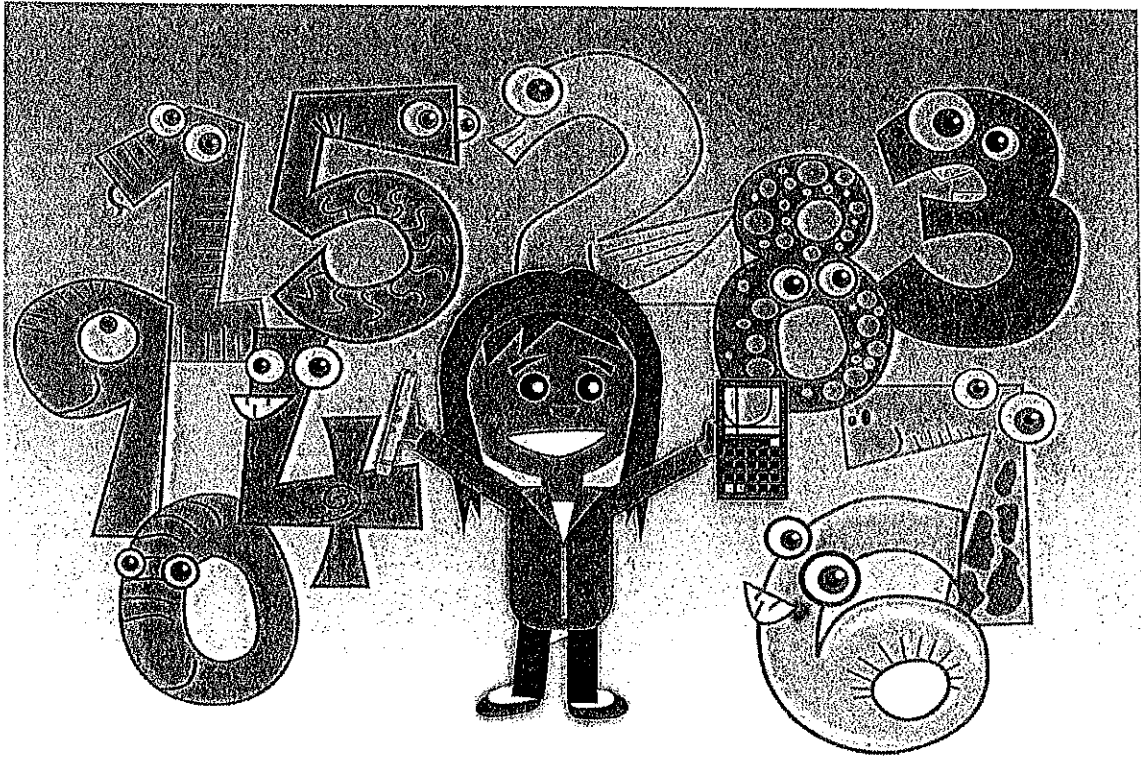# 7th grade going into 8th grade
Summer Math Packet 2023

Here is a summer packet to practice your math skills over the summer. Please hand it to your math teacher in September. This will be graded. HAVE A GREAT SUMMER!

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.

2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.

3. Add/subtract as if the numbers are whole numbers

4. Bring the decimal point straight down

ex: $14.2 - 7.934$

$$
\begin{array}{r}
14.200 \\
- 7.934 \\
\hline
6.266 \\
\end{array}
$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.

2. Ignore the decimals and multiply as if the numbers are whole numbers.

3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 6.94×7.8

$$
\begin{array}{r}
6.94 \rightarrow \text{2 decimal places} \\
\times 7.8 \rightarrow \text{1 decimal place} \\
\hline
5552 \\
+ 48580 \\
\hline
54132 \\
\end{array}
$$

3 decimal places

54.132

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.

2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.

3. Divide as if the numbers are both whole numbers.

4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: $25.3 \div 0.3$

$$
\begin{array}{r}
84.\overline{3} \\
0.3 \overline{)25.3\,0} \\
-24 \\
\hline
13 \\
-12 \\
\hline
10 \\
-9 \\
\hline
1 \\
\end{array}
$$

Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)

2. Exponents

3. Multiplication & Division (left to right)

4. Addition & Subtraction (left to right)

ex: $5 + 4(3 - 1.2)$

$5 + 4(1.8)$

$5 + 7.2$

12.2

Evaluate each expression.

