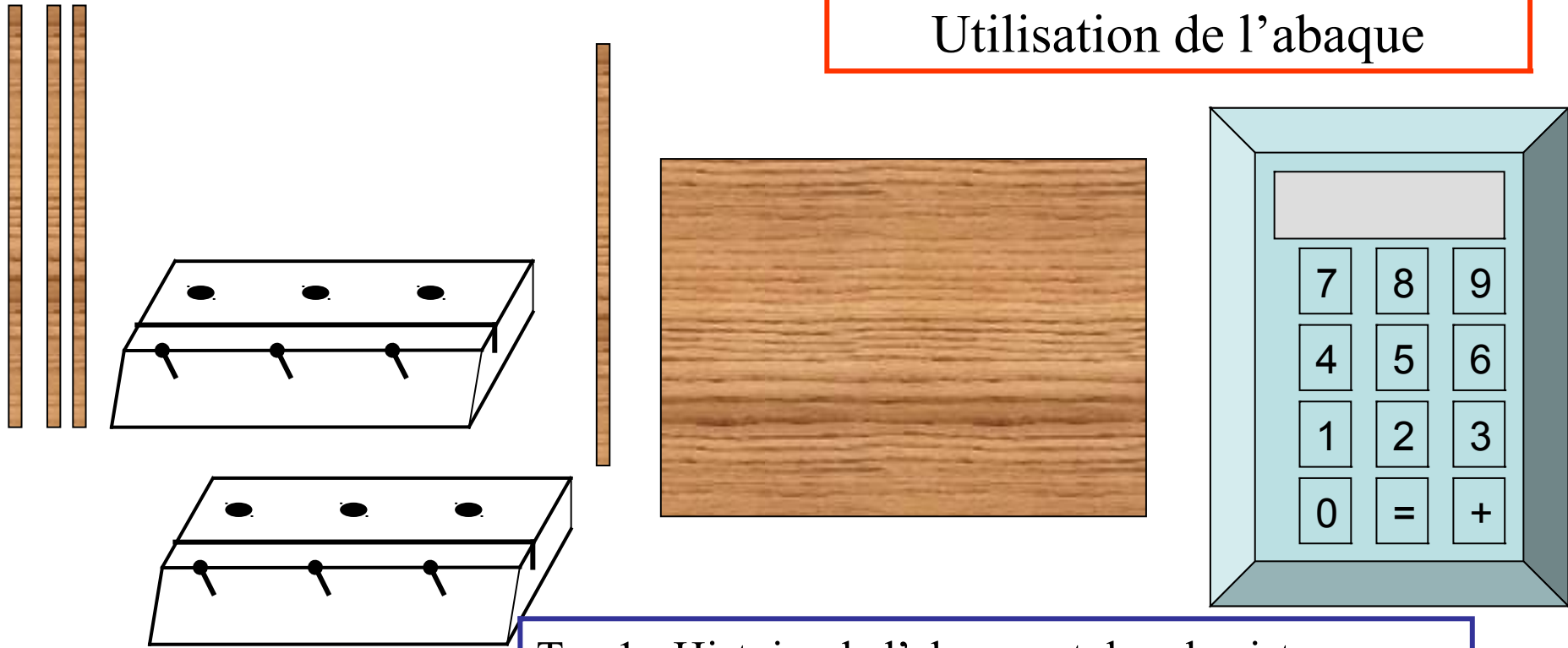
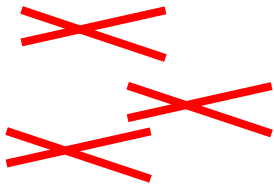


Restructuration opératoire

Utilisation de l'abaque



2	5	3
7	6	4
8	2	
1		



Tps 1 : Histoire de l'abaque et des abacistes

Tps 2 : Appropriation de l'abaque

Tps 3 : Compter sur l'abaque

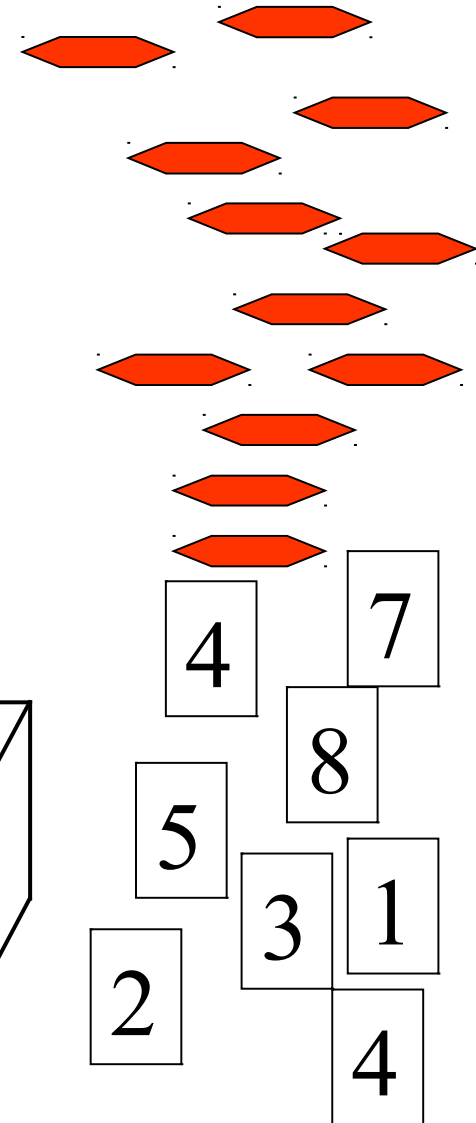
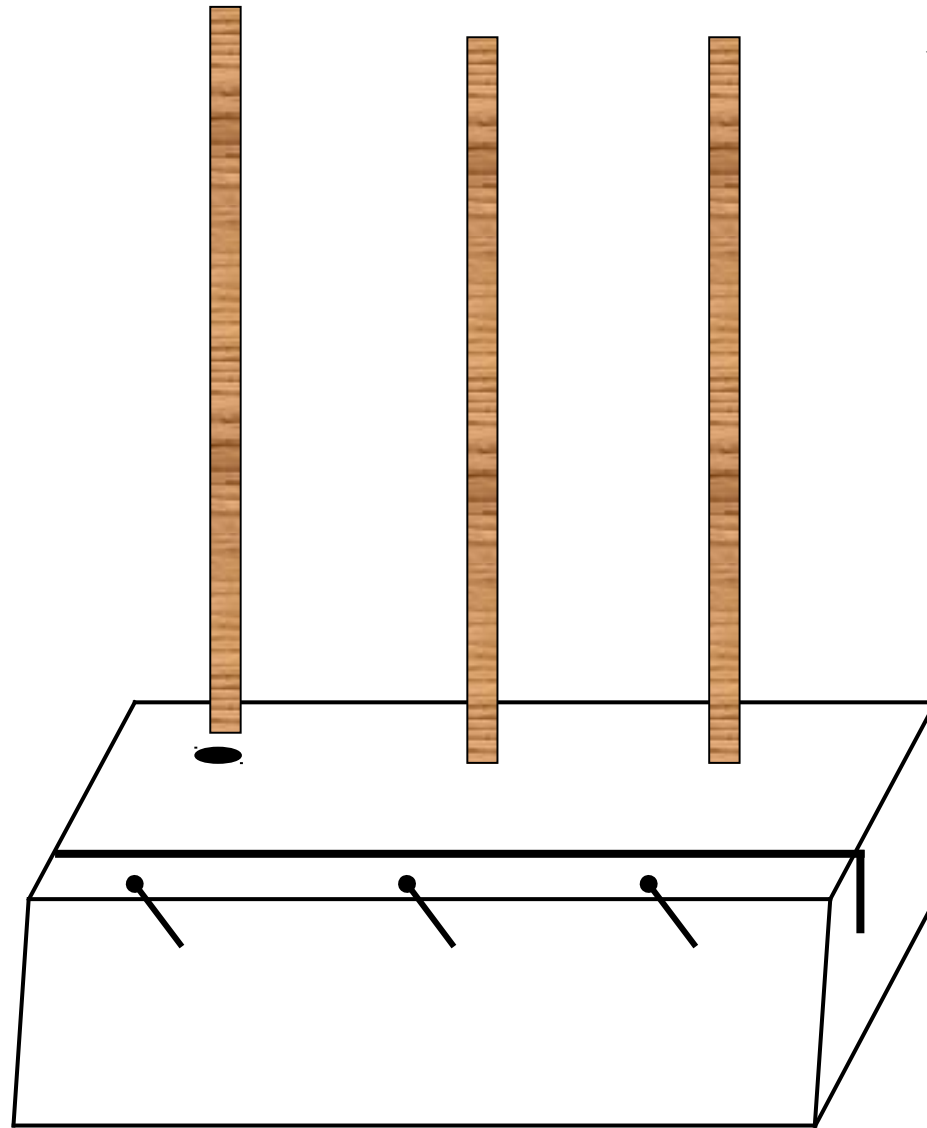
Tps 4 : Restructuration opératoire : l'addition

Tps 5 : Restructuration opératoire : la soustraction

Temps 2

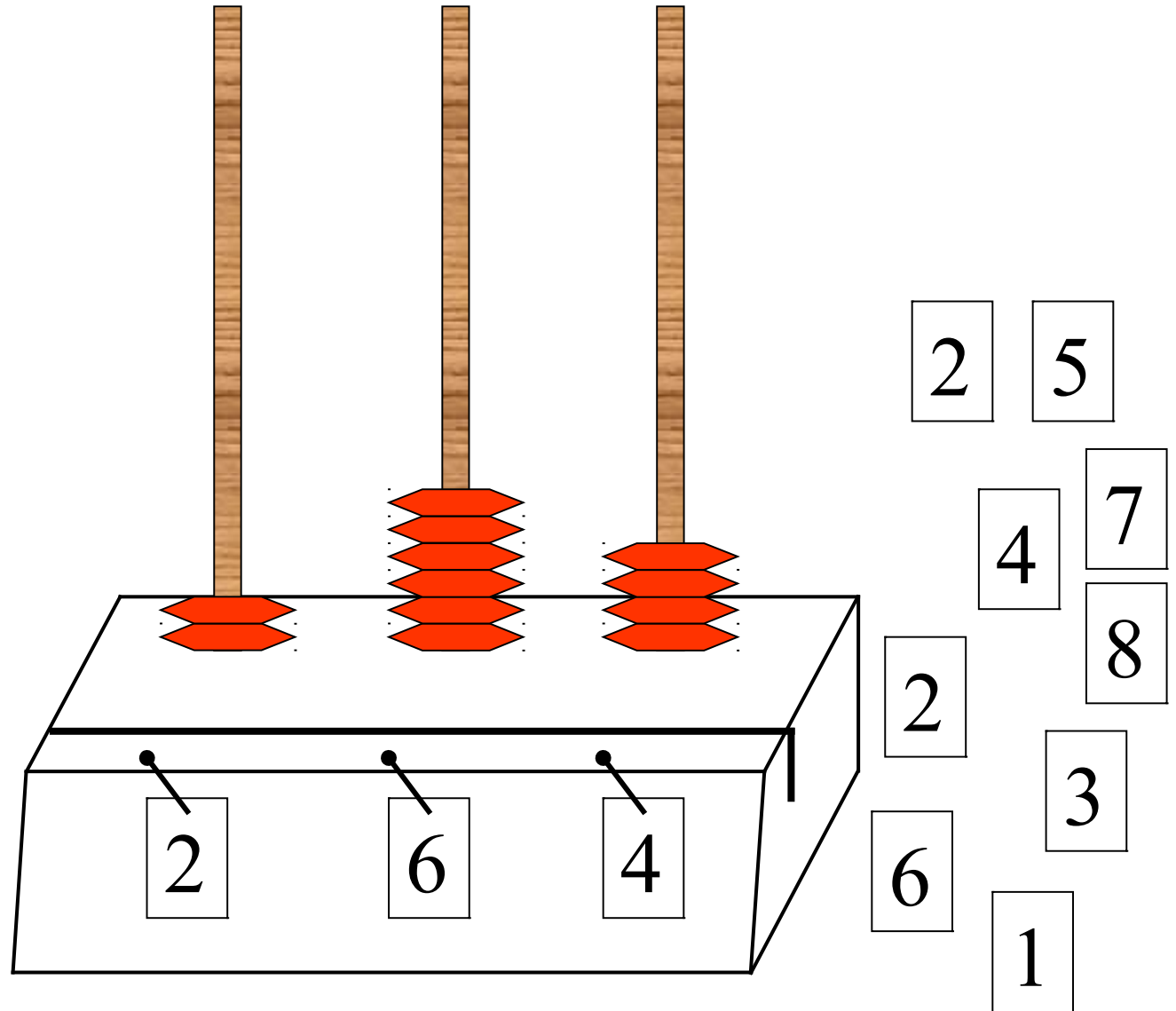
Appropriation
empirique de l'abaque

Appropriation empirique de l'abaque



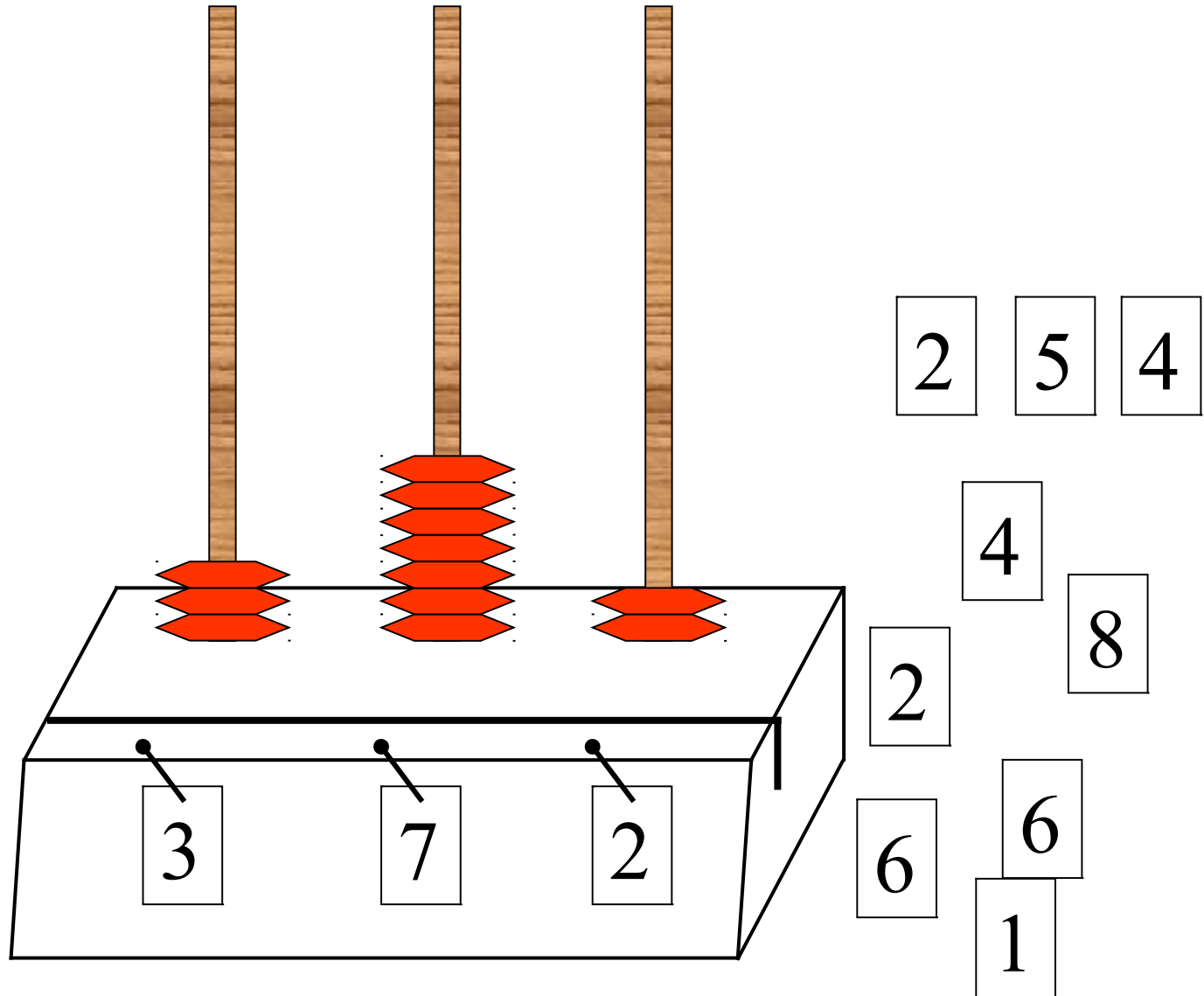
Appropriation empirique de l'abaque

On montre...



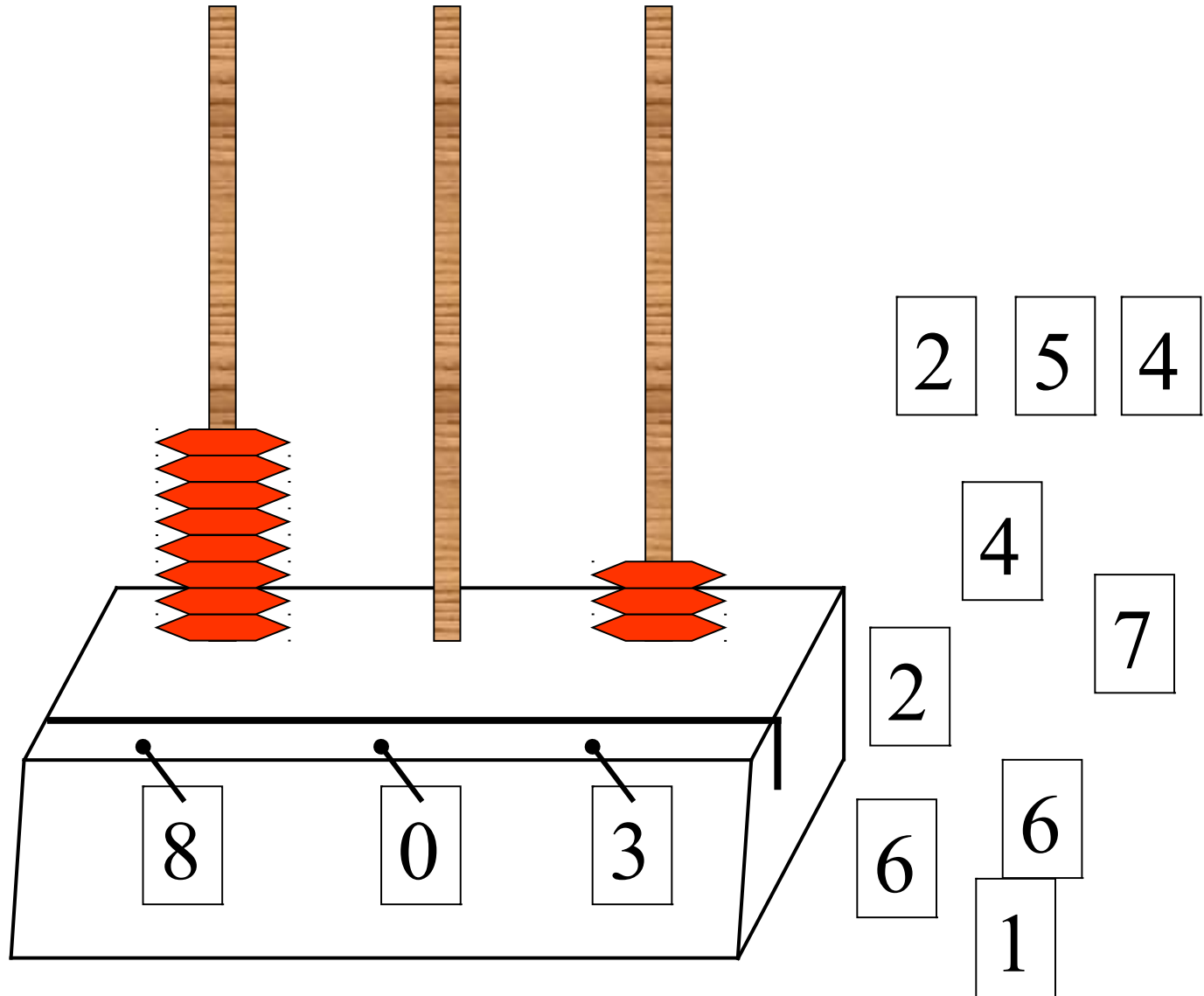
Appropriation empirique de l'abaque

On montre...



Appropriation empirique de l'abaque

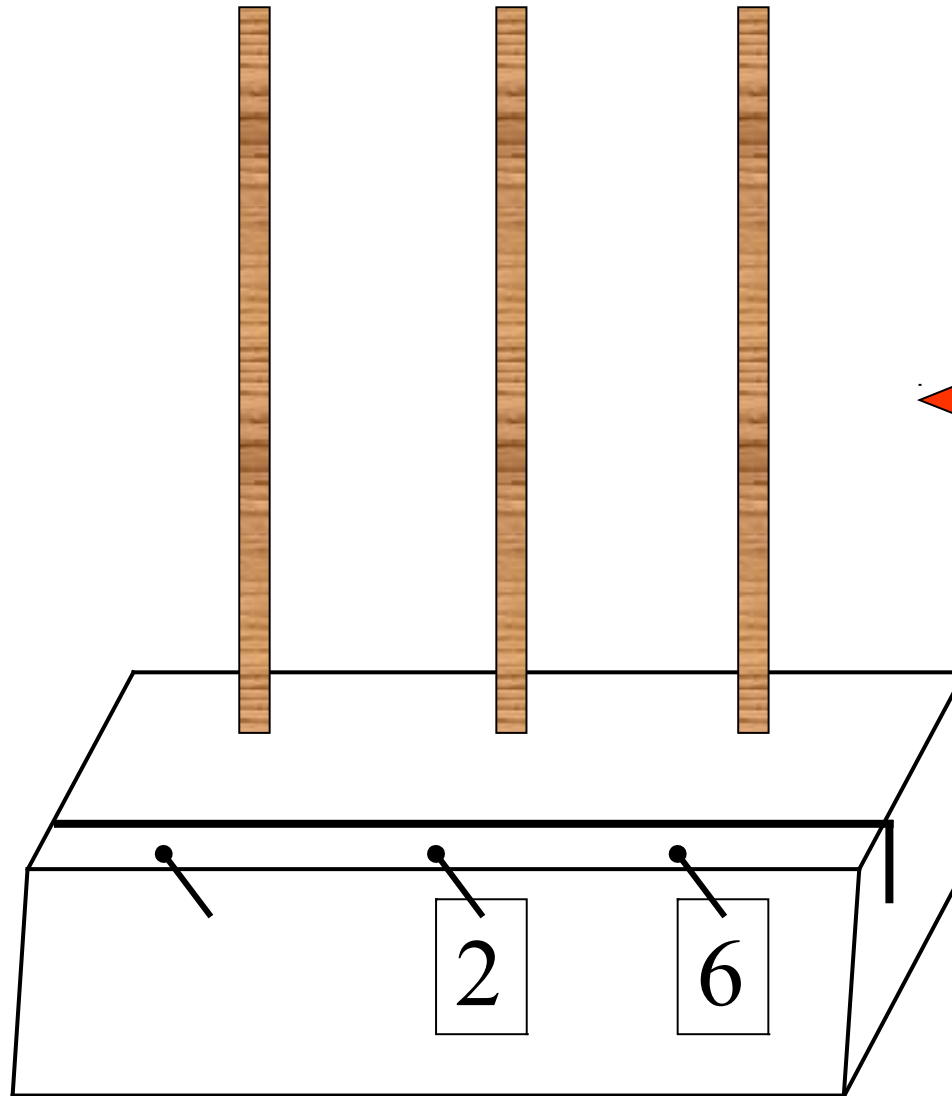
On montre...



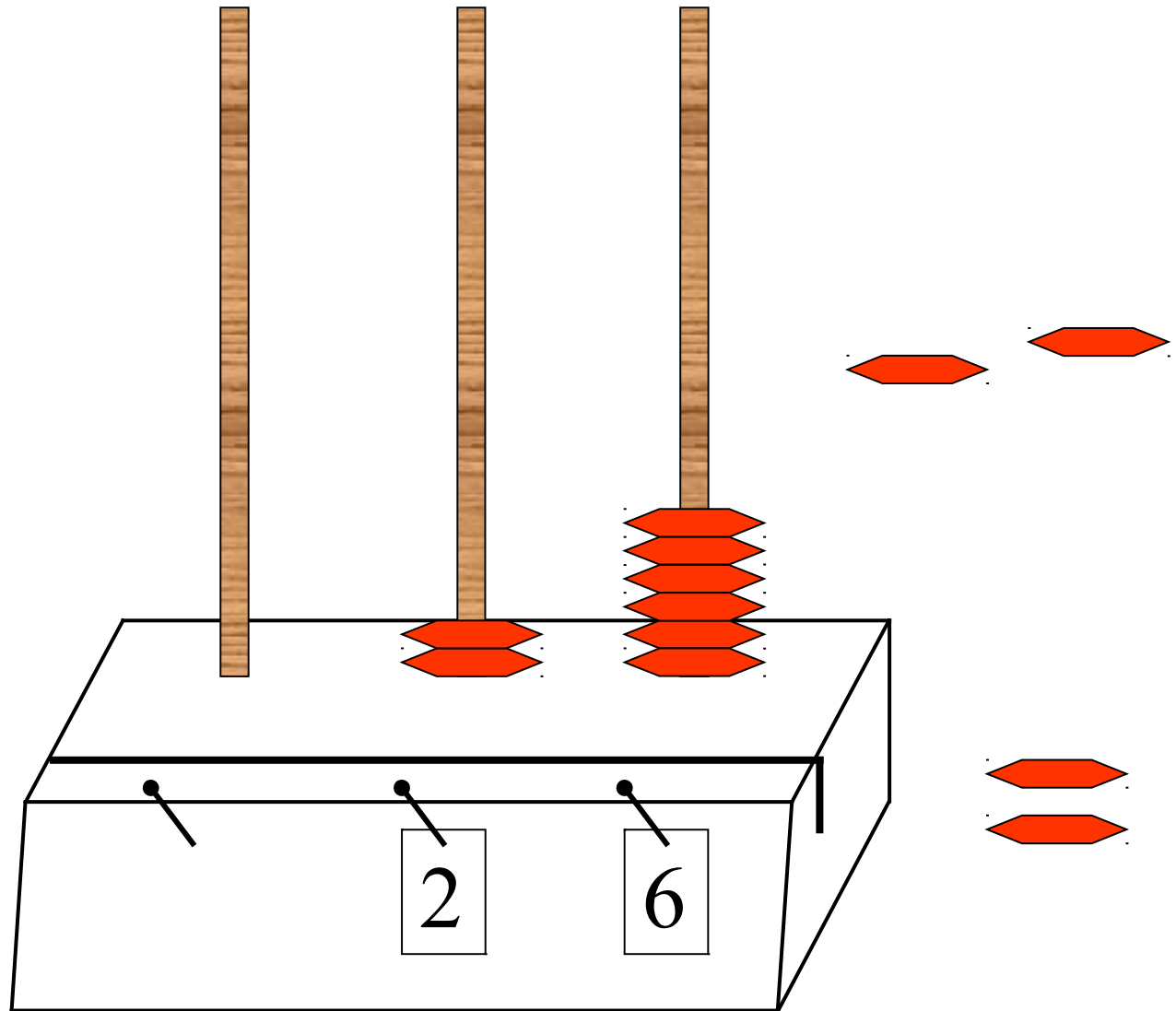
Appropriation empirique de l'abaque

L'enseignant écrit un nombre avec les étiquettes.

