MAGIC MATH

Grade: 4th Grade
Duration: 3 class periods (45 minutes each)

PROJECT DESCRIPTION

In this exciting project, 4th-grade students will take their newly acquired mental math skills and transform them into captivating Math Magic Shows. This project will not only reinforce their understanding of key math concepts but also enhance their collaboration, creativity, and presentation skills.

STEM & ACADEMIC CONCEPTS

- SCIENCE
- TECHNOLOGY
- ENGINEERING
- MATH
- WRITING

OBJECTIVES

- Content Objective: Students will learn and apply mental math strategies including number bonds, friendly numbers, and the distributive property.
- Process Objective: Students will collaborate in groups to create and present a Math Magic Show that showcases their understanding of mental math concepts.
- Skill Objective: Students will improve their mental math skills, enabling them to perform calculations quickly and accurately..

MATERIALS

- Whiteboard and markers
- Projector for displaying problems and solutions
- Chart paper and markers for group work
- Rubric for evaluating the Math Magic Show

STANDARDS

SCIENCE

- 3.ESS2.3: Earth's Systems- Use tables, graphs, and tools to describe precipitation, temperature, and wind (direction and speed) to determine local weather and climate.

ENGINEERING

- 3.ETS1.1: Design a solution to a real-world problem that includes specified criteria for constraints.
- 3.ETS1.2: Engineering Design- Apply evidence or research to support a design solution.

MATH

- 3.MD.B.3 Draw a scaled pictograph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled graphs.

WRITING

- 3.W.RBPK.8 Recall information from experiences or gather information from print and digital sources to answer a question; with support; take brief notes on sources and sort evidence into provided categories.

VOCABULARY

- **Number Bonds:** A way to break numbers into smaller parts to make calculations easier. For example, for the number 15, number bonds could be 10 + 5 or 8 + 7.
- **Friendly Numbers:** Numbers that are easy to work with mentally. Examples include 10, 20, 50, and 100.
- **Distributive Property:** Breaking apart a complex calculation into simpler parts. For example, 24 x 3 can be calculated as (20 x 3) + (4 x 3).

MAGIC MATH

Engage (Duration:)

- Begin with a brief discussion on the importance of mental math skills in everyday life.
- Share a fun math riddle to pique students' interest and curiosity. For example, "I am a two-digit number. My tens digit is 4 more than my ones digit. What number am I?
- Encourage students to think and share their answers.

Explore (Duration:)

- Introduce the concept of mental math strategies, such as using number bonds, friendly numbers, and the distributive property.
- Provide examples and solve problems together as a class.
- Engage students in group activities where they practice mental math using these strategies.

Explain (Duration:)

- Define key vocabulary words for the lesson:
  - Number Bonds: A way to break down numbers into smaller parts to make calculations easier.
  - Friendly Numbers: Numbers that are easy to work with mentally, often multiples of 10 or 100.
  - Distributive Property: The ability to break apart a complex calculation into simpler parts.
- Discuss the importance of these strategies and how they help in performing mental math calculations quickly and accurately.

Elaborate (Duration:)

- Divide students into pairs or small groups.
- Assign them a project where they create a "Math Magic Show.
- In this show, they'll demonstrate mental math tricks using the strategies learned.
- Each group should prepare a script, perform their tricks, and explain the underlying mental math concept to the class.

Evaluate (Duration:)

- Provide a rubric for assessing the Math Magic Show project.
- Evaluate groups based on:
  - Accuracy: Correctness of calculations and explanations.
  - Creativity: Uniqueness and engagement of the tricks performed.
  - Clarity: Clear explanations of the mental math strategies used.
  - Collaboration: Effective teamwork and participation of all group members.

ACTIVITY

THE ENCHANTED NUMBERS MATH MAGIC SHOW

Theme: The theme of our Math Magic Show is "The Enchanted Numbers." We will take our audience on a magical journey through the world of numbers and show them how we can perform incredible mental math tricks using our newfound skills.

Mental Math Tricks:

Trick 1: The Disappearing Digits

We'll ask a volunteer from the audience to choose a three-digit number, but not reveal it.
We will then guide the volunteer through a series of calculations: multiply the number by 7, add 9, and then subtract the original chosen number.
No matter the volunteer's starting number, the result will always be 16. We'll reveal the secret behind this trick using the distributive property.

