

WORD PROBLEMS

project based learning

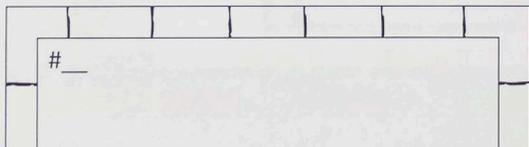
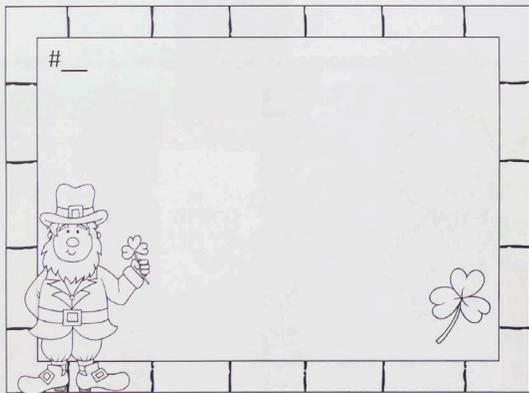
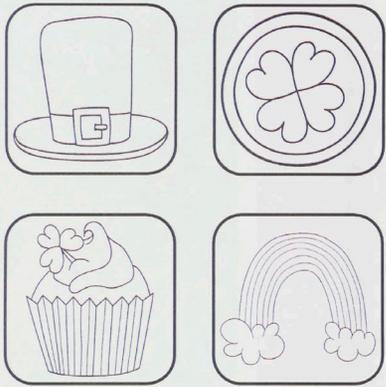
2nd Grade



CREATE A
GAMEBOARD

with leprechauns!





©Gail Bixler





Truly Tricky
Card
#6



©gabri

CREATE A BOARD GAME!

It's time to create your own board game to review one-step and two-step word problems! Here are the elements of your game:

GAMEBOARD

Game board has a trail for the player to follow. There is a starting point and a goal. The trail is made of colored squares.



GAME PIECES



Game pieces include a coin, a cupcake, and a rainbow. You can use 2, 3, or 4 players. Each player gets to choose their own pieces to keep track of where they are on the trail.

Answer Key

You need to know the answer to the word problems you created! Use the answer key to check your work.

Card #

- 1
- 2
- 3

Game Rules

Use the space below to write your game rules.

- There must be 2, 3 or 4 players to play the game. The players must take turns in order.
- Each player gets one spin. If the spinner lands on a color, the player must jump forward to the next spot of that color. If the player lands on a command, they must follow it.
- If a player lands on a spot with a leprechaun, they must pick a "Truly Tricky Card" and solve the word problem.





SELF-EVALUATION

Circle one box per row on the rubric that expresses how you rate yourself on this Project-Based Learning Activity.

| | |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| + | ✓ |
| I felt very confident about the math in this project. | I felt pretty good about my ability to complete math in this project. |
| I understood all of the math and did not need help to complete the problems. | I understood most of the math but needed a little help with some of the problems. |
| I easily used many strategies to solve the math problems efficiently. | I needed some help to use the best strategies for solving the math problems. |
| I feel I am ready for a harder math project. | I feel I would need more time to complete a similar math project. |



SELF-REFLECTION

Write a reflection of your experience with this project. How did you feel about the math word problems and creating a game board? Explain what you found easy to do and any difficulties you had while working on this project. Did you enjoy this activity? Why or why not?

I enjoyed working on this project. Writing the word problems helped me understand how the key words help the solver know what to do.



RATE THIS PROJECT

Circle the statement you most agree with.

I am ready for something harder.

This was just right.

I found this very challenging.

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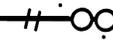
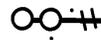


SELF-EVALUATION

SELF-REFLECTION



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For The Teacher

This **Create a Board Game** Project Based Learning packet was created for 2nd grade students. The activities included will provide your students with math practice in an engaging way. The standards addressed in this packet include:

- 2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
 - 2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.