1. $5.983 + 2.99$	2. $224 - 56.73$	3. $6.12 - 4.923$
4. $24.5 \cdot 3.2$	5. $0.23 \cdot 7$	6. $3.86 \cdot 9.15$
7. $14.8 \div 5$	8. $46.3 \div 1.5$	9. $147 \div 2.25$
10. $24.33 - 2.5 \cdot 7$	11. $3.9 + 4.5^2$	12. $9.25(18.4 - 2 \cdot 1.2)$

Solve each word problem, showing all work.

13. Jeff had $46.18 in his wallet Monday morning. He gave half of his money to his brother. He then bought two donuts for $0.75 each and a cup of coffee for $2.99. How much money did Jeff have left?	14. Five friends split a $65.20 bill at a restaurant. They also each left $2.75 for the tip. How much money did each person pay in all?

Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Add the two numerators and keep the denominator the same.

3. Add the whole numbers.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $3\frac{3}{4} + 2\frac{1}{2}$

$$3\frac{3}{4} = 3\frac{3}{4}$$
$$+\quad 2\frac{1}{2} = 2\frac{2}{4}$$
$$\overline{\qquad\qquad}$$
$$5\frac{5}{4} = \boxed{6\frac{1}{4}}$$

Subtracting Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.

3. Subtract the whole numbers.

4. Simplify the answer.

ex: $5\frac{1}{4} - 1\frac{2}{3}$

$$5\frac{1}{4} = 5\frac{3}{12} = 4\frac{15}{12}$$
$$-\quad 1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12}$$
$$\overline{\qquad\qquad}$$
$$\boxed{3\frac{7}{12}}$$

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Cross-simplify if possible.

3. Multiply the numerators and then multiply the denominators

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{\cancel{36}_{3}} \cdot \frac{\cancel{4}^{2}}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.

3. Multiply the fractions.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$$\frac{7}{1} \div \frac{7}{4}$$
$$\downarrow$$
$$\frac{^{1}\cancel{7}}{1} \cdot \frac{4}{\cancel{7}_{1}} = \frac{4}{1} = \boxed{4}$$

Evaluate each expression.

15. $\frac{4}{5} + \frac{3}{4}$	16. $4\frac{2}{7} + 2\frac{9}{14}$	17. $8\frac{11}{12} + 9\frac{5}{18}$
18. $6 - \frac{3}{8}$	19. $8\frac{3}{5} - 2\frac{1}{3}$	20. $4\frac{1}{6} - \frac{8}{9}$
21. $\frac{4}{25} \cdot \frac{15}{16}$	22. $2\frac{3}{4} \cdot 8$	23. $6\frac{5}{8} \cdot 3\frac{1}{2}$
24. $\frac{7}{9} \div \frac{2}{3}$	25. $\frac{4}{5} \div 10$	26. $5\frac{2}{3} \div 2\frac{5}{6}$

Solve each word problem, showing all work.

27. Jaimie ran $3\frac{1}{2}$ miles on Monday. She ran half as far on Tuesday as she did on Monday. How far did Jaimie run in all on Monday and Tuesday?	28. A $5\frac{1}{2}$ quart pot is filled $\frac{2}{3}$ of the way with water. How many more quarts of water can the pot hold?

Ratios

Ratios are comparisons of two quantities.
There are 3 different ways to write ratios:

- Fraction $\left(\dfrac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

Ratios can be simplified just like fractions.

ex: write the ratio of triangles to circles
in 3 ways: ▲ ▲ ▲ ▲ ◉ ◉

$$\frac{4}{2} = \boxed{\frac{2}{1}, \quad 2:1, \quad 2 \text{ to } 1}$$

Rates & Unit Rates

Rates are ratios that compare quantities measured in different units.
A unit rate is a rate with a denominator of 1.

