Incoming 8ᵗʰ Graders

Welcome back to Middle School English Language Arts! This summer you will read one required novel and one choice novel. You will complete the **Getting to Know Your Character** worksheet for the required novel and the **Character Analysis** worksheet for your choice novel. Happy Reading!

1. Required Novel: Soul Surfer, by Bethany Hamilton

2. Choice Novel: Choose one novel from the list below
Maximum Ride, by James Patterson
Lockdown: Escape from Furnace I, by Alexander Gordon Smith
A Dog's Purpose, by W. Bruce Cameron
Deadline, by Christ Crutcher
Wolf Rider, by Avi
Flipped, by Wendelin Van Draanen

Getting to Know Your Character
Summer Reading

Required Novel

TITLE OF BOOK:
AUTHOR:

CHARACTER

A **character** is a person or animal who takes part in a literary work.
Almost every book revolves around one or more main characters, called **protagonists**.

Who is the protagonist of the novel?

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CHARACTER TRAITS

A **characteristic** or **trait** is a feature that helps identify or distinguish a character from the other characters in the story.
Characteristics can be **external**, like a character's appearance, or **internal**, such as a character's personality.

Identify one of the protagonist's important **traits**.

Why is this trait important in the novel?

Find PROOF in the novel to support this trait. Cite your text evidence below:

Identify another one of the protagonist's important **traits**.

Why is this trait important in the novel?

Find PROOF in the novel to support this trait. Cite your text evidence below:

GOAL

In most stories, the protagonist has a **goal**— something that he or she wants to do. Usually, there is an enemy, problem, or obstacle, known as the main **conflict**, that stops the protagonist from accomplishing his/her goal.

What is the protagonist's goal?

CONFLICT

A **conflict** can be either **external** – between the protagonist and someone/something else – or **internal**—a character's struggle within him or herself, over different ideas or attitudes. Most stories have both types of conflict.

What is the main **external conflict** of the story?

What is the main **internal conflict** of the story?

RESOLUTION

Overcoming the conflict in the story is what changes the protagonist. Where, when, and how the protagonist overcomes the obstacle and how the protagonist subsequently changes is called the resolution.

What is the resolution of the story?

How does the protagonist change from the beginning to the end of the novel?

Character Analysis

Directions: *Consider how the main character has changed from the beginning to the end of the text.* List *at least 3* **points** along with supporting **proof** (from the text) and an **explanation** for each.

	POINT: IDEA (How has the character changed?)	PROOF: TEXT EVIDENCE	EXPLANATION
BEGINNING			
MIDDLE			
END			

Evaluating Algebraic Expressions

1. Substitute the given values for the variables in the expression

2. Evaluate the expression using the order of operations
   - Parentheses/Brackets (inside to outside)
   - Exponents
   - Multiplication/Division (left to right)
   - Addition/Subtraction (left to right)

ex: $9x^2 - 4(y + 3z)$
for $x = -3$, $y = 2$, $z = 5$

$9(-3)^2 - 4(2 + 3 \cdot 5)$

$9(-3)^2 - 4(2 + 15)$

$9(-3)^2 - 4 \cdot 17$

$9 \cdot 9 - 4 \cdot 17$

$81 - 4 \cdot 17$

$81 - 68 = \boxed{13}$

The Distributive Property

1. Multiply the number outside the parentheses by each term in the parentheses.

2. Keep the addition/subtraction sign between each term.

ex: $5(8x - 3)$

$5(8x - 3)$

$5(8x) - 5(3)$

$\boxed{40x - 15}$

Simplifying Algebraic Expressions

1. Clear any parentheses using the Distributive Property

2. Add or subtract like terms (use the sign in front of each term to determine whether to add or subtract)

ex: $2(3x - 4) - 12x + 9$

$2(3x - 4) - 12x + 9$

$6x - 8 - 12x + 9$

$\boxed{-6x + 1}$

Evaluate each expression for $a = 9$, $b = -3$, $c = -2$, $d = 7$. Show your work.