Trick 2: The Friendly Numbers Duel

Two of us will engage in a friendly math duel on stage. We'll each choose a two-digit number and quickly add them mentally. The audience will be amazed at how we can instantly come up with the sum using the friendly numbers 10, 20, 30, and so on.

Trick 3: The Number Bond Magic

We'll request the audience to shout out a number. Using the power of number bonds, we'll break down that number into smaller parts and show various ways to represent it. For instance, if the number is 24, we can show it as 20 + 4, 15 + 9, 10 + 10 + 4, and so forth.

Script:

Magician 1: Welcome, everyone, to "The Enchanted Numbers Math Magic Show"!
Are you ready to be amazed by the power of mental math? Let's begin with our first trick.

Magician 2: That's right! For our first trick, we need a brave volunteer from the audience. You, right there! Please choose a three-digit number in your mind, but don't tell us. Now, let's perform some magic calculations together.

Magician 1: Multiply your number by 7... add 9... and now subtract the number you started with. Voilà! The answer is 16, no matter what number you began with. How is that possible? It's all thanks to the distributive property, which works its magic behind the scenes.

Magician 2: Get ready for our next trick, the Friendly Numbers Duel! Watch closely as we each choose a two-digit number and instantly add them together. The secret lies in using friendly numbers like 10, 20, 30, and so on, making mental math lightning-fast!

Magician 1: And now, for our final trick, we'll demonstrate the Number Bond Magic.
Shout out any number, and we'll show you the many ways we can break it down into smaller parts using number bonds. Let's hear a number from the audience!

Audience Member: 45!

Magician 2: Fantastic choice! We can represent 45 as 40 + 5, 30 + 15, 20 + 25, and more. Number bonds help us break down complex numbers into smaller, manageable pieces.

Magician 1: Thank you, everyone, for being a wonderful audience. We hope you've enjoyed our Enchanted Numbers Math Magic Show. Remember, with the power of mental math, anyone can become a math magician!

Closing: And that's a wrap for our "Enchanted Numbers Math Magic Show." We've shown you how math can be magical and fun. Keep practicing your mental math skills, and you'll be performing your own math tricks in no time! Thank you for joining us on this enchanting journey through numbers.

CHECK FOR UNDERSTANDING

Name: _____ Date: _____

Instructions: Answer all questions and Show your work for calculations whenever necessary.

Use the mental math strategies learned in the lesson to solve the problems. Circle or write the letter of the correct answer choice.

Solve using the distributive property: 23 x 8 =

a) 160
b) 176
c) 184
d) 144

Which numbers are considered friendly numbers?

a) 9, 14, 37
b) 10, 20, 50
c) 13, 19, 42
d) 8, 18, 58

Break down the number 58 into two parts using number bonds:

a) 30 + 28
b) 40 + 18
c) 50 + 10
d) 60 + 8

In "The Disappearing Digits" trick, if a volunteer chooses the number 142, what will be the final result after following the calculations?

a) 138
b) 139
c) 140
d) 137

In the "Friendly Numbers Duel" trick, if one magician chooses 40 and the other chooses 60, what will be the sum of their numbers?

a) 90
b) 80
c) 100
d) 70

When breaking down the number 49 using number bonds, what are the possible pairs?

a) 20 + 19
b) 40 + 9
c) 25 + 24
d) 30 + 19

CHECK FOR UNDERSTANDING

In your Math Magic Show, if you asked the audience to choose a three-digit number, multiply it by 5, and then subtract the original number, what would the final result always be?

a) 5
b) 10
c) 15
d) 20

Explain one mental math trick you performed in your Math Magic Show and the strategy you used to make it work.

Tim has 87 candies, and he wants to share them equally among his 3 friends. How many candies will each friend get?

a) 28
b) 29
c) 30
d) 27

Sara bought 4 packs of pencils, and each pack contains 12 pencils. How many pencils did she buy in total?

a) 48
b) 46
c) 52
d) 44

Answers:

b 2. b 3. b 4. b 5. a 6. a 7. c 8. (Open-ended) 9. b 10. a Bonus: 14 and 15