To convert a rate to a unit rate:

1. Divide the numerator by the denominator
2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

ex: express as a unit rate:
125 miles in 4 hours

$$\frac{125 \text{ mi}}{4 \text{ hr}} \qquad 125 \div 4 = 31.25$$

$$\boxed{\frac{31.25 \text{ mi}}{1 \text{ hr}} \text{ or } 31.25 \text{ miles per hr}}$$

Fractions, Decimals, & Percent

To convert a:

- <u>Decimal to Percent</u>: move the decimal point 2 places to the right

  ex: $0.345 = \boxed{34.5\%}$

- <u>Percent to Decimal</u>: move the decimal point 2 places to the left

  ex: $7\% = \boxed{0.07}$

- <u>Decimal to Fraction</u>: write the decimal over the place value of the last digit and then simplify

  ex: $0.008 = \dfrac{8}{1000} = \boxed{\dfrac{1}{125}}$

- <u>Fraction to Decimal</u>: divide the numerator by the denominator

  ex: $\dfrac{1}{5} = 5\overline{)1.0} = \boxed{0.2}$

- <u>Percent to Fraction</u>: write the percent over 100 and then simplify

  ex: $45\% = \dfrac{45}{100} = \boxed{\dfrac{9}{20}}$

- <u>Fraction to Percent</u>: convert the fraction to a decimal and then convert the decimal to a percent

  ex: $\dfrac{3}{10} = 0.3 = \boxed{30\%}$

Percent of a Number

1. Turn the percent to a fraction or decimal.
2. Multiply the fraction/decimal by the number.

ex: Find 18% of 40

$$0.18 \cdot 40 = \boxed{7.2}$$

Write each ratio in 3 ways.

29. A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.	30. A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.

Convert each rate to a unit rate.

31. $4.25 for 64 fluid ounces	32. 297 miles on 11 gallons of gas	33. 124 feet in 10 seconds

Complete the chart by converting each number to a percent, fraction, and/or decimal.

	Fraction	Decimal	Percent
34.	$\frac{3}{8}$		
35.		0.45	
36.			72%
37.		0.1	
38.	$\frac{3}{200}$		

Find each percent of a number.

39. 30% of 90	40. 15% of 38	41. 50% of 86
42. 75% of 160	43. 24% of 35	44. 2% of 74

Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number is on the number line, the greater it is.
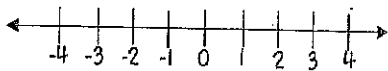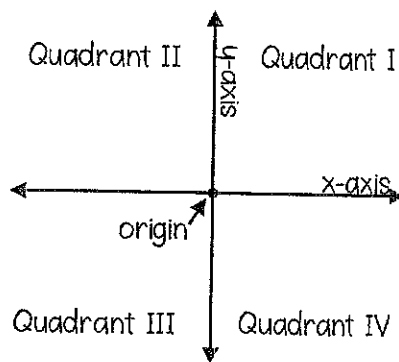

The absolute value of a number is the distance the number is from zero.

ex: compare with <, >, or =

-7 ◯ $|-9|$ ← The absolute value of $-9 = 9$

-7 $\boxed{<}$ 9

The Coordinate Plane

Quadrant II | Quadrant I
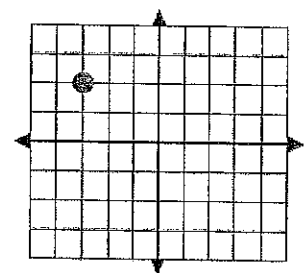Quadrant III | Quadrant IV

y-axis

x-axis

origin

Ordered Pair: (x, y)

To graph a point on the coordinate plane, start at the origin. The first number in the ordered pair (the x-coordinate) tells you how far left (if negative) or right (if positive) to move. The second number (the y-coordinate) tells you how far up (if positive) or down (if negative) to move.

ex: Graph the point (-3, 2) and state the quadrant in which it is located.

Start at the origin, and move LEFT 3 and UP 2

$\boxed{\text{Quadrant II}}$

Perimeter, Area and Volume

- Perimeter of Any Polygon: add all side lengths
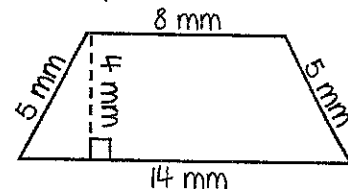
- Area of a Rectangle: $A = lw$

- Area of Parallelogram: $A = bh$

- Area of Triangle: $A = \frac{1}{2}bh$

- Area of Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

- Volume of Rectangular Prism: $V = lwh$

ex: Find the perimeter & area:

Perimeter: $P = 5 + 8 + 5 + 14 = \boxed{32 \text{ mm}}$

Area: This is a trapezoid, so use the area of a trapezoid formula: $A = \frac{1}{2}h(b_1 + b_2)$

The bases are the sides that are parallel, and the height is perpendicular to the bases.