Les élèves doivent l'écrire avec les jetons sur l'abaque.



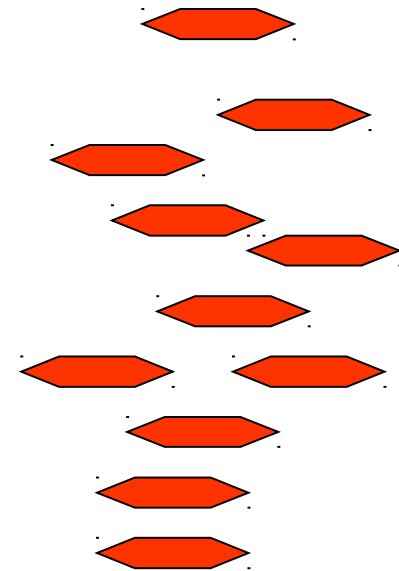
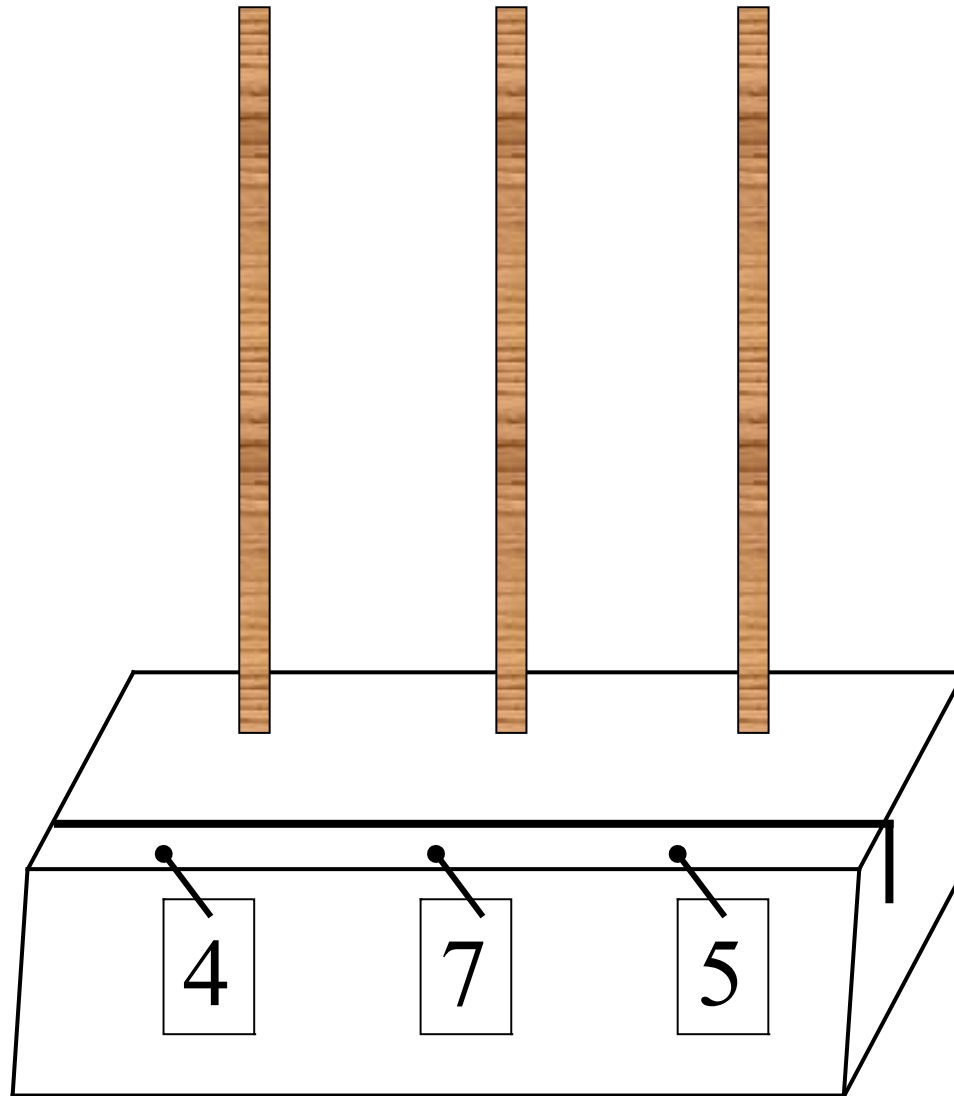
Appropriation empirique de l'abaque



Appropriation empirique de l'abaque

L'enseignant écrit un nombre avec les étiquettes.

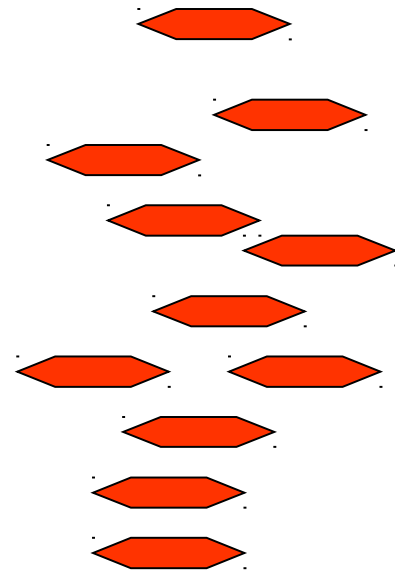
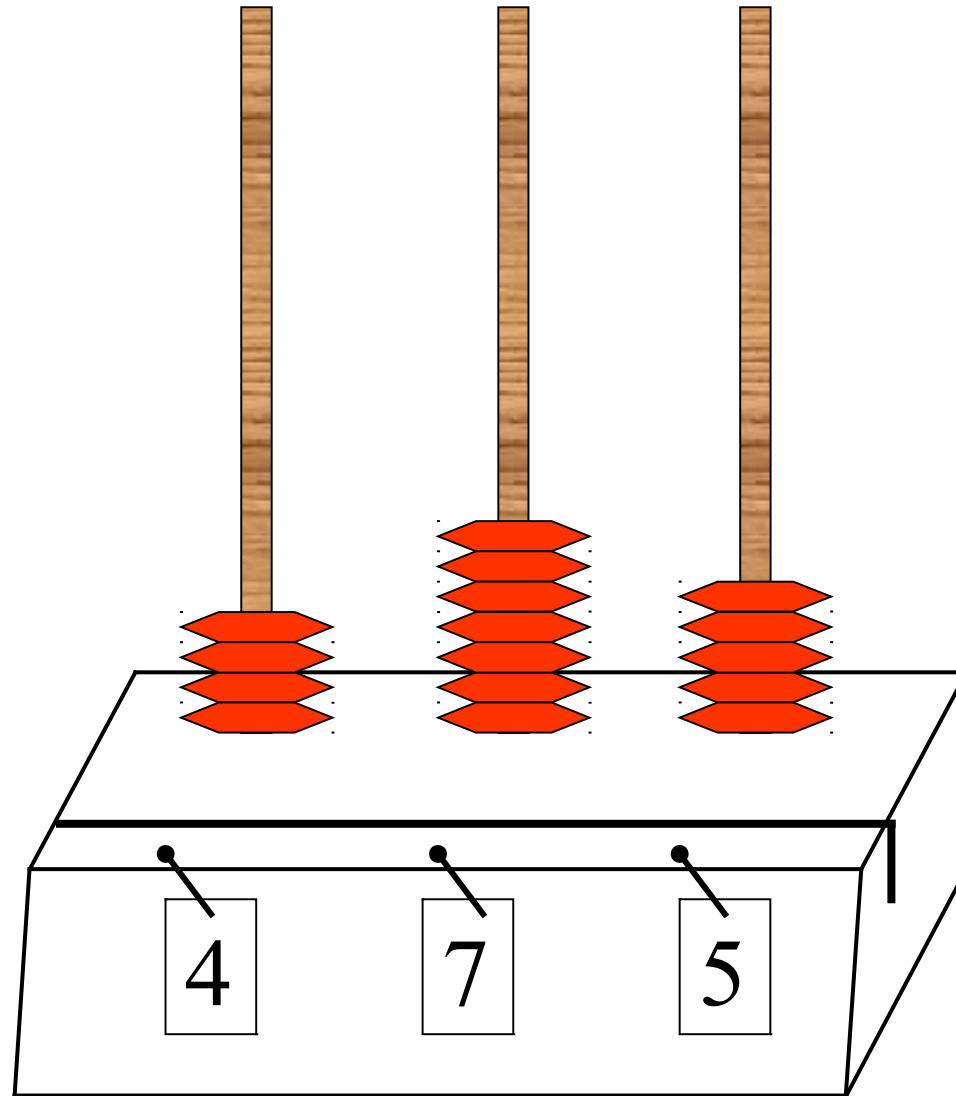
Les élèves doivent l'écrire avec les jetons sur l'abaque.



Appropriation empirique de l'abaque

L'enseignant écrit un nombre avec les étiquettes.

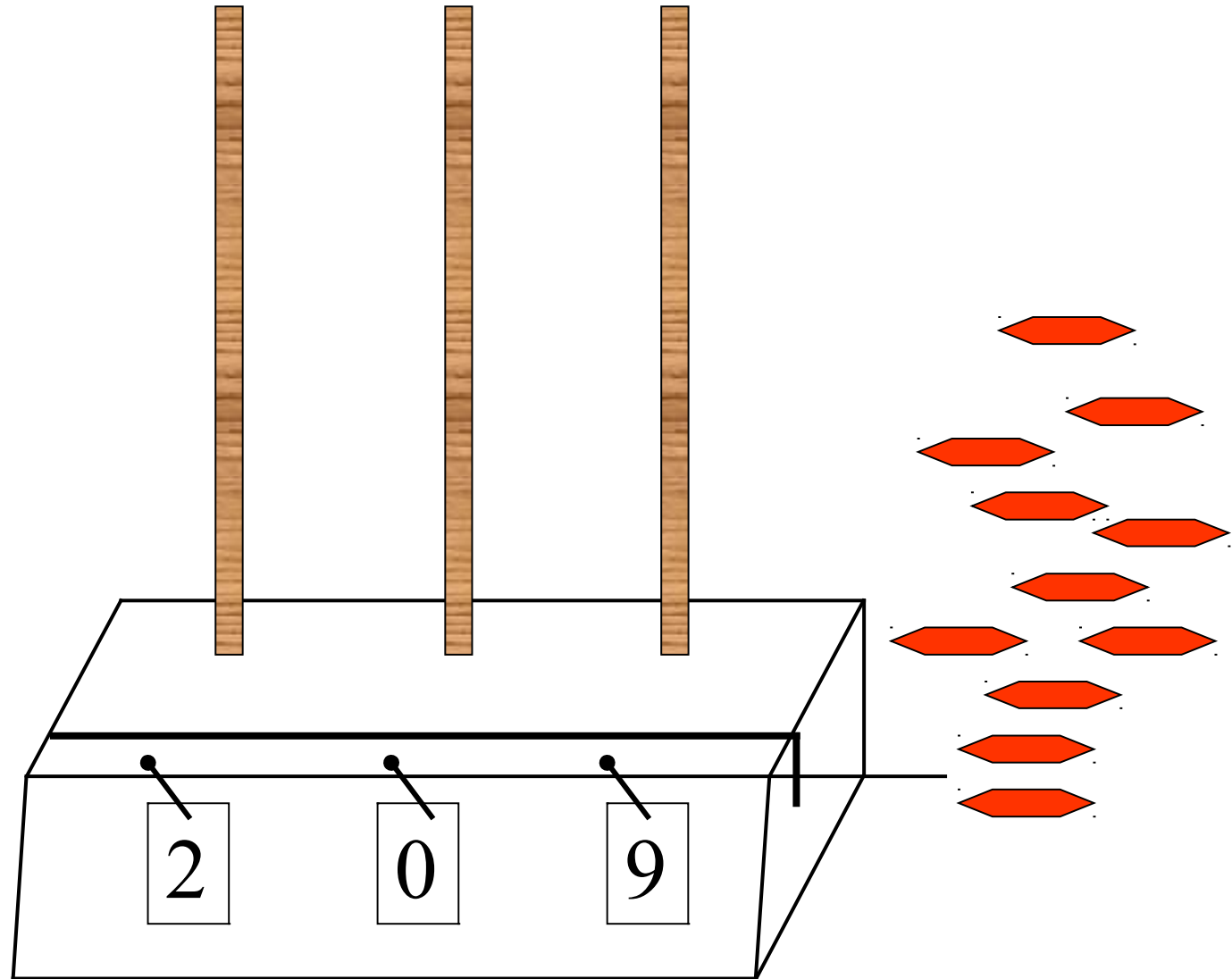
Les élèves doivent l'écrire avec les jetons sur l'abaque.



Appropriation empirique de l'abaque

L'enseignant écrit un nombre avec les étiquettes.

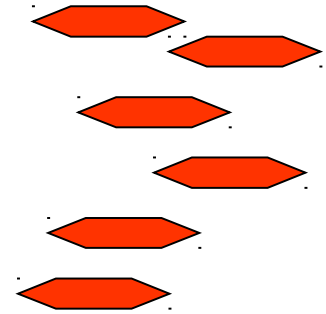
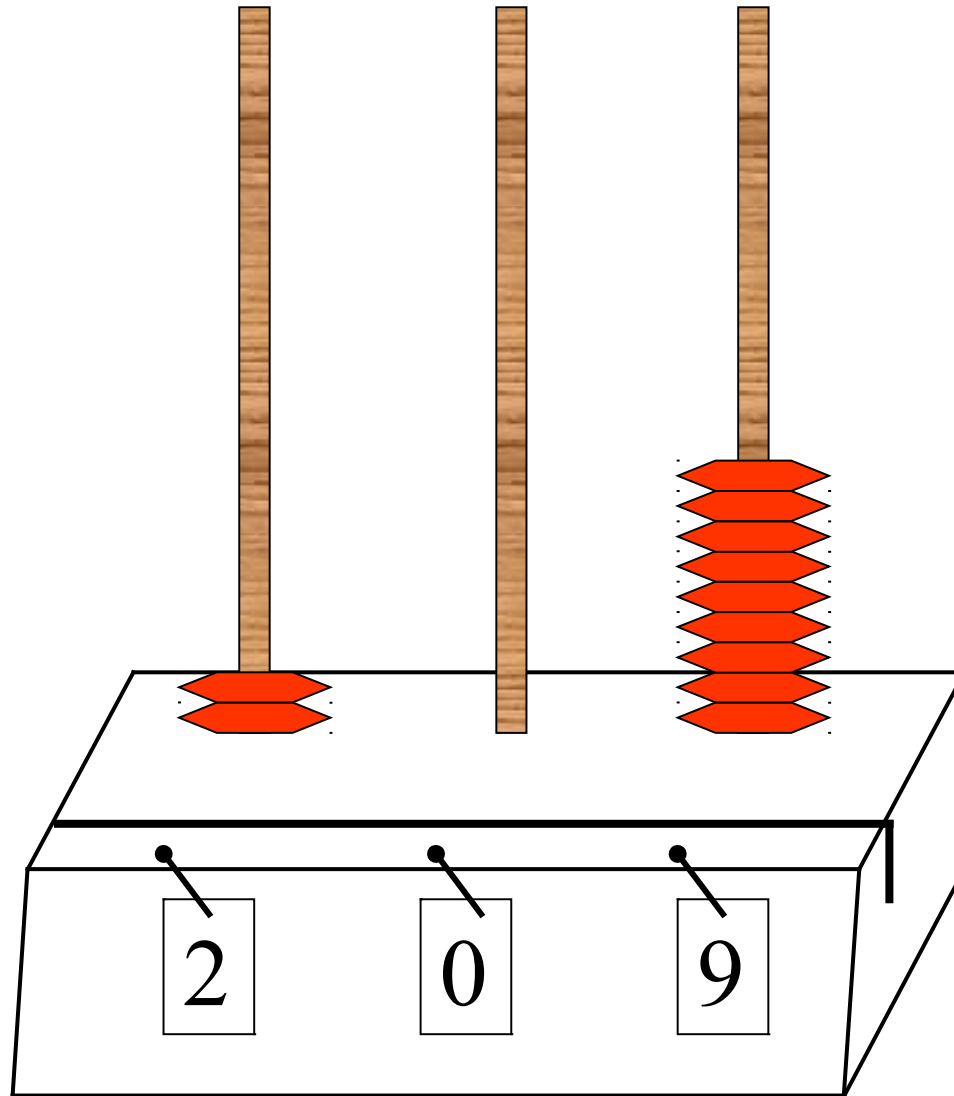
Les élèves doivent l'écrire avec les jetons sur l'abaque.



Appropriation empirique de l'abaque

L'enseignant écrit un nombre avec les étiquettes.

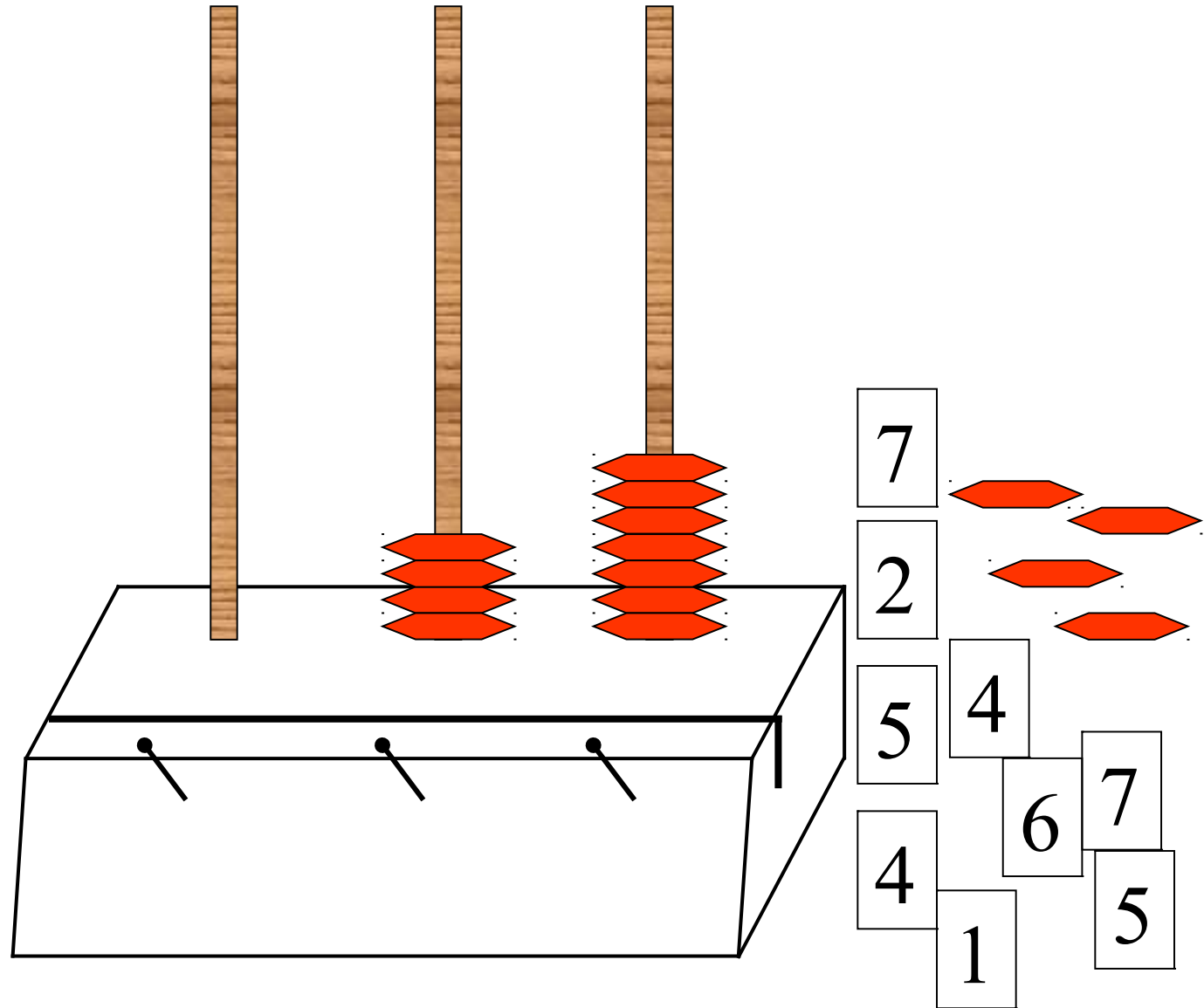
Les élèves doivent l'écrire avec les jetons sur l'abaque.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

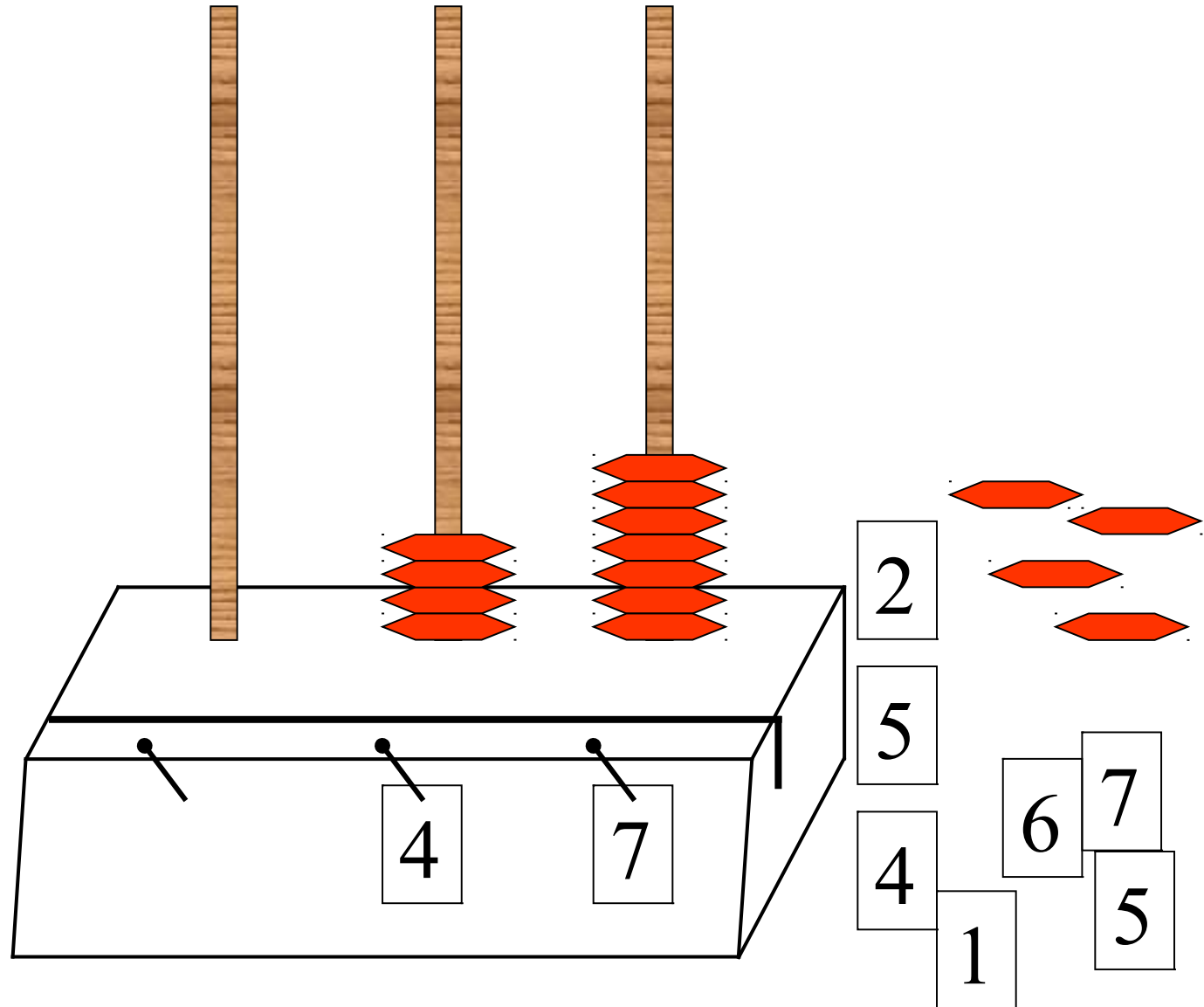
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

