Sights, Sounds and Symbols
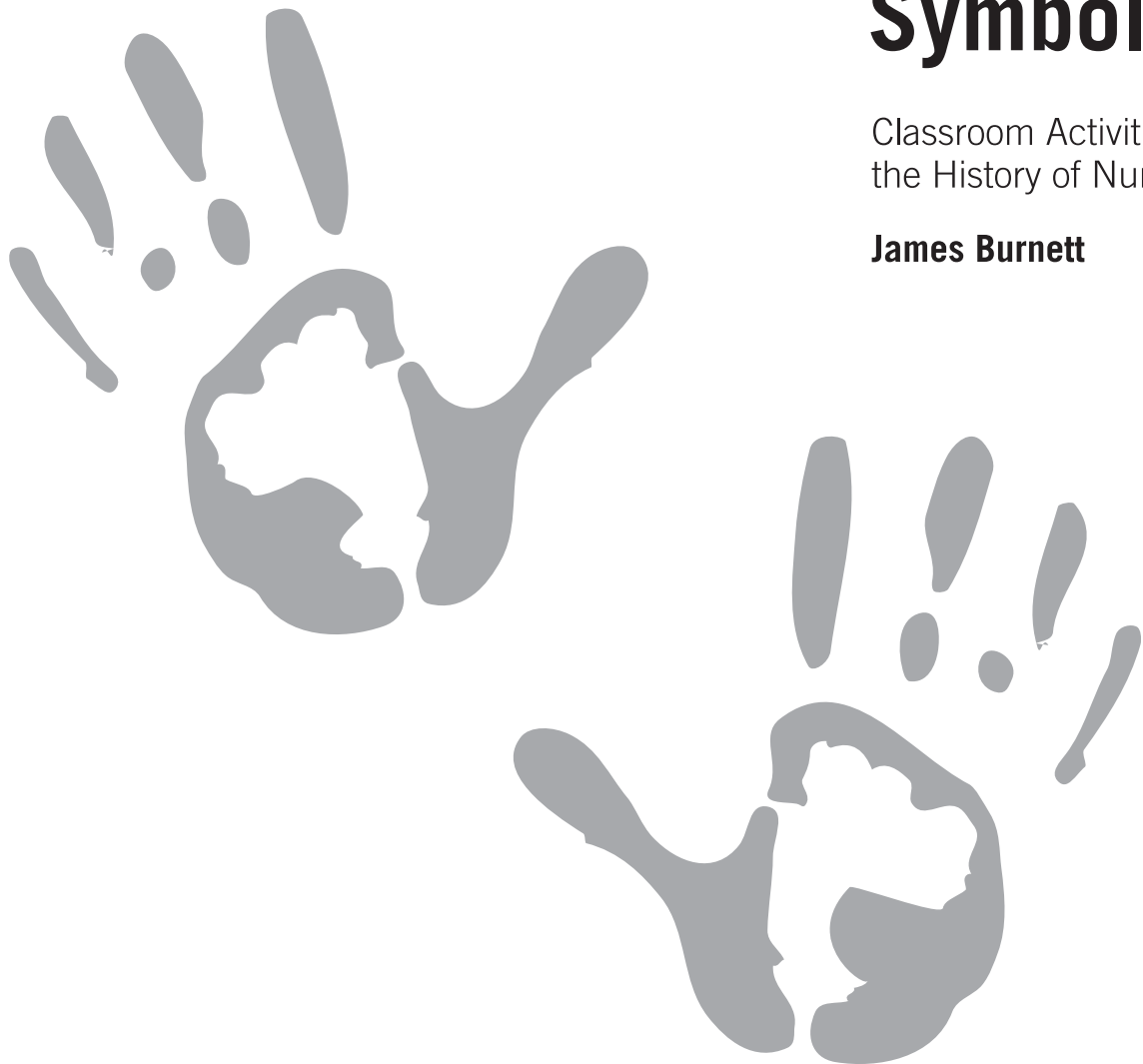
Classroom Activities on the History of Numbers
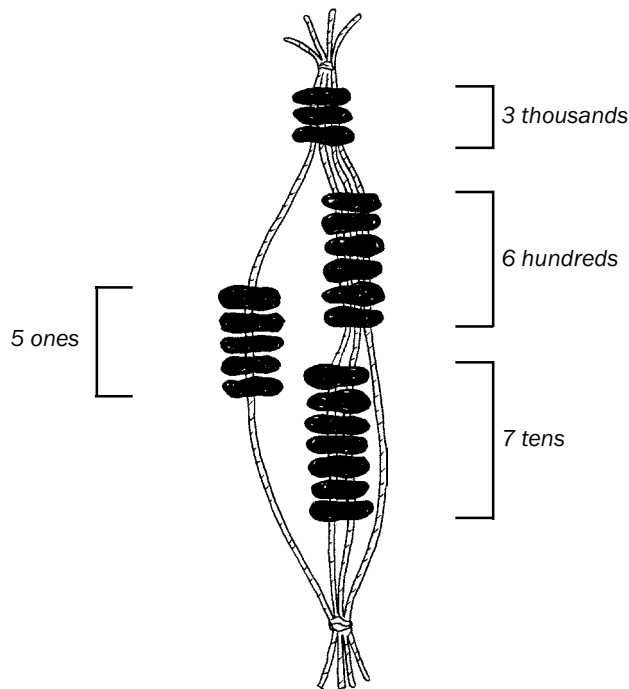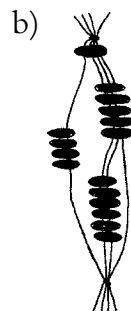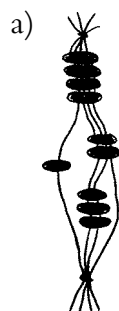
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ORIGO
EDUCATION