→ $A = \frac{1}{2}(4)(8+14) = \boxed{44 \text{ mm}^2}$

Compare the integers with <, >, or =.

45. -4 ◯ -5	46. 2 ◯ -2	47. |−5| ◯ |5|	48. -7 ◯ 6	49. -13 ◯ -9
50. |−7| ◯ -6	51. -17 ◯ -14	52. |−3| ◯ |−2|	53. 0 ◯ -6	54. |−4| ◯ |6|

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)	56. B(0, -3)
57. C(1, -1)	58. D(3, 3)
59. E(-4, 1)	60. F(2, 0)
61. G(-3, -2)	62. H(-2, 3)
63. I(0, 2)	64. J(-1, -4)

Find the perimeter, area, and/or volume of the given figure.

65. Find the perimeter & area:	66. Find the perimeter & area:	67. Find the perimeter & area:
5 cm, 13 cm, 12 cm	3.5 in, 5 in, 8 in	$3\frac{1}{2}$ in
68. Find the perimeter & area:	69. Find the area of a square with a perimeter of 45 cm	70. Find the volume:
8 ft, 3.5 ft, 4 ft, 7 ft		$2\frac{1}{8}$ mm, $6\frac{3}{4}$ mm, 2 mm

Evaluating Algebraic Expressions

1. Substitute the given numbers for the variables

2. Evaluate the expression using the order of operations

ex: evaluate $x + 4y$ for $x = 4$ & $y = 6$

$4 + 4(6)$
$4 + 24 = \boxed{28}$

One-Step Addition & Subtraction Equations

- <u>Addition Equations</u>: Subtract the number being added to the variable from both sides of the equation

ex: $\begin{array}{r} 4 + x = 18 \\ -4 \quad\quad -4 \\ \hline \boxed{x = 14} \end{array}$

- <u>Subtraction Equations</u>: Add the number being subtracted from the variable to both sides of the equation

ex: $\begin{array}{r} 20 = a - 5 \\ +5 \quad\quad +5 \\ \hline 25 = a \rightarrow \boxed{a = 25} \end{array}$

One-Step Multiplication & Division Equations

- <u>Multiplication Equations</u>: Divide both sides of the equation by the number next to the variable

ex: $\begin{array}{r} \dfrac{7b}{7} = \dfrac{28}{7} \\ \hline \boxed{b = 4} \end{array}$

- <u>Division Equations</u>: Multiply both sides of the equation by the number under the variable

ex: $5 \cdot \dfrac{n}{5} = 10 \cdot 5$
$\boxed{n = 50}$

Problem Solving

1. Read the problem. Identify the question that is being asked and the key information in the problem.

2. Plan how you are going to solve the problem and estimate the answer.

3. Solve the problem using the strategy of your choice.

4. Check your answer. Make sure your answer is reasonable and compare it to your estimate. Label your answer with appropriate units.

Evaluate each expression for $a = 5$, $b = 12$, $c = 10$, & $d = 2$.

71. $2b - a$	72. $d(ab - c)$	73. $3 + \dfrac{b}{d}$
74. $\dfrac{4a}{b + 4d}$	75. $2a^2 - c$	76. $b - c + d$

Solve each one-step equation.

77. $g + 3 = 17$	78. $r - 6 = 7$	79. $6b = 18$	80. $\dfrac{h}{9} = 3$
81. $5 = f - 8$	82. $48 = 12b$	83. $a + 24 = 83$	84. $17 + x = 23$
85. $10 = \dfrac{m}{5}$	86. $86.5 = f - 7.63$	87. $\dfrac{n}{6} = 11$	88. $\dfrac{3}{4}h = 12$

Solve each word problem using the method of your choice.

