

# Making the Mathematical Practices Routine in Grades 3-5

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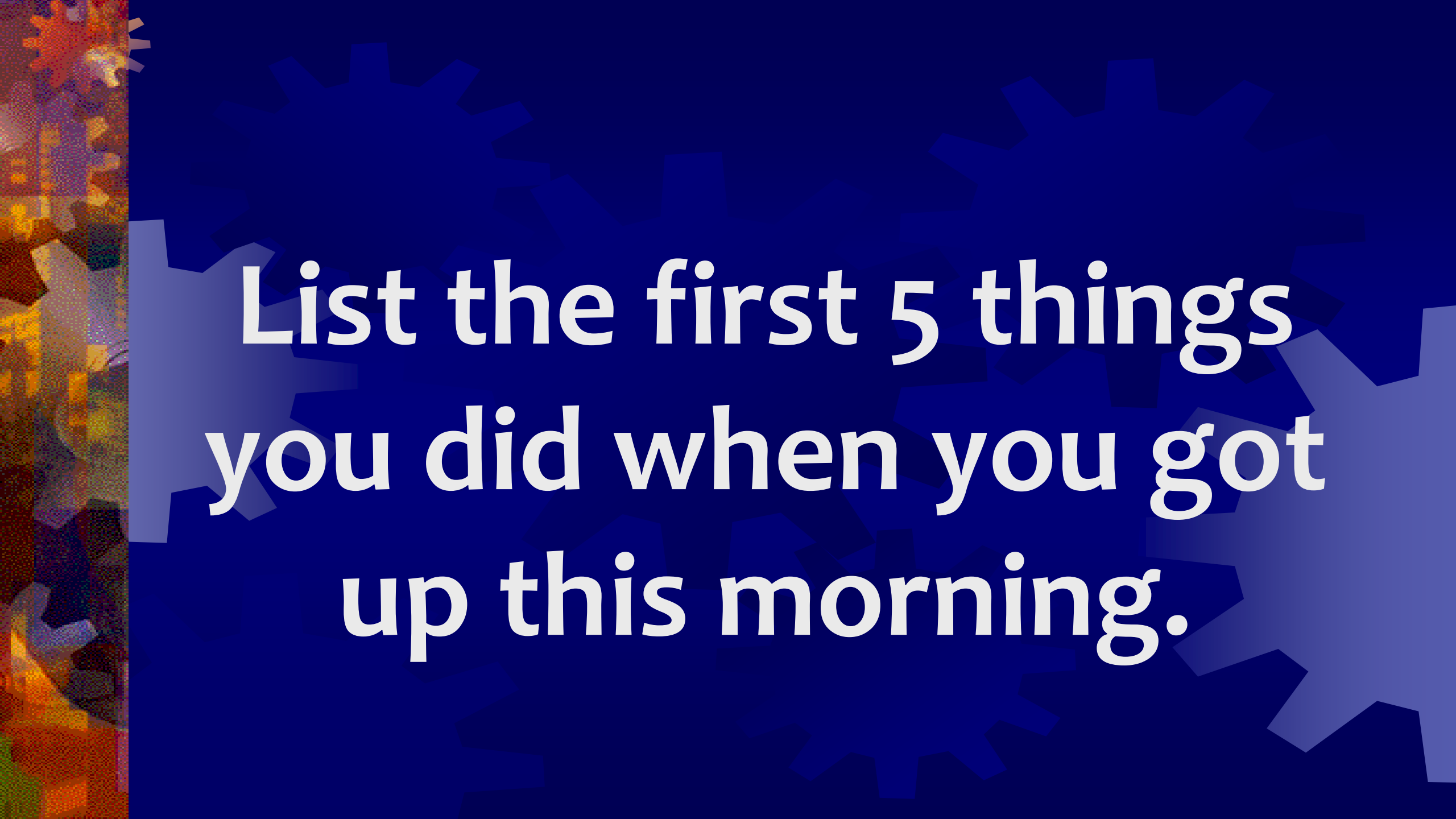
