ILEARN Computer Science Item Specifications

Computer Science Range Performance Level Descriptors (PLDs)

Standard	
Standard	**3-5.CD.2** Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.
Practices	*Developing and Using Abstractions:* Students use abstractions (generalizations) to determine how a given issue might be resolved.
Clarifications	• A problem has the potential to have one or more solutions. • Students must initiate and complete these tasks independently. • Problems will be hardware and software agnostic.
Content Limits	• Items are not hardware or software specific • Items are not about debugging; • Items solutions will not have more than two steps.
Expected Vocabulary	Problem, solution, hardware, software, troubleshoot
Not Expected Vocabulary	Abstraction
Phenomena/Context/Task Demands	
Phenomena/Context	Students are given an appropriate grade-level hardware or software problem. Examples of problems: • Audio/video problems • Frozen screen • Internet problems • Simple hardware problems
Task Demands	Students identify possible solutions to hardware problems or software problems.
Example Item	Emilia joins a video meeting with her class. She can't hear what her teacher is saying. What are some strategies she can use to troubleshoot? Choose two. ○ **Check that her volume is turned up.** ○ Type questions into a separate document. ○ Ask her teacher to speak loudly. ○ **Leave and rejoin the video call.** ○ Connect to the internet. ○ Go to a different room.

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<table>
<tr><th colspan="2">Standard</th></tr>
<tr><td>Standard</td><td>3-5.CD.3 Describe how internal and external parts of computing devices function to form a system.</td></tr>
<tr><td>Practices</td><td>Communicating about Computing: Students show how computer hardware, software, and other components all work together.</td></tr>
<tr><td>Clarifications</td><td>None</td></tr>
<tr><td>Content Limits</td><td>For grade four, students are not required to explain how one part affects another.</td></tr>
<tr><td>Expected Vocabulary</td><td>Internal, external, function</td></tr>
<tr><td>Not Expected Vocabulary</td><td>Network</td></tr>
<tr><th colspan="2">Phenomena/Context/Task Demands</th></tr>
<tr><td>Phenomena/Context</td><td>Students are given a picture or name of an internal or external part.</td></tr>
<tr><td>Task Demands</td><td>Students classify parts as internal or external.</td></tr>
<tr><td>Example Item</td><td>Decide if each computer part is internal or external. Drag and drop the part into the correct box.
<table><tr><td>Internal</td><td>External</td></tr><tr><td></td><td></td></tr></table>
Keyboard WiFi Screen Mouse Memory Website</td></tr>
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Standard	
Standard	**3-5.CD.4** Describe what distinguishes humans from machines, focusing on human intelligence versus machine intelligence.
Practices	*Communicating about Computing:* Students demonstrate different ways that computers and/or humans are intelligent.
Clarifications	None
Content Limits	Students understand the differences between the two types of intelligences but do not have to create definitions of the types of intelligence.
Expected Vocabulary	Human intelligence, machine intelligence
Not Expected Vocabulary	Hard drive, simulate, distinguish
Phenomena/Context	
Phenomena/Context	N/A
Task Demands	Students classify provided scenarios as human intelligence, machine intelligence, or both.
Example Item	Which of these are examples of machine intelligence? Choose three. ○ **Follows a program** ○ Learns through experiences ○ **Searches for information** ○ **Recalls information quickly** ○ Thinks of new ideas

