

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 6-8 History/Social Studies, Science, and Technical Subjects

Lesson 1.1

6-8.RST.3 - Reading Science/Technical

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.RST.4 - Reading Science/Technical

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

6-8.RST.6 - Reading Science/Technical

Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

6-8.RST.7 - Reading Science/Technical

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.WHST.1.d - Writing HS/S/T

Establish and maintain a formal style.

6-8.WHST.2.e - Writing HS/S/T

Establish and maintain a formal style and objective tone.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 6-8 History/Social Studies, Science, and Technical Subjects

Lesson 1.2

6-8.RST.3 - Reading Science/Technical

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.RST.4 - Reading Science/Technical

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

6-8.RST.6 - Reading Science/Technical

Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

6-8.RST.7 - Reading Science/Technical

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.WHST.1.d - Writing HS/S/T

Establish and maintain a formal style.

6-8.WHST.2.e - Writing HS/S/T

Establish and maintain a formal style and objective tone.

6-8.WHST.4 - Writing HS/S/T

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6-8.WHST.6 - Writing HS/S/T

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 6-8 History/Social Studies, Science, and Technical Subjects

Lesson 1.3

6-8.RH.4 - Reading History/Social Studies

Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

6-8.RH.7 - Reading History/Social Studies

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

6-8.RH.10 - Reading History/Social Studies

By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

6-8.RST.3 - Reading Science/Technical

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.RST.4 - Reading Science/Technical

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

6-8.RST.7 - Reading Science/Technical

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.RST.10 - Reading Science/Technical

By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

6-8.WHST.1.d - Writing HS/S/T

Establish and maintain a formal style.

6-8.WHST.1.e - Writing HS/S/T

Provide a concluding statement or section that follows from and supports the argument presented.

6-8.WHST.2.a - Writing HS/S/T

Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

6-8.WHST.2.c - Writing HS/S/T

Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

6-8.WHST.2.e - Writing HS/S/T

Establish and maintain a formal style and objective tone.

6-8.WHST.2.f - Writing HS/S/T

Provide a concluding statement or section that follows from and supports the information or explanation presented.

6-8.WHST.4 - Writing HS/S/T

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6-8.WHST.5 - Writing HS/S/T

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, focusing on how well purpose and audience have been addressed.

6-8.WHST.6 - Writing HS/S/T

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

6-8.WHST.7 - Writing HS/S/T

Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

6-8.WHST.8 - Writing HS/S/T

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

6-8.WHST.9 - Writing HS/S/T

Draw evidence from informational texts to support analysis reflection, and research.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 6-8 History/Social Studies, Science, and Technical Subjects

Lesson 2.1

6-8.RST.3 - Reading Science/Technical

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.RST.4 - Reading Science/Technical

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

6-8.RST.6 - Reading Science/Technical

Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

6-8.RST.7 - Reading Science/Technical

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.WHST.1.d - Writing HS/S/T

Establish and maintain a formal style.

6-8.WHST.1.e - Writing HS/S/T

Provide a concluding statement or section that follows from and supports the argument presented.

6-8.WHST.2.a - Writing HS/S/T

Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

6-8.WHST.2.c - Writing HS/S/T

Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

6-8.WHST.2.e - Writing HS/S/T

Establish and maintain a formal style and objective tone.

6-8.WHST.2.f - Writing HS/S/T

Provide a concluding statement or section that follows from and supports the information or explanation presented.

6-8.WHST.4 - Writing HS/S/T

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6-8.WHST.6 - Writing HS/S/T

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 6-8 History/Social Studies, Science, and Technical Subjects

Lesson 2.2

6-8.RH.7 - Reading History/Social Studies

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

6-8.RST.3 - Reading Science/Technical

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

6-8.RST.4 - Reading Science/Technical

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

6-8.RST.7 - Reading Science/Technical

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

6-8.RST.8 - Reading Science/Technical

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

6-8.RST.9 - Reading Science/Technical

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

6-8.RST.10 - Reading Science/Technical

By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

6-8.WHST.1 - Writing HS/S/T

Write arguments focused on discipline-specific content.

6-8.WHST.1.d - Writing HS/S/T

Establish and maintain a formal style.

6-8.WHST.2.e - Writing HS/S/T

Establish and maintain a formal style and objective tone.

