

Summer Mathematics

Assignment 2026

Advanced Honors Grade 6

Student Name_____

Unit 1: Scale Drawings

Overview: In this unit, you will learn how to create a scale drawing. A **scale drawing** represents an actual place or object. All measurements in the drawing correspond to the measurements of the actual object by the same scale.

Task: Drawing a **Map of Your Dream Play Zone**. You will need graph paper, a ruler or measuring tape, and a pencil.

Step 1: Measure Your Space

Pick a part of your room to draw. Use a ruler or a tape measure to find the Length and Width in feet. Round your numbers: If something is 4 feet and 2 inches, call it 4 feet to keep the math easy!

Step 2: Use the Scale

Since a room is too big to fit on a piece of paper, we use a scale. For this map, 1 foot = 2 squares on your graph paper.

Item	Length (feet)	Width (feet)	Length (squares)	Width (squares)
Room Walls				
Furniture 1				
Furniture 2				
Furniture 3				
Furniture 4				

Step 3: Draw Your Map

The Walls: Use a pencil and a ruler to draw the outside lines of your space. Count the squares carefully!

The Door: Leave a gap where the door is. Draw a little "swing" line to show which way it opens.

The Furniture: Draw your bed, desk, or toy box inside the walls using your "Squares" measurements from the table.

Step 4: Label It

Color in your furniture and label each item. You can even draw a "North, South, East, West"

compass in the corner of your paper like a real map!

Make sure your furniture doesn't overlap. In a real room, two things can't sit in the same spot!

Architect's Final Checklist

Before you hand in your "Dream Play Zone" map, go through this list to make sure everything is perfect!

1. The Math Check

- ☐ I measured all my items in **feet** first.
- ☐ I used the scale correctly (**1 foot = 2 squares**).
- ☐ I **doubled** my feet measurements to get the number of squares.
- ☐ I filled out every box in my data table.

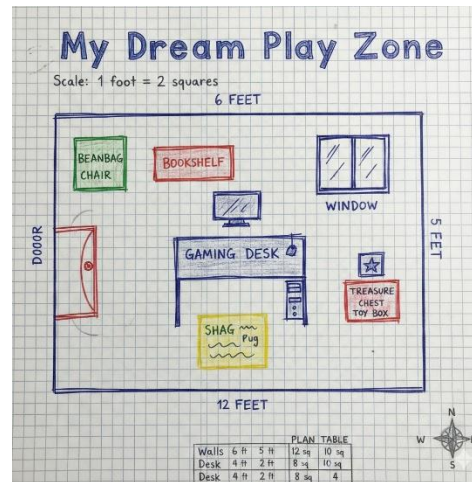
2. The Drawing Check

- ☐ I used a **ruler** so my walls and furniture have straight lines.
- ☐ My map is a "**Bird's Eye View**" (I only drew the tops of things).
- ☐ I counted the squares on the graph paper carefully to match my table.
- ☐ I left a gap for the **door** and showed which way it swings.
- ☐ None of my furniture is overlapping (unless I meant to put a lamp on top of a desk!).