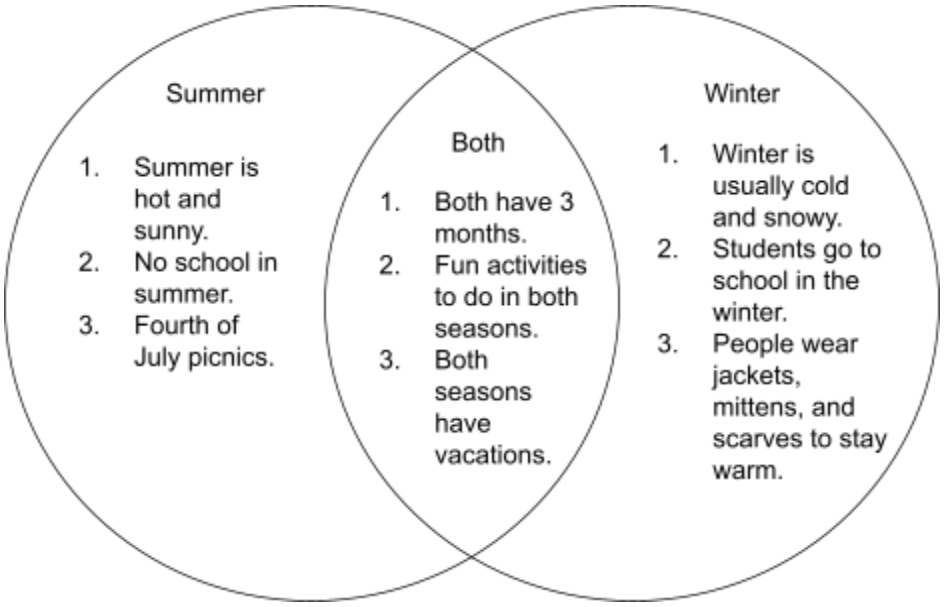
ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.DI.1** Decompose problems and subproblems into parts as a means to solving complex problems.
Practices	*Recognizing and Defining Computational Problems*: Students breaking down problems into smaller parts.
Clarifications	As a computer science standard, this expectation requires students to solve a complex problem using sequencing and/or sequencing in coding.
Content Limits	Students are not required to debug (e.g., solve an issue with existing code). Complex problems are no more than five steps.
Expected Vocabulary	Decompose
Not Expected Vocabulary	None
Phenomena/Context	
Phenomena/Context	The provided problem will relate to sequencing and/or sequencing in coding.
Task Demands	Students break a complex problem into smaller steps to solve the problem.
Example Item	Show a picture of a figure in a maze.Have the student describe steps to get from one point to another.

ILEARN Computer Science Item Specifications

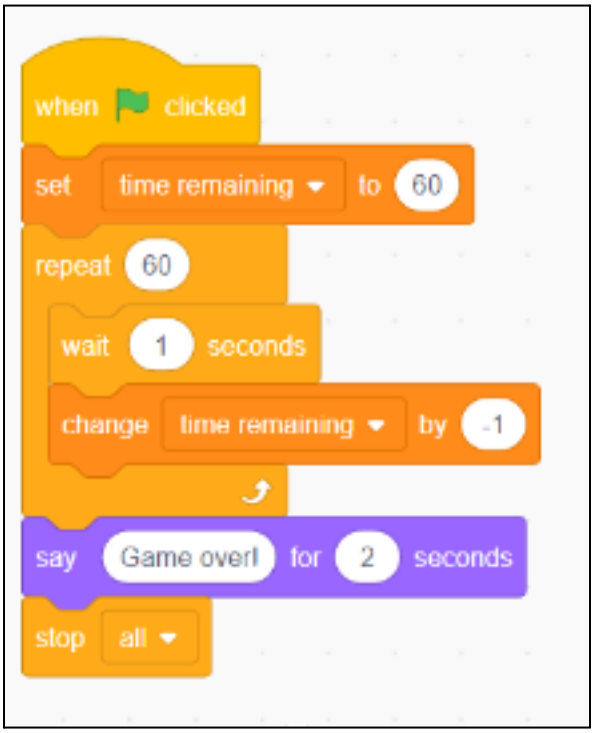
Standard	
Standard	**3-5.DI.2** Organize and present collected data visually to highlight relationships and support a claim.
Practices	*Using Abstractions*: Students organize data they have been given and recognize generalizations (abstractions) in the provided data. *Creating Computational Artifacts:* Students present data.
Clarifications	None
Content Limits	Provided data sets should not exceed 15 data points.
Expected Vocabulary	Data, survey, observations, circle graph, bar graph, line graph
Not Expected Vocabulary	Claim
Phenomena/Context/Task Demands	
Phenomena/Context	Students are provided a data set in a real-world context.
Task Demands	**Task Model 1:** Students will create a visual representation (e.g., a table or graph) from a given data set. **Task Model 2:** Students will identify a claim (e.g., generalization) about a given data set and select appropriate justification for the claim. **Task Model 3:** Students will evaluate (e.g., confirm or deny) a claim using a provided data set and will provide justification.
Example Item: Task Model 1	Layla asks her friends how many hours they spend playing outside in the summer. ● Ji plays outside about 2 hours each day. ● Veronica plays outside about 4 hours each day. ● Abijah plays outside about 2 hours each day. Create a bar graph to show the number of hours each friend plays outside.