1. $a - cd$	2. $2b^3 + c^2$	3. $\dfrac{a + d - c}{b}$	4. $(a - b)^2 + d(a + c)$
5. $4c - (b - a)$	6. $\dfrac{a}{b} - 5a$	7. $2bc + d(12 - 5)$	8. $b + 0.5[8 - (2c + a)]$

Simplify each expression using the Distributive Property.

9. $5(2g - 8)$	10. $7(y + 3)$	11. $-3(4w - 3)$	12. $(6r + 3)2$

Simplify each expression, showing all work.

13. $8(x + 1) - 12x$	14. $6w - 7 + 12w - 3z$	15. $9n - 8 + 3(2n - 11)$	16. $3(7x + 4y) - 2(2x + y)$
17. $(15 + 8d)(-5) - 24d + d$	18. $9(b - 1) - c + 3b + c$	19. $20f - 4(5f + 4) + 16$	20. $8(h - 4) - h - (h + 7)$

Solving One-Step Equations

1. Cancel out the number on the same side of the equal sign as the variable using inverse operations (addition/subtraction; multiplication/division)

2. Be sure to do the same thing to both sides of the equation!

ex: $-18 = 6j$

$$\frac{-18}{6} = \frac{6j}{6}$$

$-3 = j \longrightarrow \boxed{j = -3}$

Solving Two-Step Equations

1. Undo operations one at a time with inverse operations, using the order of operations in reverse (i.e. undo addition/subtraction before multiplication/division)

2. Be sure to always do the same thing to both sides of the equation!

ex: $\frac{a}{7} - 12 = -9$

$$\frac{a}{7} - 12 = -9$$
$$\phantom{\frac{a}{7}} + 12 \ + 12$$

$$7 \times \frac{a}{7} = 3 \times 7$$

$$\boxed{a = 21}$$

Solving Multi-Step Equations

1. Clear any parentheses using the Distributive Property

2. Combine like terms on each side of the equal sign

3. Get the variable terms on the same side of the equation by adding/subtracting a variable term to/from both sides of the equation to cancel it out on one side

4. The equation is now a two-step equation, so finish solving it as described above

ex: $5(2x - 1) = 3x + 4x - 1$

$10x - 5 = 3x + 4x - 1$

$10x - 5 = 7x - 1$
$- 7x \qquad - 7x$

$3x - 5 = -1$
$+ 5 \quad + 5$

$$\frac{3x}{3} = \frac{4}{3}$$

$$\boxed{x = \frac{4}{3}}$$

Solve each equation, showing all work.

21. $f - 64 = -23$	22. $-7 = 2d$	23. $\dfrac{b}{-12} = -6$	24. $13 = m + 21$
25. $5x - 3 = -28$	26. $\dfrac{w + 8}{-3} = -9$	27. $-8 + \dfrac{h}{4} = 13$	28. $22 = 6y + 7$
29. $8x - 4 = 3x + 1$	30. $-2(5d - 8) = 20$	31. $7r + 21 = 49r$	32. $-9g - 3 = -3(3g + 2)$
33. $5(3x - 2) = 5(4x + 1)$	34. $3d - 4 + d = 8d - (-12)$	35. $f - 6 = -2f + 3(f - 2)$	36. $-2(y - 1) = 4y - (y + 2)$

Standard Form to Scientific Notation: move the decimal after the first non-zero digit and eliminate any trailing zeros. Multiply by 10 to the power equal to the number of places you moved the decimal point. If the original number was greater than 1, the exponent is positive. If the number was less than 1, the exponent is negative.

ex: 0.0000571

$$0.00005.71$$

Original number < 1, so negative exponent

$$= \boxed{5.71 \times 10^{-5}}$$

Scientific Notation to Standard Form: move the decimal point the number of places indicated by the exponent. If the exponent is positive, move the decimal right. If negative, move left.