89. A fencing company charges $22 per foot to install a wood fence. How much will it cost to install a wood fence around a rectangular pool area that is 20 feet wide and 38 feet long?	90. A 6 inch-tall plant grew ¾ of an inch one week and twice as much the following week. How tall is the plant now?
91. Jack can read 45 pages of his book in one and a half hours. At that rate, how long will it take him to read the entire 300-page book?	92. Brian ordered 3 large cheese pizzas and a salad. The salad cost $4.95. If he spent a total of $47.60 including the $5 tip, how much did each pizza cost? (Assume there is no tax).
93. A cookie recipe calls for $3\frac{1}{4}$ cups of flour. The recipe makes 3 dozen cookies. How much four is needed to make 144 cookies?	94. Ella has a box of chocolate candies. She gives $\frac{1}{3}$ of the candies to her sister, 4 to her brother, and she eats the remaining 12 candies. How many chocolate candies were in the box originally?

Solve each word problem using the method of your choice.

|	
95. 20% of the 520 students in Wendover Middle School were involved in school sports. Of those students, 12.5% were on the wrestling team. How many students were on the wrestling team?	96. A piggy bank contains some dimes and nickels. There are 8 more dimes than nickels in the bank. There is a total of $1.40. How many of each type of coin are in the bank?
97. An elevator in a tall building goes up 7 floors, then down 9 floors, down 4 floors, up 8 floors, and down 2 floors. Now it is on floor 14. On what floor did the elevator start?	98. Jenna danced for 3 hours on Sunday, 2 hours on Monday and Tuesday, 1 hour on Thursday, 1.5 hours on Friday, and 2 hours on Saturday. She did not dance at all on Wednesday. What is the average number of hours she danced each day? Round your answer to the nearest tenth of an hour.
99. Jackie makes $15.25/hour babysitting. George makes $18.50/hour mowing the lawn. If Jackie babysits for 4 hours and George mows lawns for 3 hours, who makes more money? How much more does he/she make?	100. A box of 8 crayons costs $0.96. How much does each crayon cost? At that unit price, how much would a box of 30 crayons cost?

Summer Reading 2023

Here is a summer reading list for 7th grade going into 8th. Choose a book to read, and fill out the organizer attached. Please return it to your ELA teacher on the first day of school. EXTRA CREDIT IF YOU READ MORE THAN ONE! HAPPY READING!

Name:

- **That Was Then, This is Now, by S.E. Hinton**
- **Rules, by Cynthia Lord**
- **The Book Thief, by Markus Zusak**
- **Son** (Final book to The Giver) **by Lois Lowry**
- **Addie on the Inside** (sequel to The Misfits), **by James Howe**
- **Tex, by S. E. Hinton**
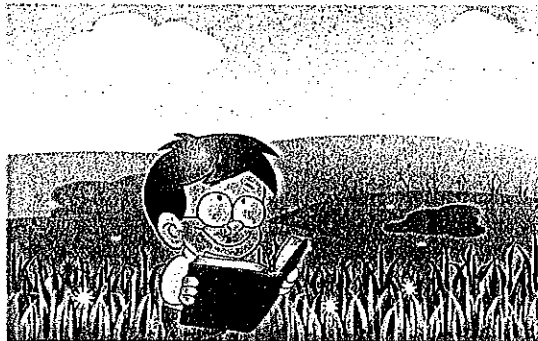
Name:_____

