Everything You Need to Ace English Language Arts
in One Big Fat Notebook


Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
3 Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).
Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.
Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.
Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.
By the end of the year, read and comprehend literary nonfiction in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
3 Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.
4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone
5 Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.
6 Explain how an author develops the point of view of the narrator or speaker in a text.
9 Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.
10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

| GRADE | 7 | READING: LITERATURE ${ }^{\text {a }}$ CCSS.ELA-LITERACYRL. $71,2,3,4,5,6,10$ |
| :---: | :---: | :---: |
|  | 1 | Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. |
|  | 2 | Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text. |
|  | 3 | Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot). |
|  | 4 | Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama. |
|  | 5 | Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning |
|  | 6 | Analyze how an author develops and contrasts the points of view of different characters or narrators in a text. |
|  | 10 | By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range. |


| GRADE 8 | READING:LITERATURE | CCSS.ELA-LITERACY.RL. $8.1,2,3,4,6,10$ |
| :--- | :--- | :--- | :--- |

Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
2 Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.

Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.
Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.
By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6-8 text complexity band independently and proficiently.
By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.
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\begin{array}{cc|l}\text { GRADE } & 6 & \text { SPEAKING \& LISTENING } \\
\hline 1 & \text { 1a CSS.ELA-LITERACYSL. } 6.1,1 A, 1 C, 2,3,4,5,6\end{array}
$$ \begin{array}{l}Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse \\
partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. \\
Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by \\
referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. \\
Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, \\

text, or issue under discussion.\end{array}\right]\)| Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it |
| :--- |
| contributes to a topic, text, or issue under study. |
| Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence |
| from claims that are not. |
| Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to |
| accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation. |


| GRADE | 6 | WRITING | CCSS.ELALITERACY. W.6.1, 1A, 1B, 1C, 1D, 1E, 2, 2A, 2B, 2C |
| :---: | :---: | :---: | :---: |
|  | 1 | Write arguments to support claims with clear reasons and relevant evidence. |  |
|  | 1a | Introduce claim(s) and organize the reasons and evidence clearly. |  |
|  | 1b | Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. |  |
|  | 1c | Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons. |  |
|  | 1 d | Establish and maintain a formal style. |  |
|  | 1 e | Provide a concluding statement or section that follows from the argument presented. |  |
|  | 2 | Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. |  |
|  | 2a | Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. |  |
|  | 2b | Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples. |  |
|  | 2c | Use appropriate transitions to clarify the relationships among ideas and concepts. |  |


| GRADE 6 | WRITING | CCSS.ELALITERACY. W.6.2D, 2E, 2F 3, 3A, 3B, 3C, 3D, 3E, 4 |
| :--- | :--- | :--- | :--- |

2d Use precise language and domain-specific vocabulary to inform about or explain the topic. Establish and maintain a formal style.

Provide a concluding statement or section that follows from the information or explanation presented.
Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.
Provide a conclusion that follows from the narrated experiences or events.
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)

\section*{| GRADE 6 | WRITING | CCSS.ELA-LITERACY.W. $6.5,6,7,8,9,9 A, 9 B, 10$ |
| :--- | :--- | :--- | :--- | \\ $5 \quad$ With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. (Editing for conventions should demonstrate command of Language standards $1-3$ up to and including grade 6 here.) \\ Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. \\ Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. \\ Draw evidence from literary or informational texts to support analysis, reflection, and research. \\ Apply grade 6 Reading standards to literature (e.g., "Compare and contrast texts in different forms or genres [e.g., stories and poems; historical novels and fantasy stories] in terms of their approaches to similar themes and topics"). \\ Apply grade 6 Reading standards to literary nonfiction (e.g., "Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not"). \\ Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of disciplinespecific tasks, purposes, and audiences. \\ Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples. \\ Use appropriate transitions to clarify the relationships among ideas and concepts.}


| GRADE 6 | LANGUAGE | CCSS.ELA-LITERACY.L. $64,4 \mathrm{~A}, 4 \mathrm{~B}, 4 \mathrm{C}, 4 \mathrm{D}, 5,5 \mathrm{~B}, 6$ |
| :--- | :--- | :--- | :--- |