ex: 3.5×10^3

Positive exponent, so move decimal right

$$3.500. = \boxed{3,500}$$

Negative Exponents & Simplifying Monomials

Zero Exponent: Any number raised to the zero power equals 1

ex: $y^0 = 1$

Negative Exponent: Move the base to the opposite side of the fraction line and make the exponent positive

ex: $x^{-4} = \dfrac{1}{x^4}$

Monomial x Monomial: Multiply the coefficients and add the exponents of like bases

ex: $(4x^3)(2x^5) = 8x^8$

Monomial ÷ Monomial: Divide the coefficients and subtract the exponents of like bases

ex: $\dfrac{a}{a^6} = a^{-5} = \dfrac{1}{a^5}$

Power of a Monomial: Raise each base (including the coefficient) to that power. If a base already has an exponent, multiply the two exponents

ex: $(-2fg^5)^3 = -8f^3g^{15}$

Power of a Quotient: Raise each base (including the coefficient) to that power. If a base already has an exponent, multiply the two exponents

ex: $\left(\dfrac{5d^3}{c}\right)^2 = \dfrac{25d^6}{c^2}$

Convert each number to Scientific Notation.

37. 67,000,000,000	38. 0.0009213	39. 0.00000000004	40. 3,201,000,000,000,000

Convert each number to Standard Form.

41. 5.92×10^{-5}	42. 1.1×10^7	43. 6.733×10^{-8}	44. 3.27×10^2

Simplify each expression. Write your answers using only positive exponents.

45. w^{-9}	46. $\dfrac{m^5}{m^2}$	47. $f^5 \cdot f^3$	48. $\left(\dfrac{h^2}{g}\right)^3$
49. $(a^5)^2$	50. $\dfrac{1}{b^{-3}}$	51. z^0	52. $4r^6 \cdot 3r \cdot 2r^2$
53. $\dfrac{9p^{-2}}{3q^{-3}}$	54. $\dfrac{8d^3}{2cd^{-2}}$	55. $(g^4h)^2 \cdot (2g^3h^{-1})^2$	56. $(6a)^0$
57. $(-3n^2k^4)^2$	58. $\left(\dfrac{w^5 x^{-2} y}{w^2 x y^4}\right)^3$	59. $\dfrac{6 \cdot 10^7}{2 \cdot 10^3}$	60. $(1.5 \cdot 10^{-6}) \cdot (4 \cdot 10^9)$

Solving Proportions

1. Set the two cross-products equal to each other

2. Solve the equation for the variable

ex: $\dfrac{m}{4} = \dfrac{3}{5}$

$\dfrac{5m}{5} = \dfrac{12}{5}$

$\boxed{m = 2.4}$

Similar Figures

1. To find a missing side length, set up a proportion, matching up corresponding sides.

2. Solve the proportion using the steps above.

ex:

9 mm   x   5.5 mm   1.5 mm
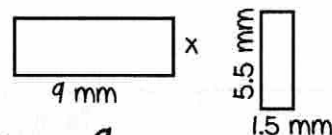
$\dfrac{x}{1.5} = \dfrac{9}{5.5}$

$\boxed{x = 2.\overline{45} \text{ mm}}$

The Pythagorean Theorem

*** The Pythagorean Theorem applies to right triangles only **

The sides next to the right angle (a & b) are legs

The side across from the right angle (c) is the hypotenuse

$b = leg$ $c = hypotenuse$ $a = leg$
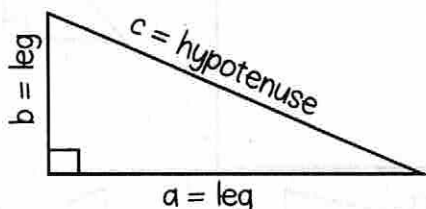
Pythagorean Theorem: $a^2 + b^2 = c^2$

To find the hypotenuse: add the squares of the legs and then find the square root of the sum

To find a leg: subtract the square of the given leg from the square of the hypotenuse and then find the square root of the difference

ex:

