Writing Numbers

by Isaac Asimov



Nobody knows when numbers were first used. Certainly it was before anyone had thought of writing them down. The first real attempts at writing were made about five thousand years ago in the land now called Iraq. At that time part of Iraq was known as Sumeria. And it was the Sumerians who first made use of writing. Other ancient peoples, the Chinese and the Egyptians, also developed systems of writing. Gradually writing came to be used all over the world.

2 When writing was invented, the Sumeri-

ans and the Egyptians had cities, temples, and farm irrigation ditches. Many people had to work together in building all of this. They all had to contribute time and effort. They also had to pay taxes. So it became important to keep tax records. The priests of the temples were in charge of such things. They had to make sure they knew who paid taxes and how much. They could try to remember this information, perhaps, but memory could play tricks, and there might be arguments. It was better to make some

From the book HOW DID WE FIND OUT ABOUT NUMBERS? by Isaac Asimov. Copyright © 1973 by Isaac Asimov. By permission of the publisher, Walker and Company.

© 1989, 1978, Science Research Associates, Inc.

Printed in the United States of America. All rights reserved.

markings that would show a permanent record of taxes. In case of argument, the markings could be checked.

- In order to keep a record of accounts, a different marking could be made for every different number. But there are so many different numbers that this would mean remembering thousands of different markings.
- Since the fingers were used in the invention of number words, the number one could be shown by a straight mark that looked like a finger. That is what the Egyptians did. They made a mark that looked like this, I, and that stood for one.
- Any mark or symbol that is used to show a number is called a *numeral*. The symbol I is an example of an Egyptian numeral. Other people used the same mark or one very like it. It seems that everybody who thought of "one" drew a picture of one finger.
- But it isn't important what the particular marks are. What is important is how they are used. We can understand this better if we use marks that are familiar to us. For the number one we can use the symbol!
- Suppose we want to write a mark for two. Instead of inventing a brand-new numeral, why not write II? This looks just like two fingers. Writing the next few numbers is easy: III is three, IIII is four, IIIII is five, and so on all the way up to IIIIIIIII for nine. We know exactly what number the symbols stand for by counting the I's. The trouble with this is that when there are many I's, it is easy to make a mistake in writing them or in counting them.
- The Egyptians usually wrote the marks in some sort of pattern. For five, they didn't write IIII; they wrote III and then wrote II underneath. It was easier to see three marks and two marks than to make out five marks in a row. In the same way they wrote nine not as IIIIIIIII but as three III's, one group under the other.

would be a problem!

- So the Egyptians invented a new mark for ten. They used a symbol like an upside-down U. We don't have to use that particular mark, however, to show how the Egyptian number system worked. Suppose we use the symbol T for ten. That would make it clear to us because, in our language, T is the first letter of the word ten. If we wanted to write eleven, we could write Tl or lT. In either case the number would be eleven. We could have Tll for twelve or lT or even lTl. In any combination the marks would add up to twelve.
- It would be easier, however, to use some regular system. Then people would get used to it and be able to understand the numbers much more easily. We could put all the large numerals on the left and all the small ones on the right. In that case twenty-three would be TTIII (ten and ten and one and one). Seventy-four would be written TTTTTTTIIII. Of course, the T's and I's would be arranged in patterns to make it easier to count them.
- The Egyptians decided that no more than nine of any symbol should be written or counted and so they invented a new numeral every time ten of any particular mark had to be written. For example, to write one hundred they could have written ten of the symbols for ten like this: TTTTTTTTT. Instead of doing that, they invented a new symbol to stand for one hundred. They used a curl that looked something like a backward 9.
- Let's call H our symbol for one hundred since that is the first letter of the word. Three hundred thirty-three could be written HHHTTTIII. We could go as high as we wanted by this method, inventing a new symbol every time we needed to show ten of a particular mark.
- Even today most cultures use some version of this method. The English language uses a system based on just ten different symbols—1, 2, 3, 4, 5, 6, 7, 8, 9, and 0. By using these few numerals, we can count into the millions, billions, and trillions.