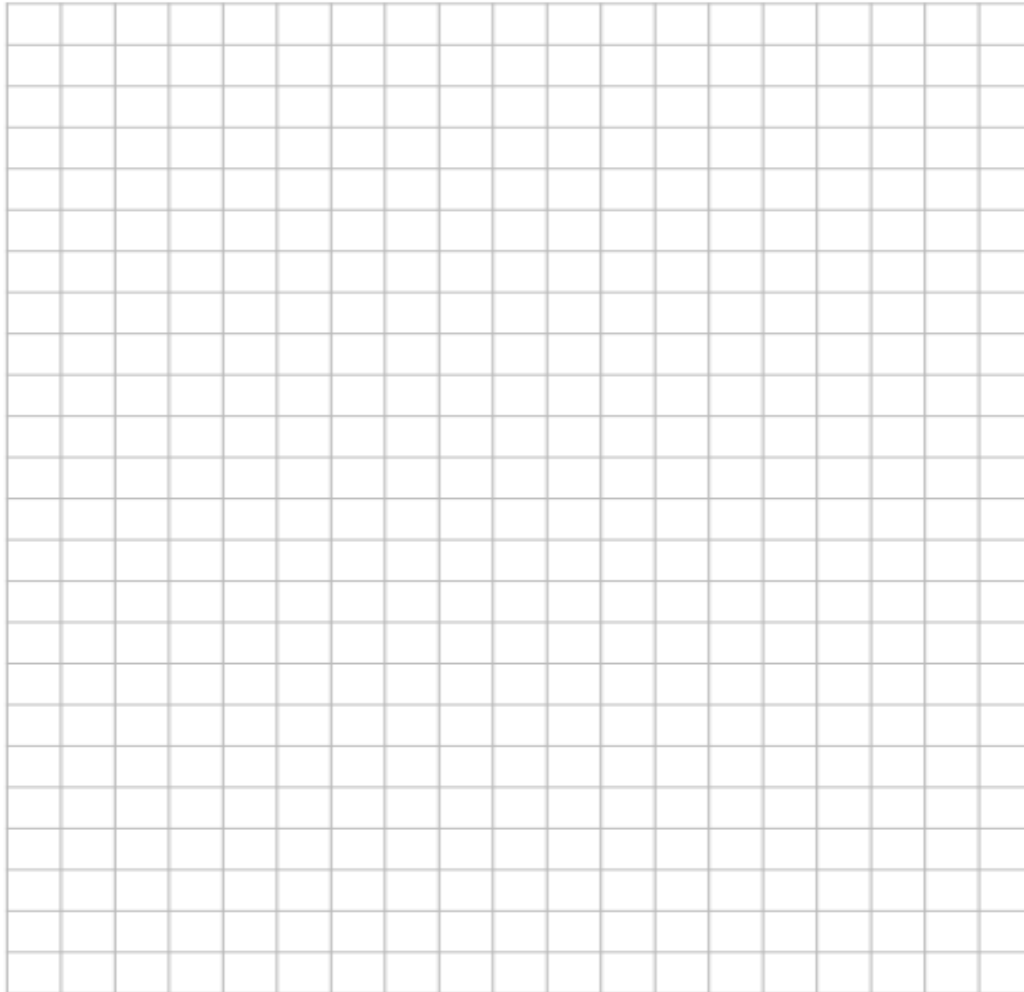
3. The Details Check 🎮

- [] I **labeled** my furniture so people know what is what.
- [] I wrote the **actual feet** measurements on the walls of my drawing.
- [] I included at least **4 items** of furniture or features.
- [] My map is neat, clean, and easy to read.

Sample Answer Key



Map of Your Dream Play Zone



Unit 2: Introducing Proportional Relationships

Overview: In this unit, you will learn what it means for two quantities to be in a **proportional relationship**.

Task: The Movie Premiere Popcorn Mix

The Situation: You are the lead chef for "Star Snacks Catering." A famous movie studio has hired you to provide its signature Gourmet Popcorn Mix for a red-carpet premiere.

The recipe below makes **1 giant bowl** (enough for 10 people). You need to scale the recipe to make sure there is enough for much larger groups!

The Signature Recipe (Makes 1 Bowl)

- 4 cups of Popped Popcorn
- 1/2 cup of Melted Caramel
- 1/4 cup of Chocolate Candies
- 2 tablespoons of Sea Salt

1. Choose Your Ingredients

Pick **two** ingredients from the list above. Write their names in the top row of the table.

2. Scale the Recipe

Complete the table to show how much of each ingredient you will need for different amounts of popcorn bowls.

Number of Bowls

Ingredient 1: _____ Ingredient 2: _____

1 Bowl (Original)

2 Bowls

5 Bowls

10 Bowls

3. The Big Event Challenge

The movie studio just called! They decided to invite more people. You now need to make **25 bowls** of popcorn.

Show your work: How much of **Ingredient 1** will you need for 25 bowls? (*Hint: You can multiply your 5-bowl amount by 5, or multiply your 1-bowl amount by 25!*)

Chef's Math Tip: When scaling recipes, every ingredient must be multiplied by the **same number** so the flavor stays exactly the same. This is called keeping the ingredients in **proportion**.

