



QUESTIONING

RIDDLE ME THIS...

Brief Description of the Lesson: Students will create original math riddles in the form of questions, write mathematical vocabulary, and show possible solutions.

SOL/POS Objective: *(List number and specific objective.)*

Mathematics

- 6.1.1.1 Read, write, round, compare, and order any whole or decimal number.
- 6.1.1.2 Students use problem solving approaches to understand concepts and skills involving numerical relationships. Students pose problems; solve routine, non-routine and multi-step problems.
- 6.1.2.7 Solve problems by working collaboratively with peers; entertain others' point of view.
- 6.1.2.8 Share and explain (verbalize/ record) thinking during and after solving a problem. Verify and interpret results of the original problem situation to determine if answers are reasonable.

Instructional Strategy:

Cues, Questions, and Advance Organizers- Students develop questions using mathematical terminology.

Materials: Pencil, *Riddle Me This* riddle handout, *Riddle Me This* student worksheet, *Riddle Me This!: Riddles and Stories to Challenge Your Mind* by Hugh Lupton (optional)

Enduring Understanding:

- Mathematics is a study of patterns, properties and relationships that uses numbers and symbols developed over time through observations, explorations and investigations that prove to be constant truths.
- Mathematics has its own language. Mathematicians acquire a specialized mathematical vocabulary and explore the mathematical patterns in order to understand concepts.
- Mathematicians must be able write about mathematics in order to explain their thinking and problem solving to others.
- Clearly stated specific questions lead to specific answers.
- Asking and answering questions creates opportunities for more in-depth learning.

Introduction/Essential Questions: *(What influences your reaction to an issue or a problem?)*

- Why does the study of mathematics have its own special vocabulary?
- How does asking questions help people learn?
- Why do you think it is important for mathematicians to be able to write and share their ideas?
- Why do mathematicians need to be able to express the written mathematical solutions for other mathematicians to read?

Thinking strategies to enhance skills of analysis, creativity, and problem solving.



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- How does questioning and creativity go together?

Teach and Explore Strategy: (*Steps in teaching the process and exploring applications*)

Prior to teaching this lesson, teach or review the introductory thinking process lesson on questioning. Help focus students' thinking by reminding them of the metacognitive component writing questions.

- Allow students to work on the math riddles from the *Riddle Me This* handout as a warm-up activity.
- Brainstorm words that have a mathematical quantitative meaning. (examples: half, double, bicycle, octopus, pentagon, hexagon, triangle.) Also, brainstorm another list of words related to mathematical operations. (examples: more than, plus, times, greater than, twice, half, squared, cubed, one-third, quarter)
- Share the book, *Riddle Me This!: Riddles and Stories to Challenge Your Mind* by Hugh Lupton or another book or resource containing additional riddles.(Optional)
- Discuss how to write good questions. Model how to create a math riddle by using the list of words the class brainstormed together. Create some math riddles together as a class. Emphasize the importance of creating a good question.
- Allow each student to develop their own riddles using the template. Students should create their riddle on the front side and then put their solution on the back. Emphasize the importance of a well written solution. Remind students to follow order of operations when creating and solving their riddles. Instruct students to use the word form of numbers in their riddles.
- Ask for student volunteers to share their riddles with the whole class or swap riddles around the room so students can solve their creations.
- Riddles can be collected and published into a class book or displayed on a bulletin board for other students to solve. Riddles could also be posted on the class website.

Assessment Evidence: (Discussion, teacher observation, completed product, student reflection...)

- Student created math riddles and solutions
- Student discussions and brainstorming

Metacognition:

- Why is creating a high quality question an important thinking skill?
- Why is being able to write about your knowledge in a subject like mathematics an important part of learning?

Extensions:

Advanced students can create their own book of math riddles. Also, students can research other more complex riddles available on the internet.

Riddle Me This

- **What coin doubles in value when half is deducted?**
- **What is the difference between a new penny and an old quarter?**
- **If you can buy eight eggs for 26 cents, how many can you buy for a cent and a quarter?**
- **Why should you never mention the number 288 in front of anyone?**
- **Where can you buy a ruler that is 3 feet long?**
- **How many times can you subtract 6 from 30?**
- **What number can you subtract half from to obtain a result that is zero?**
- **If one nickel is worth five cents, how much is half of one half of a nickel worth?**
- **A street that is 30 yards long has a tree every 6 yards on both sides. How many total trees on the entire street?**
- **How is the moon like a dollar?**
- **What is three larger than half of a dozen times the number of sides on a triangle?**
- **What is half of a half of the number of arms on an octopus?**
- **What is three times the sides of a pentagon plus four times the sides of a hexagon?**
- **How many squares will you have when you fold a paper in thirds, in half, then in half again?**

Riddle Me This

Student Riddles

Student Name: _____

Create a math riddle in the form of a question. Write the answer on the back.

Riddle Me This

Student Name: _____

Create a math riddle in the form of a question. Write the answer on the back.

Riddle Me This

- **What coin doubles in value when half is deducted?** A Half Dollar
- **What is the difference between a new penny and an old quarter?** 24 cents
- **If you can buy eight eggs for 26 cents, how many can you buy for a cent and a quarter?** Eight
- **Why should you never mention the number 288 in front of anyone?** Because it is too gross. 2 times 144 which is a gross.
- **Where can you buy a ruler that is 3 feet long?** At a yard sale
- **How many times can you subtract 6 from 30?** Once, after that is it no longer 30
- **What number can you subtract half from to obtain a result that is zero?** The number 8 – made up of two zeros on top of each other
- **If one nickel is worth five cents, how much is half of one half of a nickel worth?** 0.0125
- **A street that is 30 yards long has a tree every 6 yards on both sides. How many total trees on the entire street?** 12- six per side
- **How is the moon like a dollar?** They both have four quarters!
- **What is three larger than half of a dozen times the number of sides on a triangle?** (27: $3 + 6 \times 3 = ?$)
- **What is half of a half of the number of arms on an octopus?** (2: $8 \div 2 \div 2 = ?$)
- **What is three times the sides of a pentagon plus four times the sides of a hexagon?** (39: $3 \times 5 + 4 \times 6 = ?$)
- **How many squares will you have when you fold a paper in thirds, in half, then in half again?** 12 squares