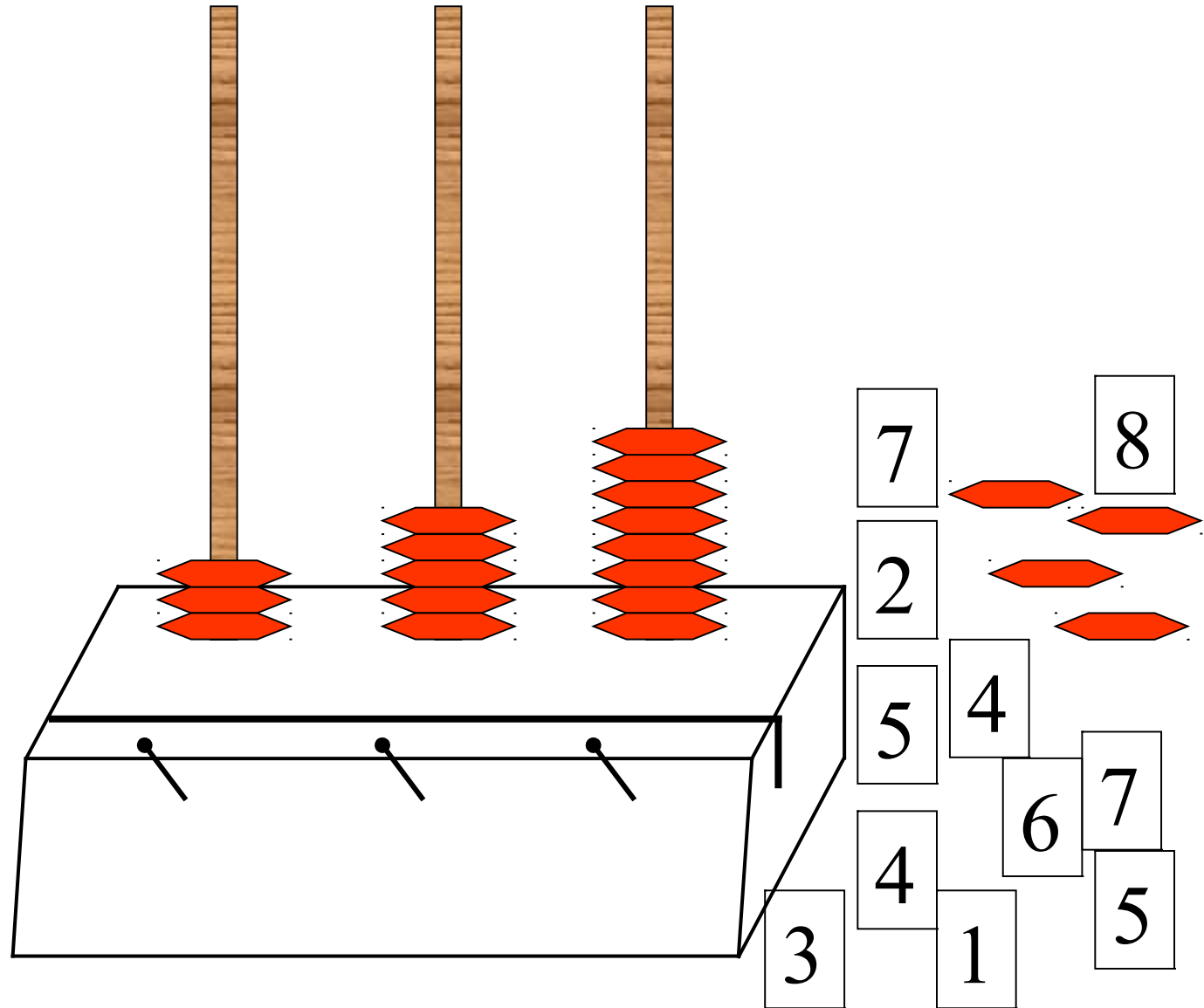
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

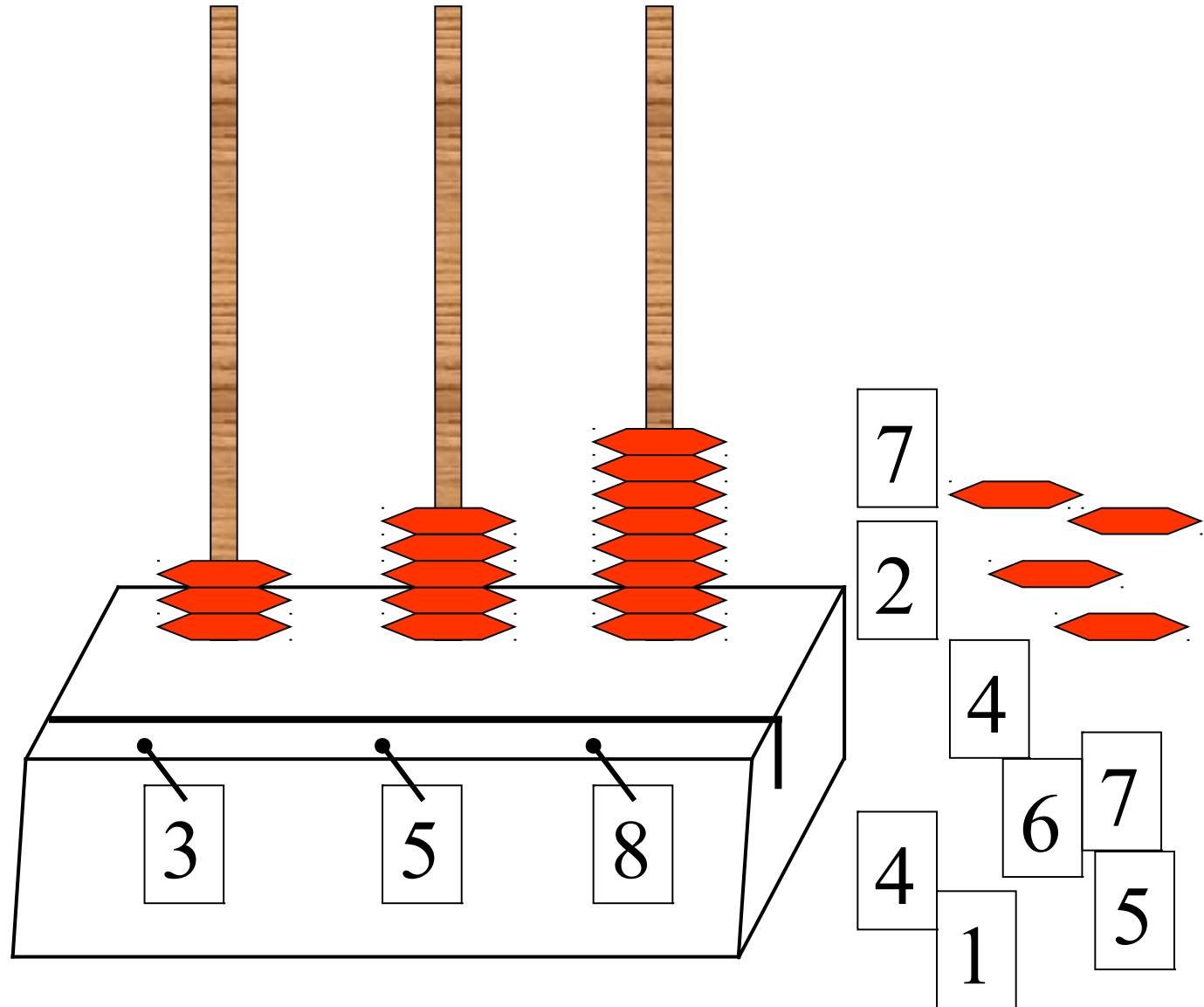
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

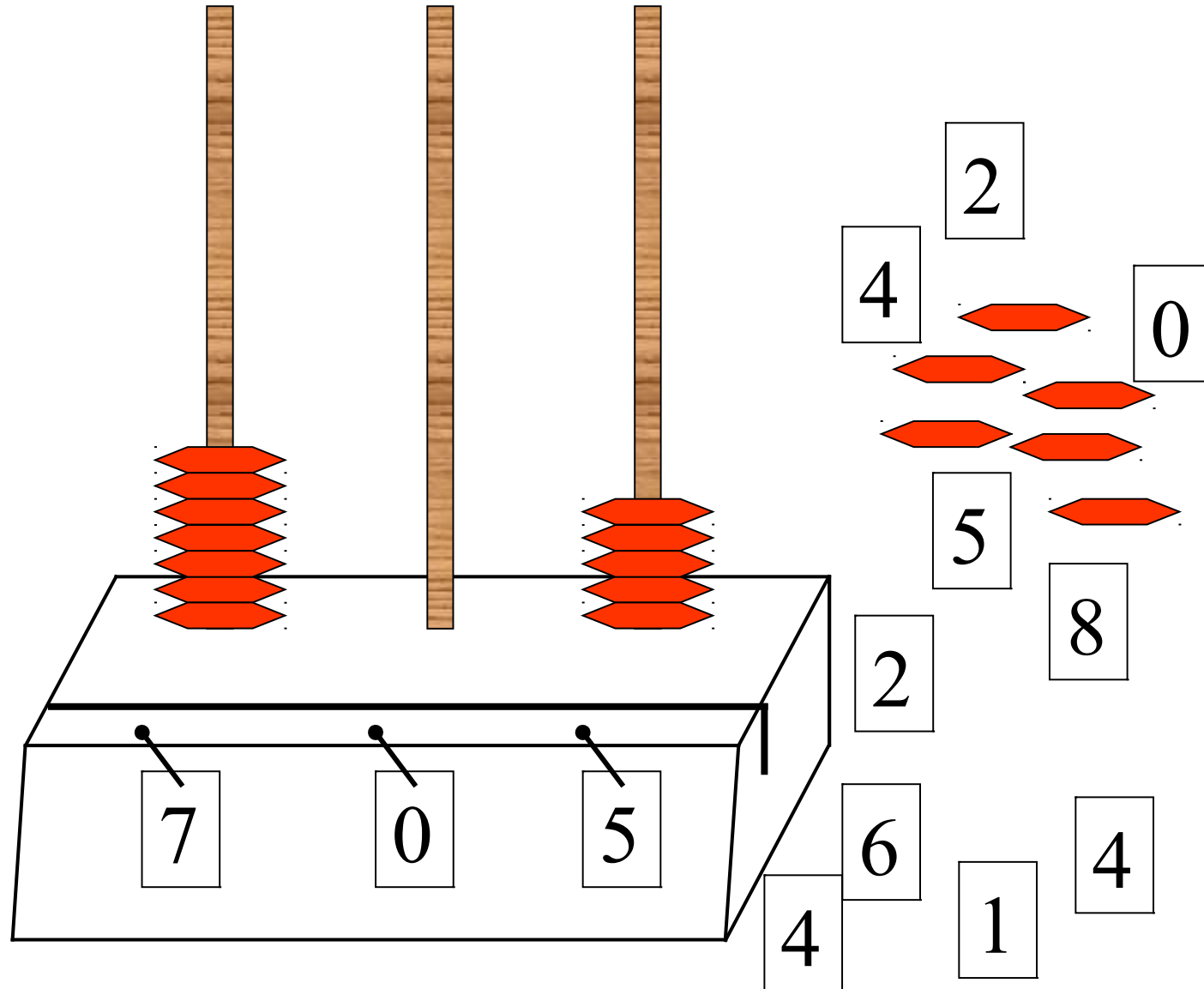
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

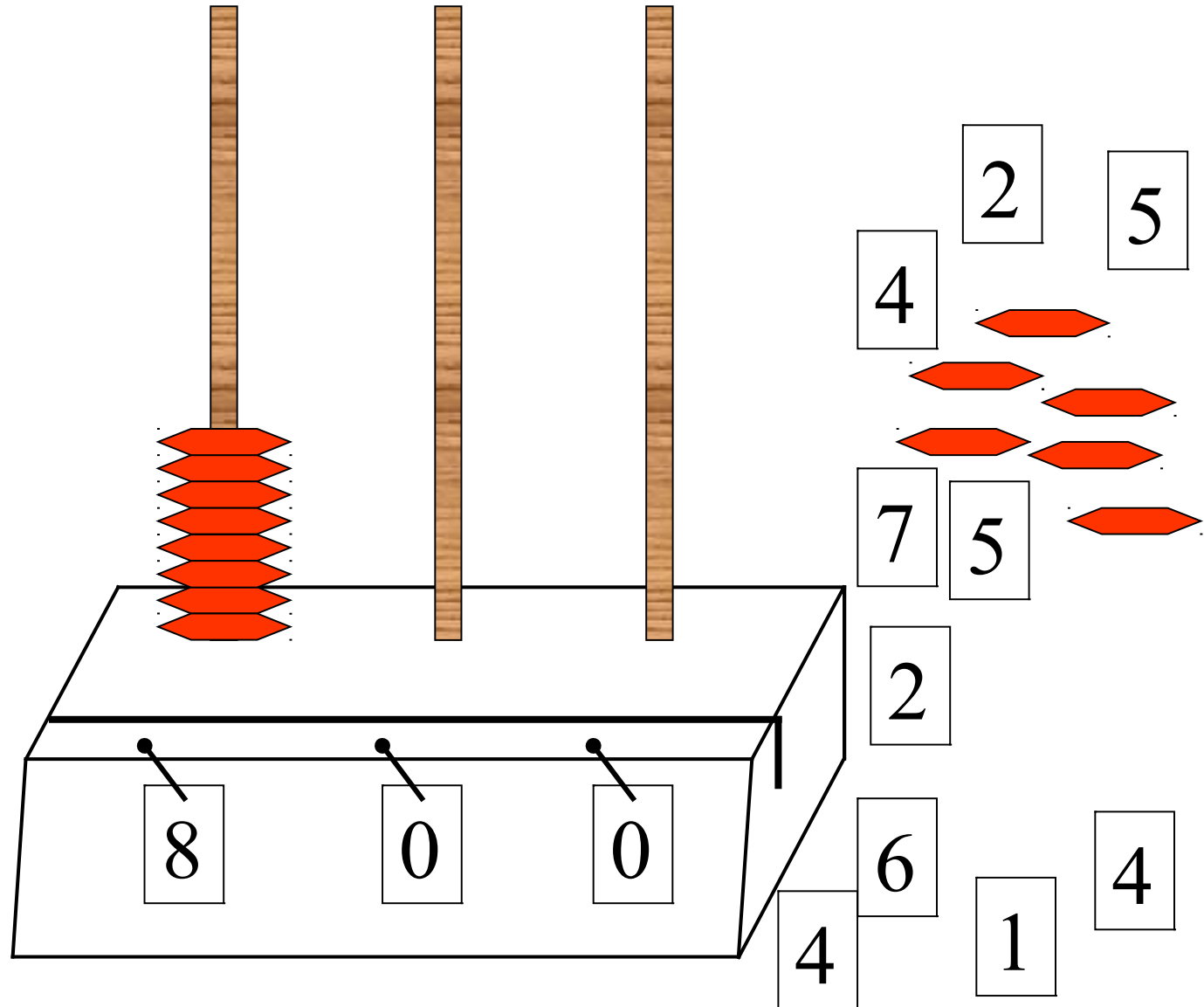
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.

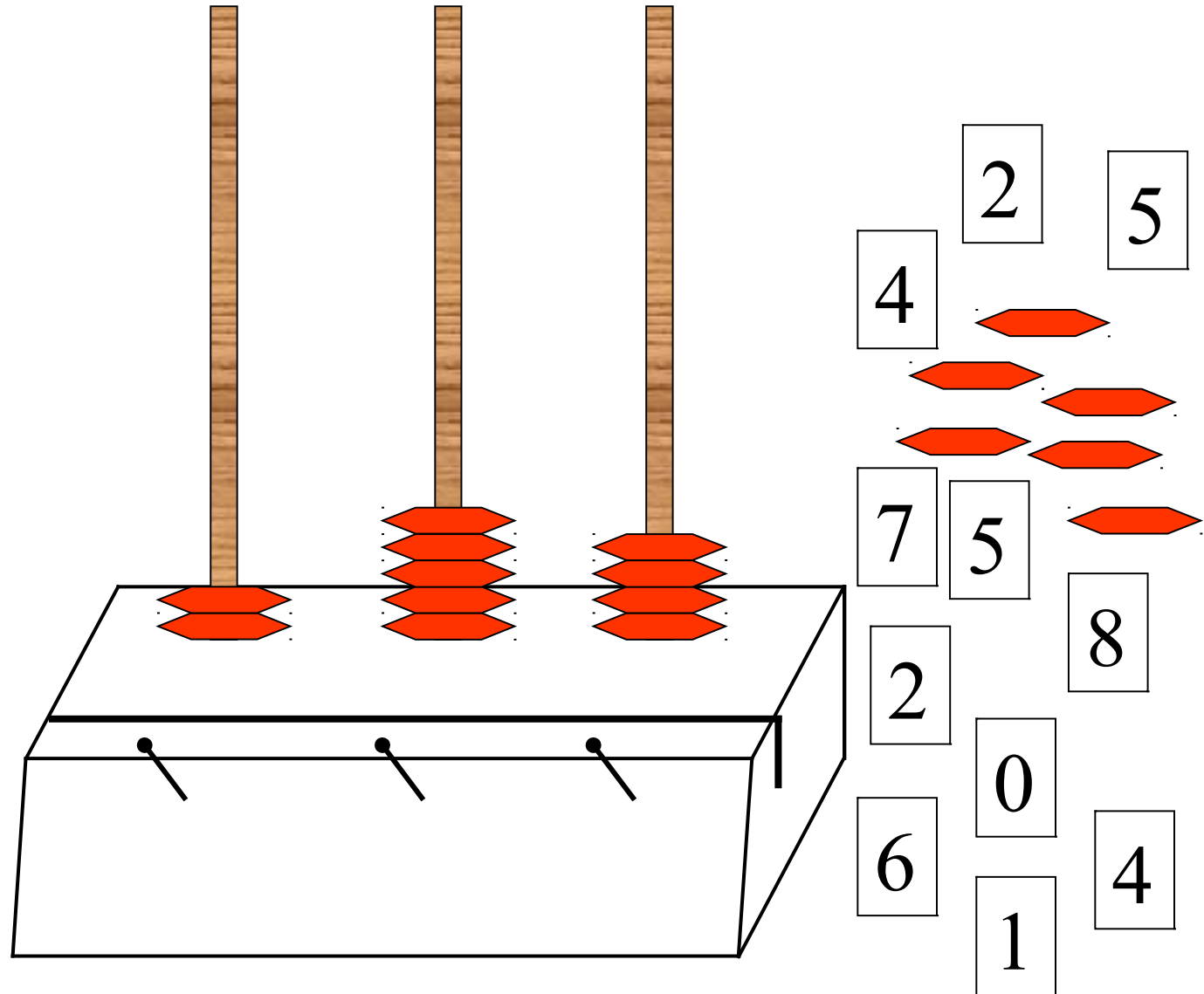
Les élèves doivent
l'écrire avec les
étiquettes.



Appropriation empirique de l'abaque

Réciproquement :
L'enseignant écrit
un nombre avec les
jetons sur abaque.
(4 tiges)

Les élèves doivent
l'écrire avec les
étiquettes.



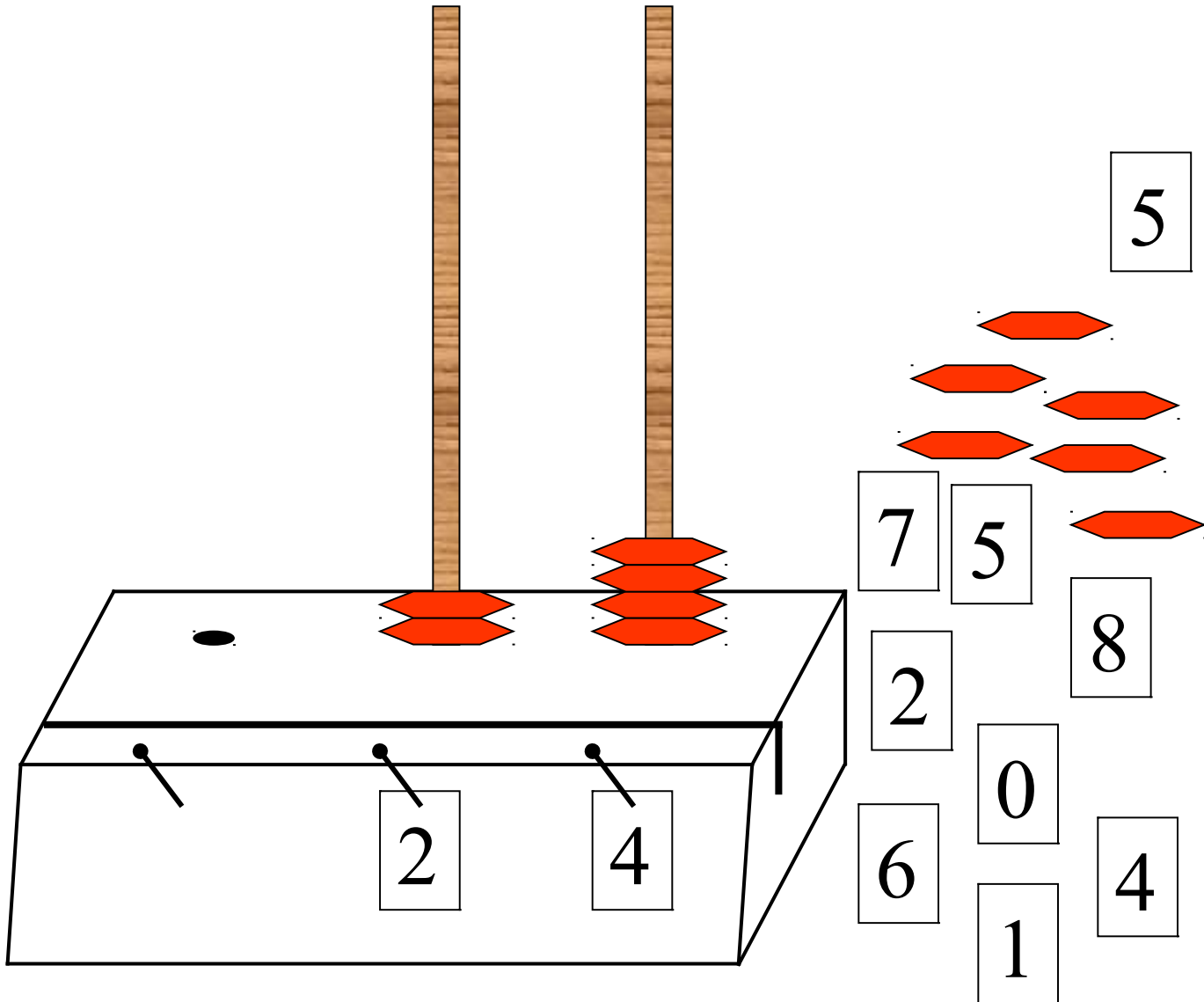
Temps 3

Compter sur l'abaque

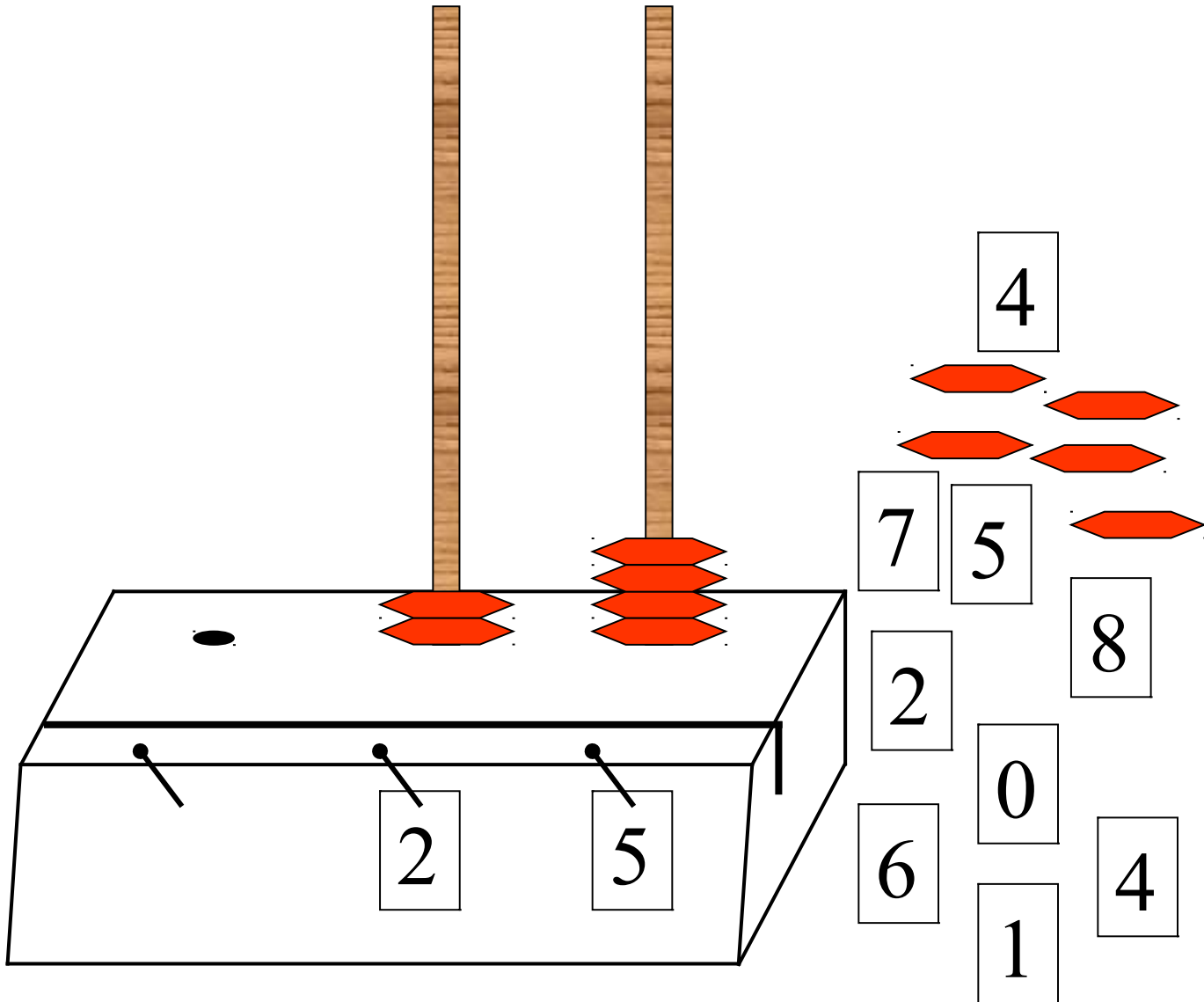
Sens direct et indirect

Compter sur l'abaque

On compte... on verbalise...
Faire...dire...
représenter..