Directions:

1. Decide if your class will complete the project as a whole group, in small groups, or independently.
2. Copy packets and provide students with materials necessary to complete the packet.
3. Students should complete the project over several days.
4. Preview the activity with your students.
5. Students will complete the self-evaluation reflection rubric.
6. Allow students an opportunity to share their completed projects.

Suggested Challenge Order & Teaching Notes:

1. Explain the project to students: They will be reviewing one and two-step word problems and create their own to complete a game board!
 - NOTE: There are two versions of this PBL activity included in this packet. You can choose to have students use our designed game board, spinner, game pieces, and game rules. This option allows students to focus solely on the word problems they will create for the game cards to go with the game board. The second option is to use the blackline game board and related game components to have students create the entire game from scratch. Choose the option that is best for your students and the time you have allotted for this PBL activity.
2. Review the anchor charts and word problem examples provided. These can be printed for students, projected for the class to see, or displayed in your classroom for reference.
3. Allow students to practice solving word problems. Go over answers with the class and address any misconceptions before students work on creating their own word problems.
4. Explain the game board and the game rules (if you are using the pre-designed option). Allow students to work through the practice of creating their own word problems.
5. Give students time to create their word problems on their Truly Tricky Cards. Students should work on their answer keys simultaneously.
6. Allow students to play their games! Students can even swap games with each other and play their classmates' game board creations. 😊

Word Problems Can Be Tricky!

Word problems can be tricky – that is why leprechauns love them!

Practice solving and creating one-step and two-step word problems by making your very own board game.



Let's get started!

- Review word problems and key words.
- Solve some practice word problems.
- Review the game parts and rules.
- Make your own word problems for the game.
- Create an answer key for your word problems.
- Play your game! Have fun!



ONE-STEP WORD PROBLEMS

Johnny and Sam are the characters in the word problem.

The numbers used in the word problem are important! They are used to write the equation.

Johnny has 8 cars and Sam has 5 cars. How many cars do they have altogether?

"Altogether" is a key word that indicates that addition is needed to solve this problem.

There are many key words that indicate whether to use addition, subtraction, multiplication, or division when solving a word problem.

show your work:

$$\boxed{8} + \boxed{5} = \boxed{12}$$

answer:

12

The show your work box is a space for you to find the answer. This example shows how to use an equation and blocks to find the answer. It's okay if your show your work box looks different!

The answer to the equation is the answer to the word problem. Johnny and Sam have 12 cars altogether!



TWO-STEP WORD PROBLEMS

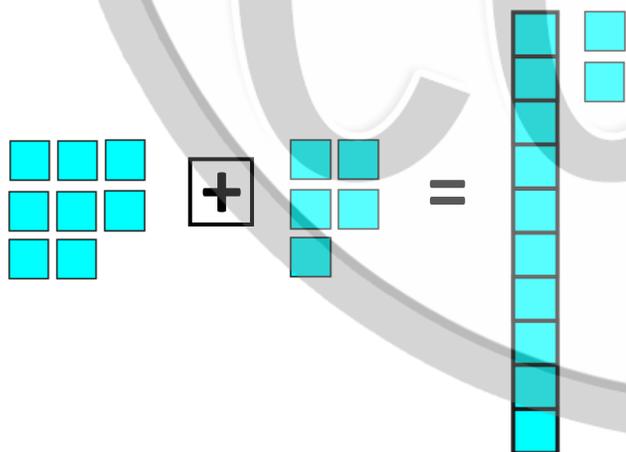
Johnny and Sam decide to share their cars. Johnny has 8 and Sam has 5. Then they give their friend Angie 2 cars for her birthday. How many cars do they have left?



STEP 1:

$$\boxed{8} + \boxed{5} = \boxed{12}$$

The key word "share" indicates addition is needed to complete the 1st step.