Title of the Novel: _____

Author of the Novel: _____

Summer Reading Assignment

Complete the following assignment. This will be due during the first week of school in September, and it will be graded. You should try your best on this assignment, so your new English teacher can see how much you know from last year!
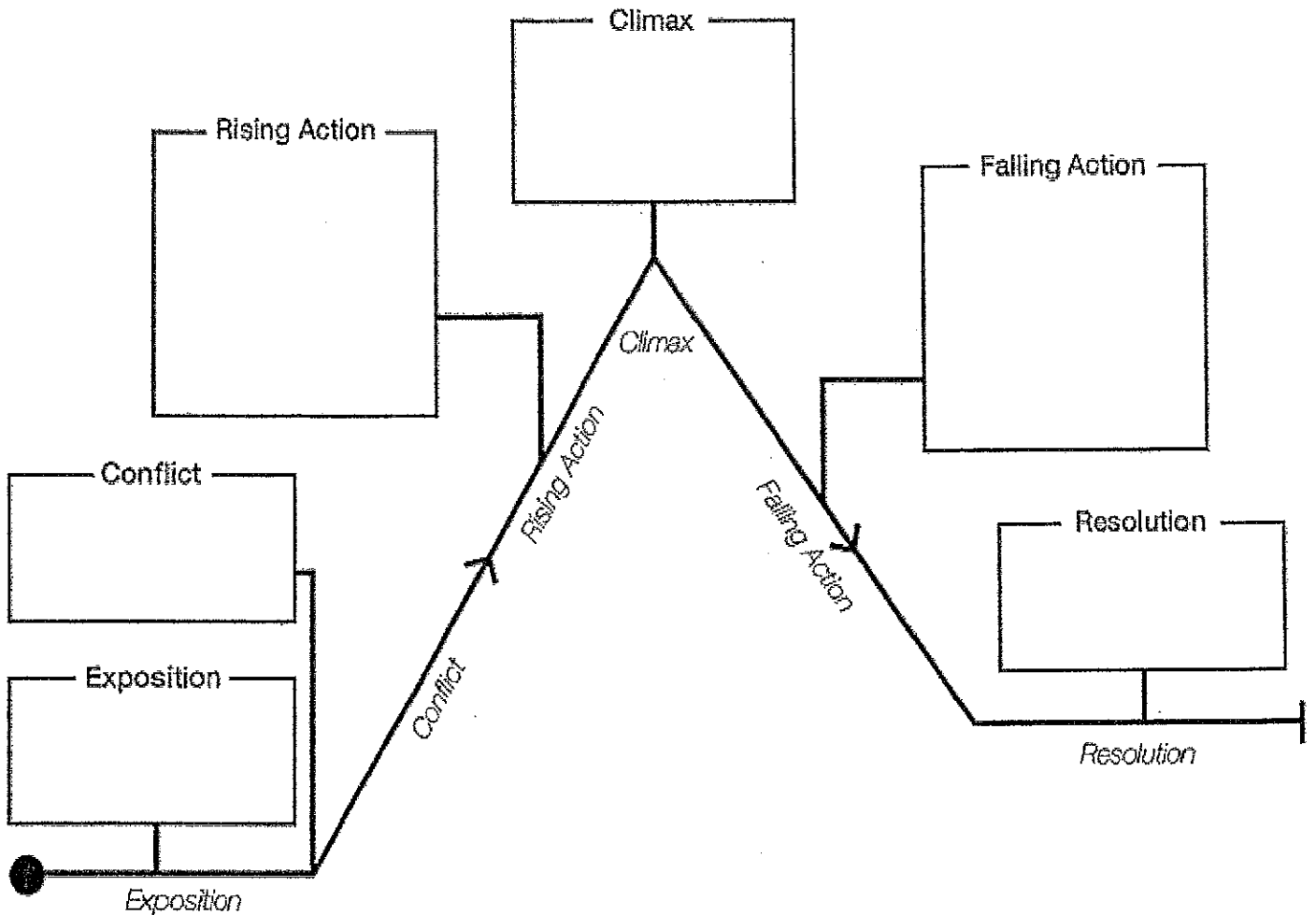
Directions: Fill in the Narrative Story Plot Structure below using the novel you read.

Name:_____

Plot Diagram
(Elements of Plot Structure)

Date: ___/___/___

Climax

Rising Action

Falling Action

Conflict

Resolution

Exposition

Climax

Rising Action

Falling Action

Conflict

Resolution

Exposition

Directions: Fill in the following literary elements chart based on the novel you read below.

Why was your novel written- PURPOSE (Circle One):	What point of view was your novel in (Circle One):	Name 1-3 themes in your novel:
To Entertain To Persuade To Explain To Inform	1st person 2nd person 3rd limited 3rd Omniscient	
What was the genre and subgenre of your novel: Fiction or Nonfiction (circle one) Subgenre/s:	**What was the mood of the novel:**	**What was/were the setting/s of the novel (place, time, culture)?**
What was the conflict in your novel (circle one): Man vs. Man Man vs. Nature Man vs. Self Man vs. Society Man vs. Machine	**What was the main conflict in the novel:**	**Who were the secondary characters in the novel?**
Who was the protagonist? **Who:** **Were they a dynamic or static character and why?**	**Who was the antagonist?** **Who:** **Were they a dynamic or static character and why?**	**What was the moral of the novel?**
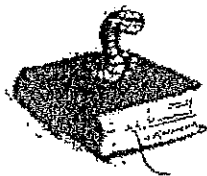
Middle School Reading Literary Terms