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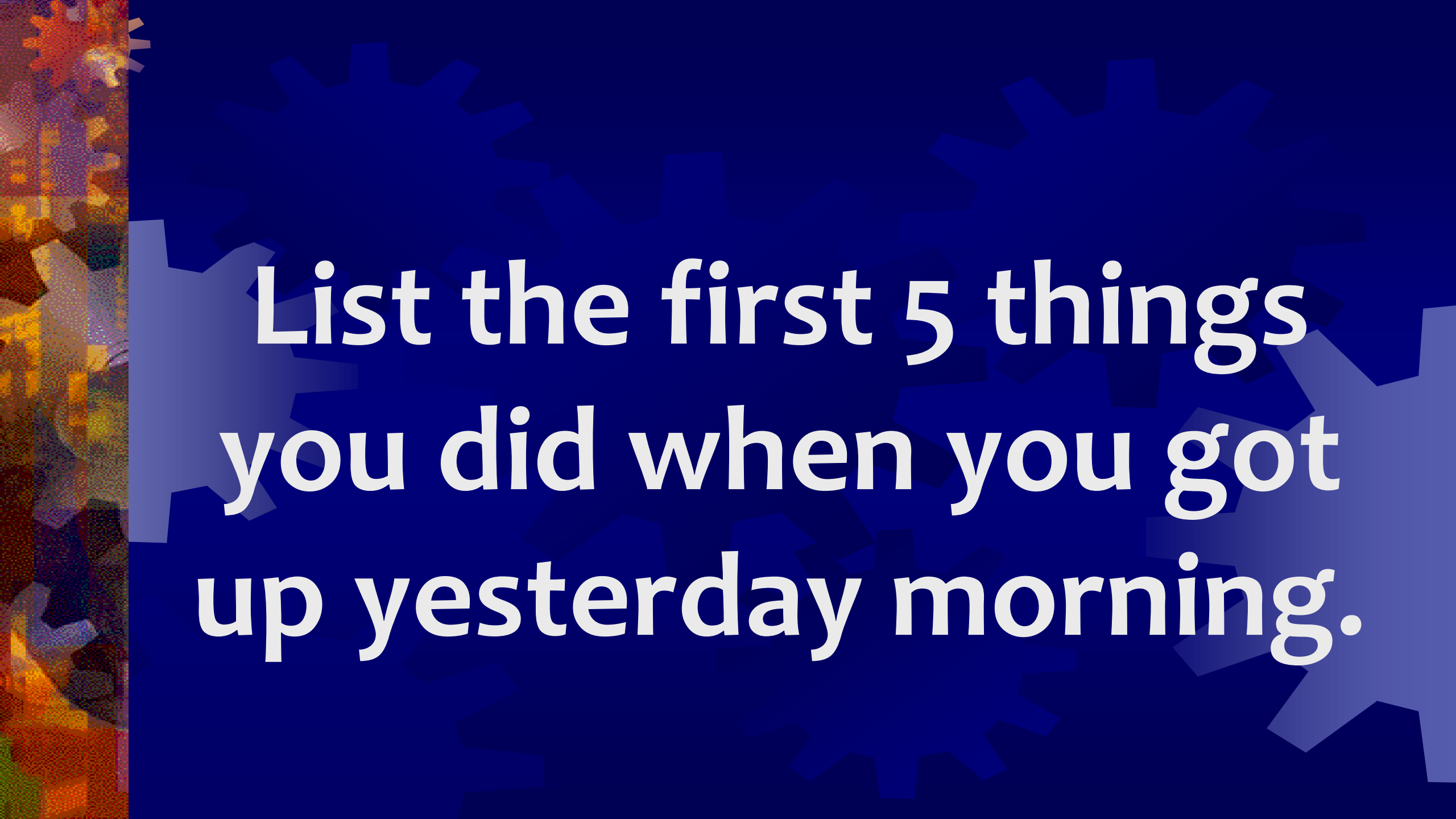
# Back to Whole Group: Prime Time Countdown

11, 7, 5, 3, 2

But NOT 1!!!!!!



