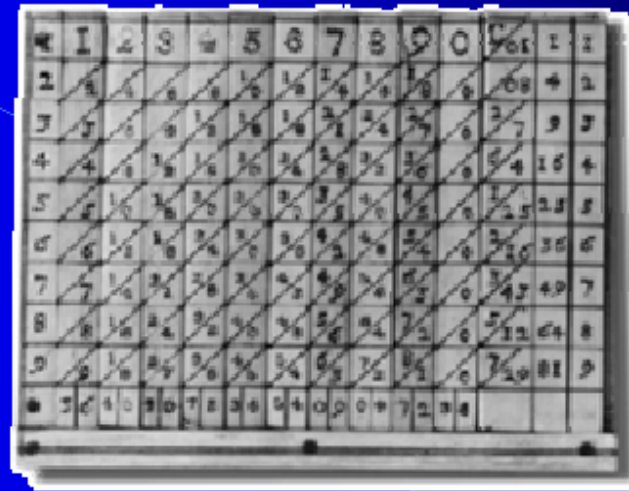




Napier's Bones



By
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2004 OCTM Conference

John Napier



The Lattice

X	0	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	1	1	1	1	1
3	0	0	0	0	1	2	2	2	2	2
4	0	0	0	1	2	3	3	3	3	3
5	0	0	1	1	2	3	3	4	4	4
6	0	0	1	2	3	4	4	5	5	5
7	0	0	1	2	3	4	5	5	6	6
8	0	0	1	2	3	4	5	6	6	7
9	0	0	1	2	3	4	5	6	7	8

How Does It Work???

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	1	1
5	3	2	1
6	4	2	1
7	4	2	2
8	5	3	2
9	6	3	2

$$743 \times 1 = 743$$

$$743 \times 2 = 1486$$

$$743 \times 3 = 2229$$

$$743 \times 4 = 2972$$

$$743 \times 5 = 3715$$

$$743 \times 6 = 4458$$

$$743 \times 7 = 5201$$

$$743 \times 8 = 5944$$

$$743 \times 9 = 6687$$



Double Digits...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	1	1
5	3	2	1
6	4	2	1
7	4	2	2
8	5	3	2
9	6	3	2

$$743 \times 56$$

$$\begin{array}{r} 4458 \\ + 3715 \\ \hline 41,608 \end{array}$$

Double Digits...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	1	1
5	3	2	1
6	4	2	1
7	4	2	2
8	5	3	2
9	6	3	2


$$743 \times 56$$

$$\begin{array}{r}
 4458 \\
 + 3715 \\
 \hline
 41,608
 \end{array}$$

Double Digits...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	3
9	6	3	3

$$743 \times 56$$

$$\begin{array}{r} 4458 \\ + 3715 \\ \hline 41,608 \end{array}$$


Double Digits...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	1	1
5	3	2	1
6	4	2	1
7	4	2	2
8	5	3	2
9	6	3	2

$$743 \times 56$$

$$\begin{array}{r} 4458 \\ + 3715 \\ \hline 41,608 \end{array}$$

Double Digits...

X	7	4	3
1	0	7	0
2	1	4	0
3	2	1	0
4	2	8	1
5	3	5	2
6	4	2	2
7	4	9	2
8	5	6	3
9	6	3	3

$$743 \times 56$$

$$\begin{array}{r} 4458 \\ + 3715 \\ \hline 41,608 \end{array}$$

Double Digits...

$$743 \times 56$$

X	7	4	3
5	3 5	2 0	1 5
6	4 2	2 4	1 8

$$\begin{array}{r} 4458 \\ + 3715 \\ \hline 41,608 \end{array}$$

Division...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	3
9	6	3	3

$$\underline{934,893} \div \underline{743}$$

$$\begin{array}{r}
 6143 \\
 4329 \\
 \underline{1918} \\
 934893 \\
 \underline{743} \\
 1486 \\
 3715 \\
 5944 \\
 \hline
 1258 \\
 \hline
 199 \\
 \hline
 743
 \end{array}$$

Division...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	3
9	6	3	3

$$\underline{934,893} \div \underline{743}$$

$$\begin{array}{r}
 6143 \\
 \underline{4329} \\
 1918 \\
 \underline{1486} \\
 3715 \\
 \underline{5944} \\
 1258
 \end{array}$$

The division process is shown with the following steps:

- 6143 is the quotient.
- 4329 is the first partial product (6143 × 743).
- 1918 is the remainder after the first step.
- 1486 is the second partial product (1918 × 743).
- 3715 is the remainder after the second step.
- 5944 is the third partial product (3715 × 743).
- 1258 is the final remainder.

