



To: 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> Grade Parents

From: The Junior High Team - Mr. Richardson, Ms. Griggs, Ms. Klute

June 7, 2023

Dear Parents,

Congratulations to your children for finishing the 2022-23 school year! It has been a joy teaching them and watching them grow these past ten months. We also welcome the incoming 6<sup>th</sup> graders to junior high as they continue their journey here at St. Anthony of Padua!

Please review the **Junior High Summer Projects**, which are required assignments for each student. The completed work will be due on the first day of school and will count as the first grades for Reading, Language, Math, Science, Social Studies, and Religion.

The **Junior High Supply List** is also provided so that you can begin to purchase materials for the school year. Please note that all Junior High students will be required to use **Chromebooks** instead of iPads for school.

In August/September, we will review Junior High policies regarding the following topics (\*found in Parent/Student Handbook online):

- Homework/Classwork\*
- Conduct\*
- Uniforms\*
- Classroom procedures
- Rotations and schedules

We appreciate the support you continue to give to your child's education. Please feel free to email any of us with any questions or concerns. You can find our contact information on the Teacher Blogs at [stanthonygardena.org](http://stanthonygardena.org). Thank you and enjoy your summer!

*St. Anthony of Padua, pray for us!*



Dear Parents and Students of the Class of 2026,

First, **congratulations** on finishing the 2022-23 school year! I hope you all enjoy your summer and come back in August *refreshed, focused, and prepared* for the joys and challenges of 6<sup>th</sup> grade.

As you may know, part of the preparation for 6<sup>th</sup> grade English Language Arts is summer reading. Every student is required to read the novel ***Wonder*** by R.J. Palacio. The book's content is fitting for this age group, and we will use it at the beginning of the year to review the literary elements. Our discussions and analysis in August and early September will focus on the elements of plot, setting, theme, and characterization that set the foundation for the year's curriculum.

Students will also take an AR quiz on *Wonder* when they come back in August. This will count for a Reading test grade and can be credited to their AR point goal (adjusted to accommodate *Wonder* quiz).

**The following assignments are also included in the 6th Grade Summer Packet:**

- ***Wonder* Book Report**
- **Math Packet**
- **Science Bridge Project**
- **Religion Mass Reflections (2)**
- **Social Studies Current Events (2)**
- **Writing Our Catholic Faith Handwriting book p.1-40**

**These will be the first graded assignments for the year, so please make sure that they are completed neatly and thoroughly.**

Thank you for your time and support. The students will enjoy the novel and the analysis we do in class. The theme of the story is relevant and the novel is a great opportunity to prepare the students for the upcoming year.

Sincerely,

*Ms. Klute*

Junior High English/6<sup>th</sup> grade Homeroom

Email: [hklute@stanthonygardena.org](mailto:hklute@stanthonygardena.org)

Website: <http://www.stanthonygardena.org/wp/sixth-grade/>

# 6<sup>th</sup> GRADE SUPPLY LIST 2023-24



## MATERIALS FEES

- \$5 for Student Planner (from school office)
- \$10 school lock (from the school office)

CLASSROOM SUPPLIES – will be collected from each student on the 1<sup>st</sup> day of school

- White copy paper
- Tissue boxes (1)
- Clorox wipes (2)
- Hand wipes (1)
- Emergency kit (labeled large Ziplock bag with
  - o 2-3 pint-sized water bottles and 2-3 non-perishable snacks)

INDIVIDUAL SUPPLIES – for students to keep and replace as needed

- Chromebook
- Pencil pouch
- No. 2 wood pencils (pack of 12+ / NO mechanical pencils)
- Pencil sharpener
- Erasers
- Blue/black pens (pack of 5+)
- Red pens (pack of 3+)
- Highlighters (3)
- Colored pencils (pack of 12)
- White-out tape
- College-ruled paper (500-count)
- Scissors
- Glue sticks (3)
- Whiteboard 9"x12"
- Small whiteboard eraser (exp. sock, piece of cloth)
- Expo/White board markers (one-8pk)
- earbuds

## MATH & SCIENCE

- (1) white 1-inch 3 ring binder w/ pocket tab dividers
- college ruled papers - reinforced - 500 count

## SOCIAL STUDIES & RELIGION

- A Catholic Youth Bible
- 2 5-STAR Notebooks with 5 sections (color – RED)
- pocket folder (color RED)

## ENGLISH/LANGUAGE ARTS

- Novels (\*available online at Amazon.com)
  - o *Wonder* by R.J. Palacio (Summer Project)
  - o *The Bronze Bow* by Elizabeth George Speare
- 1 Spiral 70-page Notebook (color - BLACK)
- 1½-inch 3-ring View Binder (color - BLACK)
- 5-tab Dividers for binder (any color)

