



# Prepare Materials for the Class Game

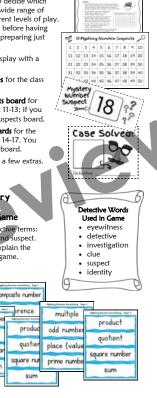
Before you print anything, read the game directions on page 7 so you'll have an understanding of how Mystery Number Detectives is played. Then review all of the available materials to decide which ones you want to use with your class. You'll find a wide range of printables to help you customize the game for different levels of play. Plan to introduce the game in a whole group lesson before having students play in teams or math centers, so begin by preparing just what you need for the class activity.

- 1. Print one copy of the class game directions to display with a document camera or overhead projector.
- 2. Print one copy of the Yes/No Question Examples for the class or one for each team of students.
- 3. Print and laminate one Mystery Number Suspects board for each student. Choose from the options on pages 11-13; if you aren't sure which one to use, start with the 50 suspects board.
- 4. Create one deck of Mystery Number Suspects Cards for the class by printing the appropriate sets from pages 14-17. You only need the first 3 sets if using the 50 suspects board.
- Print one Case Solved card for each student plus a few extras 5. Two copies of page 19 should be enough.
- ★ Review Detective and Math Vocabulary

Introduce the Detective Terms Used in the Game Mystery Number Detectives uses the following detective terms: eyewitness, detective, investigation, clue, identity, and suspect. If your students are not familiar with these terms, explain the meanings of those words before you introduce the game.

# Review Key Math Vocabulary Terms

Use the Mystery Number Word Wall Cards in the product zip folder to review the key math terms that are often used when creating yes/no questions. Only review and discuss words you've already introduced and those that are relevant for your grade level. Post the cards where they will be visible to the class.



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Mystery Number Detectives is a critical thinking game that reinforces math vocabulary and help students develop a deeper understanding of mathematical concepts. To start the game, one of the players becomes the "Eyewitness" and secretly chooses a number. The other players are "Detectives" who take turns asking yes/no questions to determine the identity of that number. Roles rotate during each round of the game. The game can be played as a whole class with the teacher as the Eyewitness and all students acting as Detectives, or students can play the game within cooperative learning teans or math centers. abulary and helps

Mystery Number Detectives consists of this PDF ebook with directions and game materials as well as two folders of bonus materials for building math vocabulary. The Math Vocabulary Quick Check Task Cards folder includes a printable PDF version of the task cards as well as images that can be used with Plickers. The Mystery Number Word Wall Cards folder has words that are commonly used when creating questions during the Mystery Number Detectives game.

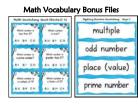
#### What's In Mystery Number Detectives

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Math Vocabulary Bonuses Located in Zip File

22 Math Vocabulary Quick Check Task Card 20 Mystery Number Word Wall Cards





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# Assess Math Vocabulary with Quick Check Task Cards

A fun way to assess knowledge of math vocabulary and number concepts is to use the Math Vocabulary Quick Check Task Cards located in the Mystery Number Detectives product zip file. There's a PDF version you can print and cut apart like traditional task cards and a folder with task card images to u with the free online Plickers program. If you aren't familiar with Plickers program, click to read my post on Corkboard Connections, <u>Plickers 101: Digital Exit Tickets and Morel</u>



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- **Teach Your Class to Play Mystery Number Detectives** Introduce *Mystery Number Detectives* to your class in whole group setting or in guided math groups before having students play in cooperative learning teams or centers. The directions are confusing to most students at first, so you'll need to provide a lot of modeling and guidance until they understand how it works. If you teach it to your whole class at once, you'll need a method of displaying the game directions and the number board, who curren a document comparer with a computer and a presidence. such as under a document camera or with a computer and a projector.
  - 1. Display the class directions (page 7), and give each student a dry erase board and marker, a laminated number board, and one Case Solved card.
  - 2. Read the directions aloud and tell your students that you are the first Eyewitness and they are Detectives. Draw out a Mystery Number Suspect card from the deck of cards without letting them see the number.
  - Tell your students that the Mystery Number Suspect is one of the numbers on their boards, and it's their job to conduct an investigation to figure out its identity. Ask everyone to write one question about the number on their dry erase boards that can be answered with "Yes" or "No." Walk around the class and read their questions as they are writing them. If your students are confused about the types of questions that are allowed, stop the game briefly to display and discuss the Yes/No Question Examples on page 8.