4. Graph Your Ingredients

Take the numbers from your table in Part 1 and turn them into **ordered pairs** (x, y).

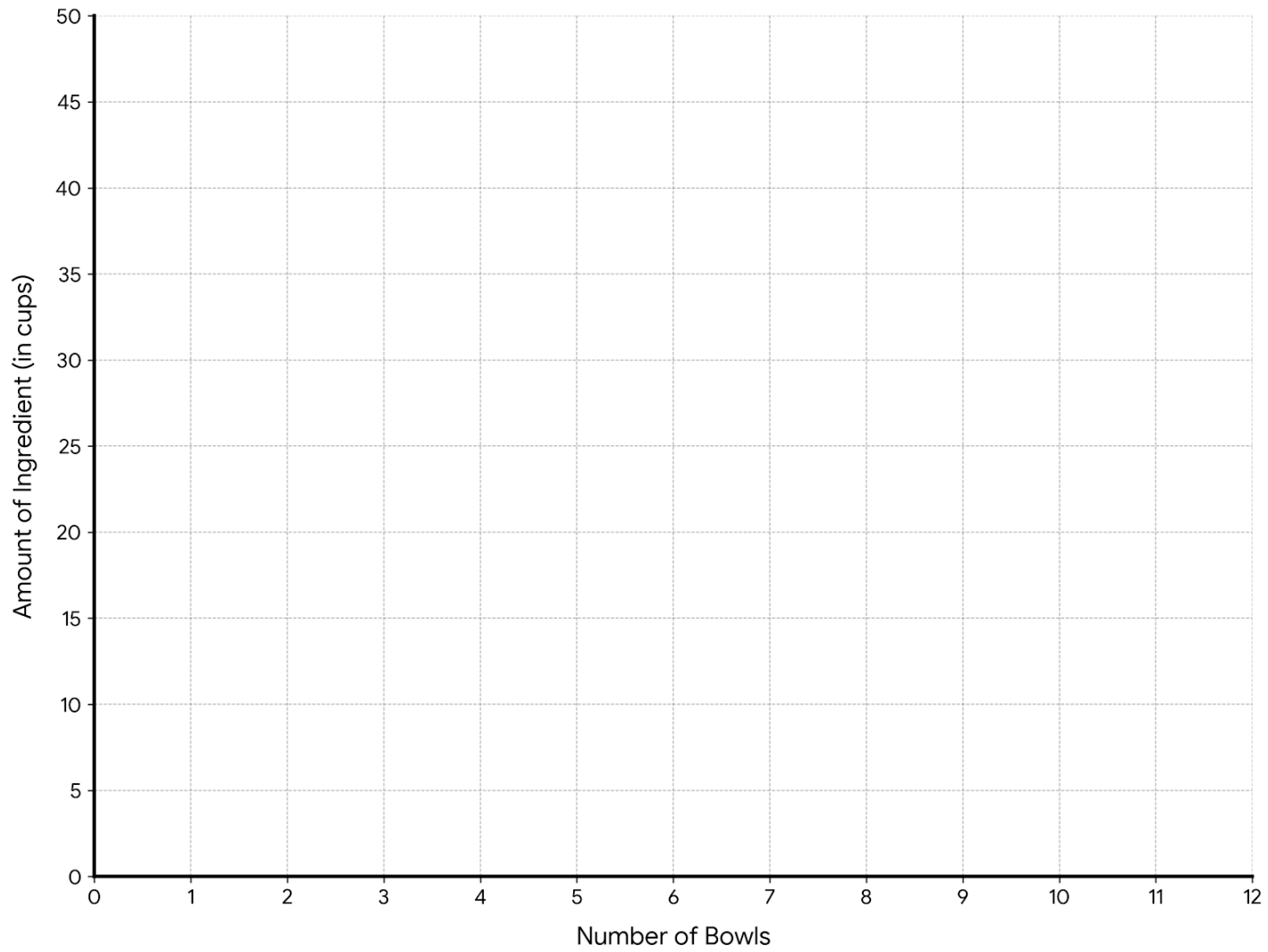
- The **x-axis** will be the **Number of Bowls**.
- The **y-axis** will be the **Amount of Ingredient** (in cups).