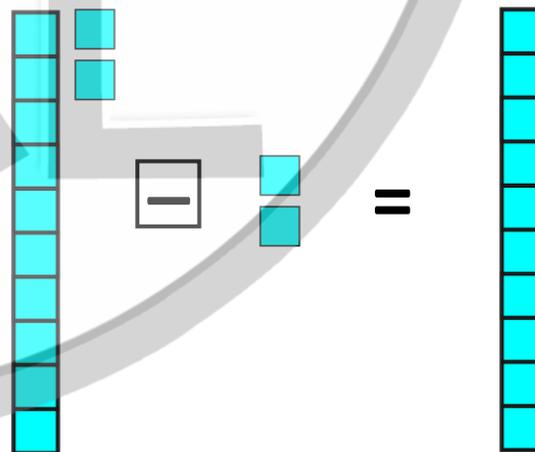


STEP 2:

$$\boxed{12} - \boxed{2} = \boxed{10}$$

answer

The key word "left" indicates subtraction is needed to complete the 2nd step.



ADDITION AND SUBTRACTION

key words



- total
- in all
- and
- altogether
- together
- perimeter
- sum
- plus
- join

If you see any of these key words, use **addition** to solve the problem!



- fewer
- are not
- leftover
- difference
- how many more
- take away
- remain
- minus
- exceed

If you see any of these key words, use **subtraction** to solve the problem!

ONE-STEP WORD PROBLEMS

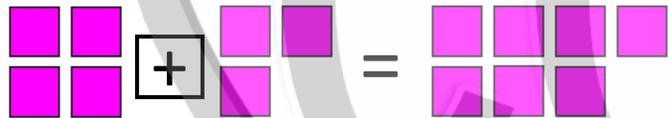
examples

Salena and Jesse have a concert in their backyard. Salena sings $\boxed{4}$ songs. Jesse sings $\boxed{3}$. How many songs did they sing altogether?

SHOW YOUR WORK:

$$\boxed{4} + \boxed{3} = \boxed{7}$$

The key word "altogether" in the word problem indicates addition.



ANSWER:

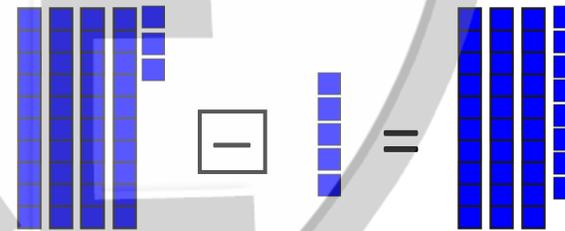
7

Luna makes a bracelet with $\boxed{43}$ glass beads. At school, $\boxed{5}$ of the beads break. How many beads are left on the bracelet?

SHOW YOUR WORK:

$$\boxed{43} - \boxed{5} = \boxed{38}$$

The key word "left" in the word problem indicates subtraction.



ANSWER:

38

Practice Solving Word Problems!

Let's practice solving word problems! You'll get to create your own next. Be sure to show your work for each problem. Remember to work carefully... word problems can be tricky!

1. Tasha and her best friend Joe each have 3 kittens. How many kittens do they have in total?

SHOW YOUR WORK:

2. Avery puts 10 olives on the tips of her fingers. She eats 3 of them. How many olives does Avery have left?

SHOW YOUR WORK:

Word problems can be tricky!



Circle the key words in the word problems!

ANSWER: _____

ANSWER: _____

3. The flight attendant poured 21 cups of water, 13 cups of juice, and 19 sodas. How many drinks did the flight attendant pour altogether?

SHOW YOUR WORK:

ANSWER: _____

4. Zoe's huge birthday cake is cut into 64 pieces. 39 of her party guests eat a piece of cake. How many pieces of cake are left?

SHOW YOUR WORK:

ANSWER: _____

Word problems can be tricky!



Circle the key words in the word problems!

5. Kingston needs to read 100 pages over the weekend. On Saturday he reads 45. How many more pages does Kingston need to read on Sunday to make it to 100?