6-8.WHST.4 - Writing HS/S/T

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6-8.WHST.6 - Writing HS/S/T

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

6-8.WHST.8 - Writing HS/S/T

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

6-8.WHST.9 - Writing HS/S/T

Draw evidence from informational texts to support analysis reflection, and research.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 8th Grade

Lesson 1.1

8.W.1.d - Writing

Establish and maintain a formal style.

8.W.2.e - Writing

Establish and maintain a formal style.

7.SL.1 - Speaking and Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

8.SL.1.b - Speaking and Listening

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

8.SL.1.c - Speaking and Listening

Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

8.SL.1.d - Speaking and Listening

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

8.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

8.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

8.L.1.b - Language

Form and use verbs in the active and passive voice.

8.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

8.L.2.a - Language

Use punctuation (comma, ellipsis, dash) to indicate a pause or break.

8.L.2.c - Language

Spell correctly.

8.L.3 - Language

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

8.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.

8.L.4.a - Language

Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

8.L.4.c - Language

Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

8.L.4.d - Language

Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

8.L.5.b - Language

Use the relationship between particular words to better understand each of the words.

8.L.6 - Language

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 8th Grade

Lesson 1.2

8.W.1.d - Writing

Establish and maintain a formal style.

8.W.2.d - Writing

Use precise language and domain-specific vocabulary to inform about or explain the topic.

8.W.2.e - Writing

Establish and maintain a formal style.

8.W.4 - Writing

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.)

8.SL.1 - Speaking and Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

8.SL.1.b - Speaking and Listening

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

8.SL.1.c - Speaking and Listening

Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

8.SL.1.d - Speaking and Listening

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

8.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

8.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

8.L.1.b - Language

Form and use verbs in the active and passive voice.

8.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

8.L.2.a - Language

Use punctuation (comma, ellipsis, dash) to indicate a pause or break.

8.L.2.c - Language

Spell correctly.

8.L.3 - Language

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

8.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.

8.L.4.a - Language

Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

8.L.4.c - Language

Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

8.L.4.d - Language

Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

8.L.5.b - Language

Use the relationship between particular words to better understand each of the words.

8.L.6 - Language

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 8th Grade

Lesson 1.3

8.RI.10 - Reading Informational

By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.

8.W.1.d - Writing

Establish and maintain a formal style.

8.W.1.e - Writing

Provide a concluding statement or section that follows from and supports the argument presented.

8.W.2.a - Writing

Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

8.W.2.d - Writing

Use precise language and domain-specific vocabulary to inform about or explain the topic.

8.W.2.e - Writing

Establish and maintain a formal style.

8.W.2.f - Writing

Provide a concluding statement or section that follows from and supports the information or explanation presented.

8.W.4 - Writing

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.)

8.W.5 - Writing

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, focusing on how well purpose and audience have been addressed.

8.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

8.W.7 - Writing

Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

8.W.8 - Writing

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

8.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

8.W.9.b - Writing

Apply grade 8 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced”).

8.SL.1 - Speaking and Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

8.SL.1.a - Speaking and Listening

Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

8.SL.1.b - Speaking and Listening

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

8.SL.1.c - Speaking and Listening

Pose questions that connect the ideas of several speakers and respond to others’ questions and comments with relevant evidence, observations, and ideas.

8.SL.1.d - Speaking and Listening

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

8.SL.2 - Speaking and Listening

Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

8.SL.4 - Speaking and Listening

Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

8.SL.5 - Speaking and Listening

Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

8.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

8.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

8.L.1.b - Language

Form and use verbs in the active and passive voice.

8.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

8.L.2.a - Language

Use punctuation (comma, ellipsis, dash) to indicate a pause or break.

8.L.2.c - Language

Spell correctly.

8.L.3 - Language

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

8.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.

8.L.4.a - Language

Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

8.L.4.c - Language

Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

8.L.4.d - Language

Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

8.L.5.b - Language

Use the relationship between particular words to better understand each of the words.

8.L.6 - Language

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 8th Grade

Lesson 2.1

8.W.1.d - Writing

Establish and maintain a formal style.

8.W.1.e - Writing

Provide a concluding statement or section that follows from and supports the argument presented.

8.W.2.a - Writing

Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

8.W.2.d - Writing

Use precise language and domain-specific vocabulary to inform about or explain the topic.

8.W.2.e - Writing

Establish and maintain a formal style.

8.W.2.f - Writing

Provide a concluding statement or section that follows from and supports the information or explanation presented.

8.W.4 - Writing

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.)