Use a different color for each ingredient so you don't get them mixed up!

Points to plot:

- Plot your points for **1, 2, 5, and 10 bowls**.
- Use a ruler to draw a straight line starting from (0, 0) through your points.

Movie Premiere Popcorn Mix - Graphing Your Recipe



5. Proportional Thinking

Proportional Relationship Rule

A relationship is proportional if:

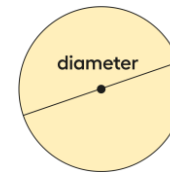
1. **The Constant Test:** You always multiply by the same number to get your answer.
2. **The Graph Test:** The line is perfectly **straight** and goes through **(0, 0)**.

Write your explanation here:

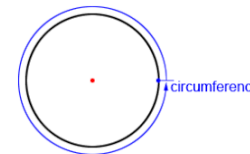
Unit 3: Measuring Circles

Overview: In this unit, you will learn all about **circles**! For this task, you will measure the **diameter** and **circumference** of different circles.

A **diameter** is a line segment that goes from one edge of a circle to the other and passes through the center. A diameter can go in any direction. Every diameter of the circle is the same length. To measure the diameter of a circle, measure the length from one edge of the circle to the other, through its center, using a ruler or meter stick.



The **circumference** of a circle is the distance around the circle. To measure the circumference of a circle, use a measuring tape to measure the distance around the circle. You could also use a piece of string to measure the distance around the circle, and then measure the length of the piece of string with a ruler or meter stick.



Mission: The Secret of the Circle

The Goal: Every circle in the world hides a secret number. Your job is to find three circular objects and use math to "unlock" that secret!

What You Will Need:

- **A measuring tool:** A string (to wrap around) and a ruler, or a flexible measuring tape.
- **A pencil and a calculator.**
- **3 Circles:** Look for things like a soup can, a frisbee, a roll of tape, or a clock.

Step 1: Learn the Terms

Before you start, you need to know where to measure:

- **Diameter (d):** The distance straight across the widest part of the circle.
- **Circumference (C):** The distance all the way around the outside edge.

Step 2: Be a Circle Detective

Measure your 3 objects in **inches**. If your measurement is between inches, round it to the nearest half-inch (like 3.5).

Object	Diameter (inches)	Circumference (inches)	Circumference $\div$ Diameter
For example, soup can	3 inches	9.4 inches	3.13 inches

What do you notice about the relationship between the diameter and circumference for each object? Show or explain your reasoning.

Step 3: Crack the Code

For each object, use your calculator to divide the **Circumference** by the **Diameter**.

What do you notice? Look at the last column in your table. Are the numbers similar or very different?

The Secret Revealed: If you measured carefully, your last column should be very close to **3.14**. This is a special number called **Pi (pi)**. No matter how big or small a circle is, its "around" is always about 3 times bigger than its "across!"

Unit 4: Proportional Relationships and Percentages

Overview: In this unit, you will extend your knowledge of **percentages** from Grade 5.



Task: The Smart Shopper Challenge

The Goal: You have saved up your allowance, and it's time to buy that one item you've been wanting. Your job is to calculate two different coupons to see which one saves you the most money!

Step 1: Pick Your Item

Search online or think of something you want to buy (like a video game, a pair of sneakers, or a LEGO set).

- **My Item:** _____
- **Original Price:** _____

Step 2: Compare the Coupons

You found two different coupons in the mail. You can only use **one**.

Coupon A: The "Percentage Off" Deal

- **25% Discount:** This means you save 25¢ for every dollar the item costs.
- *Math Hint:* Multiply your price by 0.25 to find your savings. Subtract that from the original price.

Coupon B: The "Instant Cash" Deal

- **\$10.00 Off:** This is a flat discount.
- *Math Hint:* Simply subtract \$10.00 from your original price.

Step 3: Don't Forget the Sales Tax!

In the state of New Jersey, the government adds a **7% Sales Tax** to the price *after* the discount is taken off.