**List the first 5 things  
you did when you got  
up this morning.**



**List the first 5 things  
you did when you got  
up yesterday morning.**

# Agenda

- Look at some easily implemented classroom routines.
- Analyze student work samples.
- Determine the mathematical practices that could be developed through that practice.
- Look at some fun ways to make non-mathematical routines mathematical!

# Mathematical Routines

- Offer access to the big ideas of mathematics.
- Provide opportunities for deeper understanding of content.
- Provide opportunity to develop proficiency with the mathematical practices.

# Mathematical Routines

- When implemented school-wide can provide a more coherent and better articulated mathematical experience.
- Provide basis and materials (student work) for professional development.

# Mathematical Routines

- Beginning of class
- Within lesson
- End of class
- Select and consistently use a limited number of routines





# Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments /critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

# Routine 1: How Do You Know?

- Students are presented a question that may or may not have an obvious answer.
- Individual think time and time to formulate an explanation.
- Optional time to talk with a partner or small group.
- Explanations are shared or written explanations are collected.

# Routine 1: How Do You Know?

- While passing out Math Practice Signs we are going to count by  $\frac{3}{4}$ 's
- Continue the count until we say "STOP."
- Think first about what two whole numbers the count falls between.
- Check with your partner.

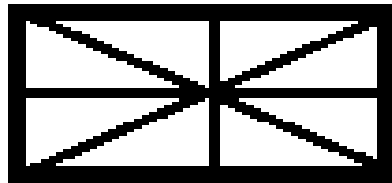
# Routine 1: How Do You Know?

- Practice this routine with the Standards for Mathematical Practices .
- Look at the example problem or situation.
- Which mathematical practice does it represent?
  - Individual time
  - Discuss with a partner

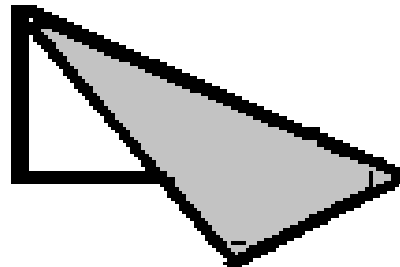
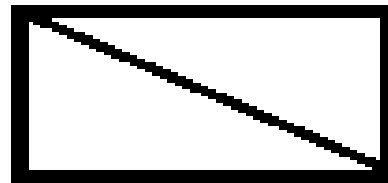
**“HOW DO YOU KNOW this problem is an example of the practice you selected?”**

# Routine 1: How Do You Know?

Ella said, "I have drawn all the lines of symmetry possible in this rectangle."



Jackie said, "But look Ella. If I fold this rectangle on the diagonal, that's not a line of symmetry."

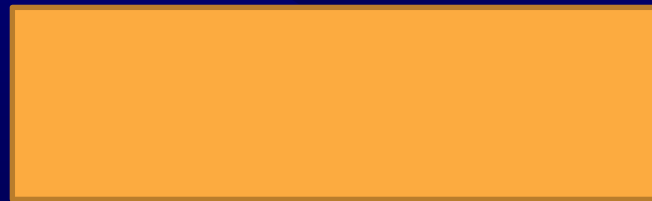


# Routine 1: How Do You Know?

Jill's teacher asked a question that had Jill stumped. The question: If the area of a shape increases, does the perimeter also increase? Jill wasn't sure where to begin exploring this idea so she started guessing and checking. Then she decided to draw some pictures. Finally, she got some square tiles to build rectangles. Maybe she could work on this problem with other students in the class.

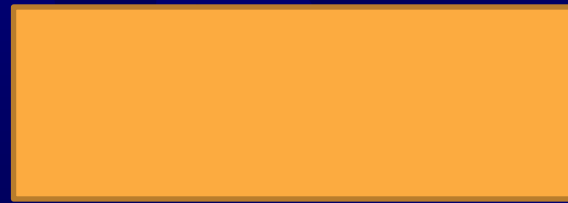
# Routine 1: How Do You Know?