MUSIC & PE - Please refer to Mrs. Garcia's and Mrs. Rubalcava's syllabus

## WEBSITES TO BOOKMARK ON CHROMEBOOK:

- STAR Testing / Accelerated Reader / Freckle (<https://global-zone52.renaissance-go.com/welcomeportal/306665> )
- St. Anthony of Padua – Teacher websites (<http://www.stanthonygardena.org>)
- Gradelink (<http://gradelink.com>)
- Socrative (<http://socrative.com>)
- Math (<https://aaamath.com>)
- Social Studies online book ([https://student.teachtci.com/student/sign\\_in](https://student.teachtci.com/student/sign_in))
- Religion prayer app: hallow.com
- Google Classroom



# Wonder by R.J. Palacio

Name \_\_\_\_\_ Date \_\_\_\_\_

Main Characters \_\_\_\_\_

Setting Introduction - How does the book begin?

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Why was Auggie only attending school now?

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Describe Auggie's first day of school.

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How did Halloween affect Auggie?

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Describe one friendship Auggie made at school. Why was this friendship important?

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How did Auggie's family members relate to him? What were their relationships like?

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How was the nature retreat a turning point in the story?

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How did the story end?

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What was the theme (main idea) of the story?

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What was unique about the narration in the story (how the story was told)?

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What was your favorite part of the story? Why?

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What are three ways you relate to Auggie's experiences in the book? Please describe.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Would you recommend the book to a friend? Why or why not?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# WHAT'S GOING ON?

Current Event #1

Date of event: \_\_\_\_\_

Location of event: \_\_\_\_\_

Summarize the main points of this current event in your own words. (Complete paragraph)

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Do you think this is an important issue? Why? (Complete paragraph)

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Write a prayer concerning this event.

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# WHAT'S GOING ON?

Current Event #2

Date of event: \_\_\_\_\_

Location of event: \_\_\_\_\_

Summarize the main points of this current event in your own words. (Complete paragraph)

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Do you think this is an important issue? Why? (Complete paragraph)

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Write a prayer concerning this event.

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## MASS REFLECTION #1

DATE: \_\_\_\_\_

### PRE-MASS REFLECTION:

1. What are the 2-3 things that are dominating your attention and thoughts today? What can you ask of God in the Liturgy to address these things?
2. The Mass is an opportunity to receive forgiveness of venial sins. Are there people who you have hurt in some way by your words, actions, or failure to act?
3. The word eucharist means "thanksgiving." What are you most thankful for today?

### POST-MASS REFLECTION

1. What experiences during the Mass did you find relevant to your current situation and life?
2. Reflections on the Liturgy of the Word: What word or phrase jumped out at you in today's reading?
3. The name Mass comes from the Latin missa, which means to "go forth" and is taken from the final words of the concluding rite. What are the greatest needs that you see in your everyday life? Empowered with the love of God in the Eucharist, what will you do to help meet those needs?

## MASS REFLECTION #2

DATE: \_\_\_\_\_

### BEFORE MASS REFLECTION:

1. Has God been at work in your daily life? What evidence is there that God is communicating with you daily? How do you expect this communication to continue during the Liturgy?
2. The Mass is an opportunity to receive forgiveness of venial sins. What personal weaknesses can God take over for you today?
3. The word eucharist means "thanksgiving." As a celebration of thanksgiving, what has God done for you in your lifetime that you can thank him for today?

### POST-MASS REFLECTION:

1. What was the holiest experience you had during Mass?
2. Reflections on the Liturgy of the Word: What did this reading remind you of in your life at this particular moment?
3. The name Mass comes from the Latin *missa*, which means to "go forth" and is taken from the final words of the concluding rite. What are the greatest needs that you see in your everyday life? Empowered with the love of God in the Eucharist, what will you do to help meet those needs?

**Addition**

Find the sum of the two numbers in each problem.  
Show all work.

Example:

$$\begin{array}{r} 1 \ 1 \\ 4 \ 4 \ 8 \\ + 1 \ 8 \ 8 \\ \hline 6 \ 3 \ 6 \end{array}$$

1. 
$$\begin{array}{r} 652 \\ + 345 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 203 \\ + 525 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} 726 \\ + 268 \\ \hline \end{array}$$

**Decimal Addition:**

Remember to line up the decimals before adding. Bring the decimal straight down in your answer.

4. 
$$\begin{array}{r} 7.75 \\ + 1.46 \\ \hline \end{array}$$

5.  $51.4 + 2.86$

6.  $.1274 + 8.25$

**Subtraction**

Find the difference between the two numbers in each problem. Show all work.