- - When everyone has written a question, ask them to hold up their boards. Choose one question to read aloud and answer. Explain that each time you answer a question, it's a clue to the number's identity. Demonstrate how to cross out numbers on their laminated boards when those numbers are no longer possibilities. For example, if a student asks if the number is greater than 30 and you respond, "No," they should cross off all
- numbers greater than 30. 5. Choose another question, read it aloud, and answer it. Show your students how to record other types of clues, such as circling numbers that are possibilities. For example if the second question asks if the number is a multiple of 5, and you respond "Yes," they can circle all remaining multiples of 5.

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	49
41	42	43	44	45	46	47	48	44	50

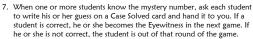
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6. When a few students think they know the identity of the mystery number suspect, tell them that they may only make ONE guess about what the number is. If they are wrong, they are out of the game until the next round. This rule is important because it eliminates random guessing and encourages kids to pose more thoughtful questions.



#### ★ Mystery Number Detective Game Variations

#### Assign Detective Partners

To increase engagement and provide support for struggling students, assign partners. Give one dry erase board, one marker, one Mystery Number Suspect Board and one Case Solved Card to each pair of students. Ask them to take turns writing questions and recording clues. Allow them to talk quietly after each question is answered so they can discuss the clues and to decide if they want to write a new question. Tell them that they may not guess the identity of the number suspect until both partners agree.

- Require Different Math Vocabulary Terms in Each Question If your students are asking the same low-level questions over and over, for instance, asking if the number is greater or less than another number, introduce a game rule that states each math vocabulary term can only be used once in the game. So if one student uses the phrase "greater than" in the first question, no one else can have the word "greater than" in their question. Allow students to erase their questions and write new ones at any time during the game.
- Use Yes/No Question Examples and Question Stem Cards To provide extra support for students who need help writing question print copies of the Yes/No Question Stem cards and have students spread them out in the middle of their teams. They may refer to the cards as the write their questions, but are not limited to asking only these questions.
- Play Until Several Students Solve the Case
  Many kids get frustrated when they're close to guessing the number, but
  another classmate guesses it first. To take the pressure off this situation, don't end the
  game when the first Detective solves the case. Instead, continue playing until five or ten
  more students solve the case. After you end the game, choose the next Eyewitness by
  shuffling the Case Solved cards and drawing out one name.

Play Mystery Fraction Detectives If your students have studied fractions, teach them how to play the fraction variation of the Mystery Number Detectives after they have mastered the whole number version. Use the fraction game directions on page 23, the fraction number board on page 24, and the fraction suspect cards on page 25. The twist in this game is that all questions have to refer coefficient to the numbers to the domainator, or the have to refer specifically to the numerator, the denominator, or the entire fraction. For example, "Is the numerator an even number?"

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1	2	3	٠	5	6	7		٩	30
11	12	13	24	15	26	1)	18	24	20
11	22	23	24	25	26	27	28	24	30
52	52	33	34	55	36	57	58	74	40
1	-2	43	-	45	4	47	-0	48	50

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#### ★ Using Mystery Number Detectives in Teams or Centers

#### **Team Directions**

The team variation of *Mystery Number Detectives* is similar to the class game with a few notable differences. Refer to the directions on page 20. First, the Eyewitness will read and answer all of his or her teammates' questions in turn rather than choosing a few questions from the whole class. If no one is ready to guess the mystery number after all questions have been answered, all team members write new questions. Another difference is that roles rotate to the left after each game, rather than having the person who guessed the number become the next Eyewitnes. This ensures that all team members have a turn as the Eyewitness.



### Team Role Cards (Optional)

Team Role Cards (Optional) To avoid confusion about whose turn it is to play a given role, you may want to give each team one Eyewitness Role Card (page 21) and enough Detective Role Cards (page 22) for the remaining team members. Print the role cards on sturdy cardstock or paper, cut them out, and fold them to form tents. After each round of play, the students pass their role tents one place to the left. The role cards are not mentioned in the directions because they are optional.