SHOW YOUR WORK:

ANSWER: _____

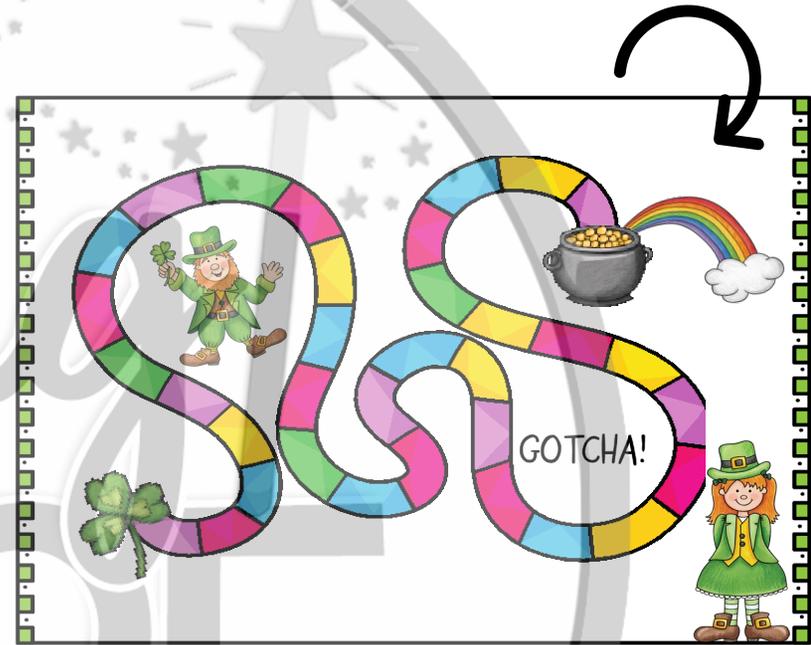
CREATE A BOARD GAME!

It's time to create your own board game to review one-step and two-step word problems!

Here are the elements of your game:

GAMEBOARD

The game board has a trail for the players to follow. There is a starting place and an ending place. Whoever reaches the pot of gold first wins the game. The game should continue until everyone finishes!



GAME PIECES

There are four game pieces: a leprechaun hat, a gold coin, a cupcake, and a rainbow.

This game can be played with 2, 3, or 4 players. Each player gets to choose their own game piece. They will use the game pieces to keep track of where they are on the trail.

TRULY TRICKY!

game rules

- There must be 2, 3, or 4 players to play the game. The players must take turns in order.



- Each player gets one spin. If the player lands on a color, they must jump forward to the next spot of that color. If the player lands on a command, they must follow it.



- If a player lands on a spot with a leprechaun, they must pick a “Truly Tricky Card” and solve the word problem. If the word problem is too tricky for a player to solve by themselves, they can ask for help from the other players.



- The first person to reach the pot of gold wins the game!
The game should continue until all players reach the pot of gold.



CREATING WORD PROBLEMS

examples



In the examples below, the first part of the word problems is given. There are three example questions that could be asked at the end. Notice the key words used, which indicate what operation will be used to solve the problem.

EXAMPLE: one-step word problem

Amelia has 11 toy trucks and Michael has 9.

_____?
_____?

Questions that could be asked to complete the word problem:

- How many toy trucks do they have altogether? → +
- How many more trucks does Amelia have than Michael? → -
- How many more trucks does Michael need in order to have the same number as Amelia? → -

EXAMPLE: two-step word problem

Amelia has 11 toy trucks and Michael has 9.
Amelia got 3 more trucks for her birthday.

_____?
_____?

Questions that could be asked to complete the word problem:

- How many toy trucks do they have altogether? → +
- How many more trucks does Amelia have than Michael? → -
- How many more trucks does Michael need in order to have the same number as Amelia? → -

CREATE YOUR TRULY TRICKY CARDS

You are going to create ten Truly Tricky word problem game cards.
Cut out the cards and write one word problem on the back of each.

SIX of the cards should have one-step word problems.
FOUR of the cards should have two-step word problems.



Do not put the answers on the cards. They will be written on the answer key.



TRULY TRICKY ANSWER KEY

You need to know the answers to the problems you created. Use this chart as an answer key. Cut it out and use it while playing your game.