1. Main Idea- what a piece of writing is mostly about
2. Summary- gives the main idea and important details of a passage
3. Theme- a more generally stated topic concerning a passage's main ideas
4. Genre- a classification of literature, such as fiction, drama, poetry, etc.
5. Fiction- a type of literature that tells a made-up story
6. Non-fiction- a type of lit. that tells about real-life people, places, events, things, etc.
7. Drama- a play written to be performed by actors
8. Myth- a folktale (fictional story) about gods and goddesses (mythology)
9. Tall Tale- an American hero folktale full of extreme exaggerations
10. Fable- a folktale, usually with talking animals, that always has a moral to it
11. Analogy- a comparison that shows a relationship between two things
12. Simile- a comparison of two unlike things using the words "like" or "as"
13. Metaphor- a comparison of two unlike things not using the words "like" or "as"
14. Paraphrase- restating something using different words (re-phrasing)
15. Context Clues- words, phrases, or sentences that give meaning to unknown words
16. Denotation- the dictionary definition of the word - the literal meaning
17. Connotation- the extra sense that the word implies – pos. or neg. (cheap/inexpensive)
18. Repetition- creating a "special effect" by repeating a sound or word
19. Suspense- a feeling of uncertainty or dread about what will happen next
20. Sarcasm- an expression that is personal, jeering, and intended to hurt
21. Oxymoron- a seemingly contradictory combination of words (jumbo shrimp)
22. Onomatopoeia- a word or phrase that imitates a sound (whoosh)
23. Plot- the action of the story
24. Resolution- the final outcome of the story-
    - or the solution of the problem
25. Character- a person or other creature in a story
26. Setting - the time and place of the story's events
27. Climax - the point of greatest interest or suspense in the story
28. Conflict - the main problem the character faces (with others, self, or nature)
29. Personification- gives animals or objects human qualities or characteristics
30. Hyperbole- the deliberate use of exaggeration
31. Symbolism - the use of one thing to stand for or represent another
32. Imagery - the use of vivid description to create a picture in the reader's mind
33. Foreshadow- gives clues that suggest what might happen in the future
34. Flashback- interrupting the story with events from the past

35. Irony- a statement meaning the opposite of what is literally stated
36. Idiom- a saying that can not be literally translated
37. Allusion- a reference to a well-known work of literature, art, music, etc.
38. Audience- the person or persons to whom the writing is addressed
39. Author- the person who wrote the story or passage, etc.
40. Narrator- the person who is telling the story
41. Point of View- the relationship of the narrator to the story (viewpoint)
42. 1st Person PoV- when a character in the story tells the story (using I, me, my, we, etc.)
43. 3rd Person PoV- when someone not in the story tells the story (like an invisible observer)
44. Dialogue- when the characters in a story speak (usually set off by quotation marks)
45. Style/Voice- the way the author uses phrases and sentences to make his story distinctive
46. Tone- the author's attitude about his topic - can be positive, negative, or neutral
47. Mood- the feeling or atmosphere in the story set by the author
48. Inference- a guess based on a known fact, a conclusion
49. Cause/Effect- a TS exploring the reason something happened (cause) and the result (effect
50. Compare/Contrast-a TS showing similarities (comparisons) and differences (contrasts)
51. Problem/Solution- a TS examining how conflicts or obstacles (problems) are overcome (resolved
52. Chronology- a TS presenting events in the order in which they occur (sequencing)
53. Inductive- a TS that starts with specific ideas and works toward a general idea
54. Deductive- a TS that starts with a general idea and works toward specific ideas
55. Spatial Order- a TS that shows where things are
56. Categorization-a TS that puts things in categories
57. Fact- a statement that can be proved - or disproved
58. Opinion- a statement that can not be proven - someone's own belief
59. Bias- a strong prejudice for one side over another - favoring only one side
60. Objective- a work based on fact, having no bias or partiality
61. Propaganda- persuasion techniques
62. Synonyms- words that have similar meanings
63. Antonyms- words that have opposite meanings