Example Item: Task Model 2	Evan records the temperature every day for one week.  **Part A:** Which statement best tells how the temperature changed from Monday to Friday? **A. The temperature went up overall.** B. The temperature went down overall. C. The temperature stayed mostly the same. D. The temperature did not have any pattern. **Part B**: What fact about the data proves your answer in Part A? A. The temperature gets higher every day. **B. The temperature gets higher most days.** C. The temperature gets lower every day. D. The temperature gets lower most days. E. The temperature stays the same every day. F. The temperature changes every day.

Example Item: Task Model 3	 Identify a claim about what is common between the winter and summer: A. Summer is longer than winter. **B. People can get a vacation from school in both summer and winter.** C. There are more fun things to do in the winter than the summer. D. People wear jackets, mittens, and scarves to stay warm in the summer.

ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.DI.3** Demonstrate how variables can represent data, and are used to store and modify information.
Practices	*Recognizing and Defining Computational Problems:* As students develop solutions for their computational problems, they may recognize the need to keep track of data in their program. This is the first step in understanding variables in computer science.
Clarifications	A variable is a container that is used to store information (e.g., colors, numbers, a type of animal).
Content Limits	None
Expected Vocabulary	Variable, data
Not Expected Vocabulary	None
Phenomena/Context	
Phenomena/Context	Students are provided a scenario where at least one variable is represented.
Task Demands	Students identify a variable that can store information using information in the provided scenario.

Example Item	The code in Figure 1 represents a timer that counts down from 60. Figure 1*  What is the variable in this program? a. Repeat 60 **b. Time remaining** c. Wait 1 second d. Say Game Over for 2 seconds **This example created using Scratch™*

ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.DI.4** Describe that data can be represented in different forms understandable by people, including words, symbols, and digital displays of color.
Practices	*Recognizing and Defining Computational Problems:* Students identify what types of data can be collected and understand the variety of ways that data can be changed both on paper and digitally. *Developing and Using Abstractions*: Students communicate the generalizations (abstractions) in their data prior to representing it in different formats.
Clarifications	N/A
Content Limits	Students will not create a visual representation of the provided data. Students will not be required to interact with colorful displays. All provided data displays will be appropriate for students who are colorblind.
Expected Vocabulary	Data, represent, digital display
Not Expected Vocabulary	Symbol
Phenomena/Context	
Phenomena/Context	Students are provided with data collected in a real-world scenario.
Task Demands	**Task Model 1:** Students are given data (e.g.,results from a survey) and choose the best way to represent the data. **Task Model 2:** Students are given data and choose which graph represents the data.