Example:

$$\begin{array}{r} 3 \ 13 \\ 7 \ ~~4~~ \ ~~8~~ \\ - 2 \ 1 \ 8 \\ \hline 5 \ 2 \ 5 \end{array}$$

7. 
$$\begin{array}{r} 407 \\ - 198 \\ \hline \end{array}$$

8. 
$$\begin{array}{r} 7,007 \\ - 2,426 \\ \hline \end{array}$$

9. 
$$\begin{array}{r} 3,414 \\ - 1,218 \\ \hline \end{array}$$

**Decimal Subtraction:**

Remember to line up the decimals before subtracting. Bring the decimal straight down in your answer.

10. 
$$\begin{array}{r} 338.38 \\ - 149.27 \\ \hline \end{array}$$

11.  $80.401 - 44.23$

12.  $75.89 - 9.4$

**Multiplication**

Find the product of the two numbers in each problem. Show all work.

Example:

$$\begin{array}{r} 54 \\ \times 16 \\ \hline 324 \\ + 540 \\ \hline 864 \end{array}$$

13.

$$\begin{array}{r} 65 \\ \times 4 \\ \hline \end{array}$$

14.

$$\begin{array}{r} 42 \\ \times 8 \\ \hline \end{array}$$

15.

$$\begin{array}{r} 84 \\ \times 39 \\ \hline \end{array}$$

Decimal Multiplication:

Multiply as you would with whole numbers. Count the decimal places in each factor. The product (answer) has the same number of decimal places.

16.

$$\begin{array}{r} .13 \\ \times 70 \\ \hline \end{array}$$

17.

$$\begin{array}{r} 5.1 \\ \times 2 \\ \hline \end{array}$$

18.

$$\begin{array}{r} .108 \\ \times 2.5 \\ \hline \end{array}$$

**Division**

Find the quotient in each problem. If there is a remainder, state the remainders as R=\_\_\_\_. Show all work. Feel free to use a separate sheet of paper.

19.

$$7 \overline{)591}$$

20.

$$12 \overline{)264}$$

21.

$$43 \overline{)2815}$$

### Decimal Division:

If the divisor (outside number) is a decimal, you must move the decimal point (using multiplication) to the right until it becomes a whole number. Then, move the decimal in the dividend (inside number) the same number of times. Divide to find your answer (quotient).

Then, move the decimal straight up from the dividend to the quotient.

Remember, no remainders.

$$\begin{array}{r} \text{quotient} \\ \text{divisor} \overline{) \text{dividend}} \end{array}$$

22.

23.

24.

$$3 \overline{) 31.8}$$

$$.5 \overline{) 7.45}$$

$$.12 \overline{) 12.24}$$

#### Rounding

Underline the given place value. Look to the right. If this digit is 5 or greater, increase the underlined digit by 1. If the digit to the right is less than 5, keep the underlined digit the same.

Round to the nearest...

hundredth

0.547 → 0.55

Round to the nearest....

25. tenth  
0.3479

26. hundredth  
0.7553

27. whole number  
3.268

28. ten  
162.21

29. thousandth  
0.0036

30. hundred  
990.54

Compare the decimals.

Compare using <, >, or =

1.2 ○ 1.20    1.2 = 1.20

31. 0.205 ○ 0.21

32. 1.03 ○ 0.03

33. 0.04 ○ 0.050

34. 0.1 ○ 0.1000

35. 0.52 ○ 0.500

36. 0.41 ○ 0.405

**Prime Number:** A whole number greater than 1 that has only two factors, 1 and itself.  
Examples: 2, 3, 5, 7, 11, 13, 17, and 19 are all prime numbers.

**Composite Number:** A whole number greater than 1 that has more than two factors.  
Example: 8 is a composite number since its factors are 1, 2, 4, 8.

Determine if the following numbers are prime or composite. If the numbers are composite, please list all of the factors.

37. 27: \_\_\_\_\_

38. 39: \_\_\_\_\_

39. 43: \_\_\_\_\_

40. 49: \_\_\_\_\_

### Exponents

A way to show repeated multiplication by the same factor is to use an exponent. In this example:  $2^3 = 2 \times 2 \times 2 = 8$ . The small raised three is the exponent. It tells how many times the number 2, called the base, is multiplied by itself.

Solve the following expressions by writing the expanded notation (repeated multiplication) and find the value.

41.  $6^2$

42.  $2^6$

43.  $3^4$

44. eight squared

45. five cubed

**Greatest Common Factor**

The greatest factor that two or more numbers have in common (*GCF*).

