

Name _____

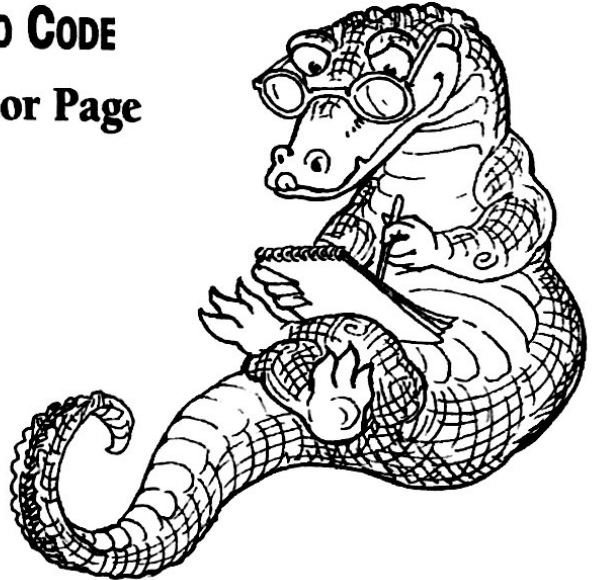
Date _____

To CODE OR NOT TO CODE

Student Investigator Page

The Crime

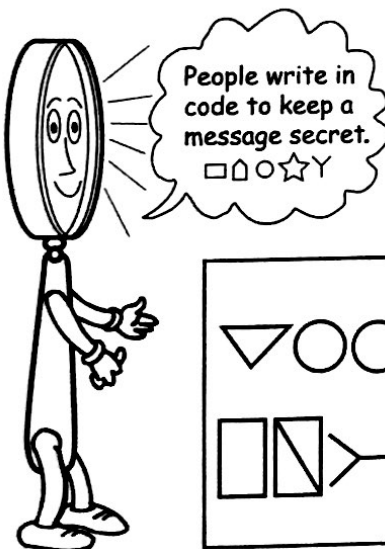
Mr. Baker, President of Space Secret Missions Inc., has found a handwritten note that looks rather strange. He tries to read the note, but cannot. It seems to be written in code. It was found lying in the hall outside his office. Because Mr. Baker and all of his employees take an oath of secrecy, this note is alarming. It might represent an attempt by someone to leak valuable information about the next space mission.



Returning to his office with the note, Mr. Baker examines it again. Mr. Baker knows that the most commonly used letter in the alphabet is "e." So he looks at the message to see if swapping the letter "e" for the most common symbol helps him.

The next most common letter is "t." Mr. Baker places a "t" where he finds the next most common symbol. Eventually, Baker breaks the code and is shocked to read its message. Mr. Baker knows that he must find out who wrote this message. He decides to trick the criminal by sending a message to which only the criminal can respond.

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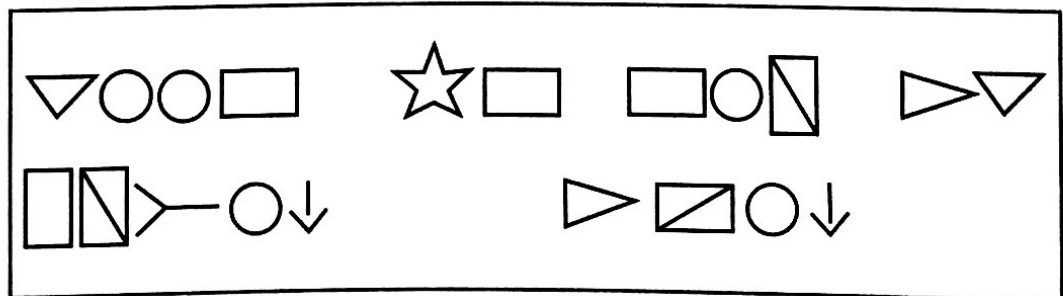


People write in code to keep a message secret.

□ △ ○ ☆ Υ

Procedure

1. Examine the coded message below.



Coded message found by Mr. Baker.

2. Enter each symbol in Table 2. Examine the message and determine how frequently each symbol is used. In Table 2, circle the most frequently used symbol.







TABLE 2. SYMBOLS AND NUMBER OF TIMES THEY OCCUR IN MESSAGE.			
Symbol	# of times used	Symbol	# of times used

3. Rewrite the message, substituting the letter "e" for the most frequently used symbol.
Code rewritten with "e" substituted for most frequently used symbol.

4. Return to Table 2. Determine the second most frequently used symbol and circle it. Rewrite the message, substituting the letter "t" for this symbol.
Code rewritten with "t" substituted for the second most frequently used symbol.

Investigation 1-2
(cont'd)

5. Late in the evening, Mr. Baker finds a magnifying glass to help him read some very small pencil marks on the note. It seems that someone who knows the code was trying to interpret the message. This is what he sees:

 = u
 = n
 = d
 = e
 = r
 = p

Substitute these letters into the coded message.

Code rewritten with new letters substituted for symbols.

6. Based on the parts of the code that you have interpreted, examine the partially decoded message. Are there any words that you can guess? If so, rewrite those words.

Code rewritten with letters you have guessed substituted for symbols.

7. In Table 3, list the codes for the letters that you now know.

TABLE 3. PIECES OF THE CODE THAT ARE KNOWN.			
LETTER	CODE	LETTER	CODE
A		N	
B		O	
C		P	
D		Q	
E		R	
F		S	
G		T	
H		U	
I		V	
J		W	
K		X	
L		Y	
M		Z	

8. You have broken much of this code. Use the code that you know to create a coded message for the author of the note. Your message can be left on the hall floor for that person to find. In your message, suggest a meeting place. The person who appears for the meeting probably wrote the original coded message.

Your message written in code.

Conclusion Questions

1. What was the message of your coded note?

2. In this investigation, you used symbols to represent individual letters. Create another code using symbols to represent entire words or phrases. Use this code to write the message "Danger, Danger. Keep out. Enemy nearby."

3. Why might a person write a message in code?

4. Why do you think airplane pilots and their ground crew use coded flag signals to direct airplanes?
