _____, _____, _____, _____, _____, _____, _____

3. Write the next four numbers in the pattern. Write even or odd

13, 15, 17, _____, _____, _____, _____ _____

32, 34, 36, _____, _____, _____, _____ _____

4. Solve the riddle.

I am an odd number. If you triple me, the total is between 8 and 10. What number am I? _____

5. An even number plus an even number equals _____

6. An odd number plus an odd number equals _____

7. An even number plus an odd number equals _____

Name _____

Date _____

One Grain of Rice?

I. Complete the following table.

Number of Days	Grains of Rice
1	1
2	2
3	
4	
5	
6	
7	
8	
9	
10	

1. What is the pattern that you notice? Explain your reasoning.

2. If a person needed to eat 128 grains of rice to be filled, by what day would he/she have to wait to eat?

One Grain of Rice?

II. Complete the following table.

Number of Days	Grains of Rice
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256
10	512

1. What is the pattern that you notice? Explain your reasoning. *Answers may vary*

2. If a person needed to eat 128 grains of rice to be filled, by what day would he/she have to wait to eat?

If a person needed to eat 128 grains of rice to be filled, they would have to wait until the eighth day.

Name _____

Date _____

Summative Assessment

I. Selected Responses

Directions: Circle the answer that extends the pattern.

1. ▲ ■ ● ▲ ■ ● _____, _____, _____

a. ■ ● ▲

b. ■ ■ ●

c. ▲ ● ■

d. ▲ ■ ●

2. 3, 6, 9, 12, _____, _____

a. 15, 18

b. 13, 15

c. 14, 16

d. 3, 6

3. ● ● ■ ■ ● ● ■ ■ ● _____, _____, _____

a. ■ ● ●

b. ● ■ ■

c. ■ ● ■

d. ● ● ■

II. Brief Constructed Response

A. Create a repeating pattern using a core of 1,2,3 and a total of nine terms.

B. Using what you know about repeating patterns, explain why your answer is correct. Use words, numbers, and/or pictures in your explanation.

Name _____

Date _____

Summative Assessment- Answer Key

I. Selected Responses

Directions: Circle the answer that extends the pattern.

1. ▲ ■ ● ▲ ■ ● _____, _____, _____ (d)

a. ■ ● ▲

b. ■ ■ ●

c. ▲ ● ■

d. ▲ ■ ●

2. 3, 6, 9, 12, _____, _____ (a)

a. 15, 18

b. 13, 15

c. 14, 16

d. 3, 6

3. ● ● ■ ■ ● ● ■ ■ ● _____, _____, _____ (b)

a. ■ ● ●

b. ● ■ ■

c. ■ ● ■

d. ● ● ■

II. Brief Constructed Response

A. Create a repeating pattern using a core of 1,2,3 and a total of nine terms.

1 2 3 1 2 3 1 2 3

B. Using what you know about repeating patterns, explain why your answer is correct. Use words, numbers, and/or pictures in your explanation. (Answers may vary)

**MSA Brief Constructed Response “Kid Speak”
Mathematics Rubric
Grades 1 through 8**

Score	
<p align="center">2</p>	<p>My answer shows I completely understood the problem and how to solve it:</p> <ul style="list-style-type: none"> • I used a very good, complete strategy to correctly solve the problem. • I used my best math vocabulary to clearly explain what I did to solve the problem. My explanation was well organized and logical. • I applied what I know about math to correctly solve the problem. • I used numbers, words, symbols or pictures (or a combination of them) to show how I solved the problem.
<p align="center">1</p>	<p>My answer shows I understood most of the problem and how to solve it:</p> <ul style="list-style-type: none"> • I used a strategy to find a solution that was partly correct. • I used some math vocabulary and most of my reasons were correct to explain how I solved the problem. My explanation needed to be more complete, well organized or logical. • I partly applied what I know about math to solve the problem. • I tried to use numbers, words, symbols or pictures (or a combination of them) to show how I solved the problem. My answer may not have been completely correct.
<p align="center">0</p>	<p>My answer shows I didn’t understand the problem and how to solve it:</p> <ul style="list-style-type: none"> • I wasn’t able to use a good strategy to solve the problem. • My strategy wasn’t related to what was asked. • I didn’t apply what I know about math to solve the problem. • I left the answer blank.