

Computer Science: AP Computer Science Principles

Use computing tools and techniques to create artifacts. [APCS1](#)

1 Use computing tools and techniques to create artifacts. [APCS1](#)

Collaborate in the creation of computational artifacts. [APCS2](#)

2 Collaborate in the creation of computational artifacts. [APCS2](#)

Analyze computational artifacts; use computing tools and techniques for creative expression. [APCS3](#)

3 Analyze computational artifacts; use computing tools and techniques for creative expression. [APCS3](#)

Use programming as a creative tool. [APCS4](#)

4 Use programming as a creative tool. [APCS4](#)

Describe the combination of abstractions used to represent data. [APCS5](#)

5 Describe the combination of abstractions used to represent data. [APCS5](#)

Explain how binary sequences are used to represent digital data. [APSC6](#)

6 Explain how binary sequences are used to represent digital data. [APSC6](#)

Develop an abstraction. [APSC7](#)

7 Develop an abstraction. [APSC7](#)

Use multiple levels of abstraction in computation. [APCS8](#)

8 Use multiple levels of abstraction in computation. [APCS8](#)

Use models and simulations to raise and answer questions. [APCS9](#)

9 Use models and simulations to raise and answer questions. [APCS9](#)

Use computers to process information to gain insight and knowledge. [APSC10](#)

10 Use computers to process information to gain insight and knowledge. [APSC10](#)

Collaborate when processing information to gain insight and knowledge. [APCS11](#)

11 Collaborate when processing information to gain insight and knowledge. [APCS11](#)

Communicate insight and knowledge gained from using computer programs to process information. [APCS12](#)

12. Communicate insight and knowledge gained from using computer programs to process information. [APCS12](#)

Use computing to facilitate exploration and the discovery of connections in information. [APCS13](#)

13 Use computing to facilitate exploration and the discovery of connections in information. [APCS13](#)

Use large data sets to explore and discover information and knowledge. [APCS14](#)

14 Use large data sets to explore and discover information and knowledge. [APCS14](#)

Analyze the considerations involved in the computational manipulation of information. [APCS15](#)

15 Analyze the considerations involved in the computational manipulation of information. [APCS15](#)

Develop an algorithm designed to be implemented to run on a computer. [APCS16](#)

16 Develop an algorithm designed to be implemented to run on a computer. [APCS16](#)

Express an algorithm in a language. [APCS17](#)

17 Express an algorithm in a language. [APCS17](#)

Appropriately connect problems and potential algorithmic solutions. [APCS18](#)

18 Appropriately connect problems and potential algorithmic solutions. [APCS18](#)

Evaluate algorithms analytically and empirically [APCS19](#)

19 Evaluate algorithms analytically and empirically [APCS19](#)

Explain how programs implement algorithms. [APCS20](#)

20 Explain how programs implement algorithms. [APCS20](#)

Use abstraction to manage complexity in programs. [APCS21](#)

21 Use abstraction to manage complexity in programs. [APCS21](#)

Evaluate a program for correctness. [APCS22](#)

22 Evaluate a program for correctness. [APCS22](#)

Develop a correct program. [APCS23](#)

23 Develop a correct program. [APCS23](#)

Collaborate to solve a problem using programming. [APCS24](#)

24 Collaborate to solve a problem using programming. [APCS24](#)

Employ appropriate mathematical and logical concepts in programming. [APCS25](#)

25 Employ appropriate mathematical and logical concepts in programming. [APCS25](#)

Explain the abstractions in the Internet and how the Internet functions. [APCS26](#)

26 Explain the abstractions in the Internet and how the Internet functions. [APCS26](#)

Explain characteristics of the Internet and systems built on it. [APCS27](#)

27 Explain characteristics of the Internet and systems built on it. [APCS27](#)

Analyze how characteristics of the Internet and system built on it influence their use. [APCS28](#)

28 Analyze how characteristics of the Internet and system built on it influence their use. [APCS28](#)

Connect the concern of cybersecurity with the Internet and the systems built on it. [APCS29](#)

29 **Connect the concern of cybersecurity with the Internet and the systems built on it.** [APCS29](#)

Analyze how computing affects communication, interaction, and cognition [APCS30](#)

30 **Analyze how computing affects communication, interaction, and cognition** [APCS30](#)

Collaborate as part of a process that scales. [APCS31](#)

31 **Collaborate as part of a process that scales.** [APCS31](#)

Connect computing with innovations in other fields. [APCS32](#)

32 **Connect computing with innovations in other fields.** [APCS32](#)

Analyze the beneficial and harmful effects of computing [APCS33](#)

33 **Analyze the beneficial and harmful effects of computing** [APCS33](#)

Connect computing within economic, social, and cultural context [APCS34](#)

34 **Connect computing within economic, social, and cultural context** [APCS34](#)