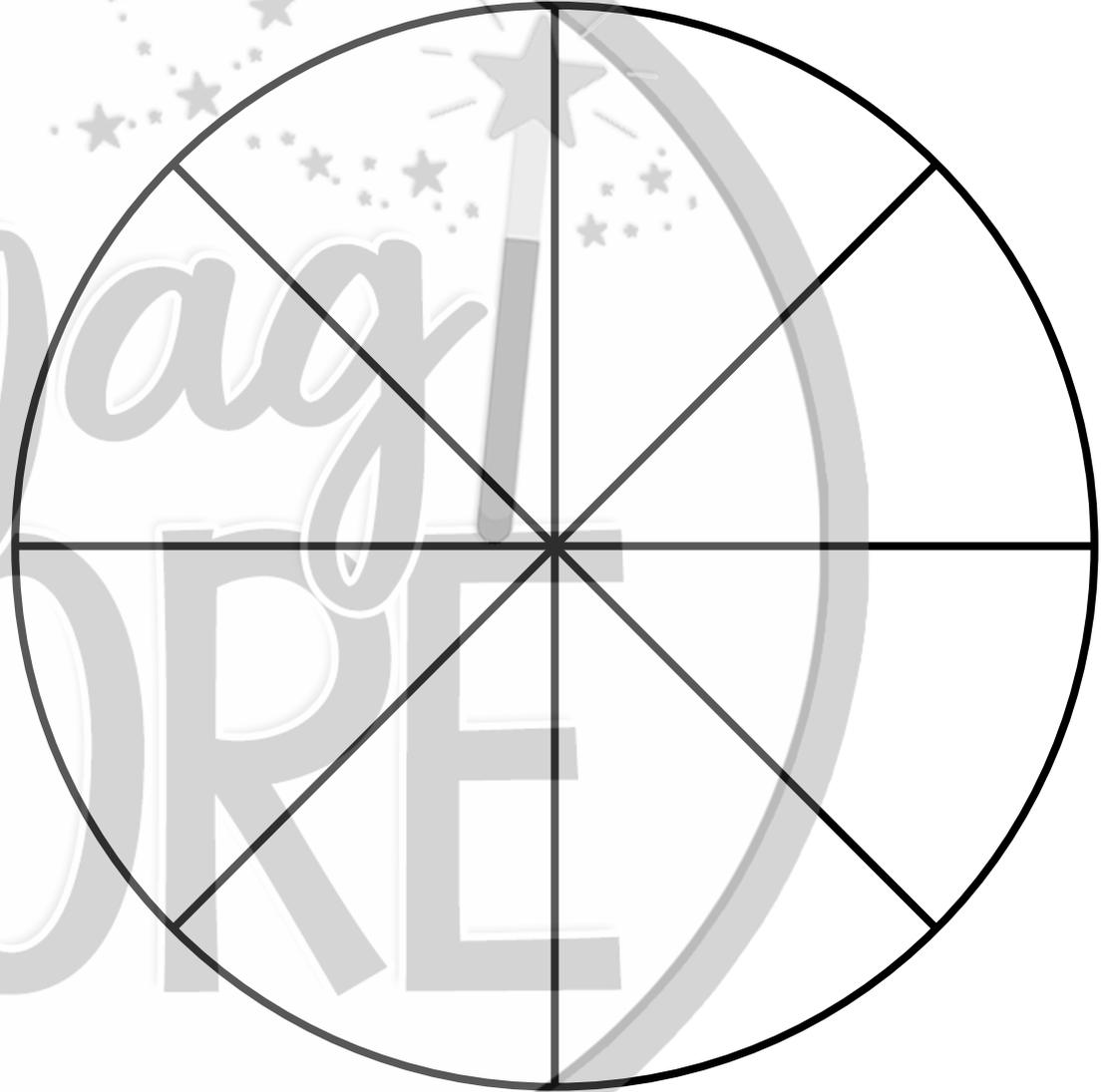
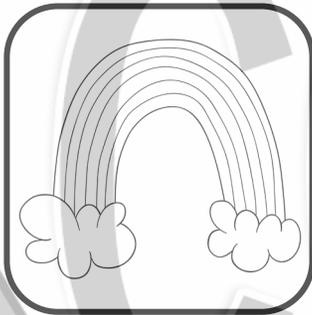
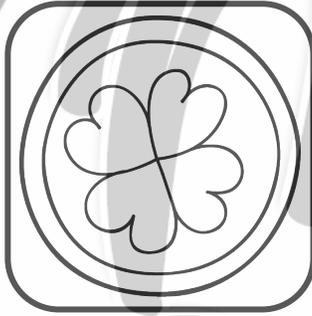
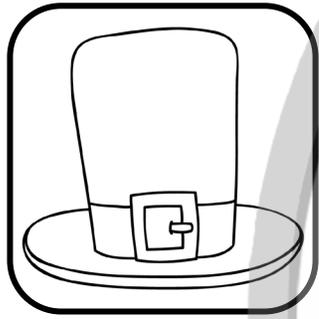
| Card # | Show Your Work! | Answer |
|--------|-----------------|--------|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |