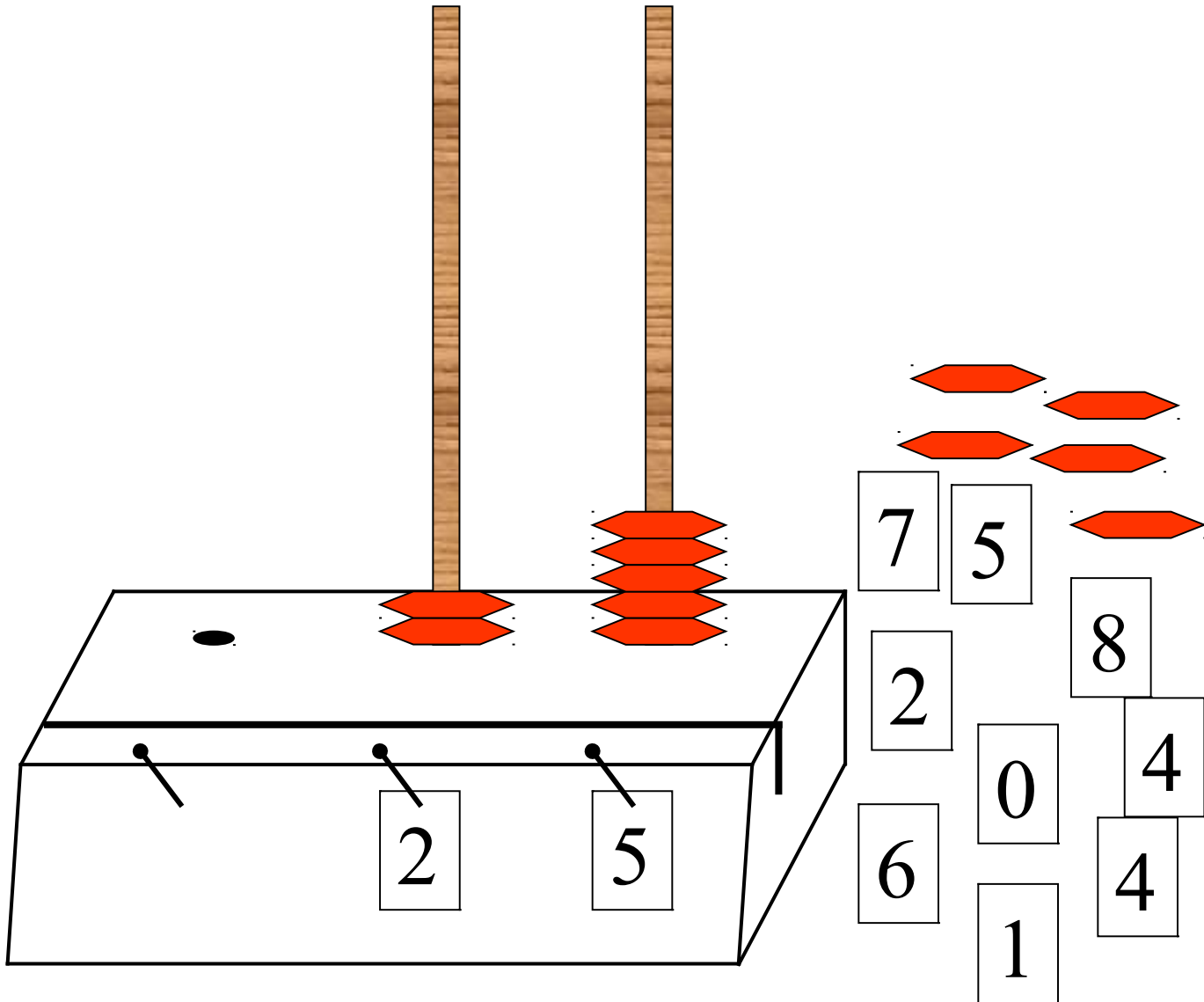


Compter sur l'abaque



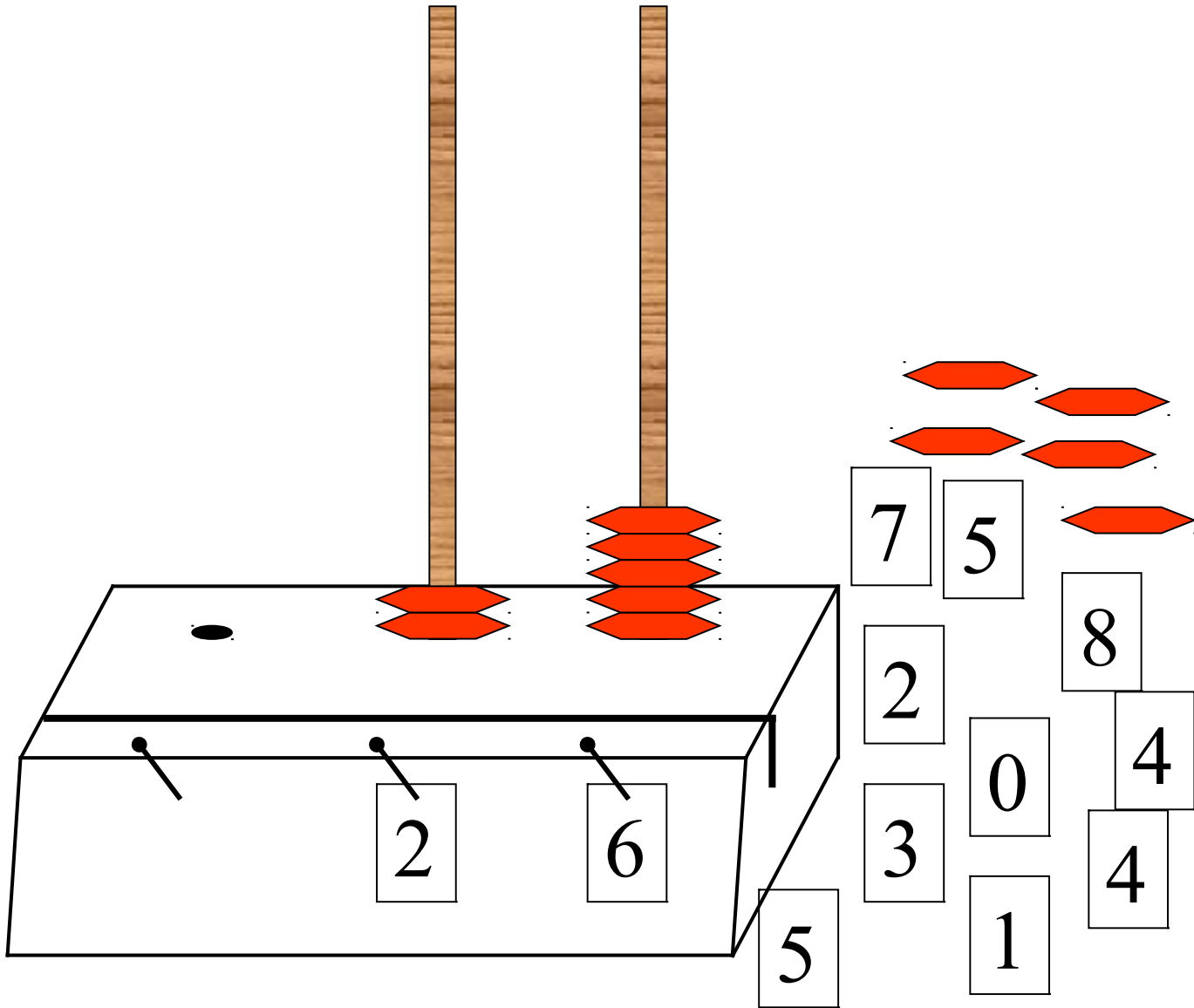
Compter sur l'abaque

On compte... on verbalise...
Faire...dire...
représenter..



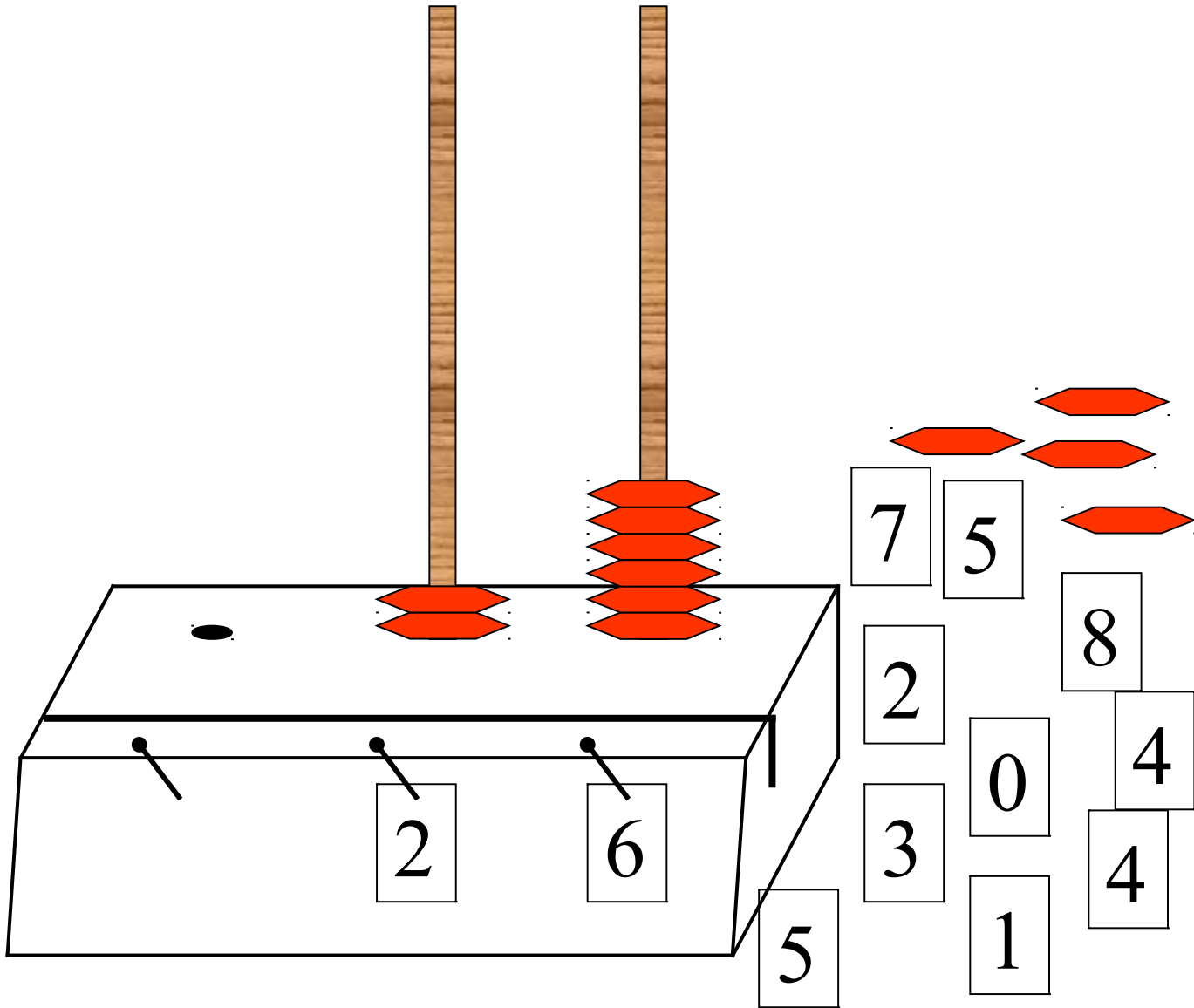
Compter sur l'abaque

On compte... on verbalise...
Faire...dire...
représenter..



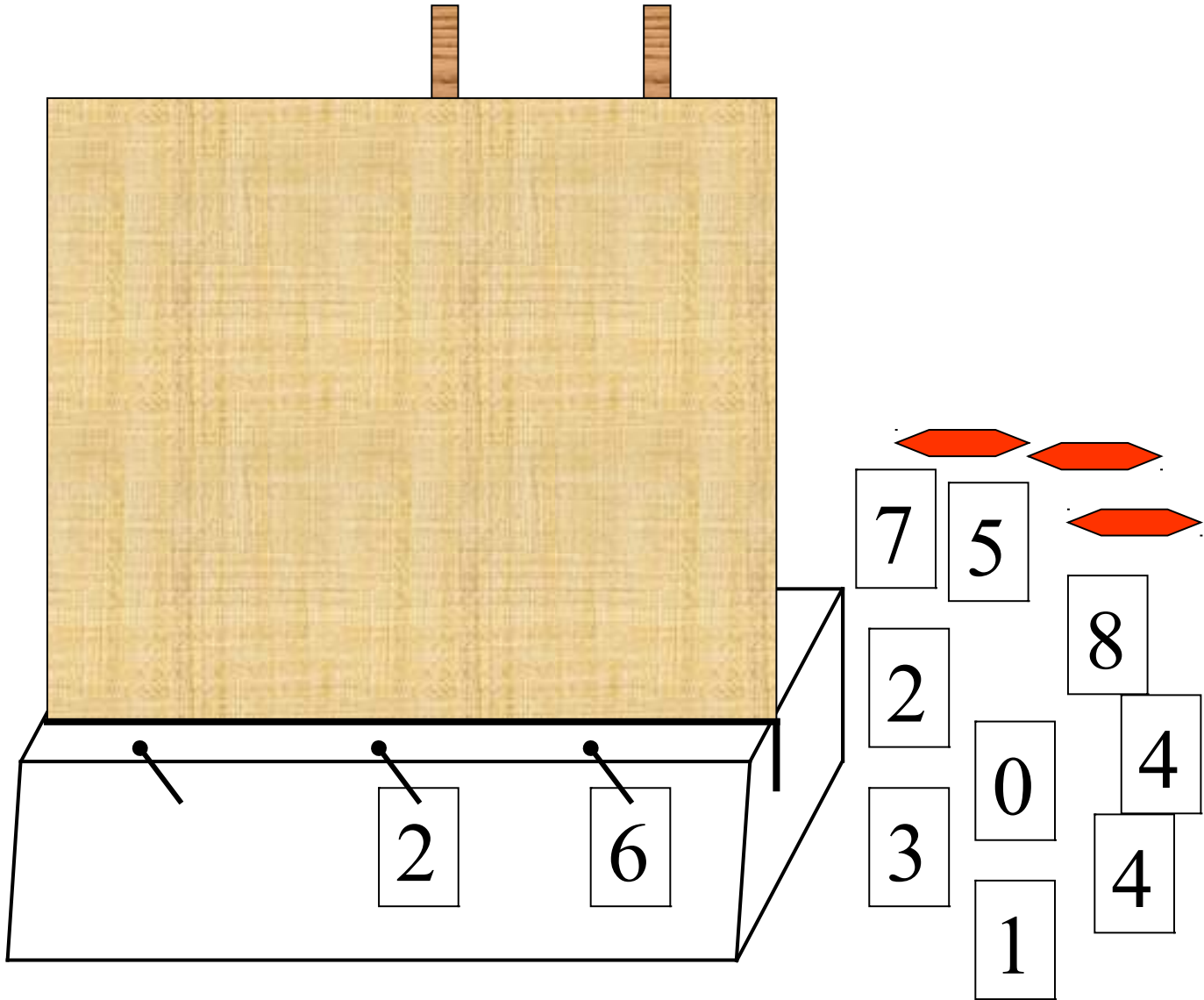
Compter sur l'abaque

On compte... on verbalise...
Faire...dire...
représenter..

