

# 2024-25 Competitive Events Guidelines

## Exploring Computer Science



Exploring Computer Science provides competitors with the opportunity to demonstrate knowledge around introductory competencies in computer science. This competitive event consists of an objective test. It aims to inspire members to learn about computers and computational systems.

### Event Overview

**Division:** Middle School

**Event Type:** Individual

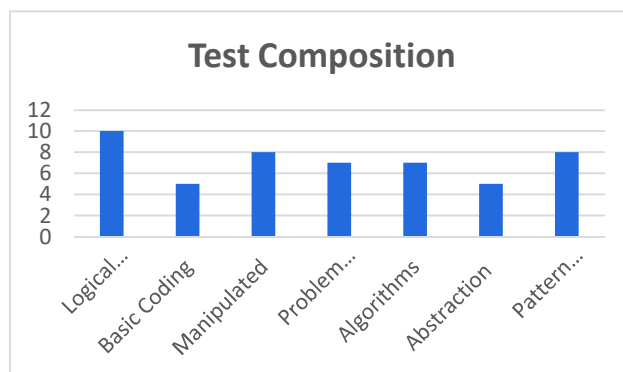
**Event Category:** Objective Test, 50-multiple choice questions (breakdown of question by competencies below)

**Objective Test Time:** 30 minutes

**NACE Connections:** Career & Self-Development

### Competencies

- Logical Reasoning
- Basic Coding
- Manipulating and Analyzing Data with Digital Tools
- Problem Solving
- Algorithms and Programs
- Abstraction and Decomposition
- Pattern Recognition



### State

Each chapter may enter three participants in this event. Testing is school site and will be conducted the two weeks prior to the state leadership conference (in March).

### National

#### Required Competition Items

<u>Items Competitor Must Provide</u>	<u>Items FBLA Provides</u>
<ul style="list-style-type: none"><li>• Sharpened pencil</li><li>• Fully powered <a href="#">device for online testing</a></li><li>• Conference-provided nametag</li><li>• Attire that meets the <a href="#">FBLA Dress Code</a></li></ul>	<ul style="list-style-type: none"><li>• One piece of scratch paper per competitor</li><li>• Internet access</li><li>• Test login information (link &amp; password)</li></ul>

#### Important FBLA Documents

- Competitors should be familiar with the Competitive Events [Policy & Procedures Manual](#), [Honor Code](#), [Code of Conduct](#), and [Dress Code](#).

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### *Eligibility*

- FBLA membership dues are paid by 11:59 pm Eastern Time on March 1 of the current program year or by SLC Conference registration deadline—whichever is earlier.
- Members may compete in an event at the National Leadership Conference (NLC) more than once if they have not previously placed in the top 10 of that event at the NLC. If a member places in the top 10 of an event at the NLC, they are no longer eligible to compete in that event.
- Members must be registered for the SLC/NLC and pay the conference registration fee to participate in competitive events.
- Each chapter may submit three entries; each state may submit four entries per event.
- Each member can only compete in one individual/team event and one chapter event (Annual Chapter Activities Presentation or Community Service Presentation) for national competition; for state competition, students may participate in one objective test, one performance event, and one chapter event.
- If competitors are late for their assigned objective test time, they will be allowed to compete with a five-point penalty until such time that results are finalized, or the accommodation would impact the fairness and integrity of the event.
- Some competitive events start in the morning before the Opening Session of NLC. The schedules for competitive events are displayed in the local time of the NLC location. Competitive event schedules cannot be changed.

### *Recognition*

- The number of competitors will determine the number of winners. The maximum number of winners for each competitive event is 10 at the NLC; 5 at the SLC.

### *Event Administration*

- This event is an objective test administered online at the SLC/NLC.
- No reference or study materials may be brought to the testing site.
- No calculators may be brought into the testing site; online calculators will be provided through the testing software.

### *Tie Breaker*

- Ties are broken by comparing the correct number of answers to 10 pre-determined questions on the test. If a tie remains, answers to 20 pre-determined questions on the test will be reviewed to determine the winner. If a tie remains, the competitor who completed the test in a shorter amount of time will place higher.