How Well Did You Read?

Write T if a statement is true according to the story. Write F if a statement is false.

- 1 Numbers were used long before anyone thought of writing them down.
- 2 People found ways of writing numbers so that they could keep records of taxes and other data.
- 3 Ancient Egyptians showed the number one this way, I, because that symbol looks like a stick.
- 4 The problem with making a single mark for each thing being counted is that with large numbers it is easy to make a mistake in writing or counting all the marks.
- 5 The Egyptians simplified the problem by inventing a special mark that stood for ten.
- 6 Review paragraph 10. In the system described there, Till stands for thirteen.
- 7 Review paragraph 13. In the system described there, HHTTII stands for two hundred twelve.
- 8 Referring again to paragraph 13, HHHHHIIII stands for four hundred four-teen.
- 9 The English language uses only nine different symbols to write numbers in the billions.

Learn about Words

Vocabulary

A You can often tell the meaning of a word by reading the words around it.

Look at each number in parentheses. Find the paragraph in the story with the same number. Then find the word that fits the given meaning. Write the word.

- 1 long ago (1)
- 2 watering (2)
- 3 sums of money that support government activities (2)
- 4 fixed; lasting (2)
- 5 well known (6)
- 6 order; arrangement (8)
- 7 union; mixture made by combining two or more things (10)
- 8 system; way of doing things (14)
- **B** A word may have more than one meaning.

Look at each number in parentheses. Find the paragraph in the story with the same number. See how the word in heavy type is used in the paragraph. Decide whether it has meaning a, b, or c. Write a, b, or c.

- 9 systems (1)
 - a political organizations
 - b plans, schemes, or methods
 - c groups of interacting electrical components
- 10 records (2)
 - a written accounts
 - b thin, flat disks for reproducing music
 - c best performances known

Word Study

C Sentences have patterns. Here are sentences in four different patterns:

1. N-V: John ran. (Noun) (Verb)

2. N-V-N: Sarah has shoes.
(Noun) (Verb) (Noun)

3. N-LV-N: Susan is a doctor.

(Noun) (Linking (Noun)

Verb)

4. N-LV-Adj: Melvin is tall.

(Noun) (Linking (Adjective)
Verb)

Compare the sentences below with the examples. Decide which pattern is used in each sentence. (Remember that am, are, is, was, and were are linking verbs.) Write N-V, N-V-N, N-LV-N, or N-LV-Adj.

11 My brother was a detective.

12 The children ate dinner.

13 Bernie sang.

14 Her hair is curly.

15 The boat sank.

16 France is a country.

17 Dion baked a pie.

18 Lynda is clever.

D A noun phrase is a group of related words that indicate persons, places, things, or ideas being discussed in a sentence. Each word group in heavy type here is a noun phrase:

Paul and Mary gave me a new bike.

A tall girl came to visit.

Sam and I like the way she smiles.

Read each sentence below. Notice the words in heavy type. If they are a noun phrase, write NP. If they are not, write No.

19 Janet and I went to school.

20 The pioneer wagons travelled west.

21 We changed our summer plans.

22 The farm woman rises at six o'clock.

23 The entire school was present.

24 The old dog barked loudly.

25 My new saddle is silver.

26 My brother and sister read the book.

E To make sensible sentences, words must be put together in a meaningful order. Read each group of words below. If the words make a sensible sentence in their present order, write S. If they make no sense because the order is jumbled, write J.

27 Sally accepted our present.

28 Ant an is small.

29 Me bring please clean a plate.

30 Steve fell off the ladder.

31 I painted the table brown.

32 Light there is window in a the.

33 The lake is very deep.

Use Your Imagination

Suppose you had to invent a new way of writing numbers. What symbol would you use for the number 1? For the number 10? For the number 100? Show your new symbols to a classmate or a friend.