Ask® Teacher Guide: January 2023

Ask®

Sharing Secrets

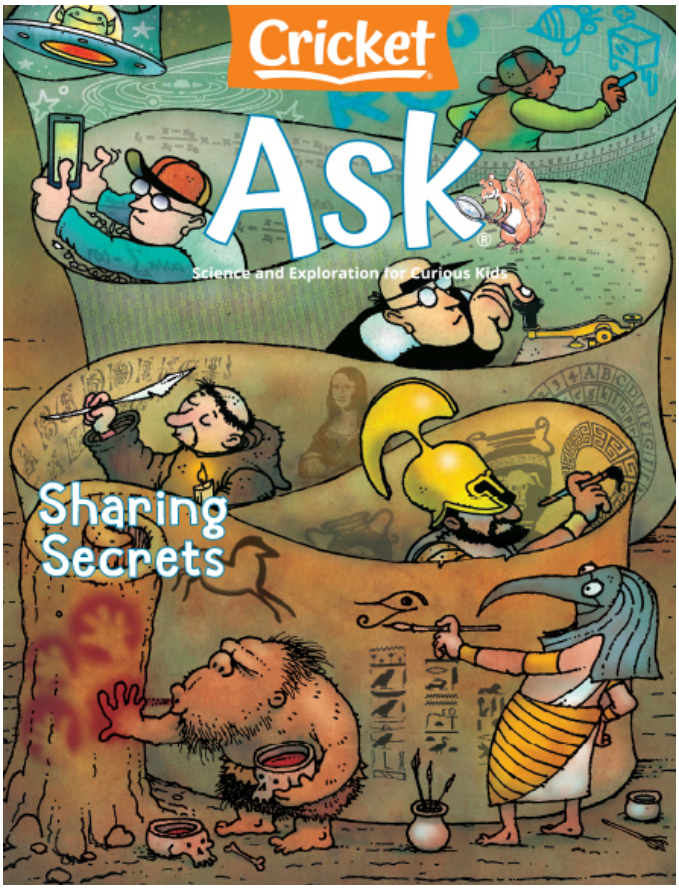
Codes and ciphers are a form of secret communication that uses symbols, letters, numbers, or signals to encrypt a message. This issue of ASK teaches readers about primitive spy methodologies and explores how computer data is transmitted and stored.

CONVERSATION QUESTION

How do secret codes protect important information?

TEACHING OBJECTIVES

- **Students will learn about various spy techniques.**
- **Students will learn how computers use a string of electrical pulses to store and send messages.**
- **Students will learn how computers utilize many tools to keep personal information private.**
- **Students will construct explanations from an expository text.**
- **Students will demonstrate the ability to properly sequence and explain a studied process.**
- **Students will compare three online security tools.**
- **Students will write a reflective essay.**
- **Students will use logic and reasoning to decipher a code.**
- **Students will practice creating secure passwords.**



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **Super Spy Techniques**
  Expository Nonfiction, ~940L
- **How to Talk to a Computer**
  Expository Nonfiction, ~820L
- **Alice and Bob Share Secrets Online**
  Expository Nonfiction, ~820L

Ask® Teacher Guide: January 2023

Super Spy Techniques

pp. 14–15, Expository Nonfiction

The practice of using spies to collect secret information has had recognized importance in military affairs since ancient times. Students will read about some of the more unusual espionage techniques.

RESOURCES

- Construct Explanations: Special Delivery

OBJECTIVES

- Students will learn about various spy techniques.
- Students will construct explanations from an expository text.
- Students will write a reflective essay.

KEY VOCABULARY

- ***stealth* (p. 14)** a secret, quiet, and clever way of moving or behaving
- ***codebook* (p. 15)** a book containing the means to decipher a code
- ***cellist* (p. 15)** a person who plays the cello

ENGAGE

Conversation Question: How do secret codes protect important information?

Show students video clips of (or simply discuss) a wide variety of spies in books and movies. Examples: *Harriet the Spy, Spy Kids, Mission Impossible, James Bond.* Pose this question: What traits and characteristics do all spies have in common?