In the Partner Design Game, Bailey had to explain to her partner Mike how to recreate a design she had drawn. Bailey wanted Mike to draw a rectangle like the one below, so she told Mike to draw a non-square rectangle.



# Routine 1: How Do You Know?

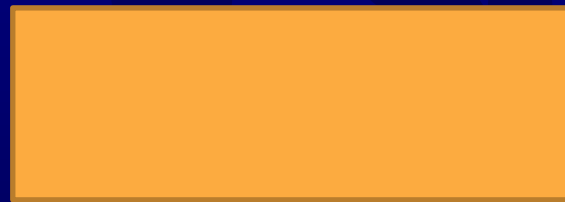
How do you know this shape  
is a rectangle?





# Routine 1: How Do You Know? Examining Student Work

How do you know that this shape is a  
rectangle?





# **Routine 1: How Do You Know?**

**Which of the mathematical practices might be developed through the use of this routine?**



# **Routine 2**

# **Alike and Different**

# **Routine 2: Alike and Different**

- **Students are presented with two or more shapes, numbers, properties, etc.**
- **Students think about and suggest ways in which the two are alike and different**
- **Can alter task easily.**
  - **Careful selection to focus on certain concepts**
  - **Let students suggest for class**
  - **Have students select and exchange**

# Back to Whole Group: Working with Vocabulary

$\frac{1}{2}$     $\frac{1}{3}$     $\frac{1}{4}$     $\frac{1}{5}$  ... these are unit fractions

# Routine 2: Alike and Different

How are  $\frac{3}{4}$  and  $\frac{5}{8}$  alike and different?

How are  $\frac{3}{4}$  and  $\frac{5}{8}$  alike and different?

## Examining Student Work



## **Routine 2: Alike and Different?**

**Which of the mathematical practices might be developed through the use of this routine?**





**Routine 3**  
**Today's Number**

# Routine 3: Today's Number

- Present carefully selected number of the day.
- Students generate a variety of representations.
- Share representations.

# Back to Whole Group: Counting to the Whole

$\frac{1}{5}$   $\frac{2}{5}$   $\frac{3}{5}$   $\frac{4}{5}$   $\frac{5}{5}$  and  $\frac{5}{5}$  makes the whole

# Routine 3: Today's Number

Today's number is  $\frac{3}{4}$

Today's number is  $\frac{3}{4}$

# Examining Student Work



## Routine 3: Today's Number

Which of the mathematical practices might be developed through the use of this routine?



# Routine 4

## Number Lines

# Routine 4: Number Lines

- Present students with a number line with only one or two numbers marked.
- Students asked to locate a value or determine value of indicated position.
- Powerful tool – number sense and computational fluency



# Implementing Number Lines

- Whole class or small groups
- Give pairs different numbers to locate
  - allows for conversation about relative magnitude
- Allows for differentiation
- Could use rope or tape on floor to create number line



# Working with Vocabulary



# Back to Whole Group:

- Teacher: “I have five sides.”
- Students: “Pentagon.”
- Teacher: “I have six sides.”
- Students: “Hexagon.”
- Teacher: “I have eight sides.”
- Students: “Octagon.”
- All: “These are types of polygons.”

# Routine 4: Number Line

- Sketch a number line with points 0 and 1,000 marked.
- Locate 571.
- Explain how you thought about this.