8.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

8.W.9.b - Writing

Apply grade 8 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced”).

8.W.10 - Writing

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 discipline-specific tasks, purposes, and audiences.

8.SL.1 - Speaking and Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

8.SL.1.b - Speaking and Listening

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

8.SL.1.c - Speaking and Listening

Pose questions that connect the ideas of several speakers and respond to others’ questions and comments with relevant evidence, observations, and ideas.

8.SL.1.d - Speaking and Listening

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

8.SL.4 - Speaking and Listening

Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

8.SL.5 - Speaking and Listening

Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

8.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

8.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

8.L.1.b - Language

Form and use verbs in the active and passive voice.

8.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

8.L.2.a - Language

Use punctuation (comma, ellipsis, dash) to indicate a pause or break.

8.L.2.c - Language

Spell correctly.

8.L.3 - Language

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

8.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.

8.L.4.a - Language

Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

8.L.4.c - Language

Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

8.L.4.d - Language

Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

8.L.5.b - Language

Use the relationship between particular words to better understand each of the words.

8.L.6 - Language

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts 8th Grade

Lesson 2.2

8.W.1.d - Writing

Establish and maintain a formal style.

8.W.2.d - Writing

Use precise language and domain-specific vocabulary to inform about or explain the topic.

8.W.2.e - Writing

Establish and maintain a formal style.

8.W.4 - Writing

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.)

8.W.7 - Writing

Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

8.W.8 - Writing

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

8.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

8.SL.1 - Speaking and Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

8.SL.1.a - Speaking and Listening

Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

8.SL.1.b - Speaking and Listening

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

8.SL.1.c - Speaking and Listening

Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

8.SL.1.d - Speaking and Listening

Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

8.SL.2 - Speaking and Listening

Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

8.SL.5 - Speaking and Listening

Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

8.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

8.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

8.L.1.b - Language

Form and use verbs in the active and passive voice.

8.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

8.L.2.a - Language

Use punctuation (comma, ellipsis, dash) to indicate a pause or break.

8.L.2.c - Language

Spell correctly.

8.L.3 - Language

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

8.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.

8.L.4.a - Language

Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

8.L.4.c - Language

Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

8.L.4.d - Language

Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

8.L.5 - Language

Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

8.L.5.b - Language

Use the relationship between particular words to better understand each of the words.

8.L.6 - Language

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts Anchor Standards

Lesson 1.1

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts Anchor Standards

Lesson 1.2

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts Anchor Standards

Lesson 1.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts Anchor Standards

Lesson 2.1

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.10 - Writing

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 tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for English Language Arts Anchor Standards

Lesson 2.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

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Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

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Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for Mathematics

Lesson 1.1

6.RP.2 - Ratios And Proportional Relationships

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 $\frac{3}{4}$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”

6.RP.3.d - Ratios And Proportional Relationships

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

6.EE.2 - Expressions And Equations

Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.2.a - Expressions And Equations

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

6.EE.2.c - Expressions And Equations

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 $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.

6.EE.6 - Expressions And Equations

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.

7.RP.1 - Ratios And Proportional Relationships

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.

7.NS.3 - The Number System

Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.4 - Expressions And Equations

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.

8.EE.1 - Expressions And Equations

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

8.EE.4 - Expressions And Equations

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for Mathematics

Lesson 1.2

6.NS.7.a - The Number System

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.

6.NS.8 - The Number System

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.

6.EE.2 - Expressions And Equations

Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.2.a - Expressions And Equations

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

6.EE.2.c - Expressions And Equations

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 $s = 1/2$.

6.EE.5 - Expressions And Equations

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.

6.EE.6 - Expressions And Equations

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.

6.EE.8 - Expressions And Equations

Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

7.NS.3 - The Number System

Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.4 - Expressions And Equations

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for Mathematics

Lesson 1.3

6.EE.2 - Expressions And Equations

Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.2.a - Expressions And Equations

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

6.EE.2.c - Expressions And Equations

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 $s = 1/2$.

6.EE.6 - Expressions And Equations

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.

7.EE.4 - Expressions And Equations

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.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for Mathematics

Lesson 2.1

6.EE.2 - Expressions And Equations

Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.2.a - Expressions And Equations

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

6.EE.2.c - Expressions And Equations

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 $s = 1/2$.

6.EE.6 - Expressions And Equations

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.

6.EE.9 - Expressions And Equations

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 $d = 65t$ to represent the relationship between distance and time.

