

Facilitation Guide



10-15 Min
Small Group



Digital Guide

ARTS EVERY DAY
IN BALTIMORE CITY PUBLIC SCHOOLS

Color by Divisor

ROUTINE OVERVIEW

Students use their understanding of divisibility and prime numbers to complete a color-by-number artwork. For each number, students determine which divisors apply and use the corresponding colors to fill in the picture. When a number is divisible by multiple divisors, students layer colors to visually represent these overlapping mathematical relationships.



Maryland Standards

MARYLAND STATE MATH STANDARDS

- **4.NOS.B.6a** – Divide whole numbers with up to four-digit dividends and one-digit divisors with and without remainders. Apply estimation strategies to estimate quotients
- **4.NOS.A.1b** – Apply and extend place value understanding to multi-digit whole numbers within 1,000,000. Estimate quantities by reasoning about their location on a number line, their relationship to benchmark numbers, and rounding to any place.

MARYLAND ARTS STANDARDS

- **VA.AS1.E:3-5:1** – Collaboratively combine ideas to generate an innovative theme, concept, or idea for art-making
- **VA.AS2.I:3-5:1** – Develop and experiment in the creation and design of artworks.



*Not in MD? View **National Standards** in the Digital Guide*

Getting Ready ★ **REVEAL MATH: 4th Grade: 7-2, 5-3**

ARTS INTEGRATED LEARNING OBJECTIVE:

Students will be able to create color-by-number artwork by determining divisors for a wide range of one to four digit numbers.

MATH SKILL: Determine what numbers are divisible by a chosen number.

ART SKILL: Recognize what colors are created by mixing primary colors together.

WHAT'S BEFORE: Recall basic division facts (Grade 3). Estimate products of multi-digit numbers (Unit 6).

WHAT'S NEXT: Use partial quotients to divide (Unit 7). Use partial quotients to divide by two-digit divisors (Grade 5).

MATH DOMAINS:

Number and Operation Sense

Use place value understanding and properties of operations to perform multi-digit arithmetic.

Divide whole numbers with up to four-digit dividends and one-digit divisors with and without remainders.

MATERIALS

- [Worksheet](#)
- [Answer Key](#)
- Crayons or Colored Pencils
- Whiteboard / Marker for checking work

Number and Operation Sense

Generalize place value understanding for multi-digit whole numbers.

Estimate quantities by reasoning about their location on a number line, their relationship to benchmark numbers, and rounding to any place.

TEACH

Facilitation Steps

1. Introduce the worksheet and color key.

- Explain that each color represents a divisor (2, 3, 5, or 7) or the category of prime numbers. Review what it means for a number to be divisible by another number and remind students that prime numbers have exactly two factors: 1 and themselves.
- Note that we'll start with the primary colors of red, yellow, and blue. Some numbers have multiple divisors, so these primary colors may be combined to make the secondary colors of green, orange, and purple.
 - *It is important for students not to color too hard in this case, because the colors will not blend together.*

2. Model how to determine which colors to use.

- Choose a number from the worksheet and identify which divisors divide it evenly. For example, 900 is divisible by 2, 3, and 5, so it would receive all three corresponding colors. Students can use a whiteboard or scrap paper to check their thinking.

3. Color the picture

- Students determine which divisors apply to each number and color each section using the corresponding colors. Some numbers may be divisible by multiple divisors, so students should layer the appropriate colors lightly to show these overlapping relationships.

4. Reflect on the math and artwork.

- Ask students:
 - What numbers could be divided by multiple divisors?
 - *It should be a secondary color.*
 - Pick one of the numbers that now has a secondary color: What color did you make when you colored it in? What primary colors did you use to make this color?
 - What emotion do you feel when you look at the art you made? What colors make you feel this way?



MATERIALS
GOOGLE FOLDER

TEACH

Assessment & Reflection

This activity is easy to assess since the teacher will know what the final product will look like. If the sheet is colored correctly, the student understands the content. You may need to encourage students to revisit the sections with multiple divisors represented to make sure they are using all the applicable colors.

For the reflection, students need to notice which numbers could be divided by different divisors. This is an essential aspect of the arts integration, because the numbers that have multiple divisors will create new colors with the primary colors.

Making emotional connections to the art is another crucial point of the reflection. If 5 is one of the divisors and is given the color blue, how would an art piece that has mostly numbers divisible by 5 make the artist feel? What if 2 is a divisor and is given the color red, and all of the numbers are even? How would that piece of art make the artist feel?

Differentiation

The coloring sheet can be edited to focus on whatever math skill you may need.

- If your focus is multiplication, change the sheet to reflect factors instead of divisors.
- If your focus is on fractions, swap the numbers for fractions.
- By changing the colors used, you can create different moods or themes.
- By changing the numbers, you can focus on not only division, but any of the four operations they may be working on in a particular unit. You can easily scale up by using more digits or down by using fewer.