#### When to Introduce Team Play

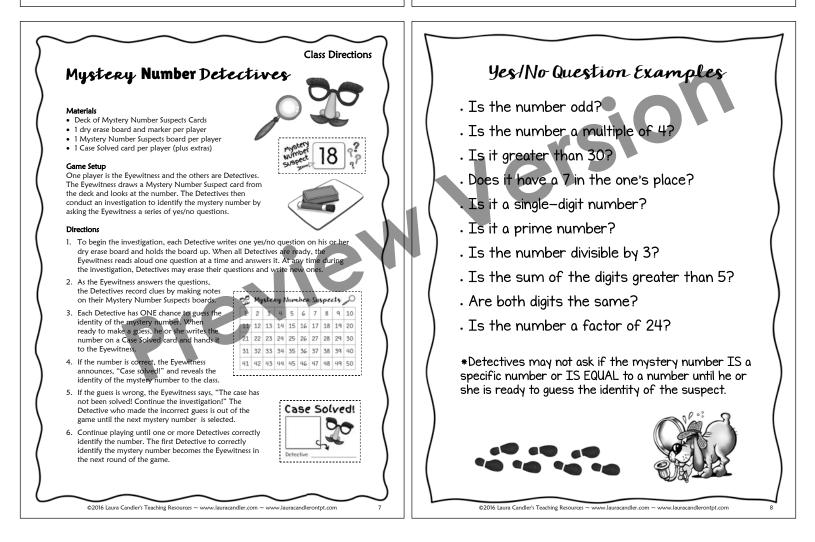
Your students might beg you to play the game in teams or centers, but it's best to play as whole class for at least a week before you allow students to play in groups without your nvolvement. The reason for this is that the game completely falls apart the first time the Eyewitness answers a question incorrectly. For example, imagine that the mystery number is 21 and a Detective asks if the number is multiple of 3. The correct answer is "Yes", but if the Eyewitness says "No," the game is destined for a very bad end with lots of arguing and frustration! The Detectives will insist that the Eyewitness answered a question wrong and the Eyewitness will strongly deny the accusation

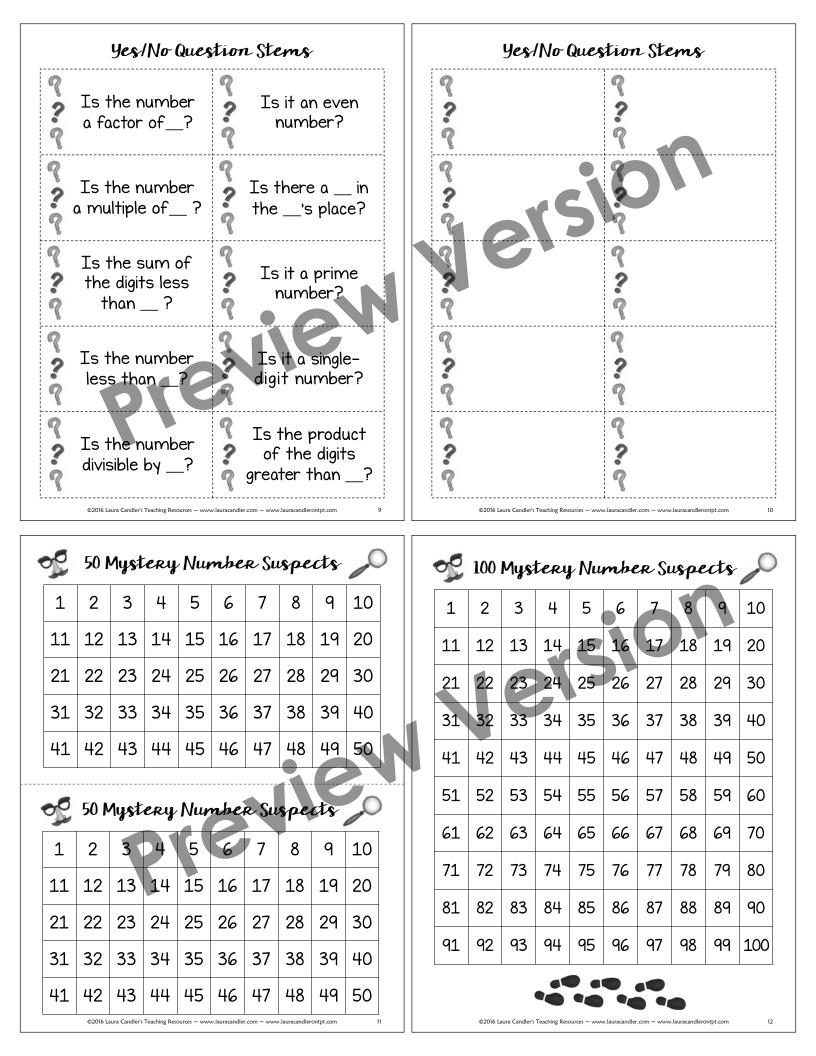
One solution is to require a written record of all questions and answers. So each time the Evewitness answers a question orally, he or she also writes the answer next to the question on the dry erase board. If limited space is a problem, students will have to use paper and pencil to ask and answer questions rather than using the dry erase boards. However, this doesn't eliminate the problem of the Eyewitness answering incorrectly. It only prevents a big argument at the end!