6.SP.5 - Statistics And Probability

Summarize numerical data sets in relation to their context, such as by:

6.SP.5.a - Statistics And Probability

Reporting the number of observations.

6.SP.5.b - Statistics And Probability

Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

6.SP.5.c - Statistics And Probability

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.

7.EE.4 - Expressions And Equations

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.

7.SP.3 - Statistics And Probability

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.

7.SP.4 - Statistics And Probability

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.

8.EE.5 - Expressions And Equations

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

8.EE.7 - Expressions And Equations

Solve linear equations in one variable.

8.F.1 - Functions

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.

8.F.2 - Functions

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.

8.F.3 - Functions

Interpret the equation $y = mx + b$ 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.

8.SP.1 - Statistics And Probability

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.

8.SP.2 - Statistics And Probability

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.

8.SP.3 - Statistics And Probability

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 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Common Core State Standards for Mathematics

Lesson 2.2

6.NS.8 - The Number System

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.

6.EE.2 - Expressions And Equations

Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.2.a - Expressions And Equations

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

6.EE.2.c - Expressions And Equations

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 $s = 1/2$.

6.EE.5 - Expressions And Equations

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.

6.EE.6 - Expressions And Equations

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.

6.SP.1 - Statistics And Probability

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.

6.SP.2 - Statistics And Probability

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.

6.SP.3 - Statistics And Probability

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.

6.SP.4 - Statistics And Probability

Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.5 - Statistics And Probability

Summarize numerical data sets in relation to their context, such as by:

6.SP.5.a - Statistics And Probability

Reporting the number of observations.

6.SP.5.b - Statistics And Probability

Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

6.SP.5.c - Statistics And Probability

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.

6.SP.5.d - Statistics And Probability

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.

7.EE.4 - Expressions And Equations

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.

7.SP.2 - Statistics And Probability

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.

7.SP.5 - Statistics And Probability

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.

7.SP.6 - Statistics And Probability

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.

7.SP.7 - Statistics And Probability

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.

7.SP.7.a - Statistics And Probability

Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

7.SP.7.b - Statistics And Probability

Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?

7.SP.8 - Statistics And Probability

Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

7.SP.8.a - Statistics And Probability

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.

7.SP.8.b - Statistics And Probability

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.

7.SP.8.c - Statistics And Probability

Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

8.NS.2 - The Number System

Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

8.EE.1 - Expressions And Equations

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

8.G.7 - Geometry

Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Next Generation Science Standards

Lesson 1.1

NGSS.MS-PS2-5 - Motion and Stability: Forces and Interactions

Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

NGSS.MS-PS4-3 - Waves and Their Applications in Technologies for Information Transfer

Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

NGSS.P1 - Science and Engineering Practices

Asking questions (for science) and defining problems (for engineering)

NGSS.P4 - Science and Engineering Practices

Analyzing and interpreting data

NGSS.P5 - Science and Engineering Practices

Using mathematics and computational thinking

NGSS.P6 - Science and Engineering Practices

Constructing explanations (for science) and designing solutions (for engineering)

NGSS.P7 - Science and Engineering Practices

Engaging in argument from evidence

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Next Generation Science Standards

Lesson 1.2

NGSS.MS-ETS1-1 - Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

NGSS.P1 - Science and Engineering Practices

Asking questions (for science) and defining problems (for engineering)

NGSS.P5 - Science and Engineering Practices

Using mathematics and computational thinking

NGSS.P6 - Science and Engineering Practices

Constructing explanations (for science) and designing solutions (for engineering)

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Next Generation Science Standards

Lesson 1.3

NGSS.MS-ETS1-1 - Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

NGSS.MS-ETS1-2 - Engineering Design

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

NGSS.MS-ETS1-3 - Engineering Design

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

NGSS.P1 - Science and Engineering Practices

Asking questions (for science) and defining problems (for engineering)

NGSS.P5 - Science and Engineering Practices

Using mathematics and computational thinking

NGSS.P6 - Science and Engineering Practices

Constructing explanations (for science) and designing solutions (for engineering)

NGSS.P8 - Science and Engineering Practices

Obtaining, evaluating, and communicating information

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Next Generation Science Standards

Lesson 2.1

NGSS.MS-ETS1-1 - Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

NGSS.MS-ETS1-2 - Engineering Design

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

NGSS.MS-ETS1-3 - Engineering Design

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

NGSS.MS-PS4-3 - Waves and Their Applications in Technologies for Information Transfer

Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

NGSS.P1 - Science and Engineering Practices

Asking questions (for science) and defining problems (for engineering)

NGSS.P3 - Science and Engineering Practices

Planning and carrying out investigations

NGSS.P4 - Science and Engineering Practices

Analyzing and interpreting data

NGSS.P5 - Science and Engineering Practices

Using mathematics and computational thinking

NGSS.P6 - Science and Engineering Practices

Constructing explanations (for science) and designing solutions (for engineering)

NGSS.P7 - Science and Engineering Practices

Engaging in argument from evidence

NGSS.P8 - Science and Engineering Practices

Obtaining, evaluating, and communicating information

Introduction to Computer Science (Middle School Alignment) (ICS MS)

Next Generation Science Standards

Lesson 2.2

NGSS.MS-ESS3-4 - Earth and Human Activity

Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

NGSS.MS-ESS3-5 - Earth and Human Activity

Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

NGSS.MS-ETS1-4 - Engineering Design

Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

NGSS.MS-LS4-4 - Biological Evolution: Unity and Diversity

Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

NGSS.MS-LS4-6 - Biological Evolution: Unity and Diversity

Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

NGSS.P1 - Science and Engineering Practices

Asking questions (for science) and defining problems (for engineering)

NGSS.P2 - Science and Engineering Practices

Developing and using models

NGSS.P3 - Science and Engineering Practices

Planning and carrying out investigations

NGSS.P4 - Science and Engineering Practices

Analyzing and interpreting data

NGSS.P5 - Science and Engineering Practices

Using mathematics and computational thinking

NGSS.P6 - Science and Engineering Practices

Constructing explanations (for science) and designing solutions (for engineering)

Introduction to Computer Science (Middle School Alignment) (ICS MS)

The Computer Science Teachers Association Standards

Lesson 1.1

CSTA.3A.CD10 Computer Science in the Modern World (MW)

Describe the major applications of artificial intelligence and robotics.

CSTA.3A.CD3 Computer Science in the Modern World (MW)

Describe the principal components of computer organization (e.g., input, output, processing, and storage).

CSTA.3A.CD4 Computer Science in the Modern World (MW)

Compare various forms of input and output.

CSTA.3A.CD6 Computer Science in the Modern World (MW)

Apply strategies for identifying and solving routine hardware and software problems that occur in everyday life.

CSTA.3A.CD9 Computer Science in the Modern World (MW)

Describe how the Internet facilitates global communication.

CSTA.3A.CI3 Computer Science in the Modern World (MW)

Describe the role that adaptive technology can play in the lives of people with special needs.

CSTA.3A.CI4 Computer Science in the Modern World (MW)

Compare the positive and negative impacts of technology on culture (e.g., social networking, delivery of news and other public media, and intercultural communication).

CSTA.3A.CI6 Computer Science in the Modern World (MW)

Differentiate between information access and information distribution rights.

CSTA.3A.CI7 Computer Science in the Modern World (MW)

Describe how different kinds of software licenses can be used to share and protect intellectual property.

CSTA.3A.CI8 Computer Science in the Modern World (MW)

Discuss the social and economic implications associated with hacking and software piracy.

CSTA.3A.CI9 Computer Science in the Modern World (MW)

Describe different ways in which software is created and shared and their benefits and drawbacks (commercial software, public domain software, open source development).

CSTA.3A.CL1 Computer Science in the Modern World (MW)

Work in a team to design and develop a software artifact.

CSTA.3A.CL3 Computer Science in the Modern World (MW)

Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration.

CSTA.3A.CL4 Computer Science in the Modern World (MW)

Identify how collaboration influences the design and development of software products.

CSTA.3A.CPP4 Computer Science in the Modern World (MW)

Apply analysis, design, and implementation techniques to solve problems (e.g., use one or more software lifecycle models).

CSTA.3A.CPP6 Computer Science in the Modern World (MW)

Select appropriate file formats for various types and uses of data.

CSTA.3A.CPP7 Computer Science in the Modern World (MW)

Describe a variety of programming languages available to solve problems and develop systems.

CSTA.3A.CPP8 Computer Science in the Modern World (MW)

Explain the program execution process.

CSTA.3A.CPP9 Computer Science in the Modern World (MW)

Explain the principles of security by examining encryption, cryptography, and authentication techniques.