INTRODUCE VOCABULARY

Post and discuss the three vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following directives, one at a time:

1. When have you moved in a **stealthy** manner? Why did you do this?
2. If you were responsible for protecting secret messages, how would you protect the **codebook**?
3. How could a **cellist** use her instrument and music to create a secret message?

READ & DISCUSS

Lead a post-reading discussion based on the following questions. Have pairs of students choose one question to investigate further.

1. Why are some techniques for transmitting secret information more practical than others?
2. Explain how Ninja military spies used trickery.
3. Why did people think that Elizabeth Van Lew was crazy? How did that make it easier for her to be a successful spy?
4. How have spies tried to destroy their codebooks?
5. How did cracking a German cipher affect Captain Georges Painvin?

SKILL FOCUS: Construct Explanations

INSTRUCT: Advise students to review the article and to study the different spy techniques. Distribute the *Construct Explanations: Special Delivery* graphic organizer. Tell students they will use information from the article to complete the chart. Students will need to provide clear explanations about what each technique is and how/why it worked.

ASSESS: Review the graphic organizer with the class. Have students share times when they tried to keep a secret (surprise party, holiday gift, friend's trust). When can it be important NOT to keep a secret?

EXTEND

Writing In referring to Captain Georges Painvin on page 15, the article states, "He taught himself code-breaking and became an expert." Review the criteria for writing a reflective essay (an essay in which the writer reflects on an experience or situation), and have students list a few skills they have taught themselves to do (a dance, a craft, a slam-dunk, etc.). Instruct students to choose one activity from the list and write a reflective essay about it. Remind students to share the struggles/joys and to support the main points with details.

Special Delivery

Construct Explanations Reread the article to find passages that explain each spy technique listed below. Record information about each technique in the spaces provided.

Tattooed Messages
Explain the technique.
Why did it work?
Fearsome Ninjas
Explain the technique.
Why did it work?
Odd Behavior
Explain the technique.
Why did it work?
Dirty Laundry Messages
Explain the technique.
Why did it work?

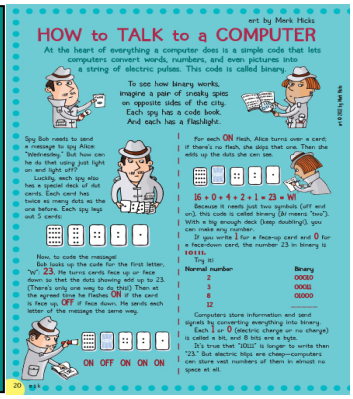
Ask® Teacher Guide: January 2023

How to Talk to a Computer

pp. 20–21, Expository Nonfiction

The daily use of computers has become a modern necessity for most people. Readers will learn how computers store, send, and encrypt information.

Lexile Score: ~820L



RESOURCES

- Sequencing a Process: Unfolding Email

OBJECTIVES

- Students will learn how computers use a string of electrical pulses to store and send messages.
- Students will demonstrate the ability to properly sequence and explain a studied process.
- Students will use logic and reasoning skills to decipher a code.

KEY VOCABULARY

- ***convert* (p. 20)** to change something from one form or function to another
- ***binary* (p. 20)** relating to or consisting of two things or parts
- ***server* (p. 21)** the main computer in a network that provides files and services that are used by the other computers

ENGAGE

Conversation Question: How do secret codes protect important information?

To motivate students to learn about this topic, introduce a simple "Book Code" deciphering activity. Have all students place the same textbook or chapter book on their desk. Teachers need to prepare by deciding on a sentence that students can decode. You will list the page number, line number, and word number for each word of the secret message. Give students time to decipher the message and allow time later for students to create their own messages using Book Code.

INTRODUCE VOCABULARY

Display the following statements and underline the key vocabulary terms. Review how to infer the meanings of new words by using context clues and background knowledge. Then have partners work together to determine the meaning of each word. Reveal definitions.

- You can convert yards into feet by multiplying by three.
- A yes-or-no question is a binary question.
- My friends and I play games on the same computer server.