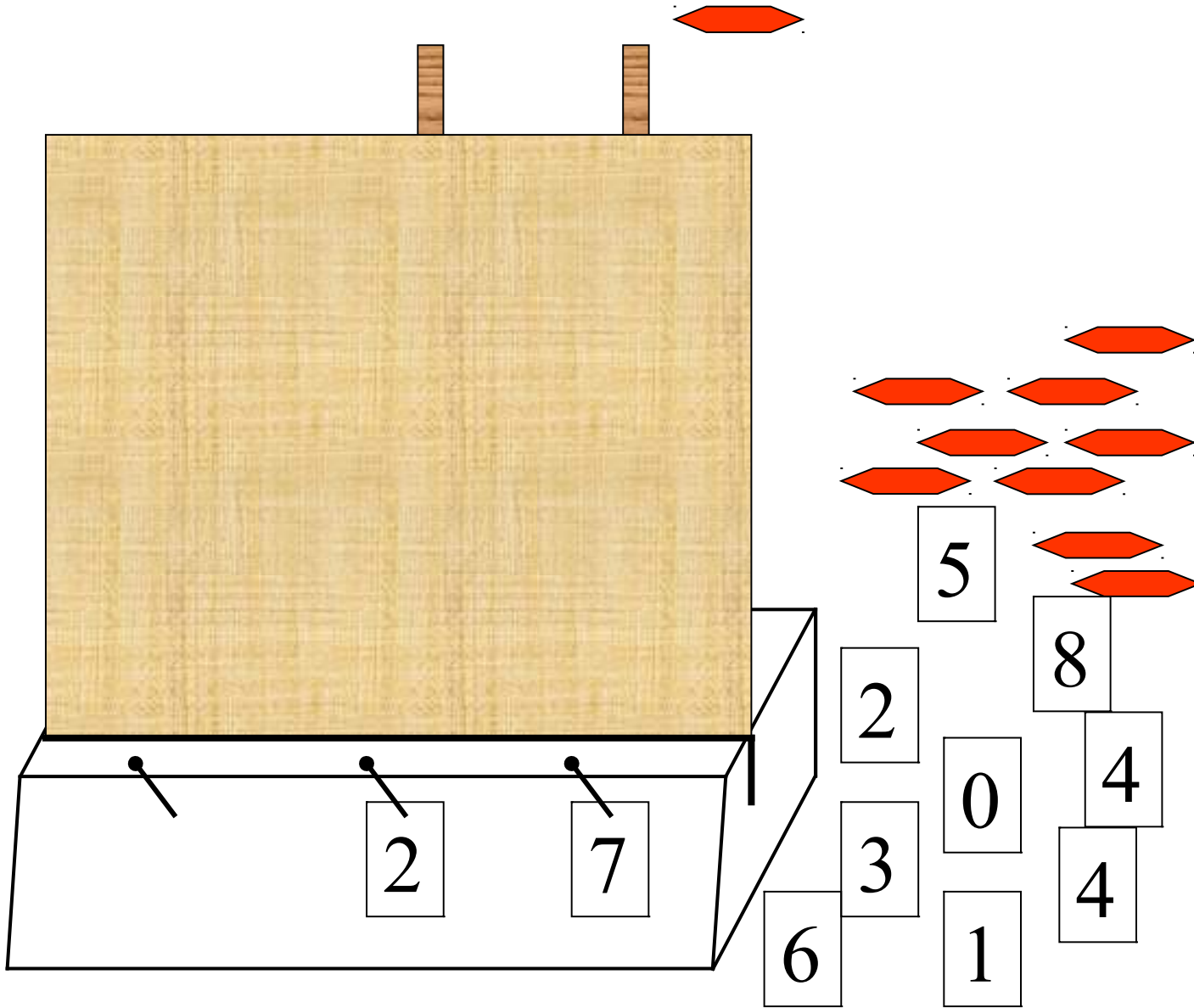


Compter sur l'abaque

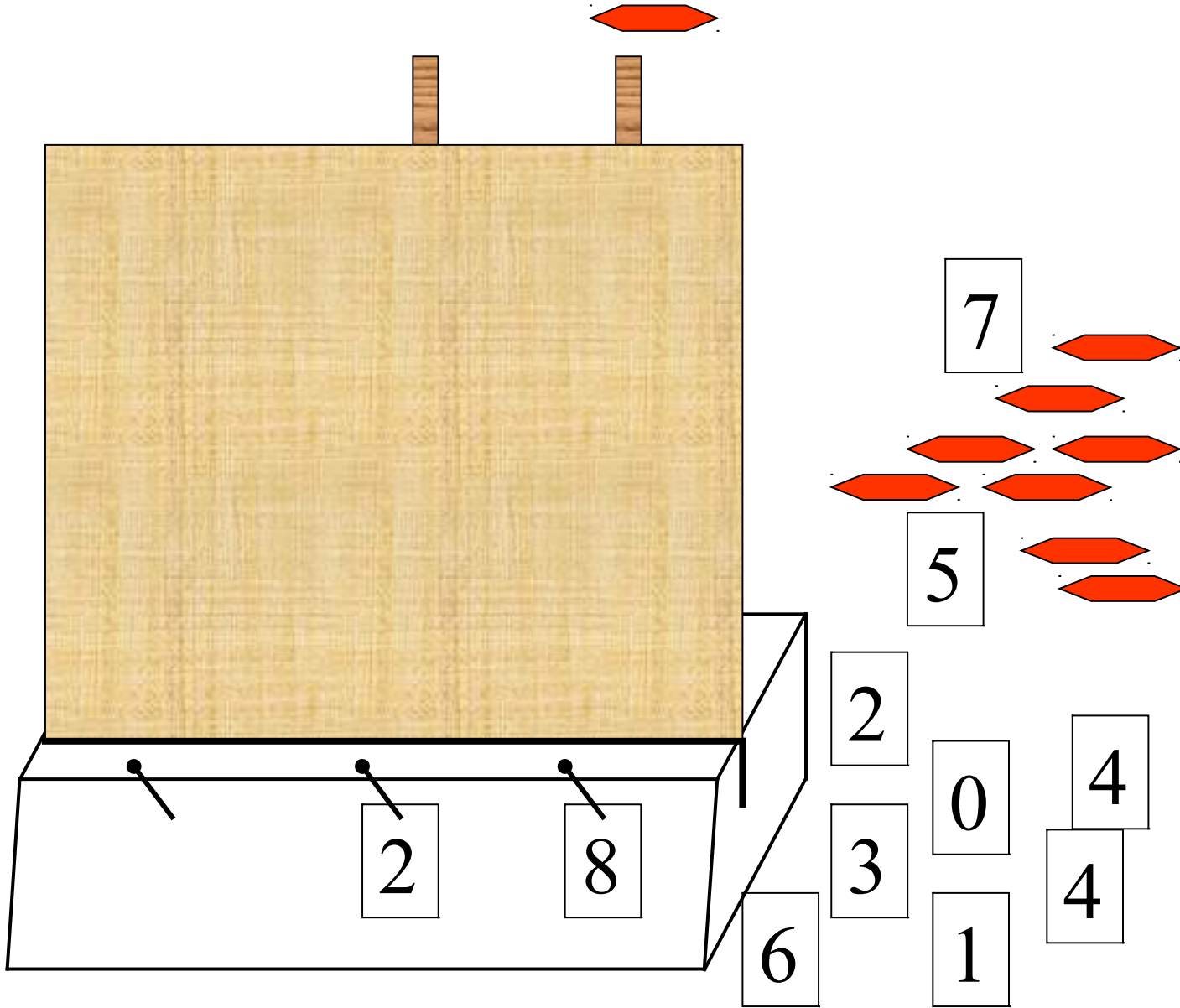
Travail en aveugle



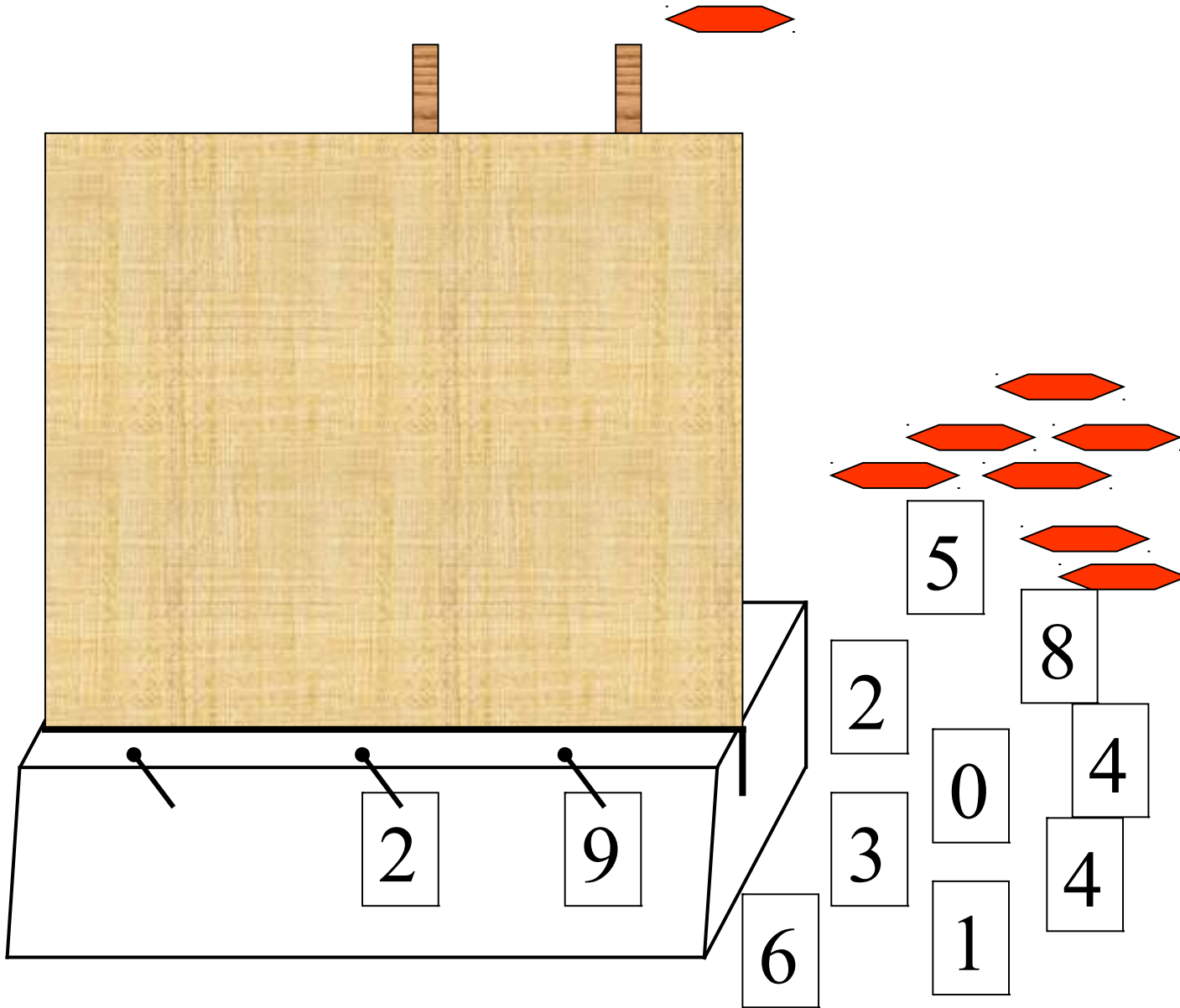
Compter sur l'abaque



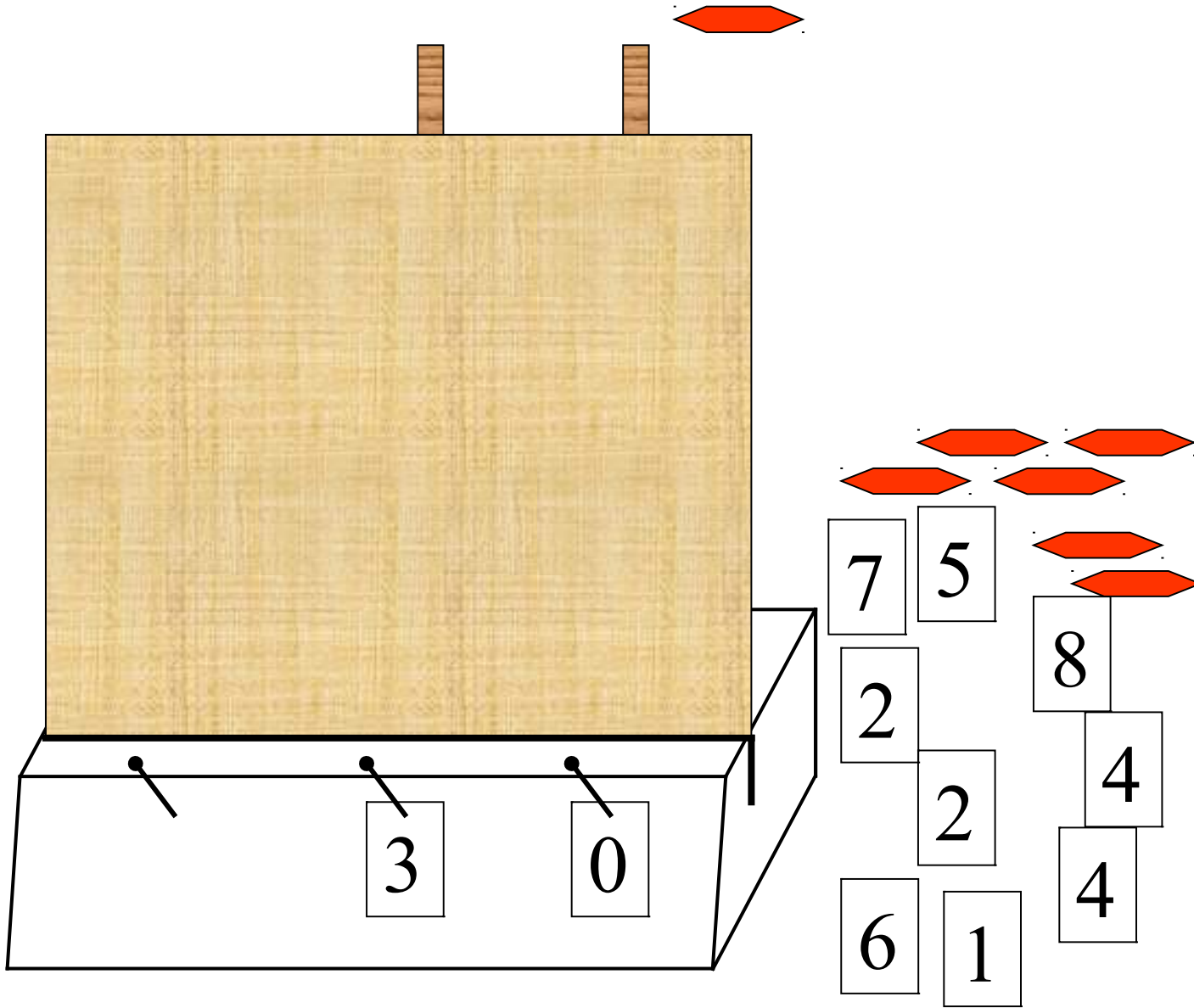
Compter sur l'abaque



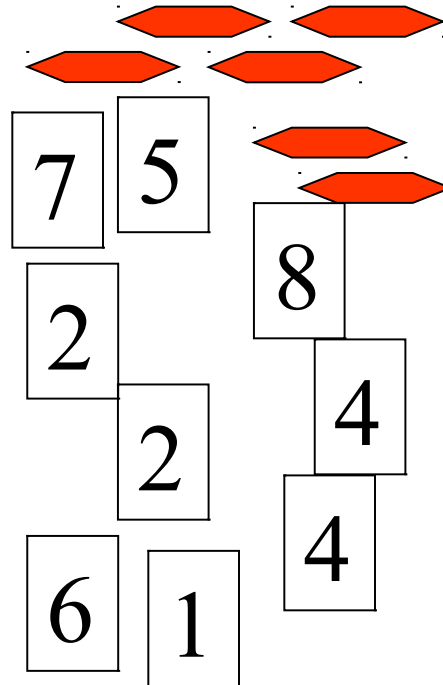
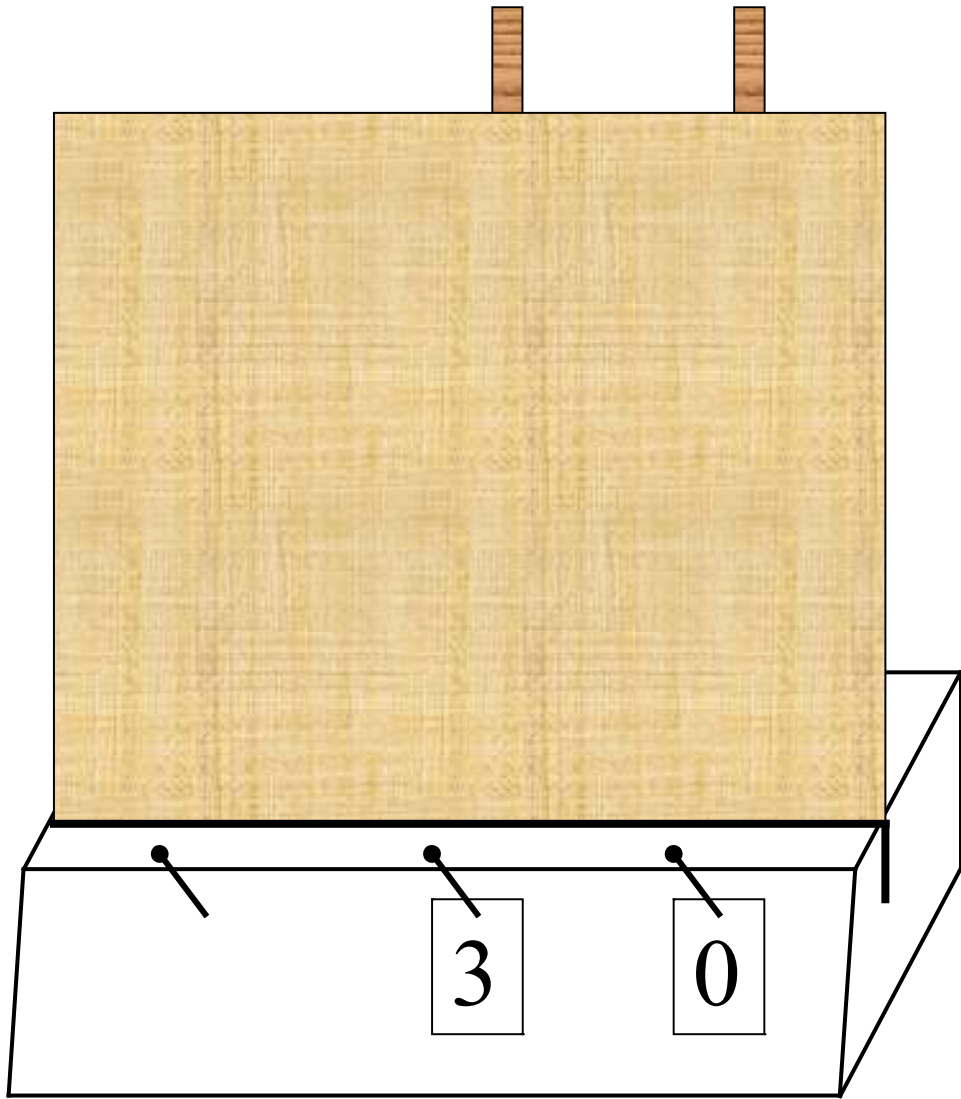
Compter sur l'abaque