1. List all the factors of **four** in order
2. List all the factors of **twenty** in order
3. List the common factors
4. Write the greatest common factor

Finding Common Factors:

4: 1, 2, 4

20: 1, 2, 4, 5, 10, 20

Common Factors: 1, 2, 4    *GCF* = 4

List all the factors for each number. Circle the common factors.

46. 18 : \_\_\_\_\_

30 : \_\_\_\_\_

Common Factors: \_\_\_\_\_      Greatest Common Factor: \_\_\_\_\_

47. 60 : \_\_\_\_\_

45 : \_\_\_\_\_

Common Factors: \_\_\_\_\_      Greatest Common Factor: \_\_\_\_\_

48. 23: \_\_\_\_\_

29: \_\_\_\_\_

Common Factors: \_\_\_\_\_      Greatest Common Factor: \_\_\_\_\_

49. 56: \_\_\_\_\_

72: \_\_\_\_\_

Common Factors: \_\_\_\_\_      Greatest Common Factor: \_\_\_\_\_



**Least Common Multiple**

The smallest nonzero multiple that two or more numbers have in common.

1. List the first 6 multiples of 4
2. List the first 6 multiples of 6
3. List the common multiples
4. Write the least common multiple.

**Finding Common Multiples:**

4: **4, 8, 12, 16, 20, 24**

6: **6, 12, 18, 24, 30, 36**

Least Common Multiple= 12

50. 8 : \_\_\_\_\_

12 : \_\_\_\_\_

Common Multiples: \_\_\_\_\_ Least Common Multiple: \_\_\_\_\_

51. 7 : \_\_\_\_\_

11 : \_\_\_\_\_

Common Multiples: \_\_\_\_\_ Least Common Multiple: \_\_\_\_\_

52. 25 : \_\_\_\_\_

10 : \_\_\_\_\_

Common Multiples: \_\_\_\_\_ Least Common Multiple: \_\_\_\_\_

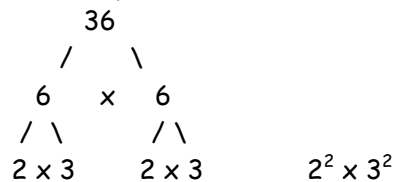
53. 24 : \_\_\_\_\_

36: \_\_\_\_\_

Common Multiples: \_\_\_\_\_ Least Common Multiple: \_\_\_\_\_

**Prime Factorization** is a composite number renamed as a product of prime numbers. You may make a factor tree to find the answer. Put final answer in exponent form.

Find the prime factorization of 36.



54.

180
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55.

525
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56.

91
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57.

48
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**Comparing Fractions**

Compare each pair of numbers. Write the correct comparison symbol ( $<$ ,  $>$ ,  $=$ ) in each circle. Make sure you have common denominators before comparing numerators.

Example:

$$\begin{array}{ccc} \frac{1}{3} & \bigcirc & \frac{3}{4} \\ \downarrow & & \downarrow \\ \frac{4}{12} & & \frac{9}{12} \end{array}$$

58.

$$\frac{3}{8} \bigcirc \frac{5}{8}$$

59.

$$\frac{3}{4} \bigcirc \frac{3}{8}$$

60.

$$\frac{1}{2} \bigcirc \frac{4}{8}$$

61.

$$\frac{3}{7} \bigcirc \frac{1}{4}$$

62.

$$\frac{3}{5} \bigcirc \frac{5}{6}$$

63.

$$\frac{7}{8} \bigcirc \frac{3}{4}$$

**Ordering Fractions**

Order the following fractions from **least to greatest**.

64.

$$\frac{3}{8} \quad \frac{5}{8} \quad \frac{4}{8} \quad \frac{2}{8} \quad \frac{7}{8}$$

65.

$$\frac{1}{5} \quad \frac{4}{5} \quad \frac{1}{10} \quad \frac{6}{10} \quad \frac{7}{10}$$

66.

$$\frac{1}{2} \quad \frac{1}{4} \quad \frac{1}{6} \quad \frac{1}{3} \quad \frac{1}{5}$$

67.

$$\frac{1}{2} \quad \frac{5}{16} \quad \frac{30}{64} \quad \frac{3}{8} \quad \frac{9}{32}$$

**Order of Operations**

Solve the following problems. Show your work. Be sure to follow the order of operations.

Parenthesis

Exponents

Multiplication or Division: Which ever comes first from left to right.

Addition or Subtraction: Which ever comes first from left to right.