READ & DISCUSS

Post and discuss questions prior to reading. Have students read the article independently. Then read the article aloud, pausing when answers to the questions are revealed.

1. What is fundamental to everything a computer does?
2. Why is the code described on page 20 called a binary code?
3. What do the spies that are sending messages and the spies that are receiving messages both need to know?
4. What is the benefit of using a 0 or 1 instead of numbers and letters?
5. What happens when you type a message into an email program?

SKILL FOCUS: Study Sequence

INSTRUCT: Review the article and guide students to notice that there is a specific process involved in transmitting email. Distribute the *Sequencing a Process: Unfolding Email* graphic organizer and instruct students to condense the process into four important steps that detail how we send and receive email.

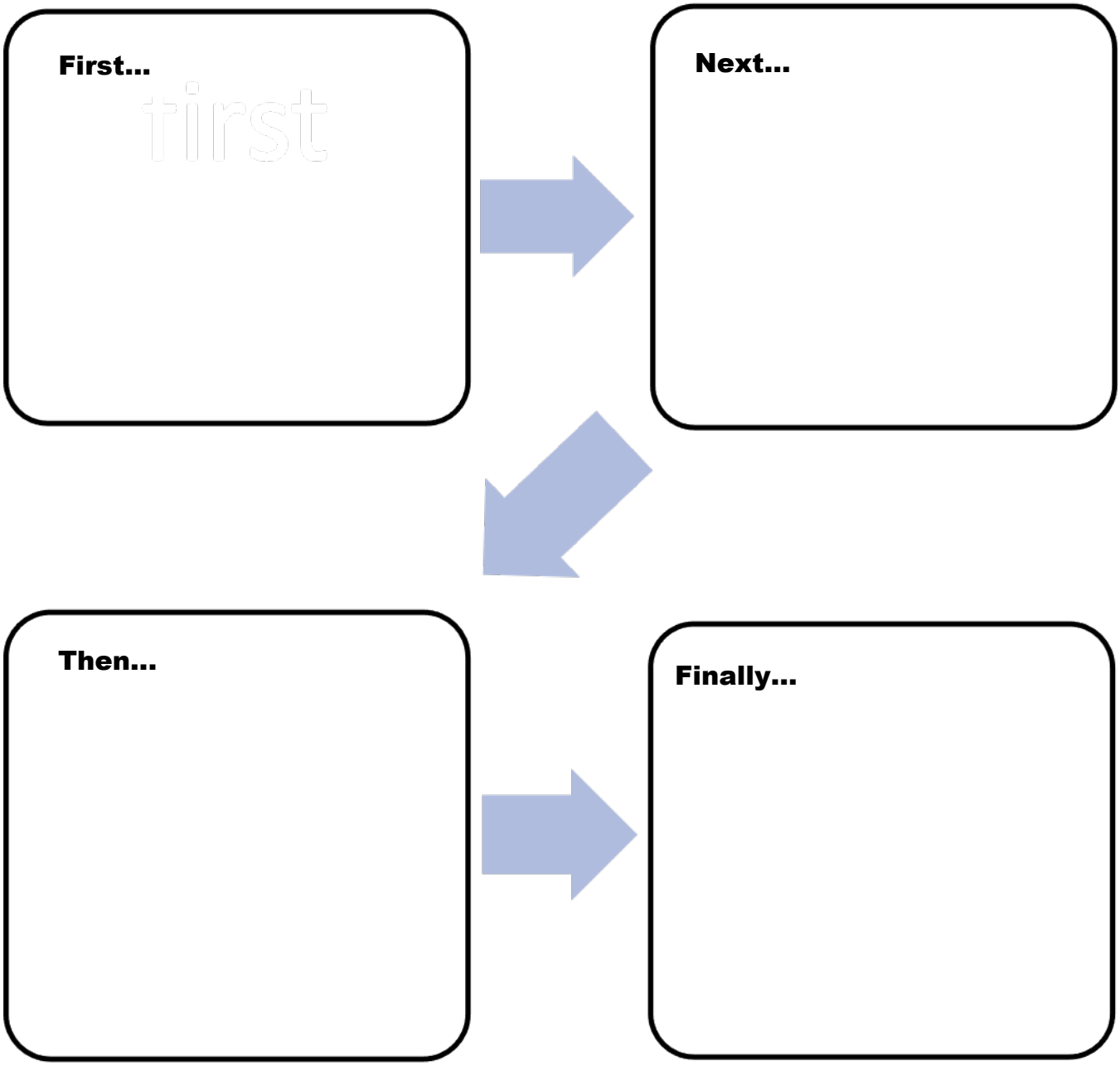
ASSESS: Circulate as students work and have them retell the process in their own words. Collect and evaluate graphic organizers for accuracy.