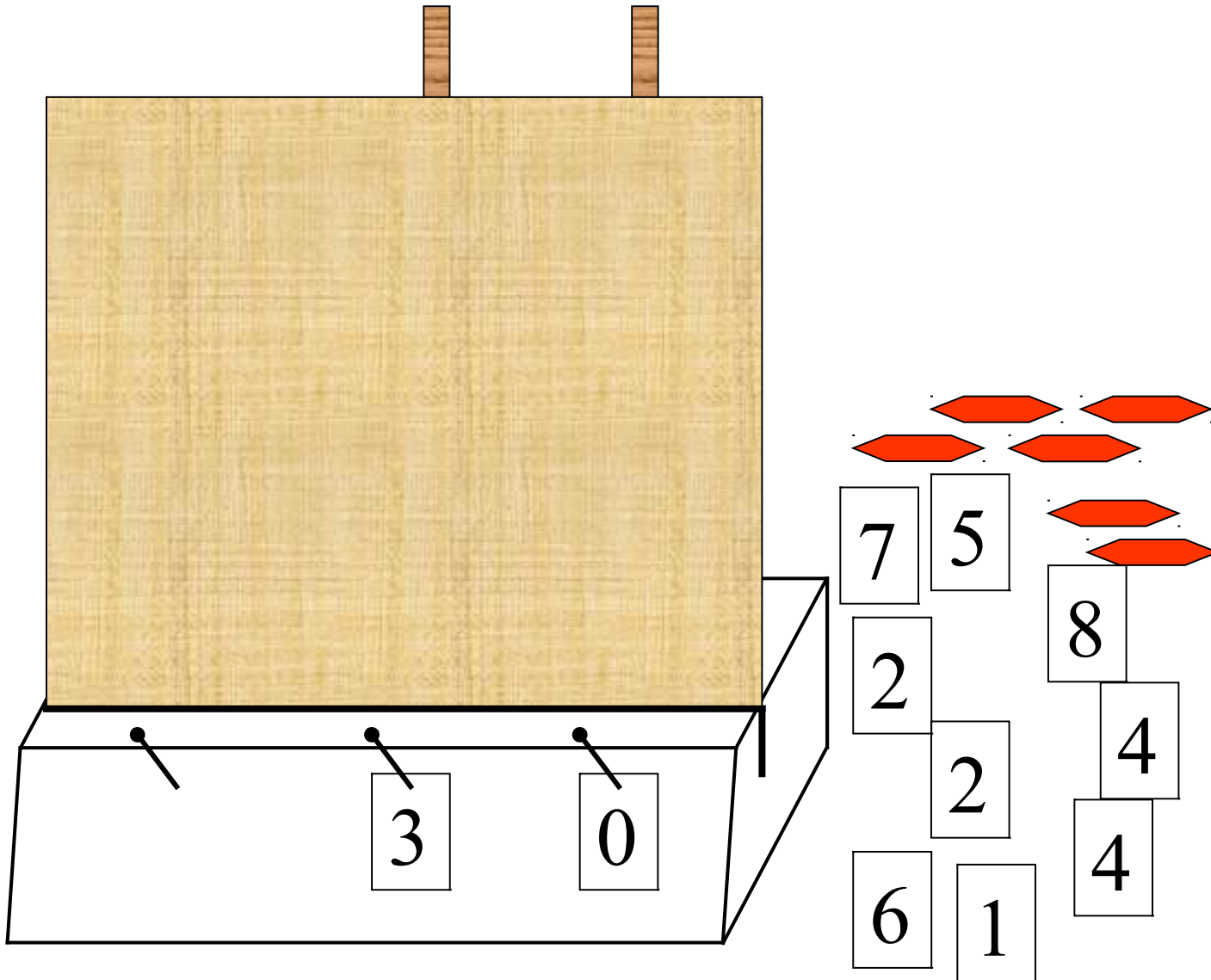
Compter sur l'abaque



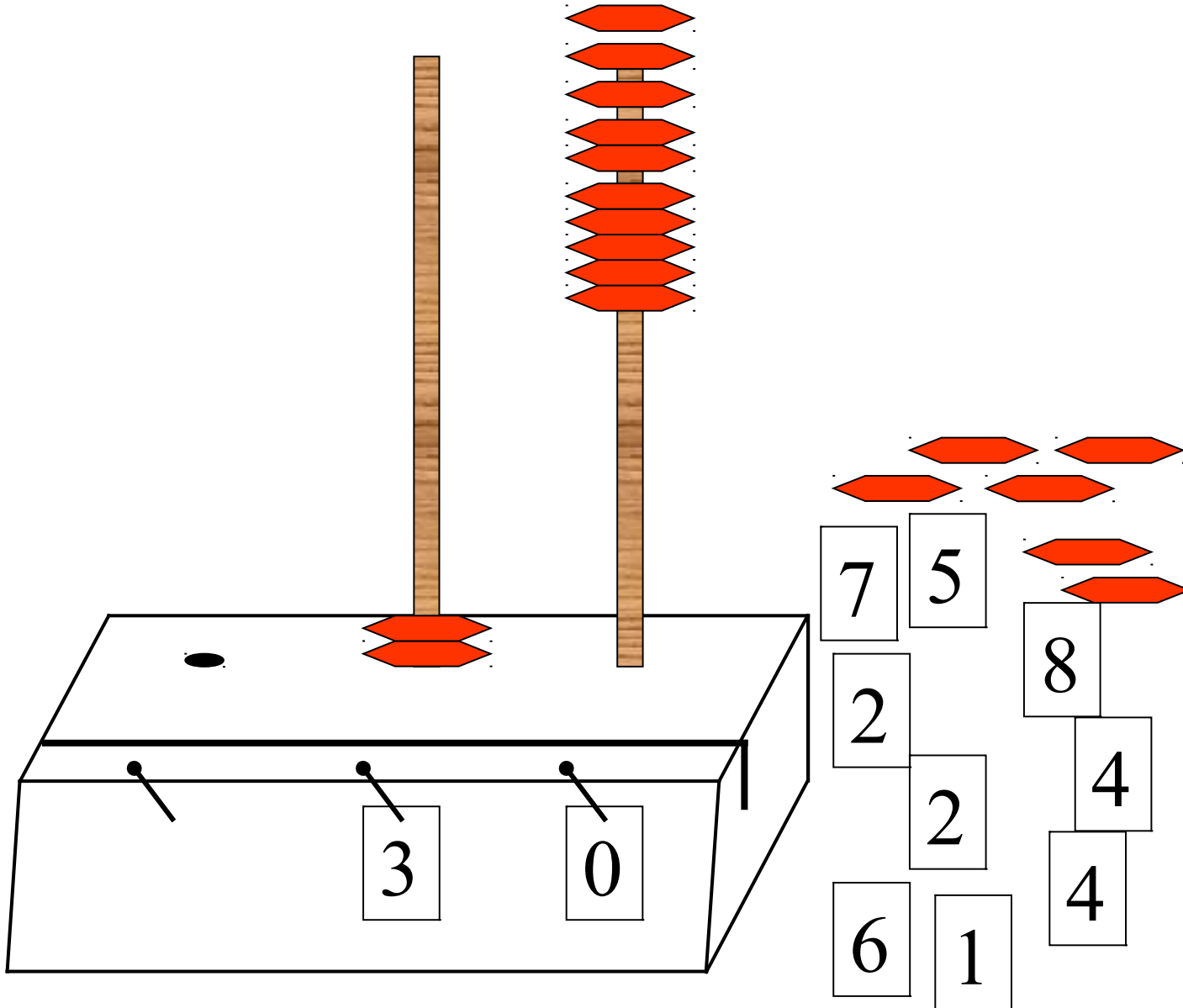
Compter sur l'abaque



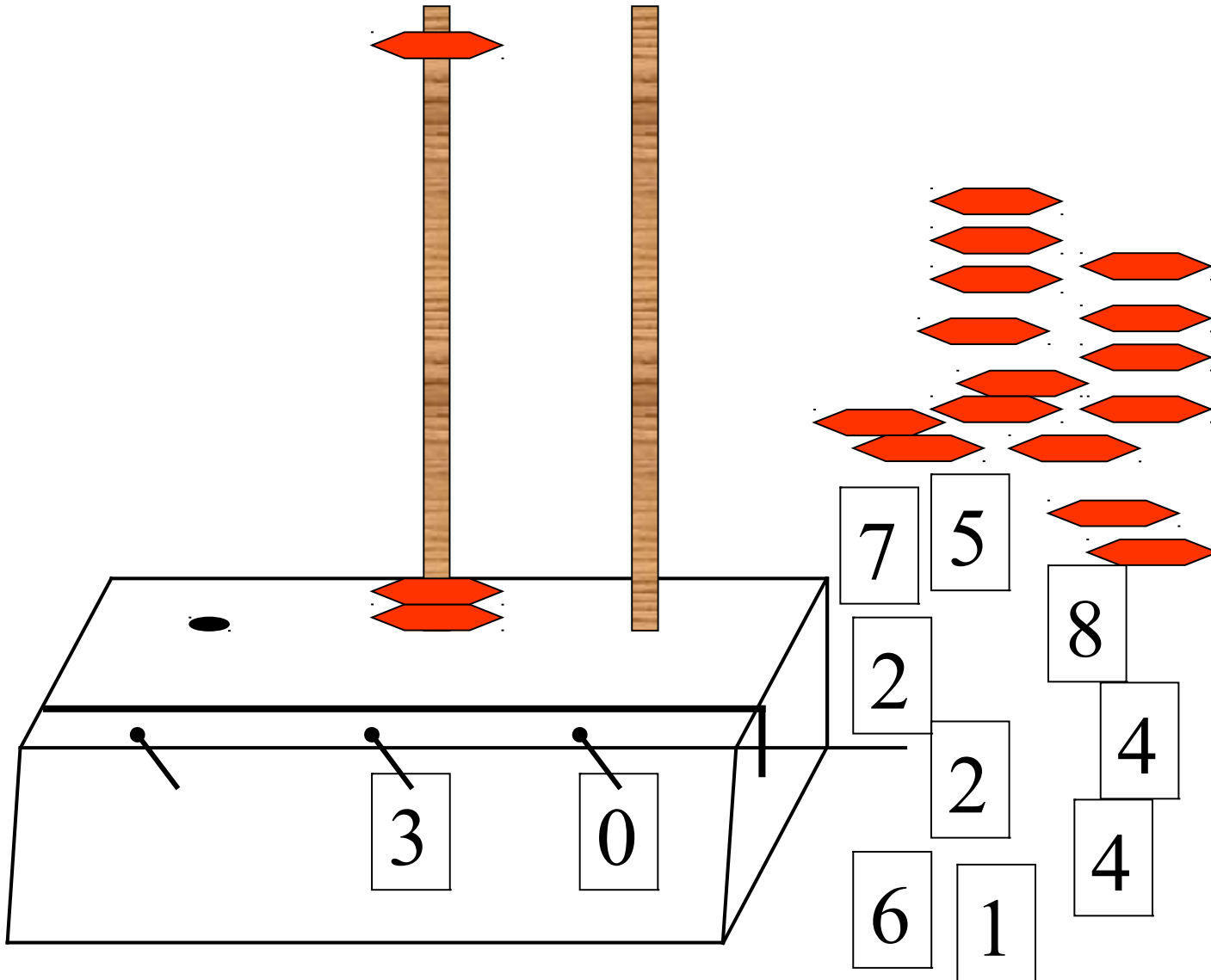
Compter sur l'abaque



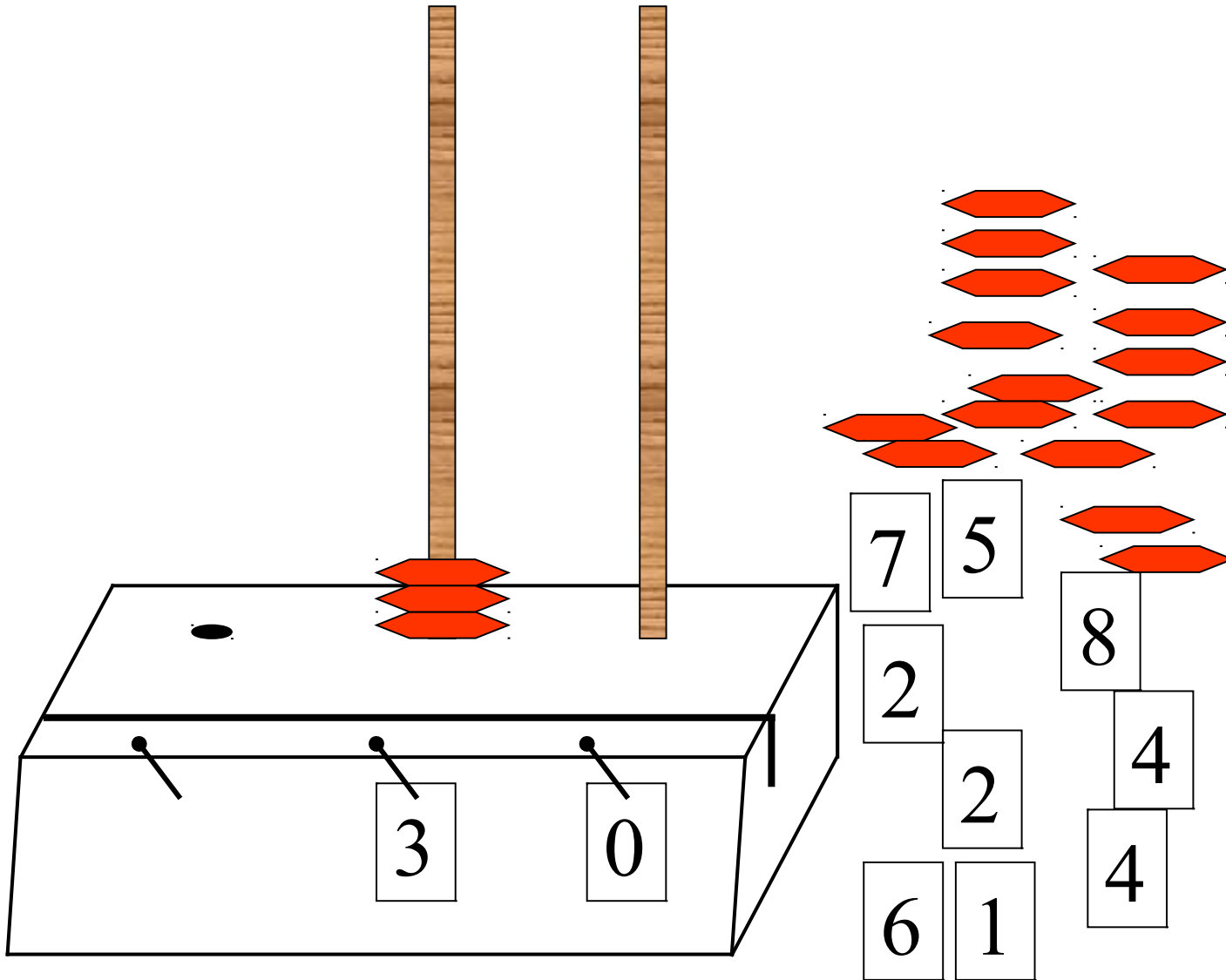
Compter sur l'abaque



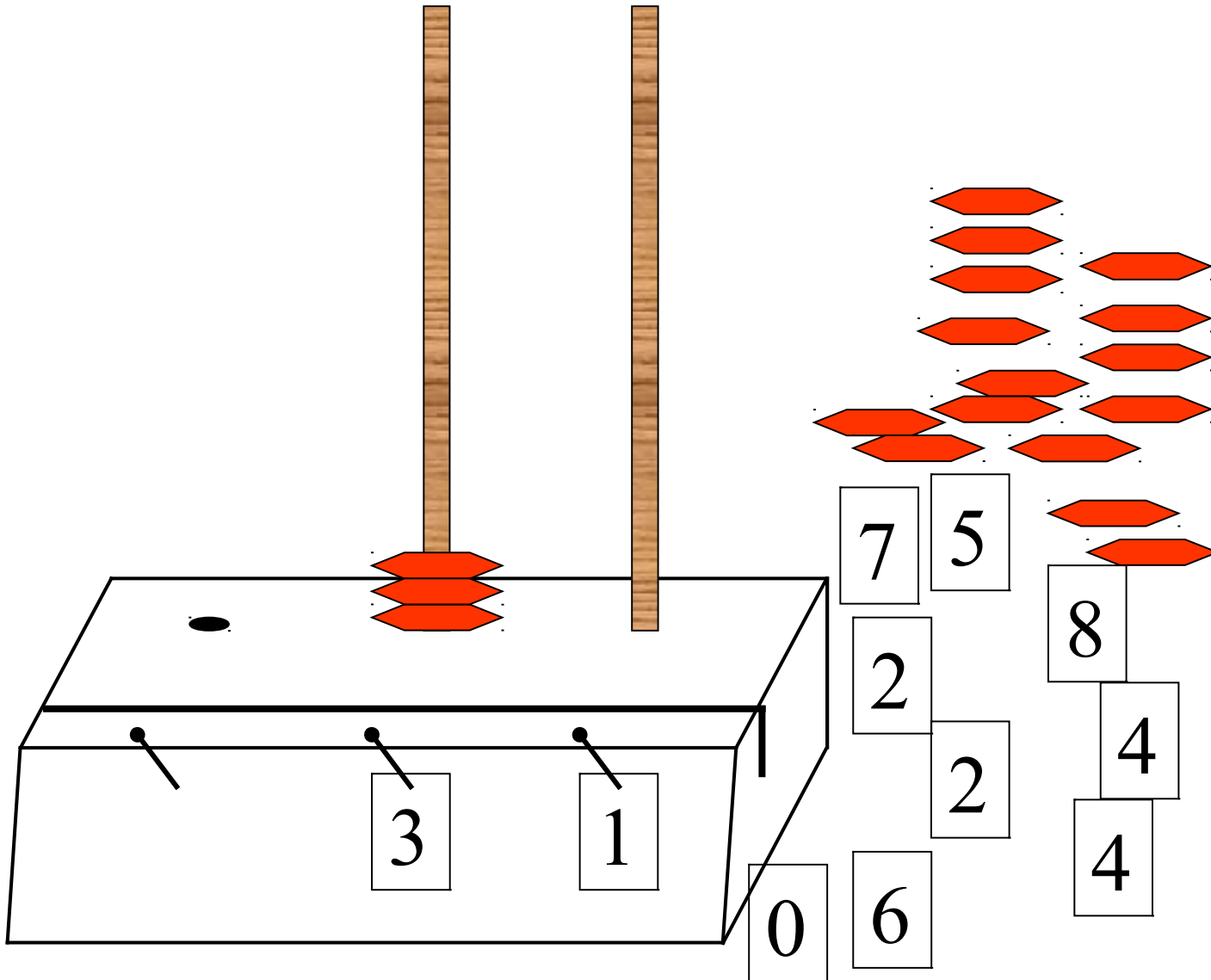
Compter sur l'abaque



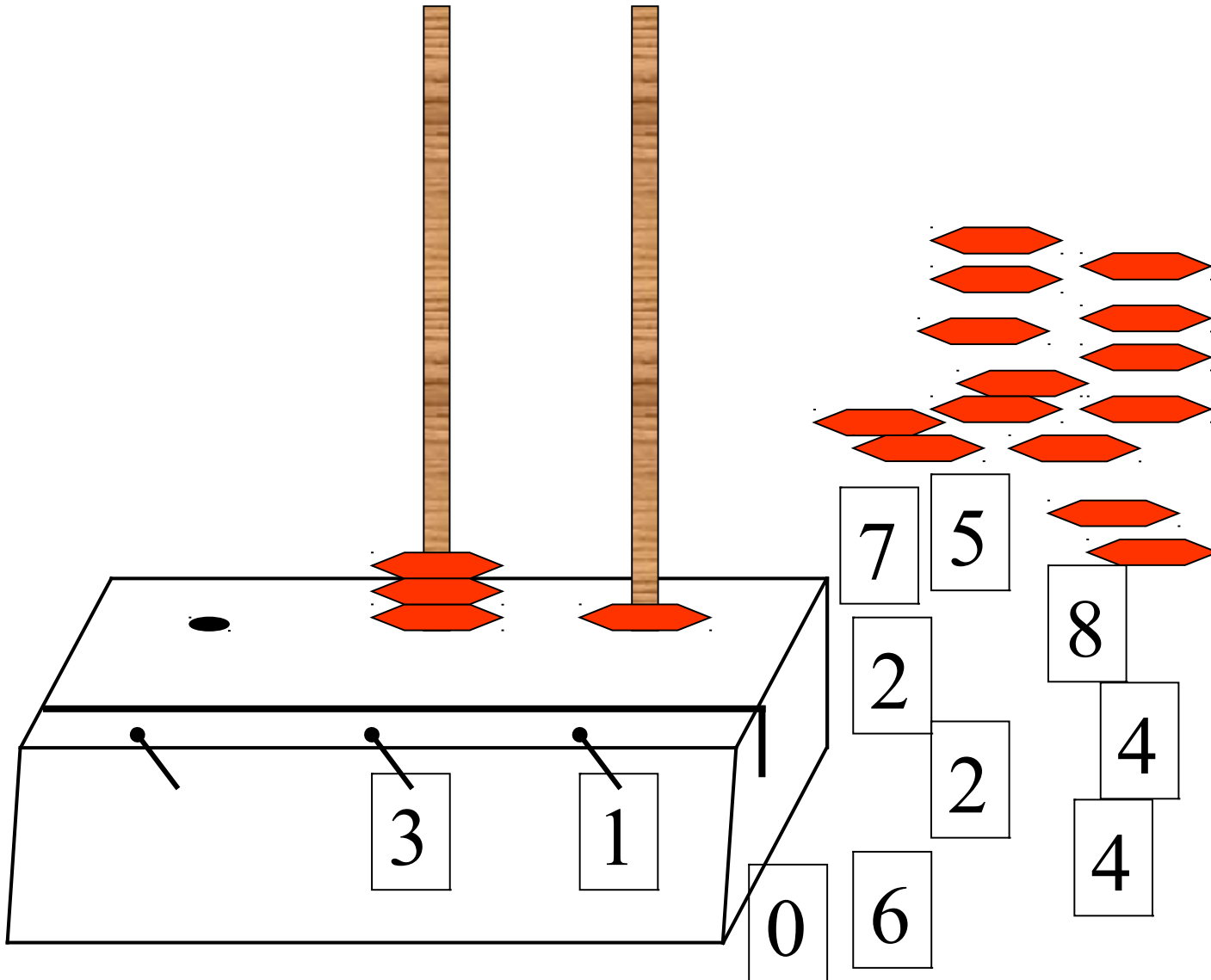
Compter sur l'abaque



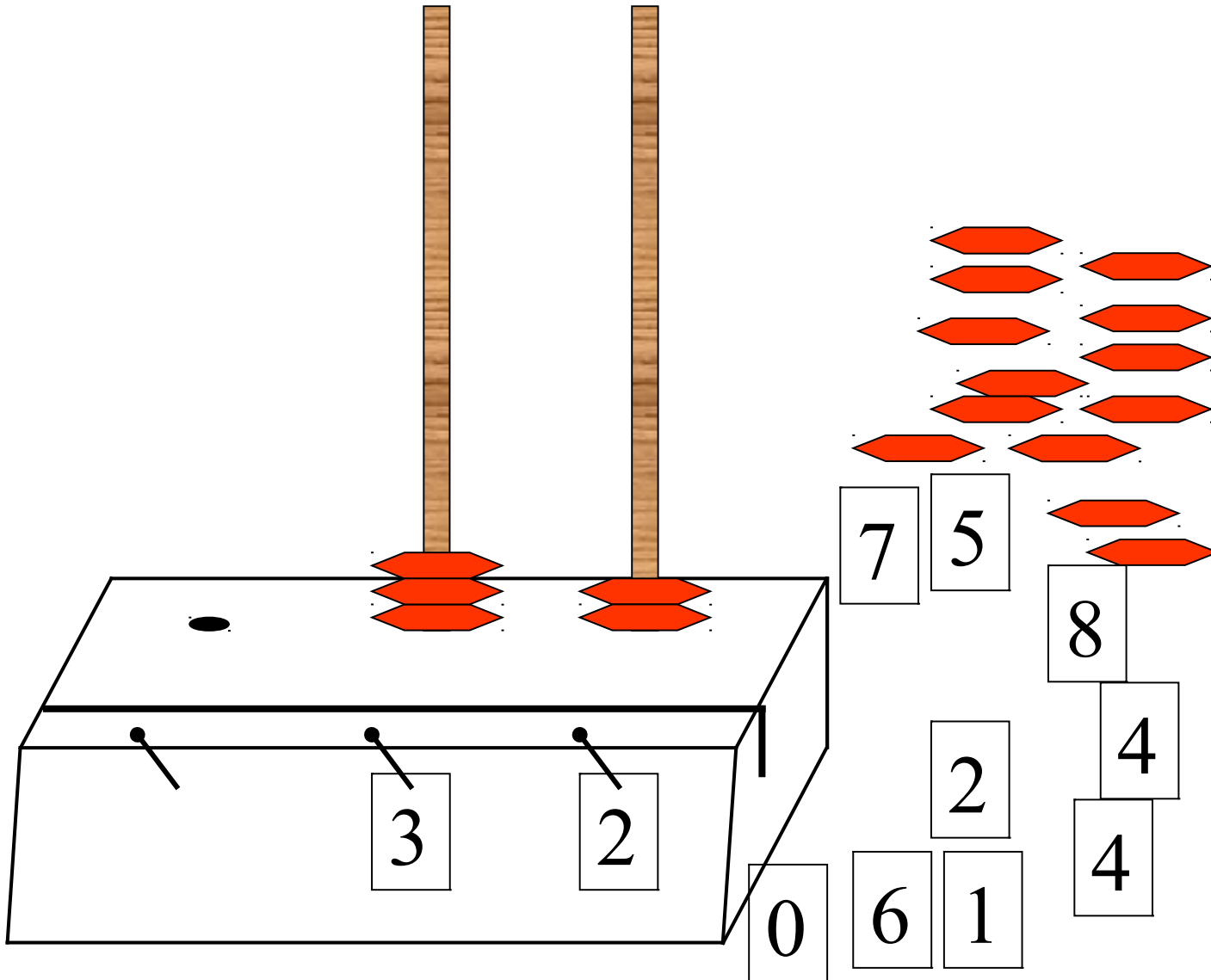
Compter sur l'abaque



Compter sur l'abaque

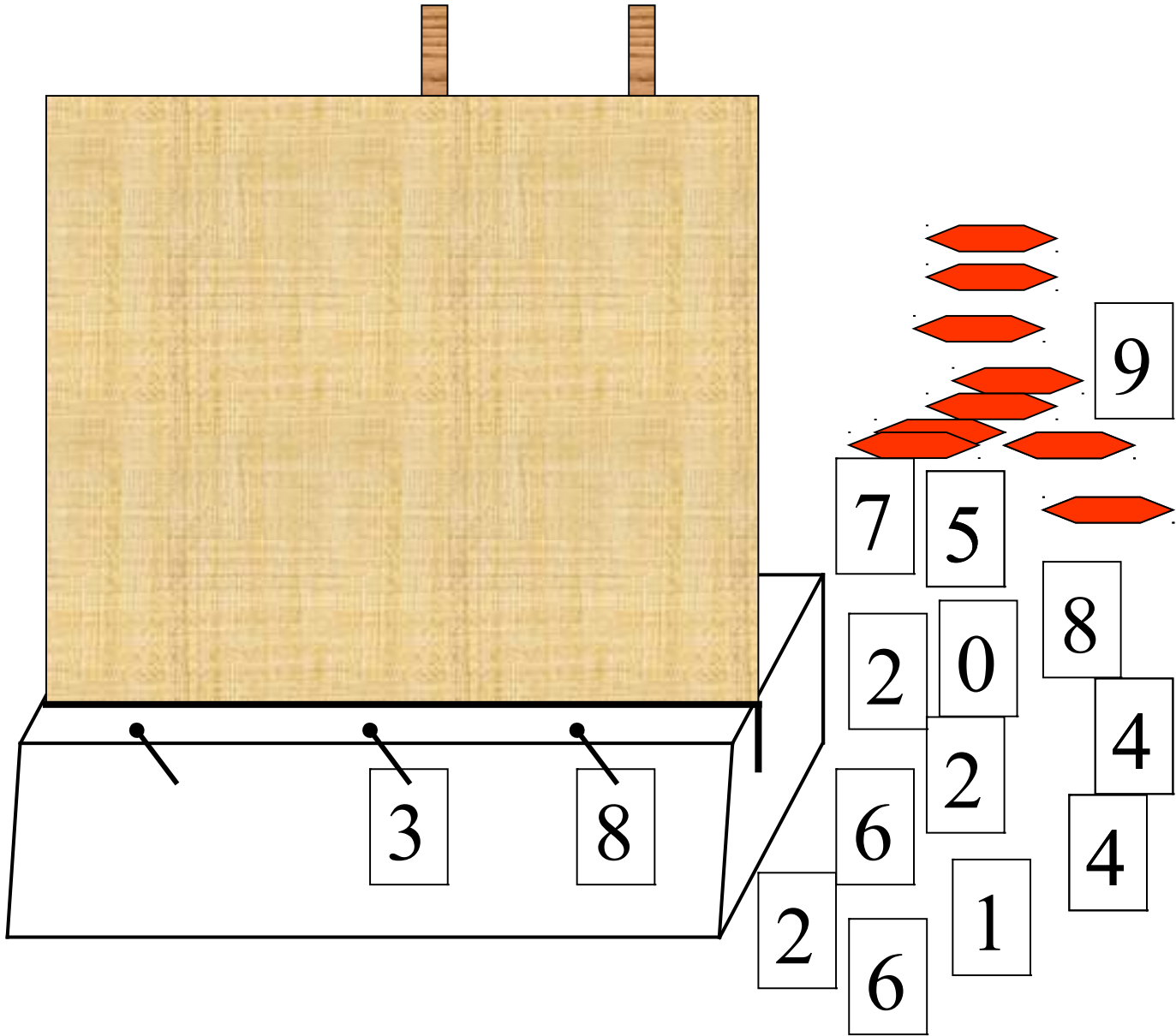


Compter sur l'abaque

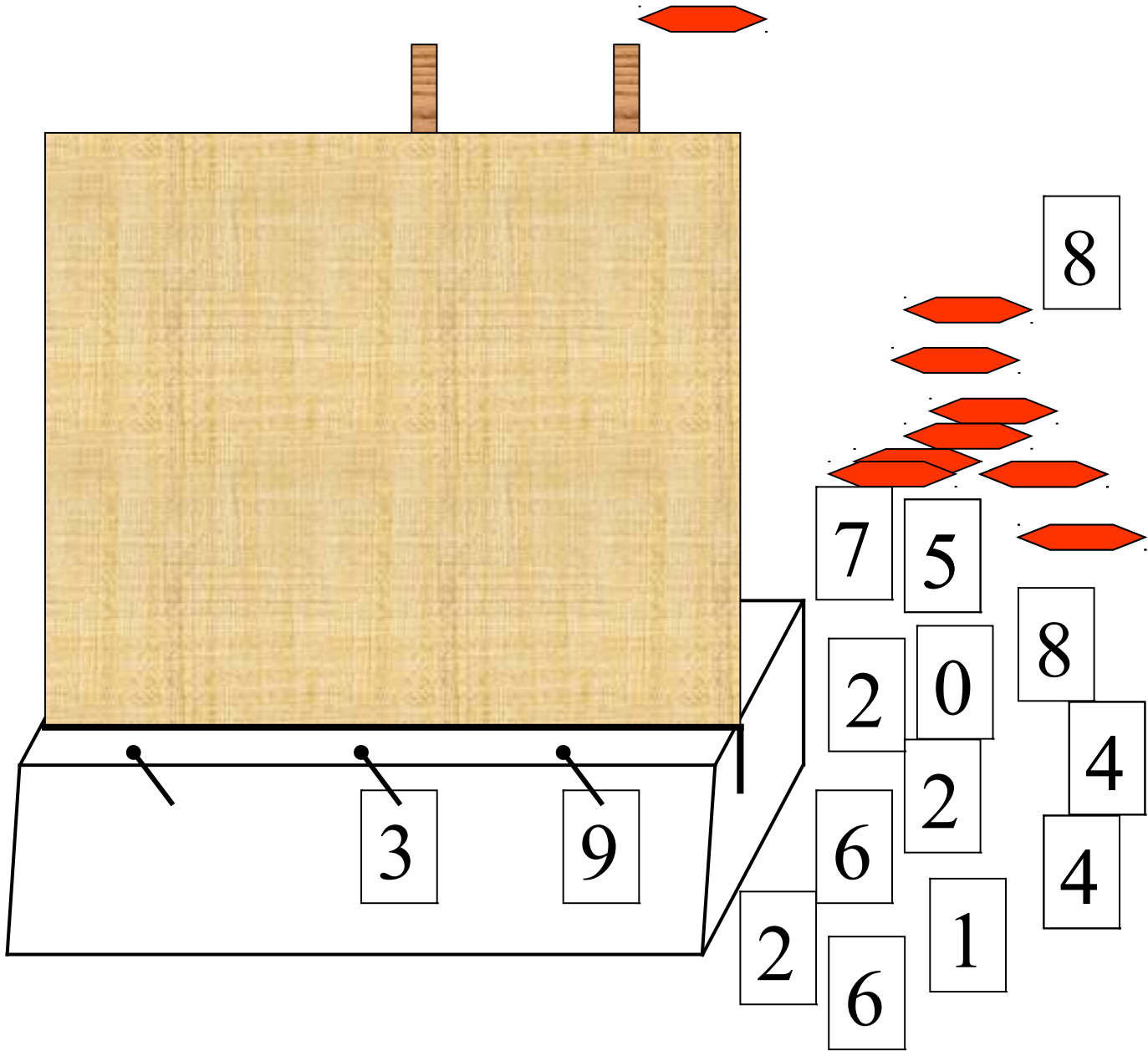


Compter sur l'abaque

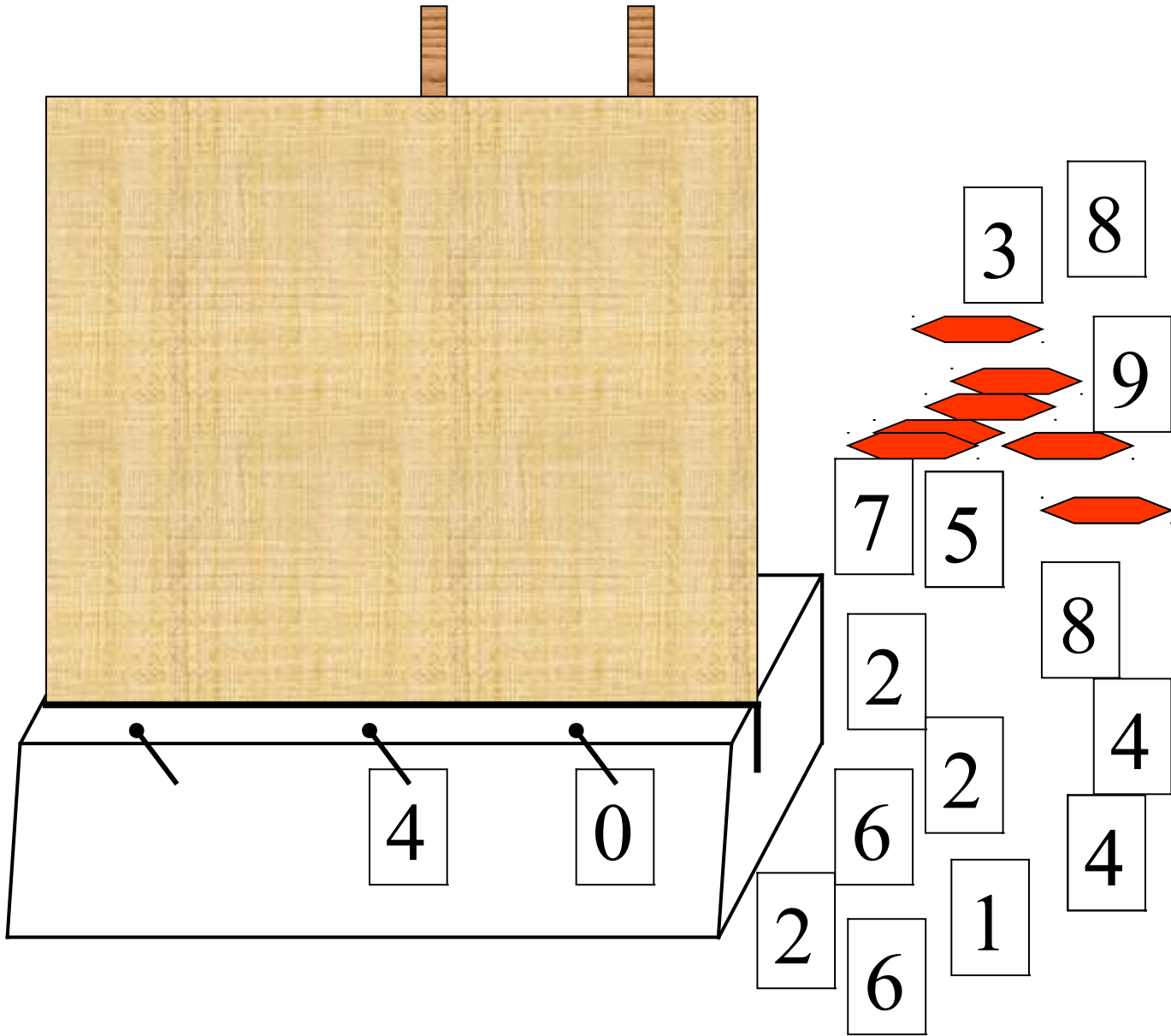
Travail en aveugle



Compter sur l'abaque



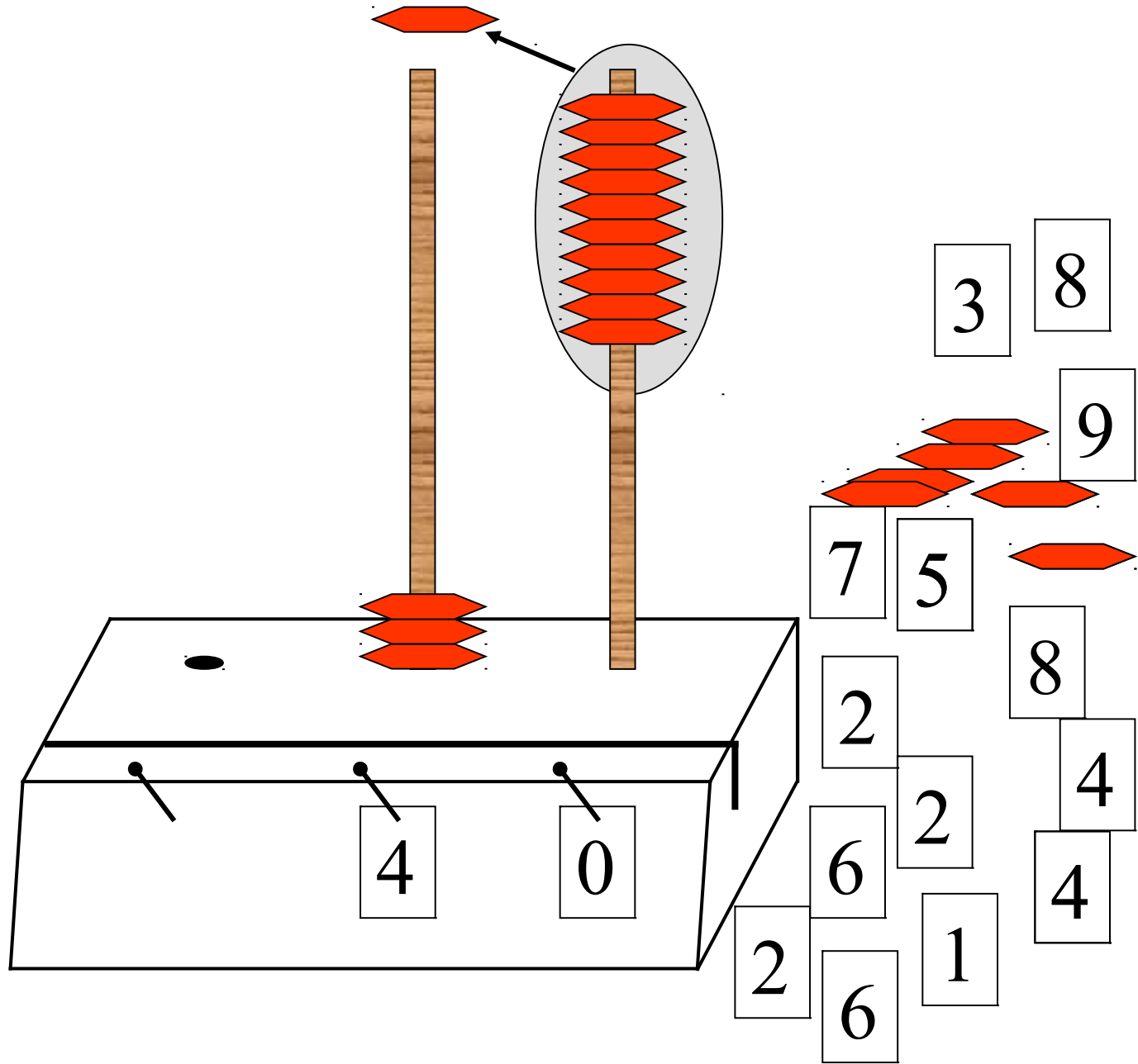
Compter sur l'abaque



Compter sur l'abaque

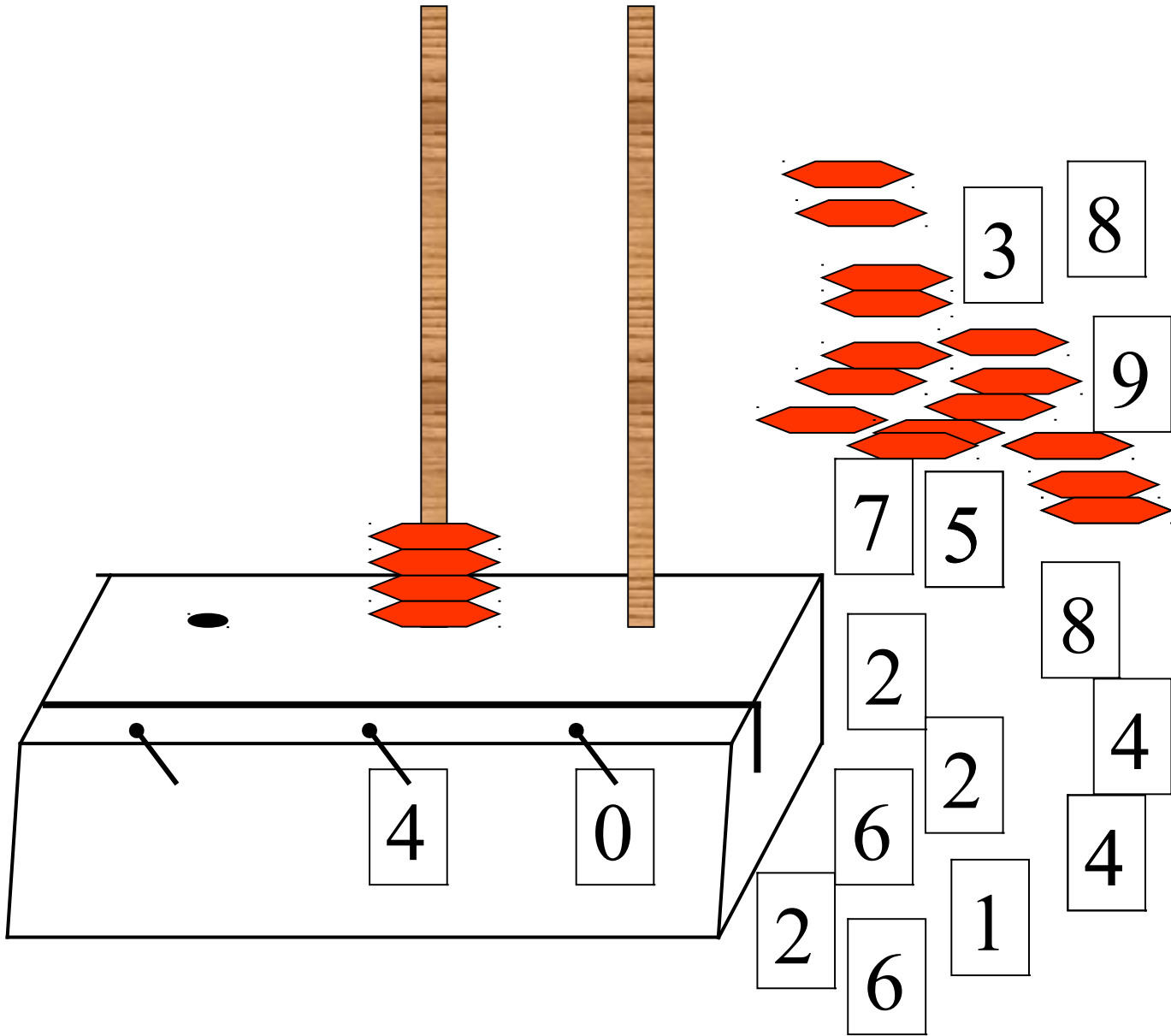
On compte... on verbalise...