Example:  $8 - 4 \div 2 + 2 =$   
 $8 - 2 + 2 =$   
 $6 + 2 =$   
 $8$

68.  $15 \times 8 - 3 =$

69.  $36 \div 4 \times 3 =$

70.  $(30 + 8) \times 6 - 1 =$

71.  $(30 + 8) \times (6 - 1) =$

72.  $(29 - 18) + 14 \div 2 + 6 =$

73.  $64 \div 8 \times 2$

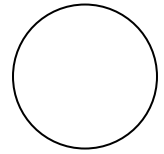
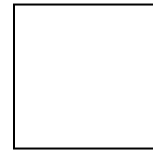
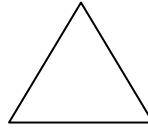
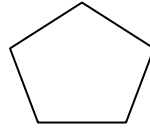
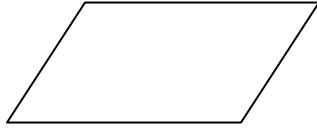
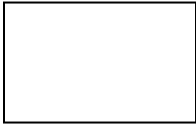
74.  $36 - 5(16 - 11) =$

75.  $25 + 18 \div 6 - 1 =$

76.  $24 + 6^2 - 1^4 =$

**Geometry-Who am I?**

Use the following shapes to answer the questions below.



77. I am a 2 dimensional shape that has four sides. I have four 90 degree angles. I have two sets of parallel lines. I also have two sides that are one length, and my other two sides are a different length.

Who am I? \_\_\_\_\_

78. I am a 2 dimensional shape that has three acute angles. All of my sides are the same length. I have no parallel sides.

Who am I? \_\_\_\_\_

79. I am a 2 dimensional shape that has four sides. I have two obtuse angles and two acute angles. I have two different sets of parallel sides. I also have two sides that are one length, and my other two sides are a different length.

Who am I? \_\_\_\_\_

80. I am a 2 dimensional shape that has 5 obtuse angles. I do not have any sides that are parallel.

Who am I? \_\_\_\_\_

81. I am a 2 dimensional shape that has four 90 degree angles. I have four sides that are all the same length. I have two different sets of parallel lines.

Who am I? \_\_\_\_\_

82. I am a 2 dimensional shape. My perimeter is also known as a circumference.

Who am I? \_\_\_\_\_

**Simply Fractions**

Simplify the following fractions. If the fractions are improper, change them to mixed numbers then simplify.

Example:  $\frac{10}{25} \div 5 = \frac{2}{5}$

83.

$$\frac{14}{28}$$

84.

$$\frac{15}{55}$$

85.

$$\frac{12}{51}$$

86.

$$\frac{34}{48}$$

87.

$$\frac{17}{4}$$

88.

$$\frac{80}{25}$$

**Adding Fractions and Mixed Numbers**

Add the following fractions. Make sure you have common denominators before adding. Remember, you only add the numerator (top number) and you keep the denominator (bottom number) the same! Simplify your final answers.

Example:

$$\begin{array}{r} \frac{1}{3} + \frac{1}{5} = \\ \downarrow \quad \downarrow \\ \frac{5}{15} + \frac{3}{15} = \frac{8}{15} \end{array}$$

89.

$$\frac{6}{10} + \frac{3}{10} =$$

90.

$$2\frac{3}{8} + 1\frac{2}{8} =$$

91.

$$\frac{1}{9} + \frac{5}{6} =$$

92.

$$\frac{1}{12} + 1\frac{2}{3} =$$

**Subtracting Fractions**

Subtract the following fractions. Make sure you have common denominators before subtracting. Remember, you only subtract the numerator (top number) and you keep the denominator (bottom number) the same! Simplify your final answers.

93.

$$\frac{5}{6} - \frac{3}{6} =$$

94.

$$2\frac{8}{12} - 1\frac{3}{12} =$$

Example:

$$\begin{array}{r} \frac{5}{6} - \frac{1}{3} = \\ \downarrow \quad \downarrow \\ \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2} \end{array}$$

95.

$$\frac{7}{10} - \frac{2}{4} =$$

96.

$$3\frac{4}{5} - \frac{1}{4} =$$

**Multiplying Fractions**

Multiply the following fractions. Multiply the numerators; then multiply the denominators. Simplify, if necessary.