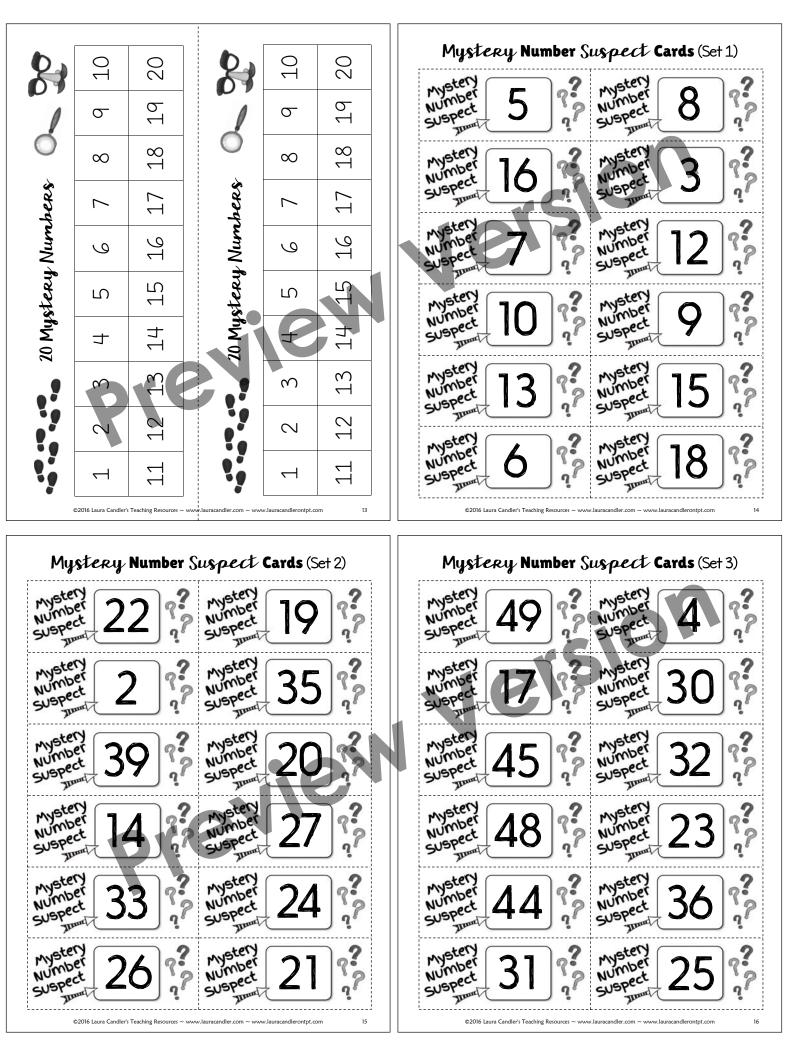


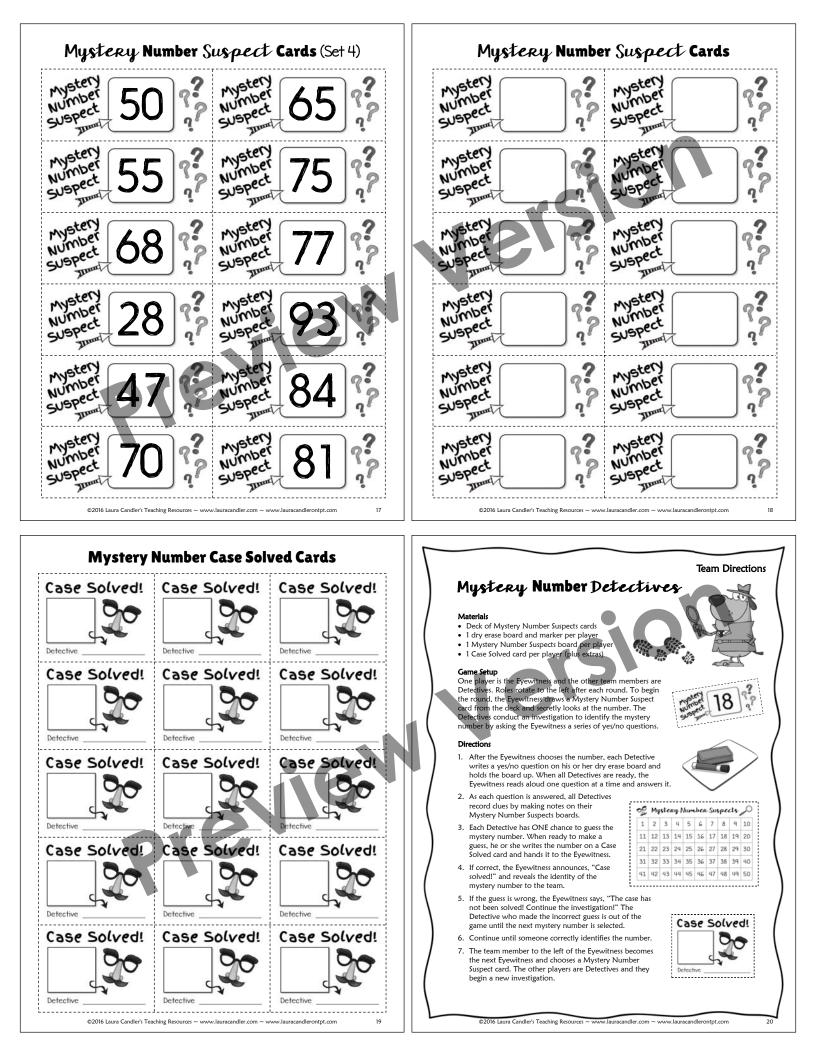
A more effective solution is to have students within teams pair up and play two against two. Two students play the role of Eyewitness together and the other two play the Detective role together. Throughout the game the Eyewitnesses and Detectives consult with each other to be sure they are asking appropriate questions and answering correctly. In this case, two head really are better than one!

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# Mystery Fraction Detectives

#### Materials

- Deck of Mystery Fraction Suspects Cards
- 1 dry erase board and marker per player1 Mystery Fraction Suspects board per player
- 1 Case Solved card per player (plus extras)

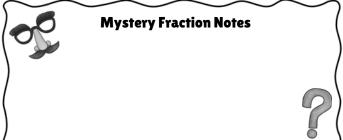
# Game Setup

One player is the Eyewitness and the others are Detectives. The Eyewitness draws a Mystery Fraction Suspect card from the deck and looks at the fraction. The Detectives then conduct an investigation to identify the mystery fraction by asking the Eyewitness a series of yes/no questions.

# Directions

- To begin the investigation, each Detective writes one yes/no question on his or her dry erase board. The question must specifically refer to the numerator, the denominator, or the whole fraction. For example, "Is the numerator an even number?" Or I's the fraction more than one hal?" At any time during the investigation, Detectives may erase their questions and write new ones.
- When all Detectives are ready, they hold up their question The Eyewitness reads one question at a time and answers in
   The Detectives record clues by making notes on their
- Mystery Fraction Suspects boards.
   Fach Detective her ONE change to suggest the identity
- Each Detective has ONE chance to guess the identity of the mystery fraction. When ready to make a guess, he or she writes the fraction on a Case Solved card and hands it to the Eyewitness.
- If the fraction is correct, the Eyewitness announces, "Case solved!" and reveals the identity of the mystery fraction.
- 6. If the guess is wrong, the Eyewitness says, "The case has not been solved! Continue the investigation!" The Detective who made the incorrect guess is out of the game for that round.
- 7. Continue playing until one or more Detectives correctly identify the fraction.
- 8. Switch roles so that a new person plays the Eyewitness for the next round.

Mystery Marian Jusperty											
Numerators											
1	2	3	4	. 9	5	6	7	8	٩		
Denominators											
1	2	3	4	5	6	7	8	٩	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		
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Case Solved!

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