Faire...dire... représenter..



Compter sur l'abaque

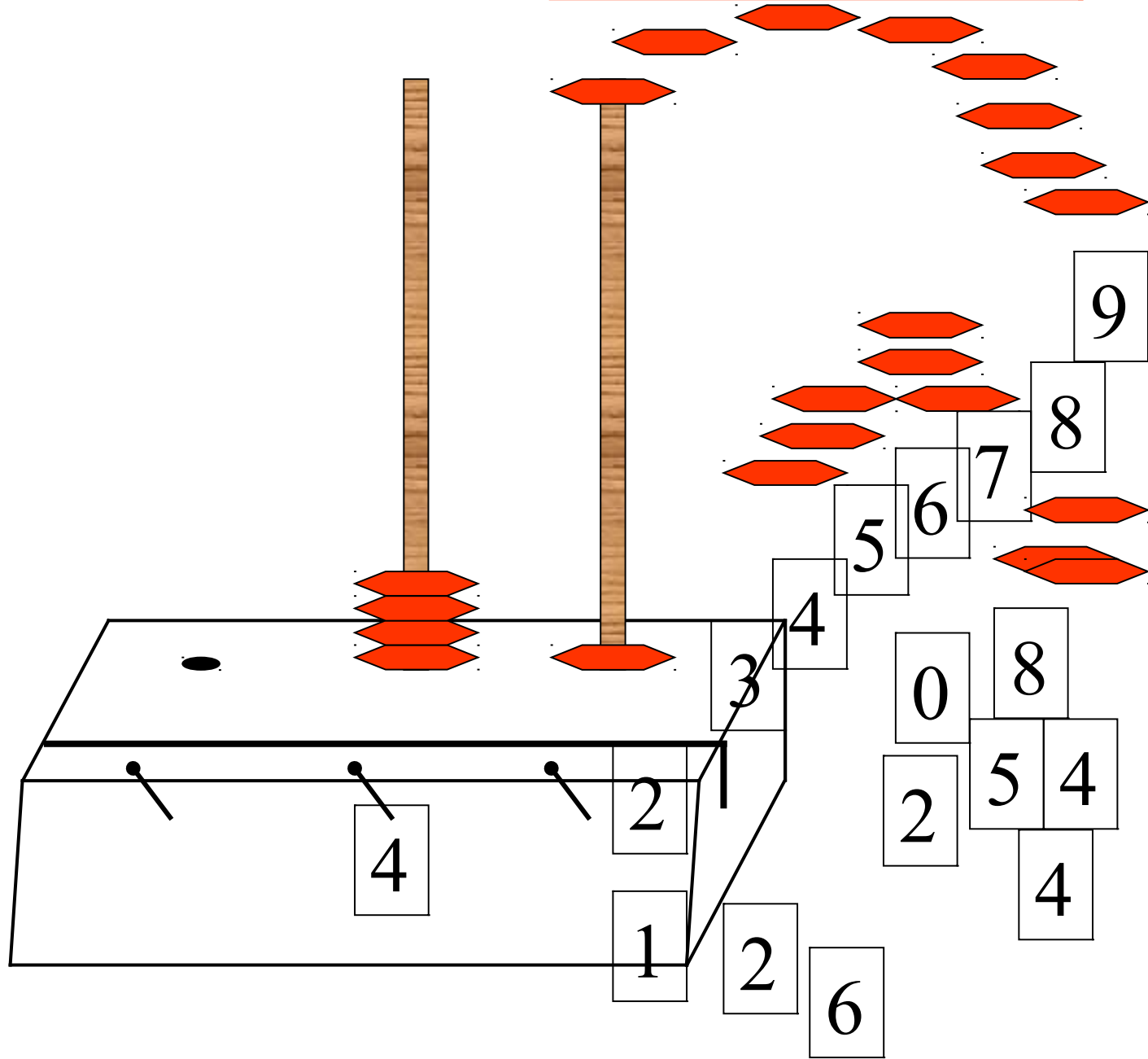
On compte... on verbalise...
Faire...dire...
représenter..



Compter sur l'abaque

On compte... on verbalise...

Faire...dire... représenter..



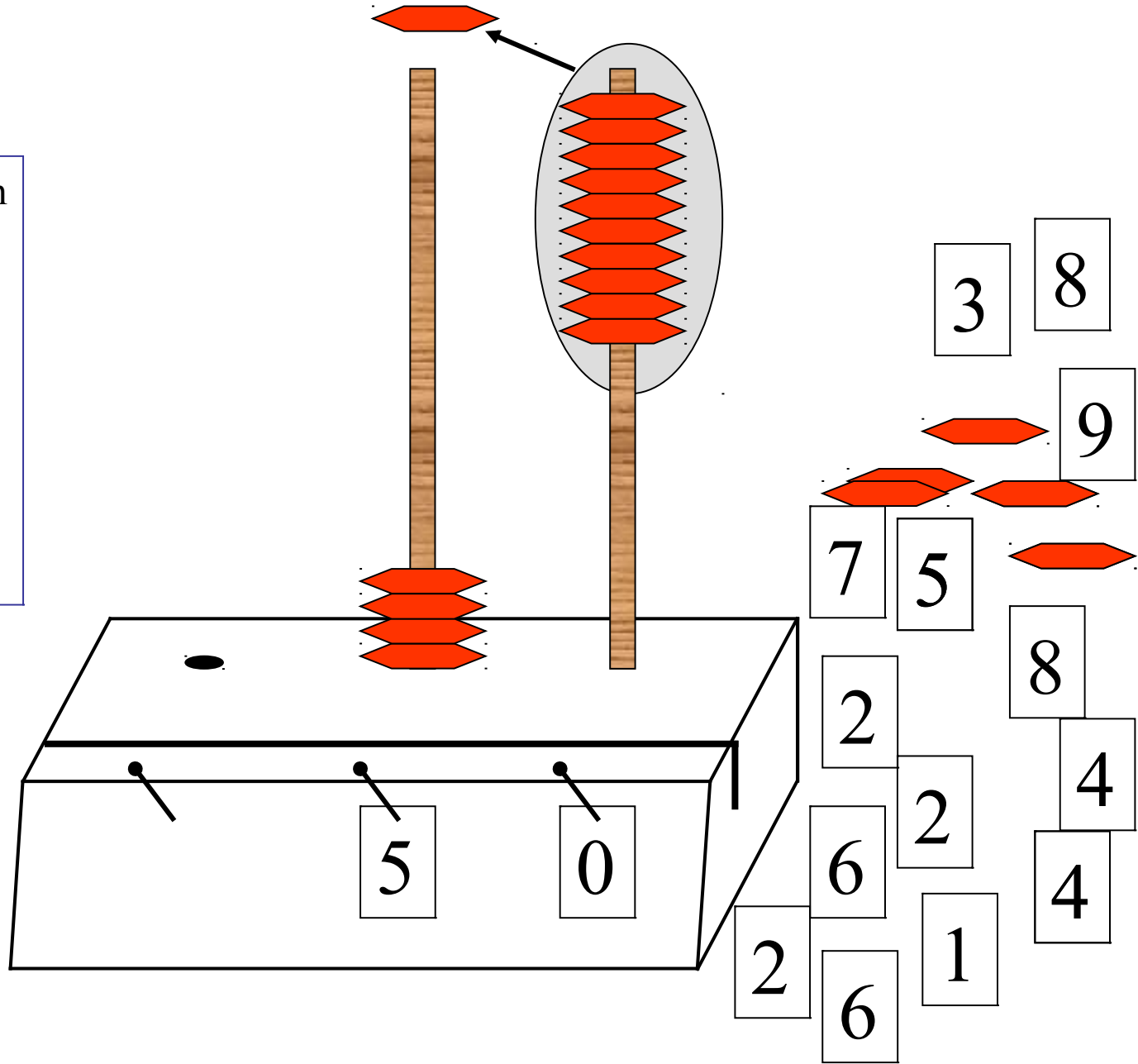
Compter sur l'abaque

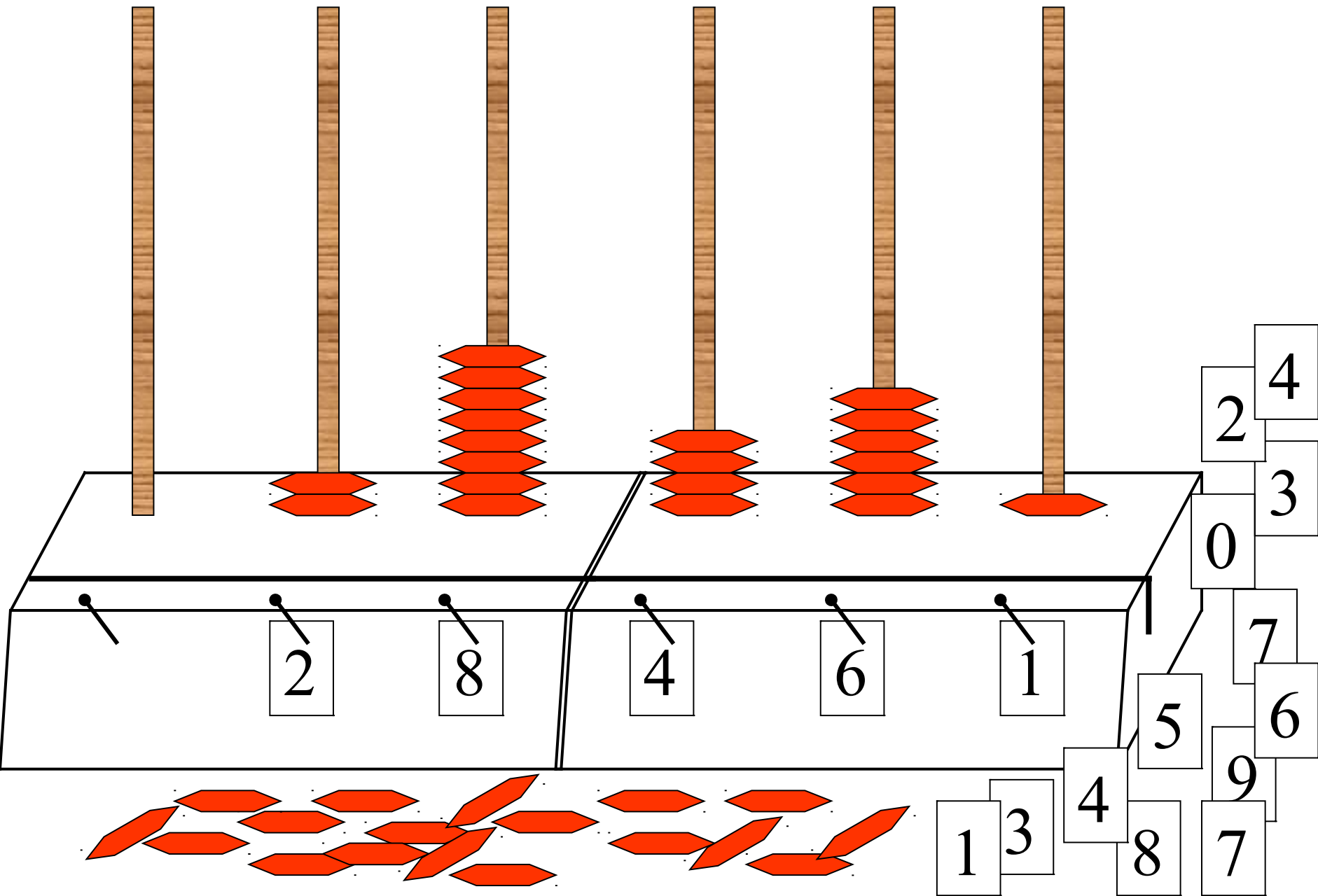
On compte... on verbalise...

Faire...dire... représenter..

10 pour 1

Amener la réciproque

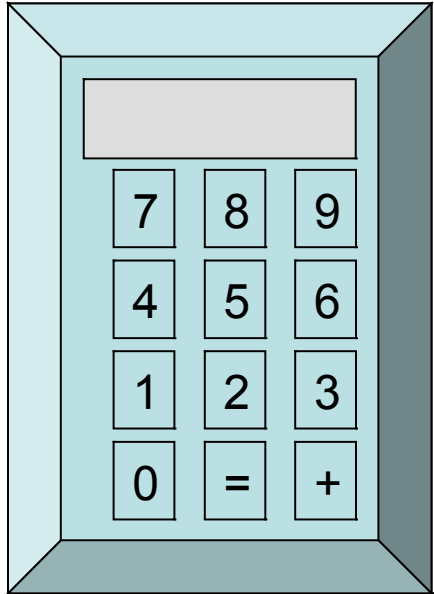
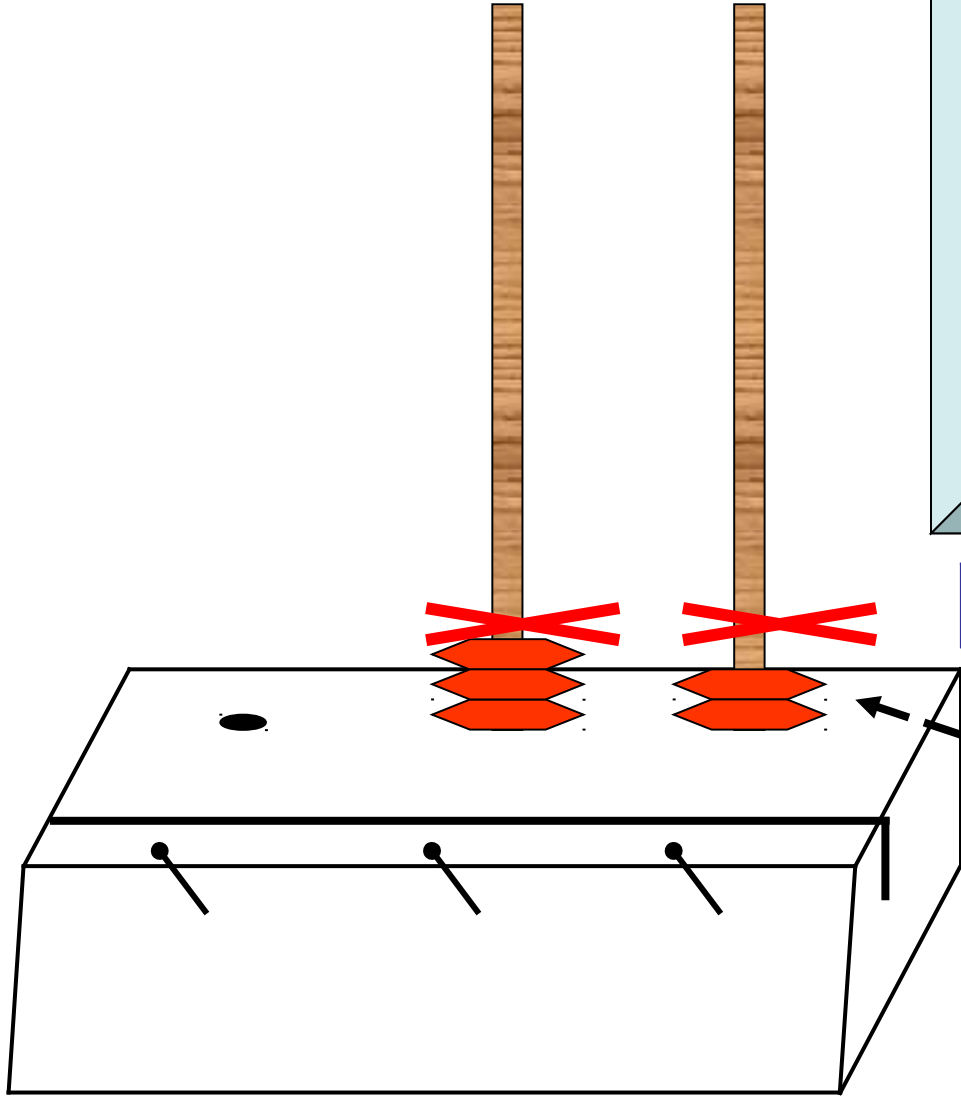
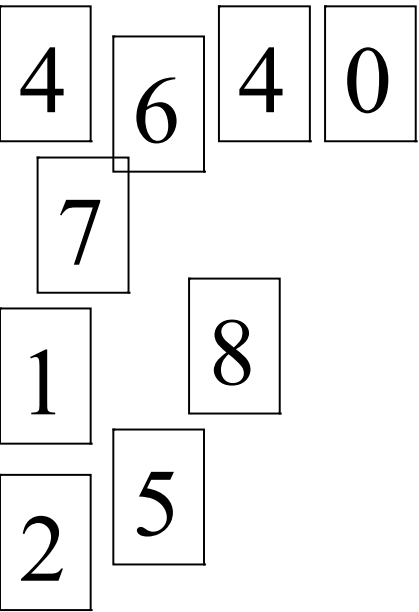
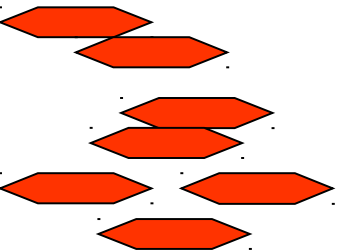




Temps 4

Restructuration
opérateur de l'addition
à partir de l'abaque

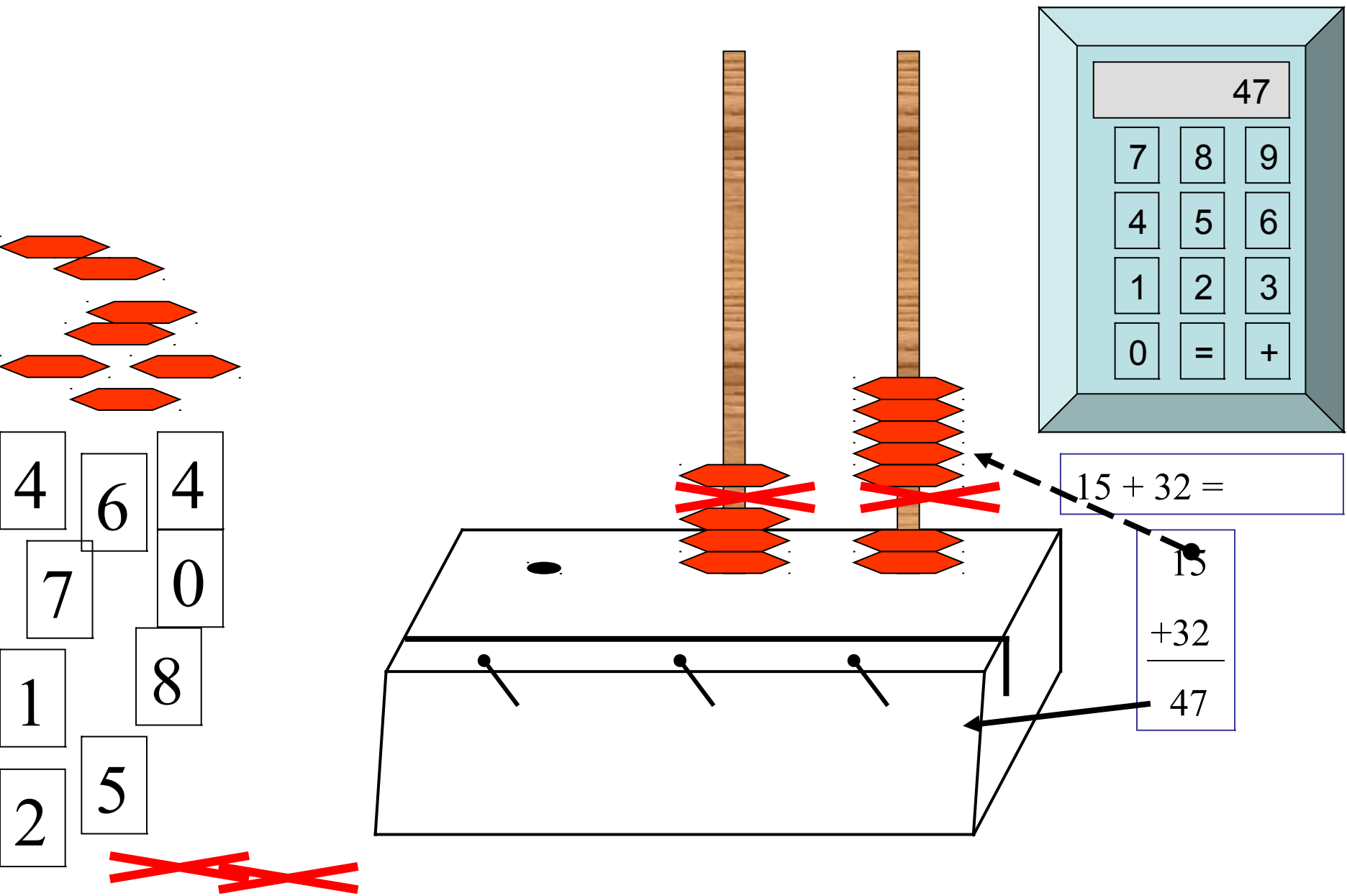
Restructuration opératoire : l'addition



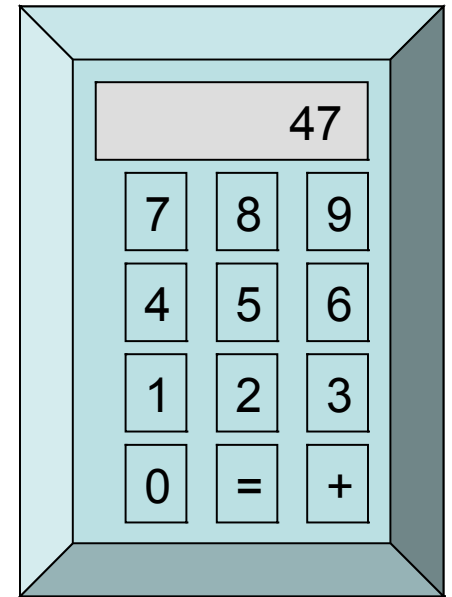
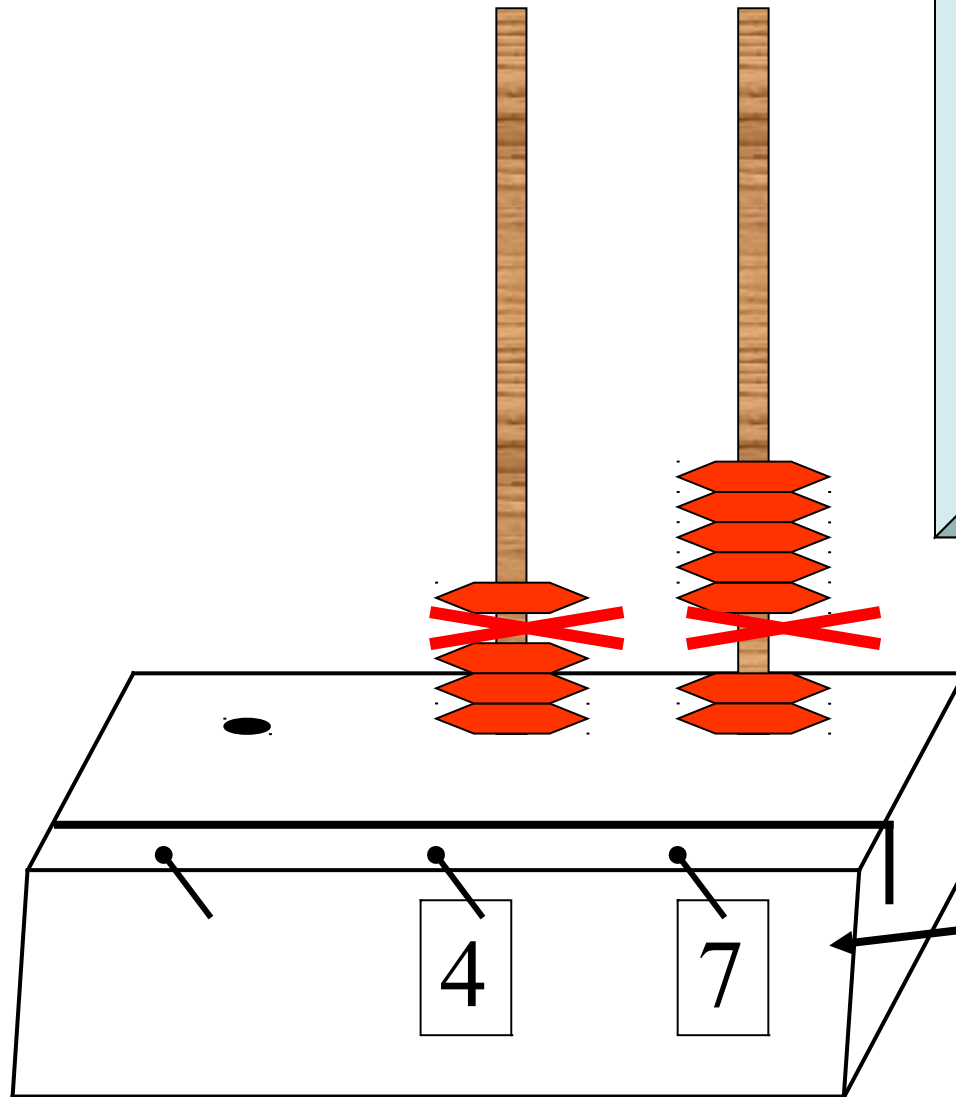
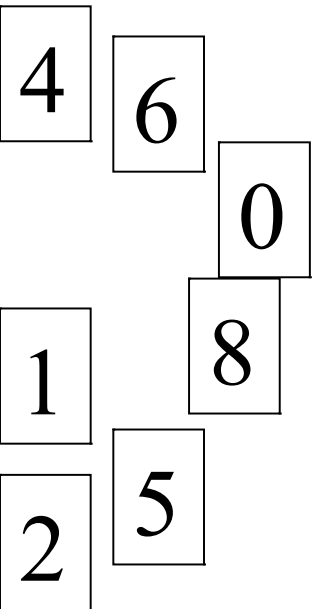
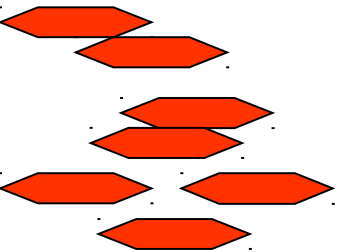
$15 + 32 =$