97.

$$\frac{3}{4} \times \frac{1}{3} =$$

98.

$$\frac{2}{3} \times \frac{5}{8} =$$

99.

$$\frac{1}{3} \times \frac{2}{5} =$$

100.

$$\frac{7}{8} \times 2 =$$

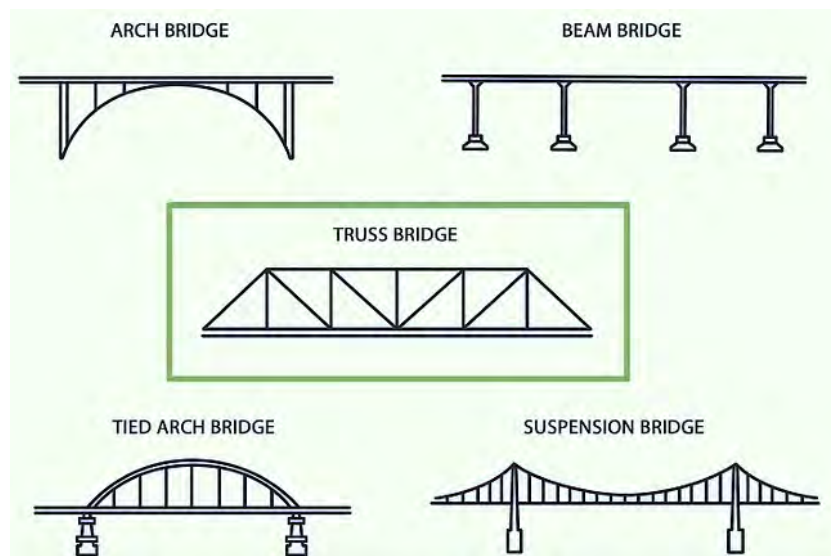
Example:

$$\frac{3}{5} \times \frac{5}{9} = \frac{15}{45} = \frac{1}{3}$$

## Junior High Physical Science Summer Packet

Dear Students,

This is your Science summer packet. You are going to design a model of a bridge. You are to bring in the completed packet with your model on Friday, August 16<sup>th</sup>. Don't wait until the last minute to do this and have fun! I hope to see some of these at open house. Have a wonderful summer and I will miss you all greatly! God bless.



Here are supplies you may want to have available as you design structures for your Bridge. Having all these supplies on hand is not necessary. Certainly you may have other supply ideas as well. You will need to use at least 5 different materials to build your bridge model.

Pipe cleaners

Construction paper

Cardboard tubes

Popsicle sticks

Masking & painters tape

Plastic/paper straws

dried sticks

toothpicks

cotton-tipped sticks

small paper cups

aluminum foil

rubber bands

playdough

white glue/glue sticks

paper clips

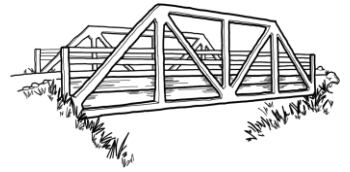
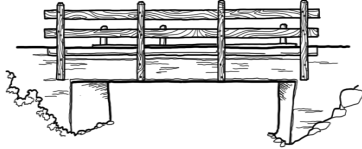
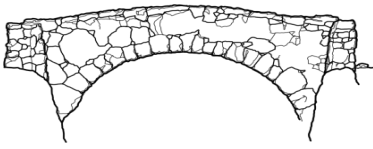
markers/crayons/pencils

newspaper

yarn/string



# Bridge Building Competition



An Engineering Design **STEAM** Challenge

Due Date: \_\_\_\_\_

The population of your city is growing! The 2-lane bridge that spans the river is being replaced with a 4-lane bridge. The bridge committee is looking for a strong and artistic that will hold the weight of big trucks. As a bridge expert, you're tasked to research, design, and build a model of a bridge to span the river. It must bear weight without collapsing. Models will be judged in a bridge showcase and competition.

Your Task:

Design a model of a bridge that can span across a river and hold weight.

Investigate: Research Types of Bridges:

- Choose and research 4 types of bridges.
- How your chosen type of bridge bear weight?
- What unique design features do they have?

Plan: Design a Bridge to Include:

- strength to carry weight without collapsing
- space underneath the bridge so the river is able to flow
- features of the chosen type of bridge

Create Model:

- Use no more than 5 materials to build a model bridge.
- Your structure needs to be a 3D representation.

Improve: Collaborate with Classmates on Design

- Share your bridge design with a classmate.
- Make changes to your structure so it is stronger and more artistic.

Submit a Report:

- Use scientific evidence to explain how your bridge bears weight.
- Explain how you used the engineering design cycle.
- Share how you incorporated math into your bridge design.

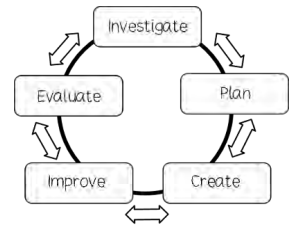




Name \_\_\_\_\_ Date: \_\_\_\_\_

# Investigate: Research Bridges

Learn about 4 types of bridges. Conduct research to help you understand their characteristics, how they carry load and unique design features.