CSTA.3A.CT2 Computer Science in the Modern World (MW)

Describe a software development process used to solve software problems (e.g., design, coding, testing, verification).

CSTA.3A.CT3 Computer Science in the Modern World (MW)

Explain how sequence, selection, iteration, and recursion are building blocks of algorithms.

CSTA.3A.CT5 Computer Science in the Modern World (MW)

Describe the relationship between binary and hexadecimal representations.

CSTA.3A.CT6 Computer Science in the Modern World (MW)

Analyze the representation and trade-offs among various forms of digital information.

CSTA.3A.CT7 Computer Science in the Modern World (MW)

Describe how various types of data are stored in a computer system.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

The Computer Science Teachers Association Standards

Lesson 1.2

CSTA.3A.CD3 Computer Science in the Modern World (MW)

Describe the principal components of computer organization (e.g., input, output, processing, and storage).

CSTA.3A.CD5 Computer Science in the Modern World (MW)

Explain the multiple levels of hardware and software that support program execution (e.g., compilers, interpreters, operating systems, networks).

CSTA.3A.CD8 Computer Science in the Modern World (MW)

Explain the basic components of computer networks (e.g., servers, file protection, routing, spoolers and queues, shared resources, and fault-tolerance).

CSTA.3A.CD1 Computer Science in the Modern World (MW)

Describe the unique features of computers embedded in mobile devices and vehicles (e.g., cell phones, automobiles, airplanes).

CSTA.3A.CI5 Computer Science in the Modern World (MW)

Describe strategies for determining the reliability of information found on the Internet.

CSTA.3A.CL1 Computer Science in the Modern World (MW)

Work in a team to design and develop a software artifact.

CSTA.3A.CL3 Computer Science in the Modern World (MW)

Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration.

CSTA.3A.CPP3 Computer Science in the Modern World (MW)

Use various debugging and testing methods to ensure program correctness (e.g., test cases, unit testing, white box, black box, integration testing).

CSTA.3A.CPP7 Computer Science in the Modern World (MW)

Describe a variety of programming languages available to solve problems and develop systems.

CSTA.3A.CPP9 Computer Science in the Modern World (MW)

Explain the principles of security by examining encryption, cryptography, and authentication techniques.

CSTA.3A.CT11 Computer Science in the Modern World (MW)

Describe how computation shares features with art and music by translating human intention into an artifact.

CSTA.3A.CT2 Computer Science in the Modern World (MW)

Describe a software development process used to solve software problems (e.g., design, coding, testing, verification).

CSTA.3A.CT9 Computer Science in the Modern World (MW)

Discuss the value of abstraction to manage problem complexity.

CSTA.3A.CT1 Computer Science in the Modern World (MW)

Use predefined functions and parameters, classes and methods to divide a complex problem into simpler parts.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

The Computer Science Teachers Association Standards

Lesson 1.3

CSTA.3A.CI10 Computer Science in the Modern World (MW)

Describe security and privacy issues that relate to computer networks.

CSTA.3A.CI2 Computer Science in the Modern World (MW)

Discuss the impact of computing technology on business and commerce (e.g., automated tracking of goods, automated financial transactions, e-commerce, cloud computing).

CSTA.3A.CI1 Computer Science in the Modern World (MW)

Compare appropriate and inappropriate social networking behaviors.

CSTA.3A.CL1 Computer Science in the Modern World (MW)

Work in a team to design and develop a software artifact.

CSTA.3A.CL2 Computer Science in the Modern World (MW)

Use collaborative tools to communicate with project team members (e.g., discussion threads, wikis, blogs, version control, etc.).

CSTA.3A.CL3 Computer Science in the Modern World (MW)

Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration.

CSTA.3A.CL4 Computer Science in the Modern World (MW)

Identify how collaboration influences the design and development of software products.

CSTA.3A.CPP10 Computer Science in the Modern World (MW)

Explore a variety of careers to which computing is central.

CSTA.3A.CPP12 Computer Science in the Modern World (MW)

Describe how mathematical and statistical functions, sets, and logic are used in computation.

CSTA.3A.CPP2 Computer Science in the Modern World (MW)

Use mobile devices/emulators to design, develop, and implement mobile computing applications.

CSTA.3A.CPP6 Computer Science in the Modern World (MW)

Select appropriate file formats for various types and uses of data.

CSTA.3A.CPP7 Computer Science in the Modern World (MW)

Describe a variety of programming languages available to solve problems and develop systems.