ILEARN Computer Science Item Specifications

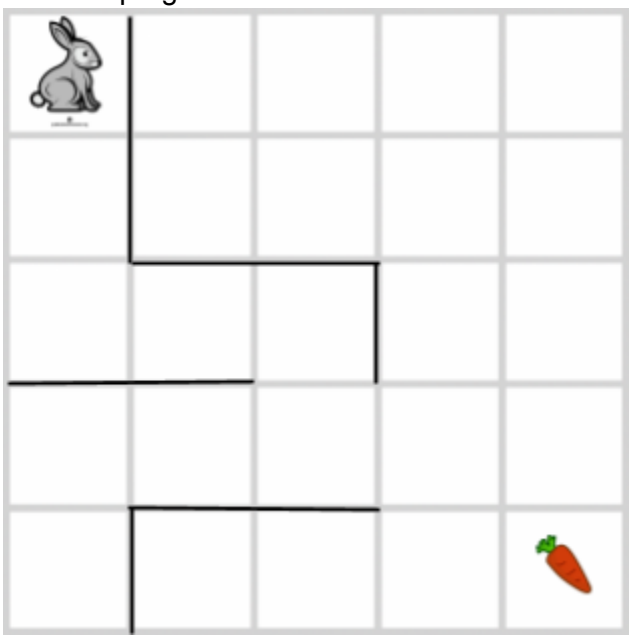
Standard	
Standard	**3-5.DI.5** Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
Practices	*Developing and Using Abstractions*: Students interpret data, identify cause-and-effect relationships, and predict outcomes or ideas. *Communicating about Computing*: Students communicate their predictions and ideas.
Clarifications	None
Content Limits	None
Expected Vocabulary	Cause, effect, predict, data
Not Expected Vocabulary	Relationship
Phenomena/Context	
Phenomena/Context	Students are given a set of data. They might be given a scenario that impacts the data provided.
Task Demands	**Task Model 1:** Students identify cause-and-effect relationships given a data set. **Task Model 2:** Students predict outcomes for new scenarios based on data provided in similar situations.

ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.IC.1** Describe the positive and negative impacts of technology on one's personal life, society, and our culture.
Practices	*Communicating about Computing:* Students communicate their understanding on how technology positively and negatively impacts different facets of peoples' lives.
Clarifications	This standard contains some of the components of digital citizenship. Technology refers to computer technology (e.g., personal computers, cell phones, tablets, video games).
Content Limits	Social media impacts will not be included (due to students' age). Any impact included must be clearly identifiable as positive or negative.
Expected Vocabulary	Technology
Not Expected Vocabulary	Society, culture, impacts
Phenomena/Context	
Phenomena/Context	Students will be asked to describe how a particular technology impacts themselves or society. Scenarios used should illustrate the impact of technology on society, life, and culture. Scenarios may reference general software that is age-appropriate (e.g., video games, text messaging).
Task Demands	Students identify the positive and negative impacts of technology on different aspects of society. Students select all the ways the technology described within a given scenario could impact themselves or society.

ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.PA.2** Design programs that incorporate sequences, events, loops, and conditionals.
Practices	*Creating Computational Artifacts*: Students create computer programs.
Clarifications	Programs will use block-based coding.
Content Limits	Program codes (e.g., code blocks) will be written in plain English or clearly defined within the item stimulus. For example, “start,” “repeat,” “move forward,” “end.” *Accessibility Consideration*: Provide an image to show the command represented within the code block. For assessment purposes, each program will use one conditional or one loop.
Expected Vocabulary	Sequence, loops, conditionals, events, programs, blocks
Phenomena/Context	
Phenomena/Context	Students will be given code blocks that they will sequence (drag, drop, and connect) to complete a given task.
Task Demands	Students develop simple programs that incorporate event, loop or conditional blocks.

Example Item	Create a program that moves the rabbit to the carrot.  Drag the code blocks into the correct order to create the program. Hop 2 steps down Hop 1 step down Hop 2 steps right Hop 1 step down Hop 2 steps right Hop 1 step right

ILEARN Computer Science Item Specifications

Standard	
Standard	**3-5.PA.3** Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
Practices	*Testing and Refining Computational Artifacts:* This standard and core practice go hand-in-hand. Debugging is a process of testing and refining computer programs. *Communicating about Computing:* Have students provide evidence about what they did to find and fix errors.
Clarifications	There could be multiple solutions to a problem. There could be multiple strategies to implementing solutions.
Content Limits	Program codes (e.g., code blocks) will be written in plain English or clearly defined within the item stimulus. For example, “start,” “repeat,” “move forward,” “end.” *Accessibility Consideration:* Provide an image to show the command represented within the code block. Sample programs should only have one bug.
Expected Vocabulary	Loops, test, debug, program, algorithm, runs (i.e., runs a program)
Phenomena/Context	
Phenomena/Context	Students will be given a sample program (with an error) and an explanation of what the program is intended to accomplish.
Task Demands	Students identify the bug in the provided program and suggest a solution to the flawed program. Students create a way to test and debug a given flawed program.