The Peruvian and Bolivian Indians

Some Indians of Peru and Bolivia in South America still use a direct descendant of the quipu. Their counting and recording device is called a *chimpu*. It is also a kind of place-value system that uses fruit seeds threaded onto string rather than knots. Four strings were needed in order to show a 4-digit number, three strings for a 3-digit number, and so on. The chimpu below shows the number 3675. Here, three seeds are threaded over four strings to indicate 3000. Six seeds are threaded over three strings to indicate 600, seven seeds threaded over two strings to represent seven tens or 70 and five seeds are threaded over one string to represent five ones or 5.

Peru
Bolivia

Peru and Bolivia

3 thousands

6 hundreds

5 ones

7 tens

Questions

1. What numbers do these chimpus show:

a)

b)

c)

2. How many strings would be needed to show a 5-digit number?

3. Sketch a chimpu to show 26 409.

4. How did you represent zero tens on your chimpu?

5. How does the method for representing zero on a chimpu compare to that on the quipu?

6. Do you think the chimpu is more or less efficient than the quipu? Use examples to support your claim.

Classroom Activities

1. Introducing the chimpu

Materials: Transparencies of **Blackline Masters 1.1** (page 9) **and 3.8**

Tell the children that some Bolivian and Peruvian Indians still use a recording device that is very similar to the quipu. Use a globe or transparency of Blackline Master 1.1 to show where Bolivia and Peru is located. Explain how these countries were once part of the Incan empire. Show the transparency of the chimpu. Ask, *What number do you think this device shows?* Elicit several responses. Ensure the children explain their thinking. Tell them that the chimpu shows a 4-digit number. Again, challenge them to work out the number that it shows. The discussion will vary from class to class. It may be necessary to explain how the number is represented on the chimpu.

> The children could use a colour to mark the location of the cultures they studied in this chapter on their copy of Blackline Master 1.1. A legend could indicate that these cultures used 'concrete' number systems.

2. Analysing the chimpu

Confirm that the children understand how numbers are represented on the chimpu. Ask, *How many strings would be needed to show a three- … five- … or two-digit number? How many strings would be needed to show the number five thousand and sixty-two?* (Four strings would still be needed.) Have the children sketch chimpus to show how the Peruvian and Bolivian Indians would show the numbers 6419 and 75 046.

3. Making a chimpu

Materials: Lengths of string or wool; scissors; beads

The children may like to experiment with string and beads to make their own chimpu. Ensure they share the end result with the class.

4. Comparing the quipu and chimpu

Have the children brainstorm all the similarities and differences between the quipu and chimpu. List their responses on the board. Direct the children to write a short paragraph to summarise the main points that were identified. Encourage them to sketch a quipu and a chimpu that show the same 4-digit number of their choice. This will support their summary.