- **The Tax Math:** Multiply your discounted price by 0.07 to find the tax. Add that tax to your discounted price to get your **Final Total**.

Step	Coupon A (25% Off)	Coupon B (\$10 Off)
Price After Coupon		
Tax (7% of the price above)		
Final Total		

Step 4: The Best Deal

Which coupon should you use? Explain why!

Smart Shopper Tip: Sometimes a percentage is better, and sometimes a flat dollar amount is better. It usually depends on how expensive the item is! If your item was very cheap (like \$15), which coupon do you think would win?

Unit 5: Rational Number Arithmetic

Overview: In this unit, you will learn about how **rational numbers** are used in different contexts (temperature, money, elevation, etc). In this task, you still study the elevations in New Jersey. **Elevation** is measured relative to sea level (0 feet/meters). Positive numbers show height above sea level (mountains, hills). Negative numbers show depth below sea level (valleys, ocean floor).



Task: Sayreville Elevation Expedition

The Goal: Calculate how much the land rises and falls as you travel between different landmarks in and around Sayreville.

The Data Table

Here are the elevations (height above or below sea level) for several well-known spots in the Sayreville area:

- 1) Calculate the elevation changes between the points in the table below.

Landmark	Elevation (in feet)
Raritan Bay Waterfront Park	3 ft
Cheesequake State Park (Entrance)	52 ft
Julian Capik Nature Preserve (Hill)	110 ft
Sayreville High Point (Parlin Area)	177 ft
Marshland near South River	-10 ft

Part 1: Calculating Elevation Changes

To find the **Elevation Change**, you subtract the starting elevation from the ending elevation.

Formula: End Elevation - Start Elevation =

Calculate the change for these trips:

1. From the Marshland to the Waterfront Park: $3 - (-10) = \underline{\hspace{1cm}}$ feet.

2. From the Waterfront Park to Cheesequake State Park:

$$52 - 3 = \underline{\hspace{1cm}} \text{ feet.}$$

3. From Cheesequake State Park to the Sayreville High Point:

$$177 - 52 = \underline{\hspace{1cm}} \text{ feet.}$$

4. From the Sayreville High Point down to the Marshland:

$$-10 - 177 = \underline{\hspace{1cm}} \text{ feet.}$$

Part 2: Thinking Like a Geographer

Answer these questions based on your math:

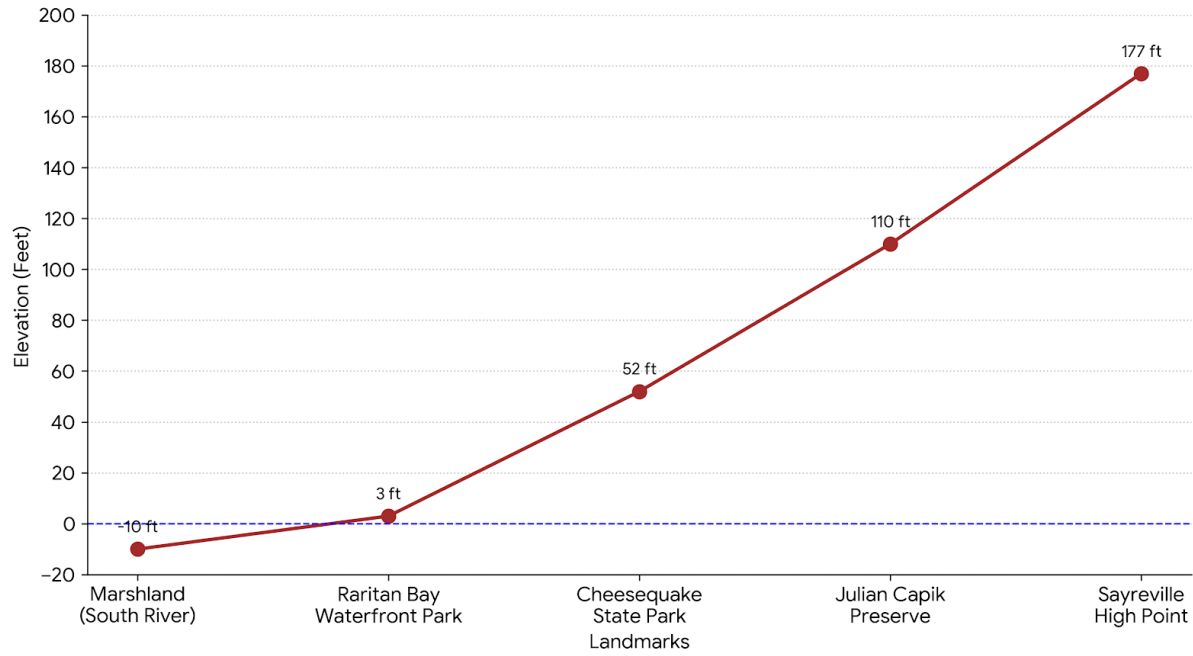
- Which trip had the biggest "climb" (increase in elevation)?