Describe the characteristics of

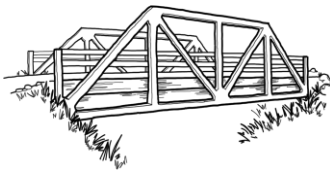
## Truss Bridges:

*How do they carry load?*

Describe the characteristics of

## Suspension Bridges:

*How do they carry load?*



# 4 Types of Bridges

Describe the characteristics of

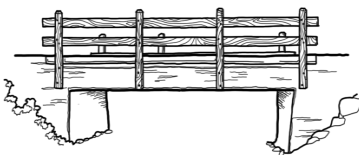
## Beam Bridges:

*How do they carry load?*

Describe the characteristics of

## Arch Bridges:

*How do they carry load?*

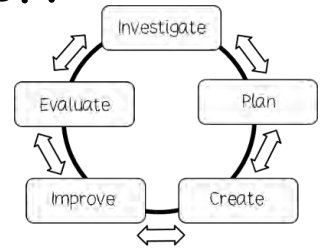




Name \_\_\_\_\_ Date: \_\_\_\_\_

# Plan: Bridge Design Sketch

After investigating characteristics of bridges, choose one type and draw a plan for your design. Use up to 5 materials. Label the materials you plan to include.



Large empty rectangular area for drawing the bridge design plan.

Type of Bridge Created: \_\_\_\_\_

**Math Connection:** Explain how you have used math to designed your bridge. How will math be applied as you build the bridge?

*Consider: Size/Area of the space? Geometry? Measurements?*

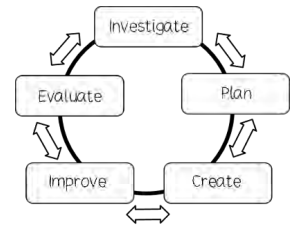
Five horizontal dashed lines for writing the math connection explanation.



Name \_\_\_\_\_ Date: \_\_\_\_\_

# Improve: Design Brainstorm

After you have developed your bridge sketch, share your design with a classmate. Brainstorm new ideas you can incorporate in your structure's design.



How can I improve the structure so it can **bear more weight**?

How can I improve the bridge design so it spans a **longer distance**?

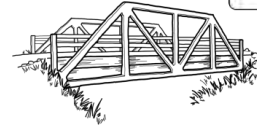
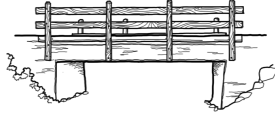
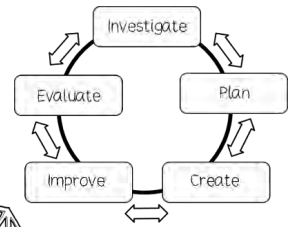
How can the **artistic design** of the bridge be improved?

What can I do to make the structure more **realistic**?

My Collaboration Colleague

Name \_\_\_\_\_ Date: \_\_\_\_\_

# Evaluate: Bridge Reflection



Type of Bridge Created: \_\_\_\_\_

Give scientific evidence to explain/tell how the design of the bridge helps to hold weight.

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Explain/tell how the structure performed in the weight test. Reflect on improvements that can be made to strengthen the bridge.

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**Mathematical Application:** Share how you used math in your design.

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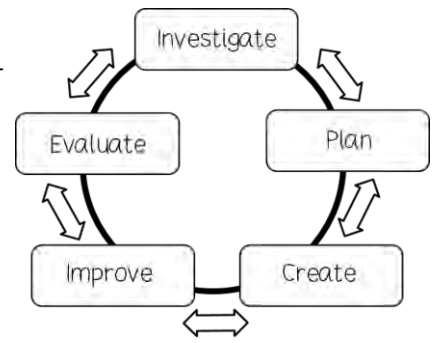
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Name \_\_\_\_\_

Engineers use **critical thinking skills** when designing a solution. Write about what you did as you worked through the design cycle.



Investigate:

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Plan:

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Create:

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Improve:

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Evaluate:

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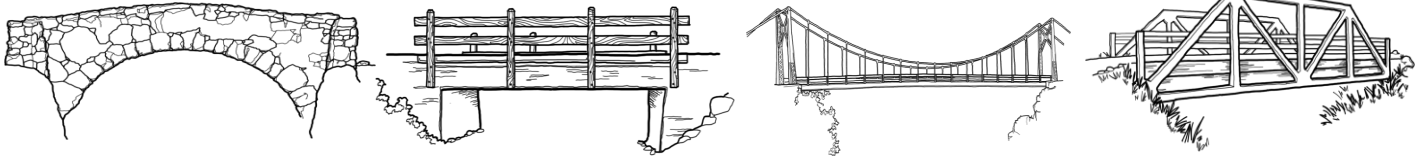
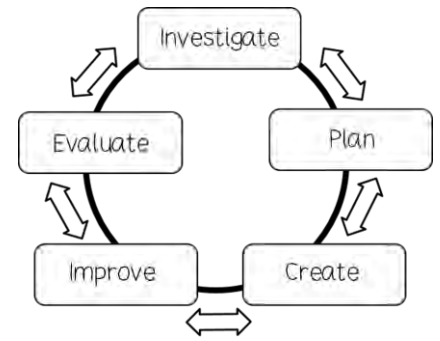
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Name \_\_\_\_\_