EXTEND

Logic Have the class revisit page 20 of the article. Give each student five index cards and instruct them to draw dots on the cards as shown. Then have students create a codebook for themselves using the following pattern: A=1, B=2, C=3... Have them practice using the cards and code to spell out their names letter by letter. As a cooperative activity, have pairs of students create a short phrase for another pair to decipher.

Unfolding Email

Sequencing a Process Reread the article and highlight sentences that detail the process involved in transmitting email. Condense the process into four steps and explain each step in the correct order.



Ask® Teacher Guide: January 2023

Bob and Alice Share Secrets Online

pp. 22–23, Expository Nonfiction

Most of us give very little thought to communicating through email and text messages. This article explains the computer processes that make this a reliable and largely safe practice.

RESOURCES

- Compare and Contrast: Privacy Protectors

OBJECTIVES

- Students will learn how computers utilize many tools to keep personal information private.
- Students will compare three online security tools.
- Students will practice creating secure passwords.

KEY VOCABULARY

- ***eavesdropper* (p. 22)** a person who secretly listens to what is being said in private without consent of the speaker(s)
- ***unscramble* (p. 22)** to separate something into its original components
- ***encryption* (p. 23)** the process of converting information or data into a code, especially to prevent unauthorized access

ENGAGE

Conversation Question: How do secret codes protect important information?

Guide a discussion about online usage. Compile a master list regarding how students communicate, share, and shop online. Then pose these questions: *How important is your online privacy? Have you ever felt threatened or intimidated by an online communication? What steps do you take to ensure that your online experiences are safe?*

INTRODUCE VOCABULARY

Post the key terms and discuss the definitions. Then distribute grid paper. Tell students they will be creating a word search puzzle using those three words (*eavesdropper*, *unscramble*, *encryption*) in addition to another 17 theme-related words. Suggest students highlight topical words as they read for use in the word search. Share the puzzles with another class for use as a prereading exercise for this article.

READ & DISCUSS

Pose the following questions to prompt meaningful discussion.

1. How do computers keep secrets online?
2. What was the solution to sharing keys safely online?
3. How do public keys work?
4. Why is public key encryption compared to a padlock?
5. List three tools that computers use to keep secrets safe.

SKILL FOCUS: Compare and Contrast

INSTRUCT: Students will compare the three different online security measures studied in the article: passwords, captchas, and biometrics. Have students work in pairs to reread the article and underline information that will be helpful for this purpose. Introduce the *Compare and Contrast: Privacy Protectors* graphic organizer and have partners record the data in the organizer.

ASSESS: Reconvene and review the graphic organizer with the class. Have students share their answers to the question in the Think Tank.

EXTEND

Critical Thinking Remind students that a more secure password is harder to crack. According to studies, the following criteria make it unlikely that your code will be cracked: 12 characters containing at least one uppercase letter, one symbol, and one number. (In fact, it would take a computer 34,000 years to crack a code made with these elements!) In addition, it is important to create a password that the user can easily remember and that does not correspond to personal information, such as a birthday. Using the formula above, give students an example of a secure password, such as *20!GoJets!23*. Have students use the formula to create three secure passwords.

Privacy Protectors

Compare and Contrast Record the information on the chart and then answer the question in the Think Tank.

Security Tool	Definition	Example	How does it provide security?
passwords			
captchas			
biometrics			

Think Tank: How are the tools listed above similar to each other? How are they different? Discuss with a partner.