### *Americans with Disabilities Act (ADA)*

- FBLA meets the criteria specified in the Americans with Disabilities Act for all competitors with accommodations submitted through the conference registration system by the registration deadline.

# 2024-25 Competitive Events Guidelines

## Exploring Computer Science



### *Penalty Points*

- Competitors may be disqualified if they violate the Code of Conduct or the Honor Code.
- Five points are deducted if competitors do not follow the Dress Code or are late to the testing site.

### *Electronic Devices*

- Unless a pre-approved accommodation is in place, all cell phones, smart watches, and headphones must be turned off and put away before competition begins. Any visibility of these devices will be considered a violation of the Honor Code.

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## Exploring Computer Science



### Study Guide: Competencies and Tasks

- A. Logical Reasoning
  - 1. Be able to follow a set of statements to a logical conclusion using deductive reasoning.
  - 2. Be able to follow a set of statements to a logical conclusion using inductive reasoning.
  - 3. Recognize what types of data a website should ask of its users and what it shouldn't for the sake of user privacy.
- B. Basic Coding
  - 1. Understand and use loops.
  - 2. Understand and use conditionals.
  - 3. Understand and use functions.
  - 4. Understand proper variable and function naming.
  - 5. Recognize strings, Booleans, and arrays/list.
  - 6. Recognize programming/markup languages used in web design.
- C. Manipulating and Analyzing Data with Digital Tools
  - 1. Basic binary/hexadecimal conversion.
  - 2. Understand and implement an arithmetic mean.
  - 3. Understand and implement an arithmetic median.
  - 4. Understand and implement an arithmetic mode.
  - 5. Understand and implement an arithmetic range.
  - 6. Understand the purpose of a standard deviation.
- D. Problem Solving
  - 1. Understand how computers make decisions.
  - 2. Explain how computers take input and give output.
- E. Algorithms and Programming
  - 1. Explain how a computer might search through data.
  - 2. Be able to recognize a computer program.
  - 3. Recognize the best algorithm for a simple problem (i.e. single loop vs nested loop).
  - 4. Understand when a nested loop is needed.
  - 5. Associate loops with underlying conditionals.
  - 6. Understand how data is stored in a computer and accessed by programs.
  - 7. Use flowcharts and/or pseudocode to address complex problems as algorithms.
  - 8. Create clearly named variables that represent different data types and perform operations on their values.
  - 9. Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
  - 10. Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
  - 11. Create procedures with parameters to organize code and make it easier to reuse.
  - 12. Seek and incorporate feedback from team members and users to refine a solution that meets user needs.
  - 13. Incorporate existing code, media, and libraries into original programs, and give attribution.
  - 14. Systematically test and refine programs using a range of test cases.
  - 15. Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.
  - 16. Document programs in order to make them easier to follow, test, and debug.
- F. Abstraction and Decomposition

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## Exploring Computer Science



1. Understand the importance of abstraction and decomposition and be able to define both.
  2. Recognize if a process is too specific or broad and can therefore be split or combined.
  3. Be able to perform decomposition on real world problems into a series of steps and processes.
  4. Be able to abstract an idea.
- G. Pattern Recognition
1. Be able to deduce the missing element in a patterned series.
  2. Recognize patterns in computer code.
  3. Be able to correctly sequence a set of objects.
  4. Be able to recognize and continue patterns.
- H. Computing Systems
1. Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.
  2. Design projects that combine hardware and software components to collect and exchange data.
  3. Systemically identify and fix problems with computing devices and their components.
- I. Networks and the Internet
1. Model the role of protocols in transmitting data across networks and the Internet.
  2. Explain how physical and digital security measures protect electronic information.
  3. Apply multiple methods of encryption to model the secure transmission of information.
- J. Data and Analysis
1. Represent data using multiple encoding schemes.
  2. Collect data using computational tools and transform the data to make it more useful and reliable.
  3. Refine computational models based on the data they have generated.
- K. Impacts of Computing
1. Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
  2. Discuss issues of bias and accessibility in the design of existing technologies.
  3. Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.
  4. Describe tradeoffs between allowing information to be public and keeping information private and secure.

Computer Science Teachers Association (2017). *CSTA K–12 Computer Science Standards, Revised 2017*. Retrieved from <https://csteachers.org/k12standards/>.