

Part 3: Exam practice

Match the statements 1–6, which describe number systems in different cultures, with the cultures and languages A–F.

- 1 In this community, people do not really learn how to count, because there is no need for them to learn. _____
- 2 The most used system was started by these people. _____
- 3 The counting system in this culture works with small sets but uses addition. _____
- 4 The situation in this community demonstrates that people can estimate quantities even in cultures where exact numbers do not exist. _____
- 5 The system here has been in existence for a very long time but may not be the best one. _____
- 6 The counting system in this culture is different from that in most other cultures. _____

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| A Pirahã |
| B Mundurucu |
| C Yupno |
| D Waimirí |
| E English |
| F Indian |

In *Rarities in Numeral Systems*, Harald Hammarström lists 12 South American languages that lack exact numbers above one. He prefers to call these systems 'one-few-many', since there are usually words in these languages for 'few' and 'many'. He also mentions two languages that have no exact numbers. The most studied of these is Pirahã, which is spoken by only about 400 people. It has a word for 'about one' and a word for 'about two'. As if that wasn't fuzzy enough, the words for 'about one' and 'about two' are the same – hoi – the only difference being a change in inflection.

The Amazonian Indians whose sense of number has been most closely studied are the Mundurucu, who have numerical words only up to five. Animals and babies are good at discriminating quantities above five, so one would expect that the Indians are too – even though they do not have words to express such amounts. And this is exactly what experiments conducted by the French linguist Pierre Pica have confirmed: when given tests that involve comparing sets of more than five dots on a screen, the Mundurucu scored just as high as Westerners. When Pica looked more closely at the Mundurucu's number words, he realised that only their words for one and two were used with any sense of exactness. The words for three, four and five were approximations – as if what they meant to say was 'threeish', 'fourish' and 'fiveish'. In this aspect, the Mundurucu are just like the 'one-two-many' tribes, who also have exact numbers only up to two.

When Indians do learn numbers, in fact, they appear uninterested by them. A Pirahã girl was once taken out of the village to receive medical treatment. During her time with Brazilians she learnt some Portuguese and how to count in Portuguese. No problem. But after returning to the community, while she retained some Portuguese she quickly forgot how to count.

Anthropologists first reached communities on the other side of the world, in Papua New Guinea, in the late nineteenth century. They discovered that they used not just their fingers to count but also their whole bodies. The natives started out with the fingers and thumb of one hand for one to five, but then carried on for higher numbers with wrist, elbow, shoulders, sternum and so on. For example, one tribe, the Yupno, go as high as 34: their word for 34 is 'one dead man'. These Papuan 'body-tally' systems are unusual because almost all other systems group numbers in much smaller sets.

In the Amazon there are also tribes with bases of two, three and four. For example, the Waimirí have words for one to three, and then say '3+1', '3+2', '3+3', '3+3+1', '3+3+2' and '3+3+3'.

Our base ten system of the digits zero to nine, which has its origins in India, is now in use all over the developed world. It is a natural system, but for several hundred years mathematicians have questioned whether it is the wisest base for us to have. The campaign for adding two new numbers, so that our system becomes base 12, is still active – the argument is to do with the extra divisibility of 12 compared with ten, since 12 can be divided by two, three, four and six while ten can be divided only by two and five. In fact, there are humans that already use base 12: and almost all of them belong to the tribes of the Plateau area of northern Nigeria.