- Why is the Marshland elevation a negative number?

- If you were riding a bike from the Sayreville High Point to the Raritan Bay, would you be mostly pedaling uphill or coasting downhill? How do you know?
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Detective Tip: When you subtract a negative number (like in Question 1), it's like adding! You are moving from below sea level up to the surface, and then 3 feet higher.

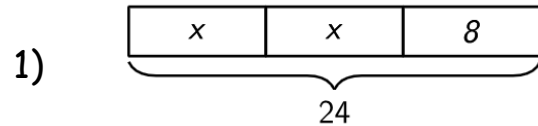
Sayreville Terrain Profile (Side View)



Unit 6: Expressions, Equations, and Inequalities

Overview: In this unit, you will build upon your strategies for solving linear equations from Grade 5. You will continue to use tape diagrams as a tool for modeling linear equations.

Task: For each tape diagram shown below, write an equation and find the missing value of x . Show or explain your reasoning. Then create your own tape diagram!



$x =$ _____

2)

$x + 8$	$x + 8$
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$\underbrace{\hspace{10em}}_{24}$

$x = \underline{\hspace{2cm}}$

3)

$x + 3$	$x + 3$	$x + 3$	$x + 3$	$x + 3$
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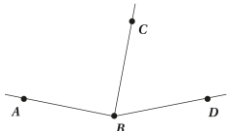
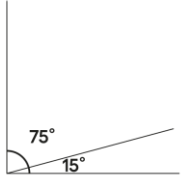
$\underbrace{\hspace{15em}}_{24}$

$x = \underline{\hspace{2cm}}$

4) Create your own tape diagram. Reference the tape diagrams in #1-3. Show or explain how to find the missing value.

Unit 7: Angles, Triangles, and Prisms

Overview: In this unit, you will first learn about different types of **angles**.

Adjacent angles share a side and a vertex. In this diagram, angle ABC is adjacent to angle DBC .	
Complementary angles have measures that add up to 90° . For example, a 15° angle and a 75° angle are complementary.	
Supplementary angles have measures that add up to 180° . For example, a 15° angle and a 165° angle are supplementary.	

Project: Geometric "Stained Glass" Art

The Goal: You are a designer creating a colorful stained-glass window for a new building in Sayreville. To make it strong and beautiful, your design must use specific types of angles.

Step 1: Geometry Vocabulary Refresher

Before you draw, remember these "Angle Rules":

- **Complementary Angles:** Two angles that add up to exactly 90° (they make a perfect "L" corner).
- **Supplementary Angles:** Two angles that add up to exactly 180° (they make a flat, straight line).
- **Adjacent Angles:** "Neighbor" angles that share a side and a corner point, but don't have to add up to a specific number.

Step 2: Create Your Art

On your graph paper, use a ruler to draw a large square or rectangle. Inside that shape, draw straight lines that criss-cross to create different sections.

Your design must include:

1. At least **one pair** of Complementary angles.
2. At least **one pair** of Supplementary angles.
3. At least **one pair** of Adjacent angles (that are *not* 90° or 180°).

Step 3: The Color Key

Use a different color to highlight each type of angle in your art. Fill out the key below so your "builder" knows which is which!

Angle Type	Color Used
complementary	
supplementary	
adjacent (and not complementary or supplementary)	

Sample Angle Art