START

TRULY
TRICKY!

END





Answer Key

You need to know the answers to the word problems you created! Use the space to fill out the answers.



| Card # | Answer |
|--------|--------|
| | |
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| | |

Game Rules

Use the space below to write your game rules.



CREATE YOUR GAME CARDS

Decide how many word problem cards will be needed for the game. Cut out the cards and decorate the front. Number the cards on the front and write the word problem on the back.



Be sure to have a mix of one-step and two-step word problems.

Do not put the answers on the cards. They will be written on the answer key.

EXAMPLE:

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p># <u>1</u></p> <p>Truly Tricky Card</p>   | <p>Johnny and Sam decide to share their cars. Johnny has 8 and Sam has 5. Then they give their friend Angie 2 cars for her birthday. How many cars do they have left?</p>  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SELF-REFLECTION

Write a reflection of your experience with this project. How did you feel about the math word problems and creating a game board? Explain what you found easy to do and any difficulties you had while working on this project. Did you enjoy this activity? Why or why not?

RATE THIS PROJECT

Circle the statement you most agree with.

I am ready for something harder.

This was just right.

I found this very challenging.

SELF-EVALUATION

Circle one box per row on the rubric that expresses how you rate yourself on this Project-Based Learning Activity.

|  |  |  |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| I felt very confident about the math in this project. | I felt pretty good about my ability to complete the math in this project. | I felt a lot of the math in this project was too hard for me to do alone. |
| I understood all of the math and did not need help to complete the problems. | I understood most of the math but needed a little help to solve some of the problems. | I understood some of the math but needed help to complete most of the problems. |
| I easily used many strategies to solve the math problems efficiently. | I needed some help to use the best strategies for solving the math problems. | I had trouble understanding the best way to solve many of the math problems. |
| I feel I am ready for a harder math project. | I feel I would like to spend more time practicing similar math problems. | I feel I need assistance to work on similar math problems. |

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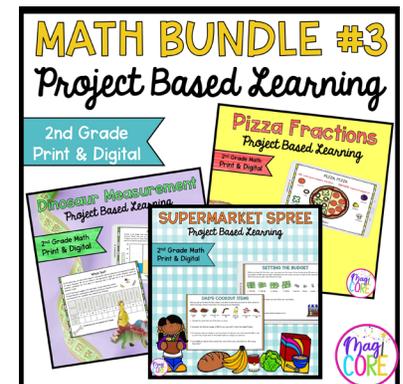
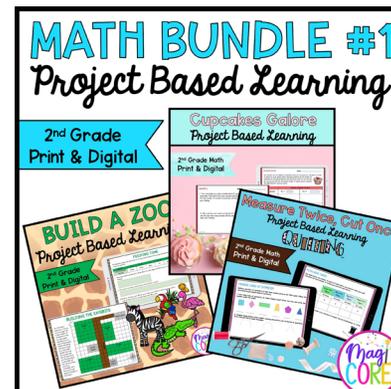


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