CSTA.3A.CPP9 Computer Science in the Modern World (MW)

Explain the principles of security by examining encryption, cryptography, and authentication techniques.

CSTA.3A.CT10 Computer Science in the Modern World (MW)

Describe the concept of parallel processing as a strategy to solve large problems.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

The Computer Science Teachers Association Standards

Lesson 2.1

CSTA.3A.CD7 Computer Science in the Modern World (MW)

Compare and contrast client-server and peer-to-peer network strategies.

CSTA.3A.CD8 Computer Science in the Modern World (MW)

Explain the basic components of computer networks (e.g., servers, file protection, routing, spoolers and queues, shared resources, and fault-tolerance).

CSTA.3A.CI11 Computer Science in the Modern World (MW)

Explain the impact of the digital divide on access to critical information.

CSTA.3A.CL1 Computer Science in the Modern World (MW)

Work in a team to design and develop a software artifact.

CSTA.3A.CL2 Computer Science in the Modern World (MW)

Use collaborative tools to communicate with project team members (e.g., discussion threads, wikis, blogs, version control, etc.).

CSTA.3A.CL3 Computer Science in the Modern World (MW)

Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration.

CSTA.3A.CL4 Computer Science in the Modern World (MW)

Identify how collaboration influences the design and development of software products.

CSTA.3A.CPP11 Computer Science in the Modern World (MW)

Describe techniques for locating and collecting small- and large-scale data sets.

CSTA.3A.CPP12 Computer Science in the Modern World (MW)

Describe how mathematical and statistical functions, sets, and logic are used in computation.

CSTA.3A.CPP1 Computer Science in the Modern World (MW)

Create and organize Web pages through the use of a variety of web programming design tools.

CSTA.3A.CPP2 Computer Science in the Modern World (MW)

Use mobile devices/emulators to design, develop, and implement mobile computing applications.

CSTA.3A.CPP5 Computer Science in the Modern World (MW)

Use Application Program Interfaces (APIs) and libraries to facilitate programming solutions.

CSTA.3A.CPP6 Computer Science in the Modern World (MW)

Select appropriate file formats for various types and uses of data.

CSTA.3A.CPP7 Computer Science in the Modern World (MW)

Describe a variety of programming languages available to solve problems and develop systems.

CSTA.3A.CPP9 Computer Science in the Modern World (MW)

Explain the principles of security by examining encryption, cryptography, and authentication techniques.

CSTA.3A.CT4 Computer Science in the Modern World (MW)

Compare techniques for analyzing massive data collections.

CSTA.3A.CT5 Computer Science in the Modern World (MW)

Describe the relationship between binary and hexadecimal representations.

CSTA.3A.CT7 Computer Science in the Modern World (MW)

Describe how various types of data are stored in a computer system.

CSTA.3A.CT9 Computer Science in the Modern World (MW)

Discuss the value of abstraction to manage problem complexity.

Introduction to Computer Science (Middle School Alignment) (ICS MS)

The Computer Science Teachers Association Standards

Lesson 2.2

CSTA.3A.CL1 Computer Science in the Modern World (MW)

Work in a team to design and develop a software artifact.

CSTA.3A.CL3 Computer Science in the Modern World (MW)

Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration.

CSTA.3A.CPP10 Computer Science in the Modern World (MW)

Explore a variety of careers to which computing is central.

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CSTA.3A.CPP8 Computer Science in the Modern World (MW)

Explain the program execution process.

CSTA.3A.CT3 Computer Science in the Modern World (MW)

Explain how sequence, selection, iteration, and recursion are building blocks of algorithms.

CSTA.3A.CT4 Computer Science in the Modern World (MW)

Compare techniques for analyzing massive data collections.

CSTA.3A.CT6 Computer Science in the Modern World (MW)

Analyze the representation and trade-offs among various forms of digital information.

CSTA.3A.CT7 Computer Science in the Modern World (MW)

Describe how various types of data are stored in a computer system.

CSTA.3A.CT8 Computer Science in the Modern World (MW)

Use modeling and simulation to represent and understand natural phenomena.

CSTA.3A.CT9 Computer Science in the Modern World (MW)

Discuss the value of abstraction to manage problem complexity.

CSTA.3A.CT1 Computer Science in the Modern World (MW)

Use predefined functions and parameters, classes and methods to divide a complex problem into simpler parts.