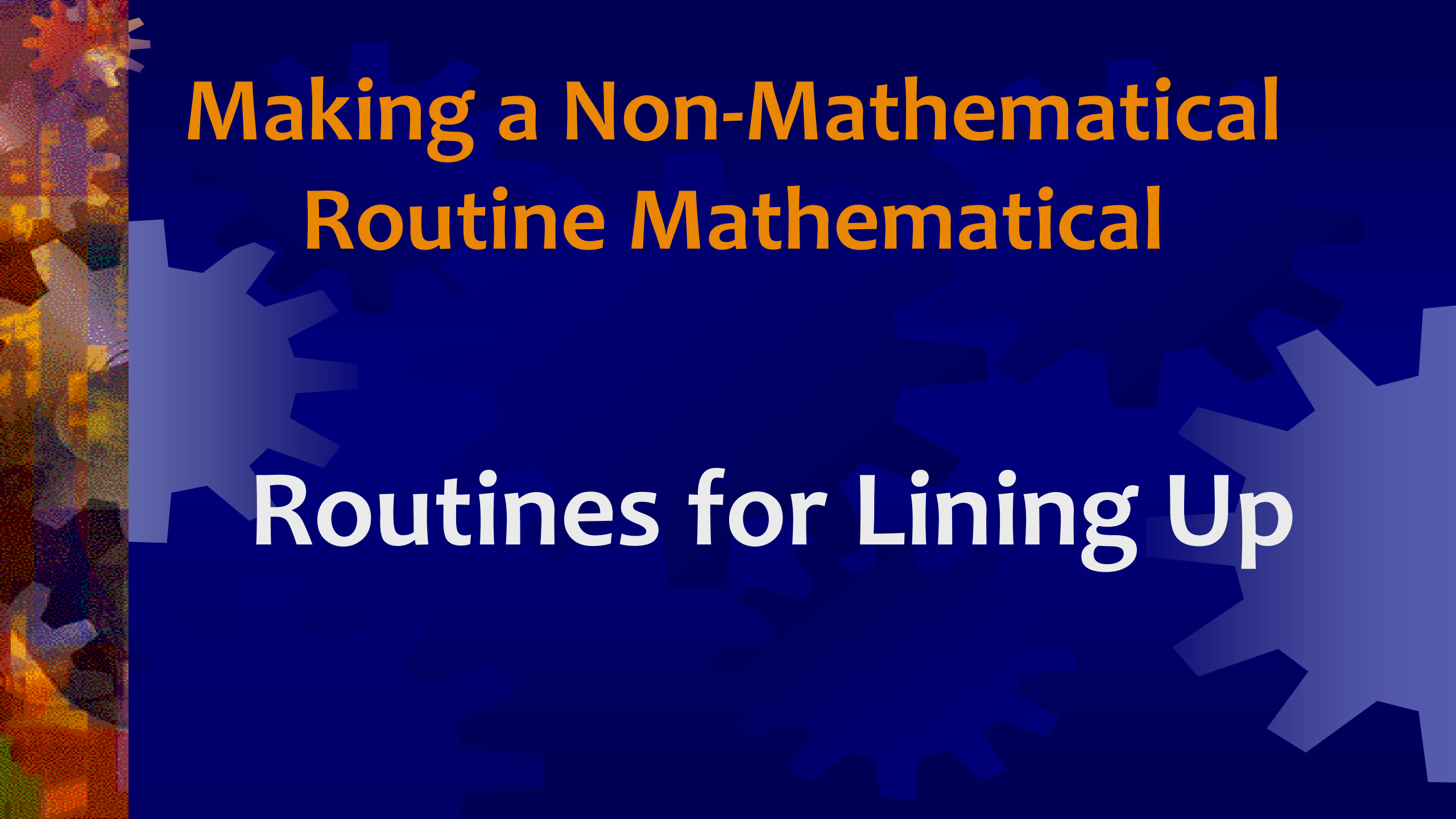
# Routine 4: Number Line

## Examining Student Work



# Routine 4: Number Line

Which of the  
mathematical practices  
might be developed  
through the use of this routine?