# Designing a Bridge

## Using the Engineering Design Cycle!



Hi structural engineer! As you explore different ways to design a bridge that includes **scientific evidence** to enable your structure to hold a load without collapsing, you will find yourself making changes. Keep going! Engineers are always thinking of ways to make their idea better when they design. Write about what you did as you worked through each part of the design cycle.

Investigate:

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Plan:

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Create:

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Improve:

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Evaluate:

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Name: \_\_\_\_\_

Grade: \_\_\_\_\_

# Bridge Building Competition STEAM Challenge Rubric

	Bridge Structure & Effort	Use of Engineering Design Cycle	Bridge Report, Accuracy, & Conventions
<b>Structural Engineer</b> Excellent: 4 Points 	The student's 3D bridge structure is <u>exceptional</u> . Their design <u>effectively</u> use 5 or fewer materials. It replicates a researched bridge type, is realistic and artistic. There is space underneath to allow river to flow. The bridge is exceptionally able to bear weight well. <b>The engineer goes beyond expectations.</b>	The student engineer effectively explains in <b>full detail</b> , throughout the design process, how the bridge was created using the engineering cycle. The student <b>fully</b> showcased critical thinking as they problem solved design improvements.	The student's <u>written</u> explanation uses <b>scientific evidence</b> to explain how the bridge design enables it to <b>hold weight</b> . Student <b>accurately</b> explained how math was incorporated into the structure's design. There is <b>consistent</b> use of grade level appropriate sentences, grammar, and spelling.
<b>Bridge Designer</b> Satisfactory: 3 Points 	The student's 3D bridge structure is <b>well done</b> . They sufficiently use 5 or fewer materials. It showcases a researched bridge type, is realistic and has artistic qualities. There is space underneath to allow river to flow. The bridge is able to bear <b>some</b> weight. <b>The engineer followed all given directions.</b>	The student engineer explains in <b>basic detail</b> , throughout the design process, how the bridge was created using the engineering cycle. The student demonstrated <b>some</b> critical thinking as they problem solved design improvements.	The student's <u>written</u> explanation uses <b>basic scientific evidence</b> to explain how the bridge design enables it to <b>hold weight</b> . Student <b>begins</b> to explain how math was incorporated into the structure's design. The student <b>frequently uses</b> grade appropriate sentences, spelling, and grammar. Errors exist, but do not interfere with meaning.
<b>Bridge Watcher</b> Needs Improvement: 2 Points 	The student's 3D bridge structure gives <u>limited thought</u> to a researched bridge type. They use few realistic or artistic details. Their use of 5 or fewer materials could be improved. There may not be space underneath to allow river to flow. The bridge may or may not be able to bear weight. <b>The engineer did not follow all directions.</b>	The student engineer uses <b>few details</b> , throughout the design process, to show how the bridge was created using the engineering cycle. Some phases may be omitted. The student is <b>limited</b> in show how they used critical thinking to problem solve the design.	The student's <u>written</u> explanation <b>leaves out important scientific evidence</b> to explain how the bridge design enables it to hold weight. <b>Few, if any details</b> are used to explain how math was incorporated into the structure's design. The student uses many sentences that are not grade level appropriate. There are <b>several errors</b> that interfere with the flow/meaning.
<b>Drive-by Visitor</b> Unsatisfactory: 1 Point 	The student's 3D bridge structure is <u>missing many components</u> of a researched bridge type. They lack in realistic or artistic details. Their use of 5 or fewer materials need to be improved. There may not be space underneath to allow river to flow and bridge may not be able to bear weight. <u>The model does not support a well thought out design.</u> <b>The engineer did not follow all directions.</b>	The student engineer uses <b>limited detail</b> , throughout the design process, to show how the bridge was created using the engineering cycle. Some phases may be omitted. The student <b>did not adequately</b> show how critical thinking was used to problem solve the design.	The student's <u>written</u> explanation <b>did not include relevant scientific evidence</b> to explain how the bridge design enables it to hold weight. Details are few and/or <b>do not accurately</b> explain how math was incorporated into the structure's design. There are significant gaps in the information. Grammar and spelling errors <b>prevent understanding to be conveyed.</b>