$6 \quad$ Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

| GRADE | 6 | READING: INFORMATIONAL TEXT | CCSS.ELA-LITERACY.RI.6.1, 2, 3, 4, 7, 10 |
| :---: | :---: | :---: | :---: |
|  | 1 | Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. |  |
|  | 2 | Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. |  |
|  | 3 | Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes). |  |
|  | 4 | Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings. |  |
|  | 7 | Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. |  |
|  | 10 | By the end of the year, read and comprehend literary nonfiction in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range. |  |
|  | 9 b | Apply grade 6 Reading standards to literary nonfiction (e.g., "Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not"). |  |
|  | 10 | Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of disciplinespecific tasks, purposes, and audiences. |  |
|  | 2b | Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples. |  |
|  | 2 c | Use appropriate transitions to clarify the relationships among ideas and concepts. |  |
| GRADE | 6 | SPEAKING \& LISTENING |  |
|  | 1 | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. |  |
|  | 1 a | Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. |  |
|  | 1 c | Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion. |  |
|  | 2 | Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study. |  |
|  | 4 | Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation. |  |
|  | 6 | Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 here for specific expectations.) |  |
| GRADE | 6 | WRITING ${ }^{\text {CCSS.ELA-LITERACYW. } 64,} 7,8,9,10$ |  |
|  | 4 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.) |  |
|  | 7 | Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. |  |
|  | 8 | Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. |  |
|  | 9 | Draw evidence from literary or informational texts to support analysis, reflection, and research. |  |
|  | 10 | Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of disciplinespecific tasks, purposes, and audiences. |  |
| GRADE | 6 | EXPRESSIONS \& EQUATIONSCCSS. <br> A.2C, | MATH.CONTENT.6.EE.A.1, A.2, A.2A, A.2B, $\text { A.3, A.4, B. } 5, \text { B. } 6, \text { B. } 7$ |
|  | A. 1 | Write and evaluate numerical expressions involving who | -number exponents. |
|  | A. 2 | Write, read, and evaluate expressions in which letters sta | nd for numbers. |

A.2a $\quad$ Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract $y$ from 5 " as $5-y$.
A.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8+7)$ as a product of two factors; view $(8+7)$ as both a single entity and a sum of two terms.
A.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V=s 3$ and $A=6 s 2$ to find the volume and surface area of a cube with sides of length $s=1 / 2$.
A. 3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2+x)$ to produce the equivalent expression $6+3 x$; apply the distributive property to the expression $24 x+18 y$ to produce the equivalent expression $6(4 x+3 y)$; apply properties of operations to $y+y+y$ to produce the equivalent expression $3 y$.
A. 4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y+y+y$ and $3 y$ are equivalent because they name the same number regardless of which number y stands for..
B. 5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
B. 6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
B. 7 Solve real-world and mathematical problems by writing and solving equations of the form $\mathrm{x}+\mathrm{p}=\mathrm{q}$ and $\mathrm{px}=\mathrm{q}$ for cases in which $\mathrm{p}, \mathrm{q}$ and x are all nonnegative rational numbers.

## GRADE 6 EXPRESSIONS \& EQUATIONS CCSS.MATH.CONTENT.6.EE.B.8, C. 9

B. 8 Write an inequality of the form $\mathrm{x}>\mathrm{c}$ or $\mathrm{x}<\mathrm{c}$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $\mathrm{x}>\mathrm{c}$ or $\mathrm{x}<\mathrm{c}$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
C. 9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d=65 t$ to represent the relationship between distance and time.

| GRADE 7 | E |  |
| :---: | :---: | :---: |
| A. 1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. |  |
| A. 2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a+0.05 a=1.05$ a means that "increase by $5 \%$ " is the same as "multiply by 1.05 ." |  |
| B. 3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $\$ 25$ an hour gets a $10 \%$ raise, she will make an additional $1 / 10$ of her salary an hour, or $\$ 2.50$, for a new salary of $\$ 27.50$. If you want to place a towel bar $93 / 4$ inches long in the center of a door that is $271 / 2$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. |  |
| B. 4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. |  |

B. 4 a Solve word problems leading to equations of the form $p x+q=r$ and $p(x+q)=r$, where $p, q$, and $r$ are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm . Its length is 6 cm . What is its width?
B.4b Solve word problems leading to inequalities of the form $\mathrm{px}+\mathrm{q}>\mathrm{r}$ or $\mathrm{px}+\mathrm{q}<\mathrm{r}$, where $\mathrm{p}, \mathrm{q}$, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $\$ 50$ per week plus $\$ 3$ per sale. This week you want your pay to be at least $\$ 100$. Write an inequality for the number of sales you need to make, and describe the solutions.