12 cm   x   15 cm
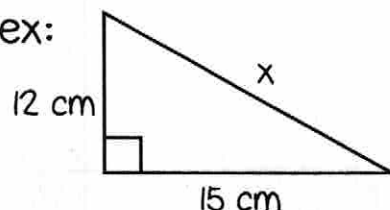
x is the hypotenuse

$12^2 + 15^2 = x^2$

$144 + 225 = x^2$

$369 = x^2$

$x = \sqrt{369}$ $\boxed{\approx 19.2 \text{ cm}}$

ex: $a = ?, b = 3, c = 6$
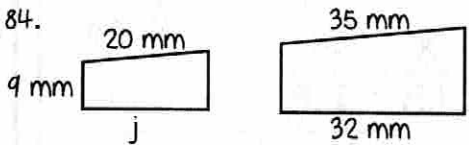
a is a leg

$a^2 + 3^2 = 6^2$

$a^2 + 9 = 36$
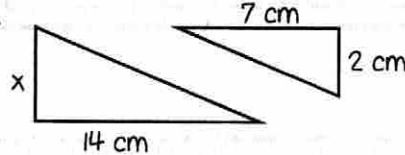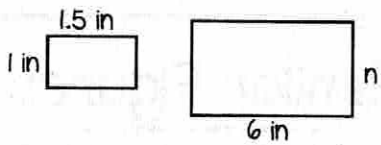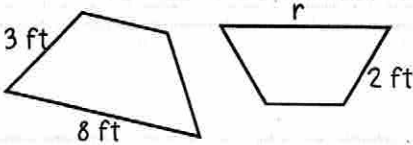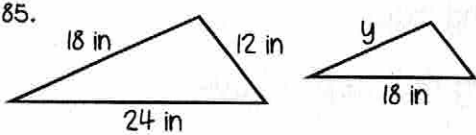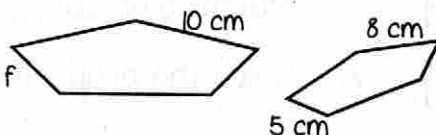
$a^2 = 36 - 9 = 27$

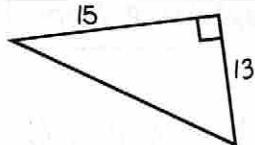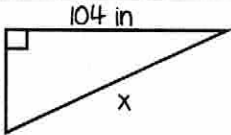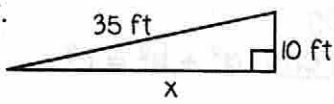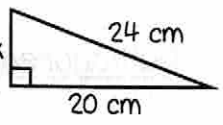$a = \sqrt{27}$ $\boxed{\approx 5.2}$
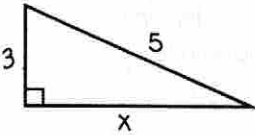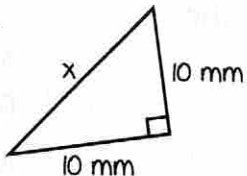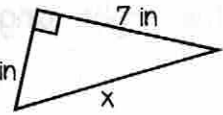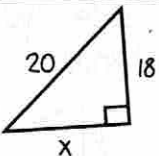
Solve each proportion, showing all work.

76. $\frac{6}{7} = \frac{4}{m}$	77. $\frac{12}{5} = \frac{k}{3}$	78. $\frac{h}{7} = \frac{8}{2}$	79. $\frac{22}{n} = \frac{9}{36}$	80. $\frac{4}{21} = \frac{3}{c}$

Assume each pair of figures is similar. Find the missing side length, showing all work.

81. 7 cm, 2 cm, x, 14 cm	82. 1.5 in, 1 in, 6 in, n	83. r, 3 ft, 2 ft, 8 ft
84. 20 mm, 35 mm, 9 mm, j, 32 mm	85. 18 in, 12 in, y, 24 in, 18 in	86. 10 cm, 8 cm, f, 5 cm

Find the missing side length in each right triangle to the nearest tenth. Show your work!

87. $a = 6, b = 8, c = ?$	88. $a = ?, b = 9\,cm, c = 13\,cm$	89. $a = 7, b = ?, c = 14$	90. $a = 14\,in, b = 14\,in, c = ?$
91. 3, 5, x	92. x, 10 mm, 10 mm	93. 7 in, 5 in, x	94. 20, 18, x
95. 15, 13	96. 104 in, 52 in, x	97. 35 ft, 10 ft, x	98. 24 cm, x, 20 cm

Determine whether or not you can form a right triangle from the given side lengths. Explain.

99. 18, 22, 26	100. 5, 12, 13