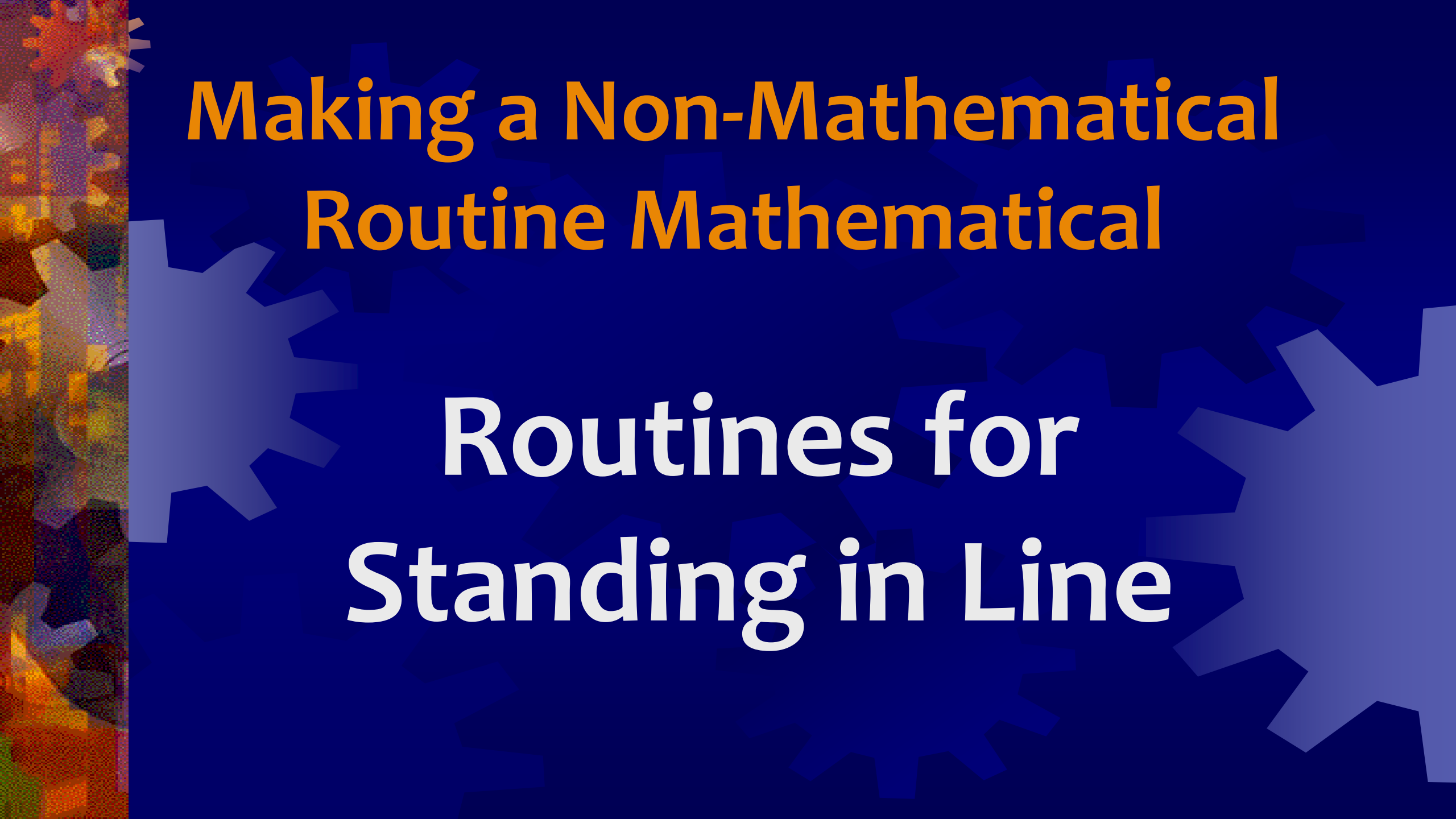
# Making a Non-Mathematical Routine Mathematical

## Routines for Lining Up

# Routines for Lining Up

- Multiples
- Polygons
- Mystery Number
- Prime Numbers
- Seating





# Making a Non-Mathematical Routine Mathematical

## Routines for Standing in Line

# Making a Non-Mathematical Routine Mathematical

- Skip counting
- Prime numbers
- Mathematical alphabet
- Rock-scissors- paper
- Whiteboard exit

# Sources

- McCoy, A. C., Barnett, J., & Combs, E. (2013). *High-yield Routines for Grades K-8.*
- Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2007). *Elementary and middle school mathematics: Teaching developmentally.*



# Thank you!

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