## GRADE 8 FUNCTIONS $\mid$ CCSS.MATH.CONTENT.8.FA.1, A.2, A.3, B.4, B. 5

A. 1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. 1
A. 2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
A. 3 Interpret the equation $\mathrm{y}=\mathrm{mx}+\mathrm{b}$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A=s 2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1),(2,4)$ and $(3,9)$, which are not on a straight line.
B. 4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. B. 5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
A.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V=s 3$ and $A=6 s 2$ to find the volume and surface area of a cube with sides of length $s=1 / 2$.
A. 3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2+x)$ to produce the equivalent expression $6+3 x$; apply the distributive property to the expression $24 x+18 y$ to produce the equivalent expression $6(4 x+3 y)$; apply properties of operations to $y+y+y$ to produce the equivalent expression $3 y$.
A. 4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y+y+y$ and $3 y$ are equivalent because they name the same number regardless of which number y stands for..
B. 5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

\section*{| GRADE 6 | GEOMETRY | CCSS.MATH.CONTENT.6.G.A.1, A.2, A.3, A4 |
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Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
A. 2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V=1 \mathrm{w} h$ and $V=b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
A. 3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving realworld and mathematical problems.
A. 4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

\section*{GRADE $7 |$|  | GEOMETRY | CCSS.MATH.CONTENT.G.A.1, A.2, A.3, B4, B.5, B. 6 |
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A. 1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
A. 2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
A. 3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
B. 4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
B. 5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
B. 6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

GRADE $7 |$|  | GEOMETRY | CCSS.MATH.CONTENT.7.G.A.1, A.2, A.3, B4, B.5, B. 6 |
| :--- | :--- | :--- | :--- |

A. 1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
A. 2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
A. 3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
B. 4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
B. 5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
B. 6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

| GRADE | 8 | GEOMETRY | CCSS.MATH.CONTENT.8.G.A.1, A.1A, A.1B, A.1C, A.2, A.3, A.4, A.5, B.6, B. 7 |
| :---: | :---: | :---: | :---: |
|  | A. 1 | Verify experimentally the properties of rotations, reflections, and translations: |  |
|  | A.1a | Lines are taken to lines, and line segments to line segments of the same length. |  |
|  | A.1b | Angles are taken to angles of the same measure. |  |
|  | A.1c | Parallel lines are taken to parallel lines. |  |
|  | A. 2 | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. |  |
|  | A. 3 | Describe the effect of dilations, translations, rotations, and reflections on twodimensional figures using coordinates. |  |
|  | A. 4 | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. |  |
|  | A. 5 | Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. |  |
|  | B. 6 | Explain a proof of the Pythagorean Theorem and its converse. |  |
|  | B. 7 | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. |  |


| GRADE | 8 | GEOMETRY | CCSS.MATH.CONTENT.8.G.B.8, C. 9 |
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\section*{| GRADE | 6 | THE NUMBER SYSTEM | CCSS.MATH.CONTENT.6.NS.C.7B, C.7C, C. 8 |
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C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 $\mathrm{oC}>-7 \mathrm{oC}$ to express the fact that -3 oC is warmer than -7 oC .
C.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $|-30|=30$ to describe the size of the debt in dollars.
C. 8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

| GRADE | 7 | THE NUMBER SYSTEM | CCSS.MATH.CONTENT.2.NS.A.1, A.1A, A.1B, A.IC, A.1D, <br> A.2, A.2A, A.2B, A.2C, A.2D |
| :---: | :---: | :--- | :--- |
| A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; <br> represent addition and subtraction on a horizontal or vertical number line diagram. |  |  |
| A.1a | Describe situations in which opposite quantites corbine to make 0 . For example, a hydrogen atom has 0 charge <br> because its two constituents are oppositely chargece. |  |  |