Division...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	3
9	6	3	3

$$\underline{934,893} \div \underline{743}$$

$$\begin{array}{r}
 6143 \\
 \underline{4329} \\
 1918 \\
 \underline{934893} \\
 743 \\
 \underline{1486} \\
 3715 \\
 \underline{5944} \\
 1258
 \end{array}$$

$\begin{array}{r} 199 \\ \hline 743 \end{array}$

Division...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	3
9	6	3	3

$$\underline{934,893} \div \underline{743}$$

6	1	4	3				
4	3	2	9				
1	9	1	8				
9	3	4	8	9	3		
7	4	3					
1	4	8	6				
	3	7	1	5			
	5	9	4	4			

1	2	5	8	

199	

Division...

X	7	4	3
1	0	0	0
2	1	0	0
3	2	1	0
4	2	8	1
5	3	2	1
6	4	2	1
7	4	9	2
8	5	6	2
9	6	3	2

$$\underline{934,893} \div \underline{743}$$

$$\begin{array}{r}
 6143 \\
 4329 \\
 1918 \\
 \hline
 934893 \\
 743 \\
 \hline
 1486 \\
 3715 \\
 \hline
 5944
 \end{array}$$

1	2	5	8	199
<hr/>				743

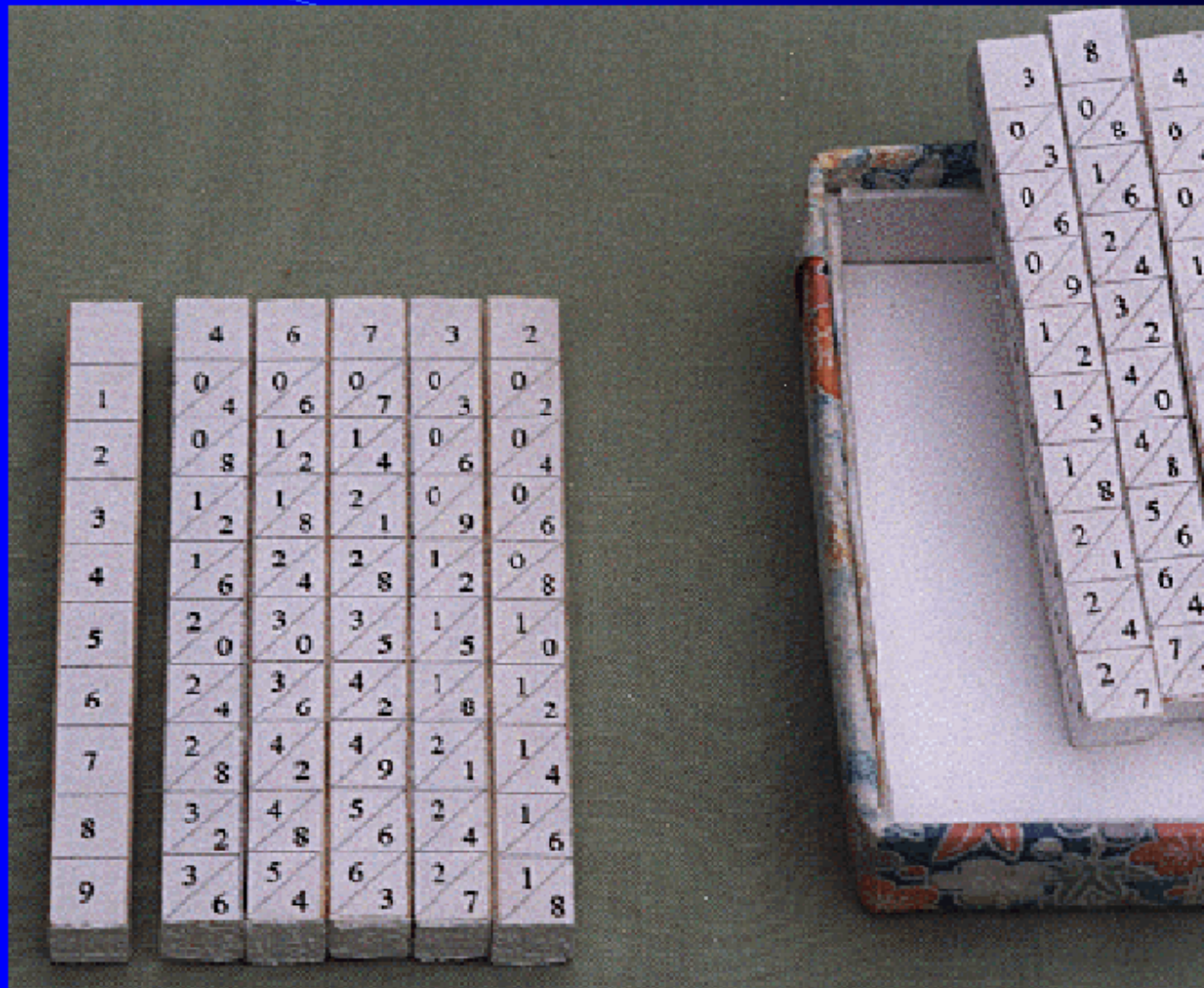
Napier's Online Simulator

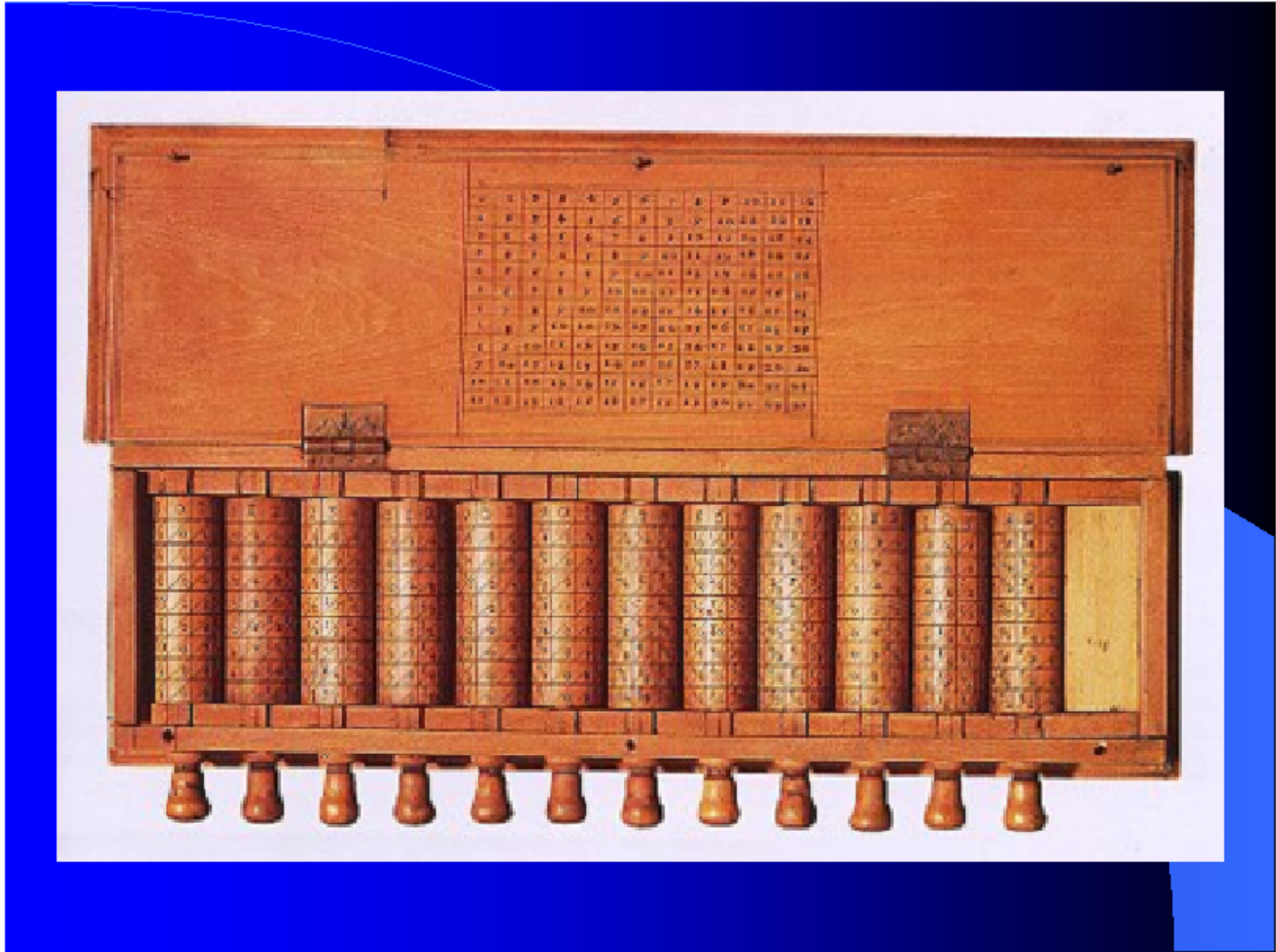
The image shows a screenshot of a web-based Napier's Bones simulator. It features a 9x3 grid of numbers. The columns are headed 7, 4, and 3. The rows are numbered 1 through 9 on the left. Each cell in the grid contains a number, with diagonal lines indicating the addition of the numbers in the row and column. Below the grid is a control bar with a text input field containing '743', a 'Base' label, and a numeric input field containing '10' with left and right arrow buttons.

	7	4	3
1	7	4	3
2	14	8	6
3	21	12	9
4	28	16	12
5	35	20	15
6	42	24	18
7	49	28	21
8	56	32	24
9	63	36	27

743 Base 10

<http://www.cut-the-knot.com/blue/Napier.html>





Title: Oct 26 - 10:15 AM (19 of 21)

Questions, Comments, Short Debates