| A.1b | Understand $\mathrm{p}+\mathrm{q}$ as the number located a distance $\|\mathrm{q}\|$ from p , in the positive or negative direction depending on <br> whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). <br> Interpret sums of rational numbers by describing real-world contexts. |
| :---: | :--- |
| A.1c | Understand subtraction of rational numbers as adding the additive inverse, $\mathrm{p}-\mathrm{q}=\mathrm{p}+(-\mathrm{q})$. Show that the distance <br> between two rational numbers on the number line is the absolute value of their difference, and apply this principle in <br> real-world contexts. <br> A.1d |
| Apply properties of operations as strategies to add and subtract rational numbers. |  |


| GRADE | 7 | THE NUMBER SYSTEM | CCSS.MATH.CONTENT.7.NS.A. 3 |
| :---: | :---: | :--- | :--- |
|  | A. 3 | Solve real-world and mathematical problems involving the four operations with rational numbers. |  |


| GRADE | 8 | THE NUMBER SYSTEM |
| :---: | :---: | :--- | CCSS.MATH.CONTENT.8.NS.A.1, A. 2.


| GRADE | 6 |  | A. |
| :---: | :---: | :---: | :---: |
|  | A. 1 | Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was $2: 1$, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." |  |
|  | A. 2 | Understand the concept of $a$ unit rate $a / b$ associated with a ratio $a: b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3 / 4$ cup of flour for each cup of sugar." "We paid $\$ 75$ for 15 hamburgers, which is a rate of $\$ 5$ per hamburger." 1 |  |
|  | A. 3 | Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. |  |
|  | A.3a | Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. |  |
|  | A.3b | Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? |  |
|  | A.3c | Find a percent of a quantity as a rate per 100 (e.g., $30 \%$ of a quantity means $30 / 100$ times the quantity); solve problems involving finding the whole, given a part and the percent. |  |
|  | A.3d | Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. |  |
|  | 6c | Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. |  |

C. 7 Understand ordering and absolute value of rational numbers.
C.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3>-7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.

|  | 7 |  | $\text { A.2C, A.2D, A. } 3$ |
| :---: | :---: | :---: | :---: |
|  | A. 1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $1 / 2$ mile in each $1 / 4$ hour, compute the unit rate as the complex fraction $1 / 2 / 1 / 4$ miles per hour, equivalently 2 miles per hour. |  |
|  | A. 2 | Recognize and represent proportional relationships between quantities. |  |
|  | A. 2 a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. |  |
|  | A. 2 b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. |  |
|  | A. 2 c | Represent proportional relationships by equations. For example, if total cost $t$ is proportional to the number $n$ of items purchased at a constant price $p$, the relationship between the total cost and the number of items can be expressed as $\mathrm{t}=\mathrm{pn}$. |  |
|  | A. 2 d | Explain what a point ( $\mathrm{x}, \mathrm{y}$ ) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0,0)$ and $(1, r)$ where $r$ is the unit rate. |  |
|  | A. 3 | Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. |  |


| GRADE | 6 | STATISTICS \& PROBABILITY | CCSS.MATH.CONTENT.6.SP.A.1, A.2, A.3, B.4, B.5, B.5A, B.5B, B. 5 C B.5D |
| :---: | :---: | :---: | :---: |
|  | A. 1 | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages. |  |
|  | A. 2 | Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. |  |
|  | A. 3 | Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. |  |
|  | B. 4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. |  |
|  | B. 5 | Summarize numerical data sets in relation to their context, such as by: |  |
|  | B. 5 a | Reporting the number of observations. |  |
|  | B. 5 b | Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. |  |
|  | B.5c | Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. |  |
|  | B.5d | Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. |  |

 PROBABILITY
A. 1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
A. 2

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
B. 3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.
B. 4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.
C. 5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $1 / 2$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
C. 6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
C. 7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
C. 8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
C.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
C.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

## 

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
A. 2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
A. 3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of $1.5 \mathrm{~cm} / \mathrm{hr}$ as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
A. 4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?
B. 5 Summarize numerical data sets in relation to their context, such as by:
B.5a Reporting the number of observations.
B.5b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
B.5c Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
B.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.