15
+32
—

Restructuration opératoire : l'addition



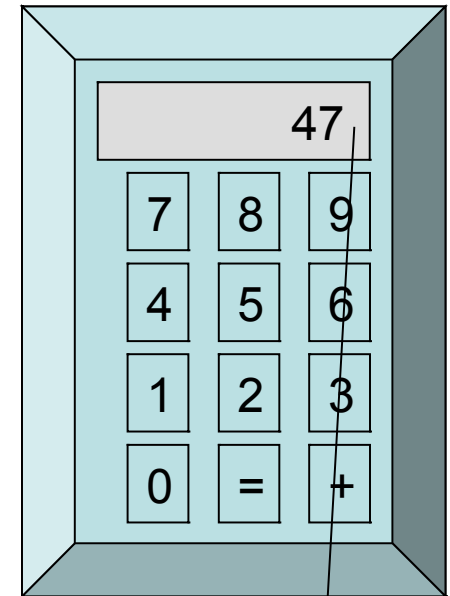
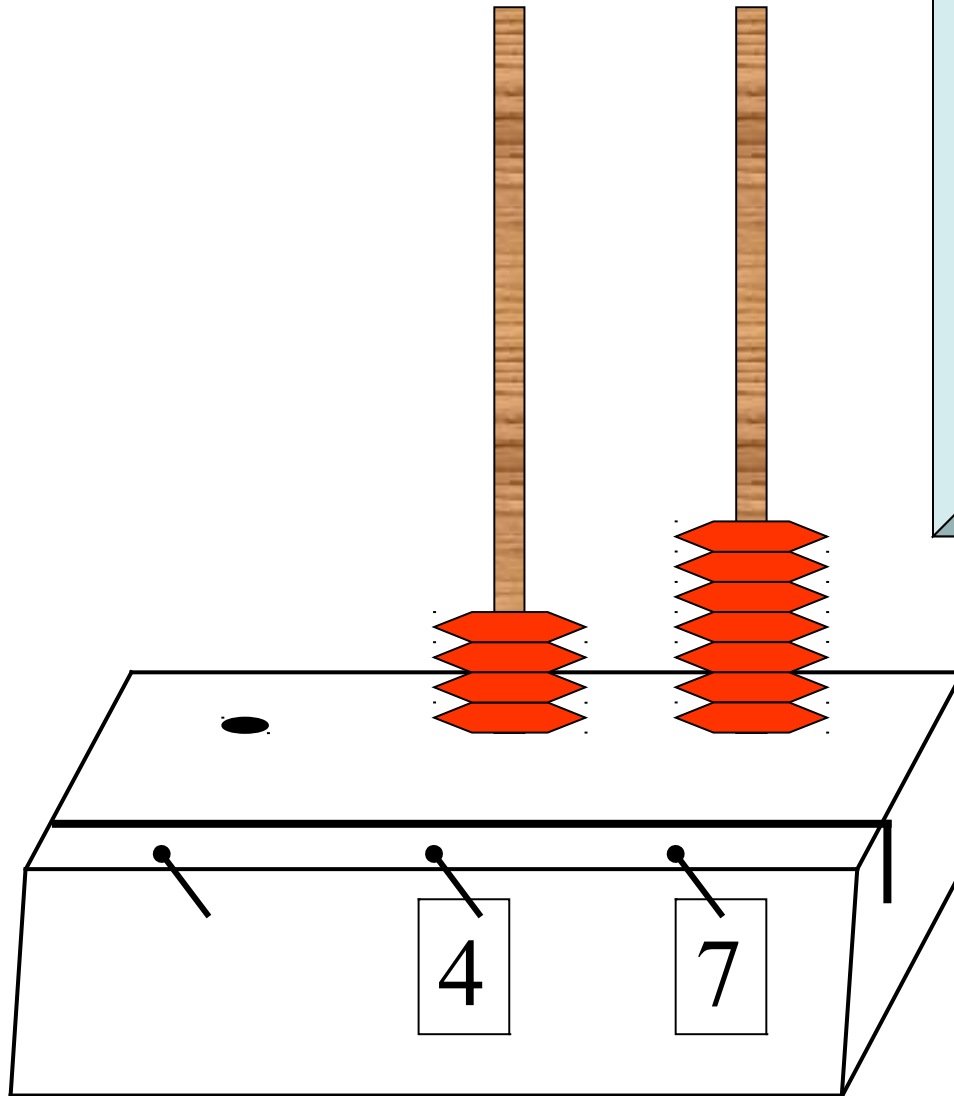
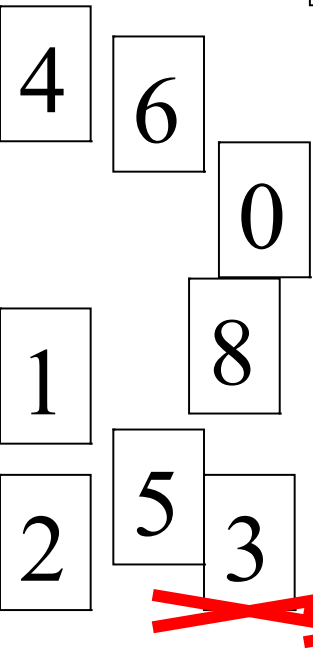
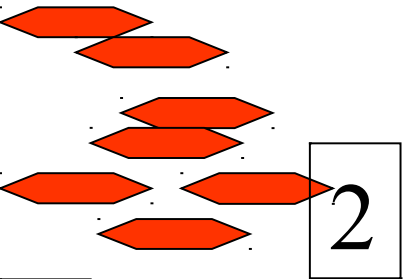
Restructuration opératoire : l'addition



$$15 + 32 =$$

$$\begin{array}{r} 15 \\ +32 \\ \hline 47 \end{array}$$

Restructuration opératoire : l'addition



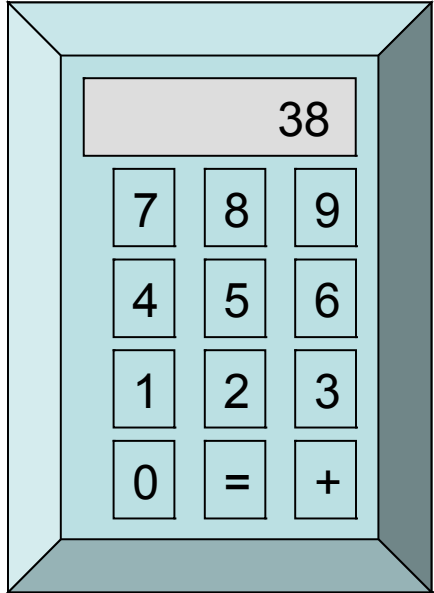
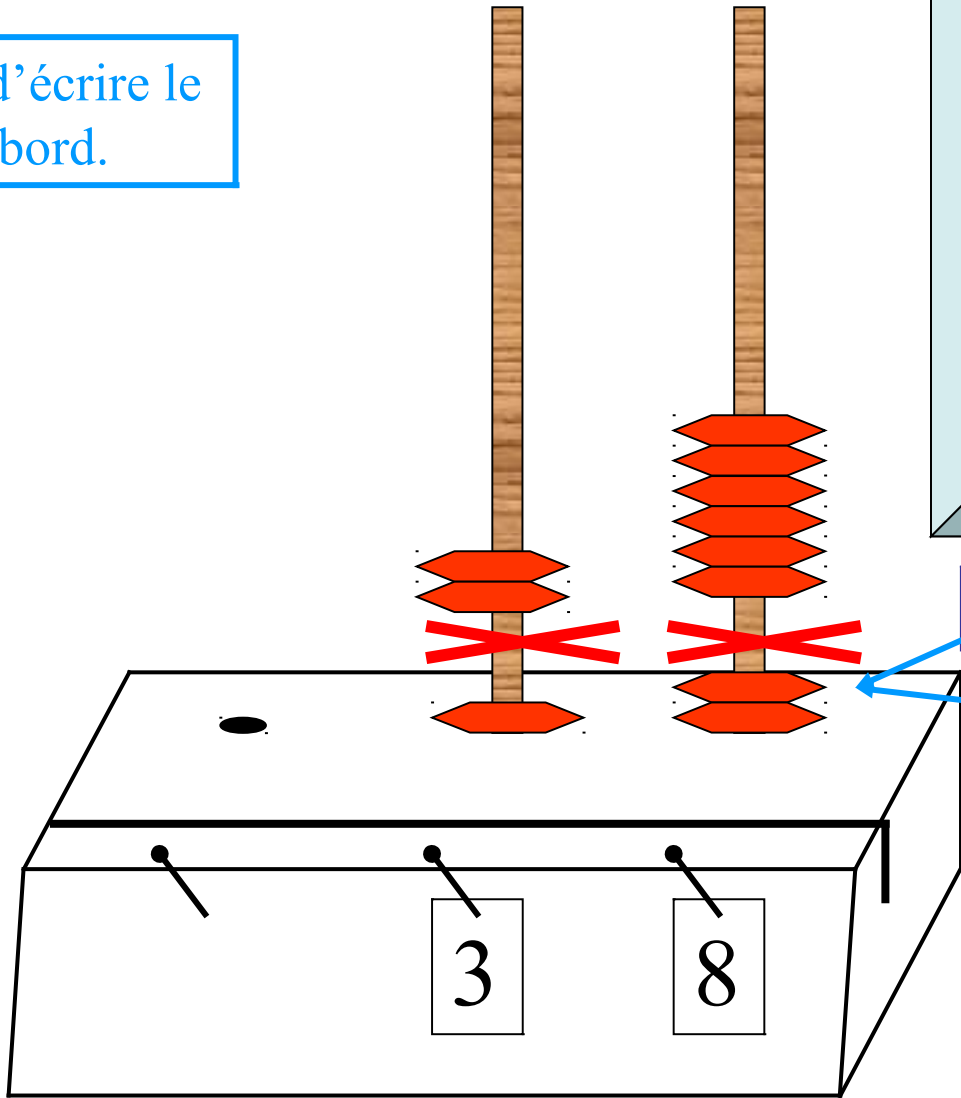
$15 + 32 =$

$$\begin{array}{r} 15 \\ +32 \\ \hline 47 \end{array}$$

Restructuration opératoire : l'addition

Prendre l'habitude d'écrire le premier nombre d'abord.

4 6 2
4 7 0
1 5
2



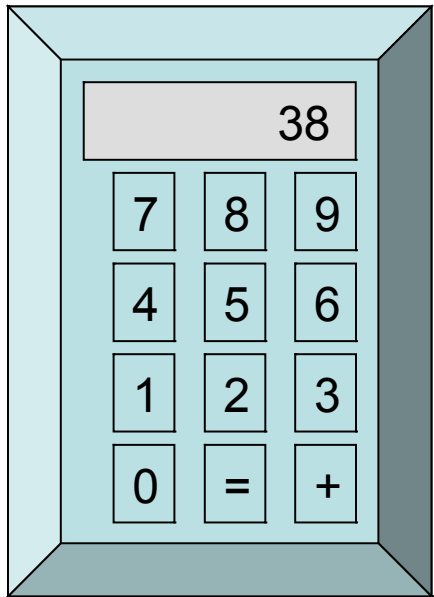
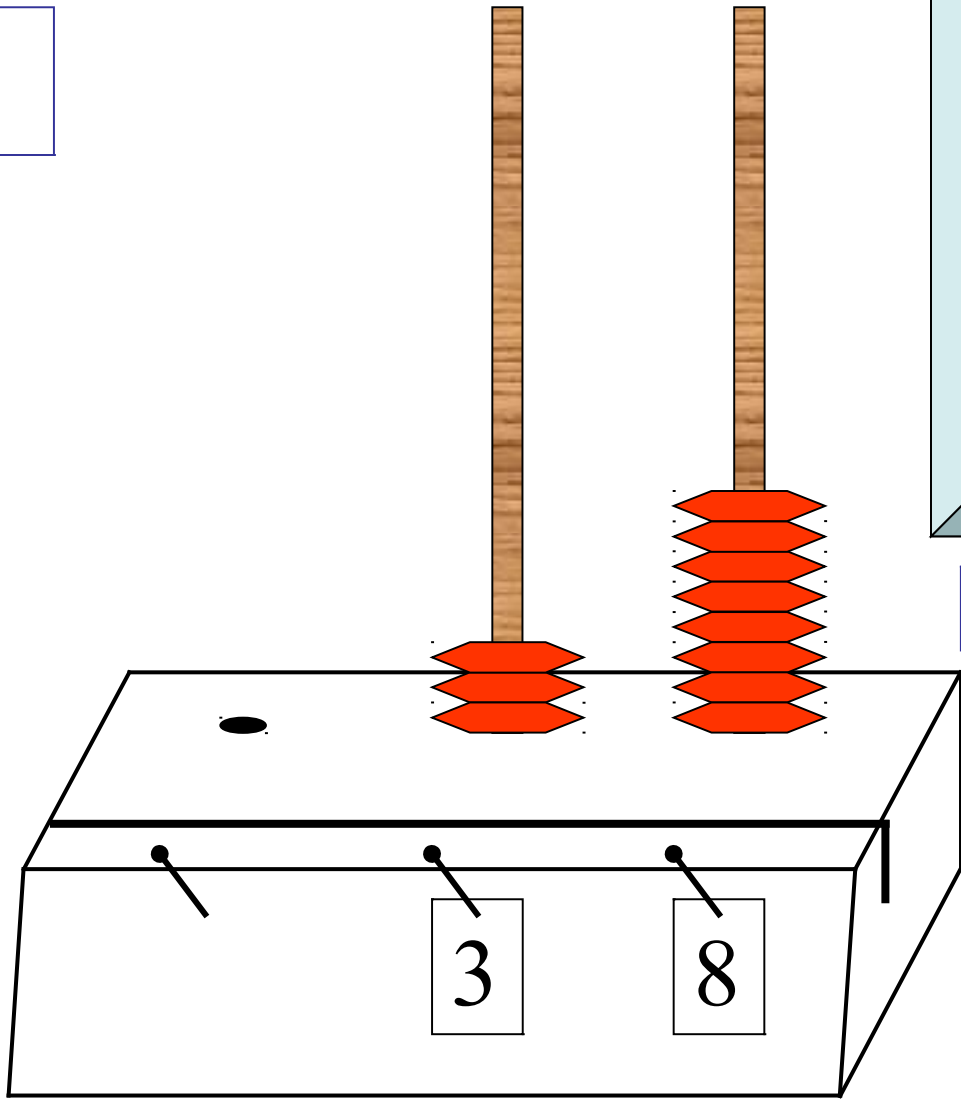
$12 + 26 =$

$$\begin{array}{r} 12 \\ +26 \\ \hline 38 \end{array}$$

Restructuration opératoire : l'addition

Faire et dire... sur plusieurs exemples

A collection of red arrow-shaped beads and numbered boxes. There are 10 beads arranged in a pattern. Below them are several boxes containing numbers: a box with '2', a box with '0', a box with '3', and a box with '8'. At the bottom, there are two red 'X' marks.



$12 + 26 =$

$$\begin{array}{r} 12 \\ +26 \\ \hline 38 \end{array}$$

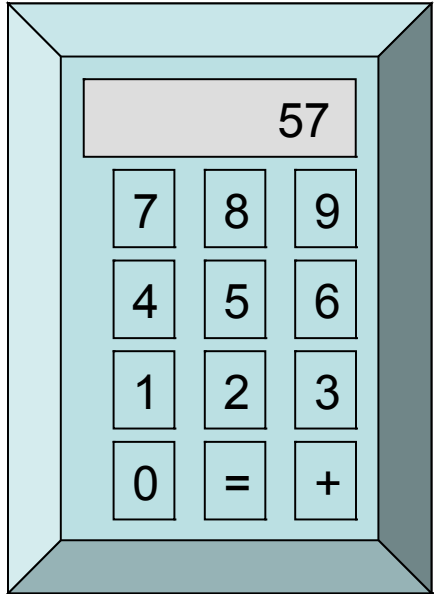
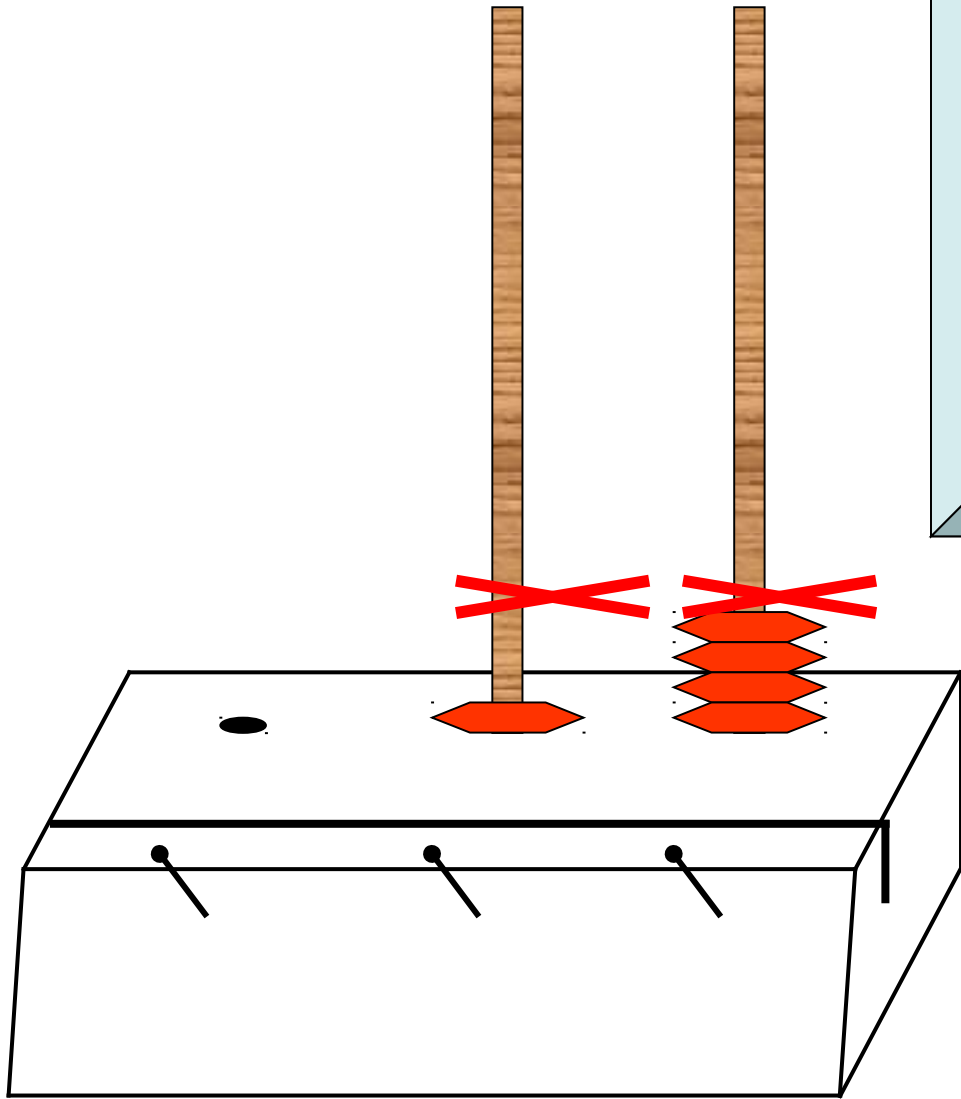
Restructuration opératoire : l'addition

Travailler en aveugle ou pas...

A collection of red arrow-shaped blocks, some pointing right and some pointing left, arranged in a pattern. Below them is a grid of numbers in boxes:

4	6	2
4	7	0
1		3
2	5	8

Red 'X' marks are drawn over the bottom row of numbers (2, 5, 8) and the top row of arrow blocks.



$$\begin{array}{r} 14 \\ +43 \\ \hline \end{array}$$

Restructuration opératoire : l'addition

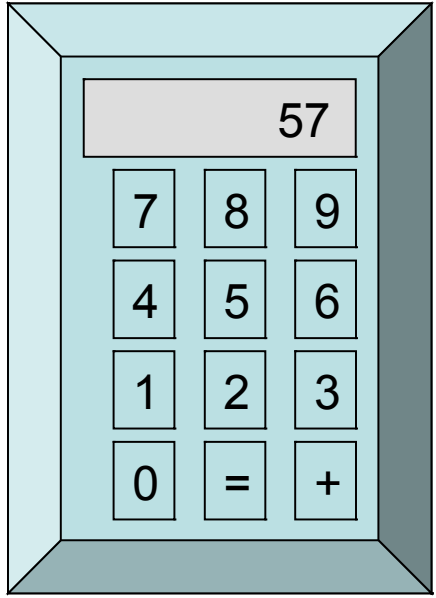
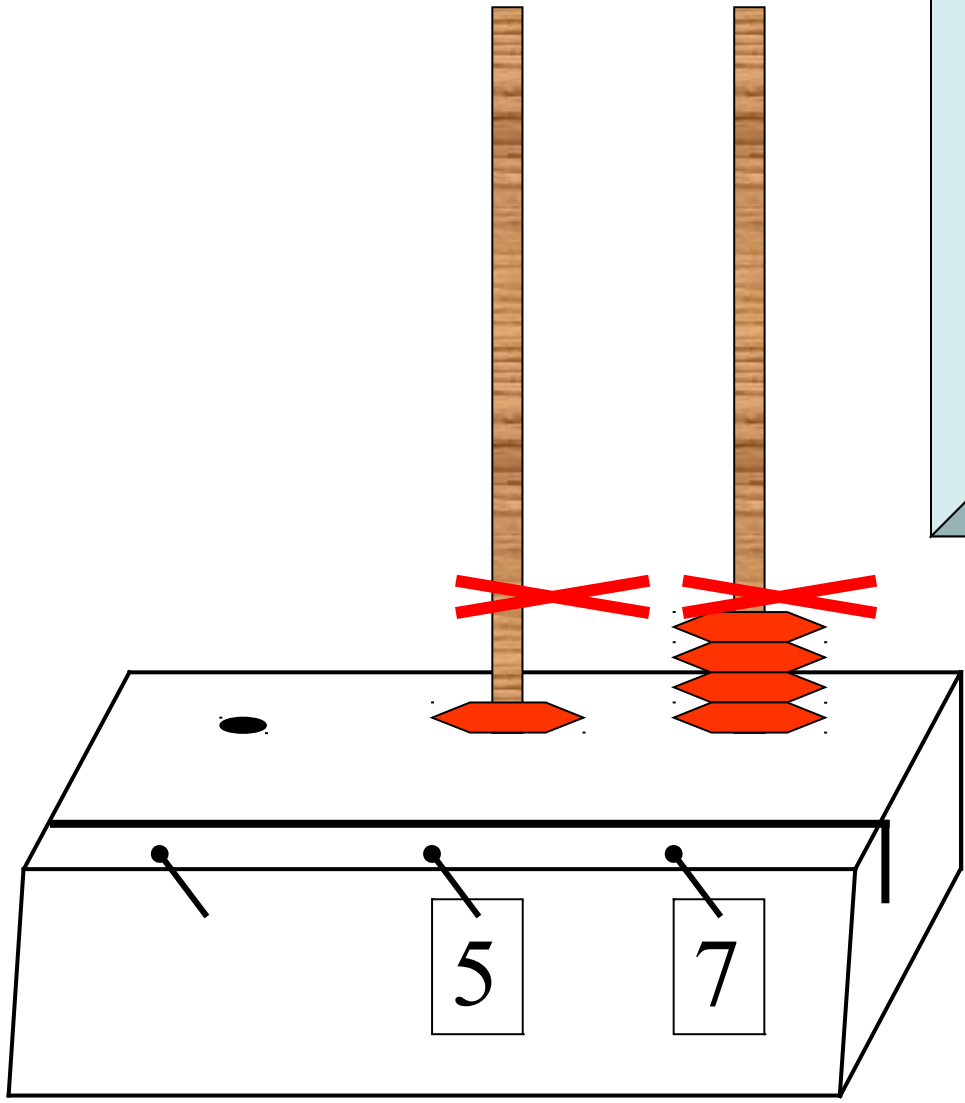
Travailler en aveugle

4 6 2

4 0

1 3

2 8

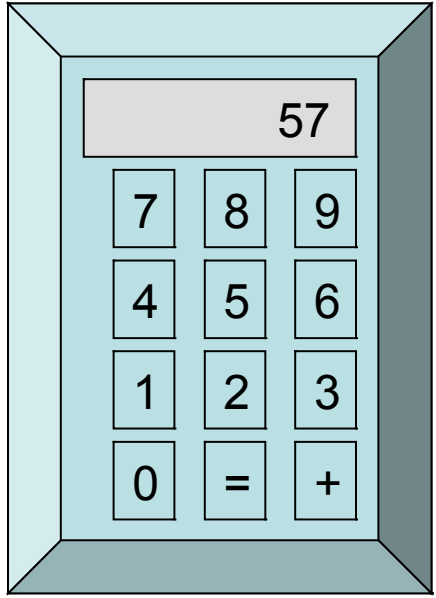
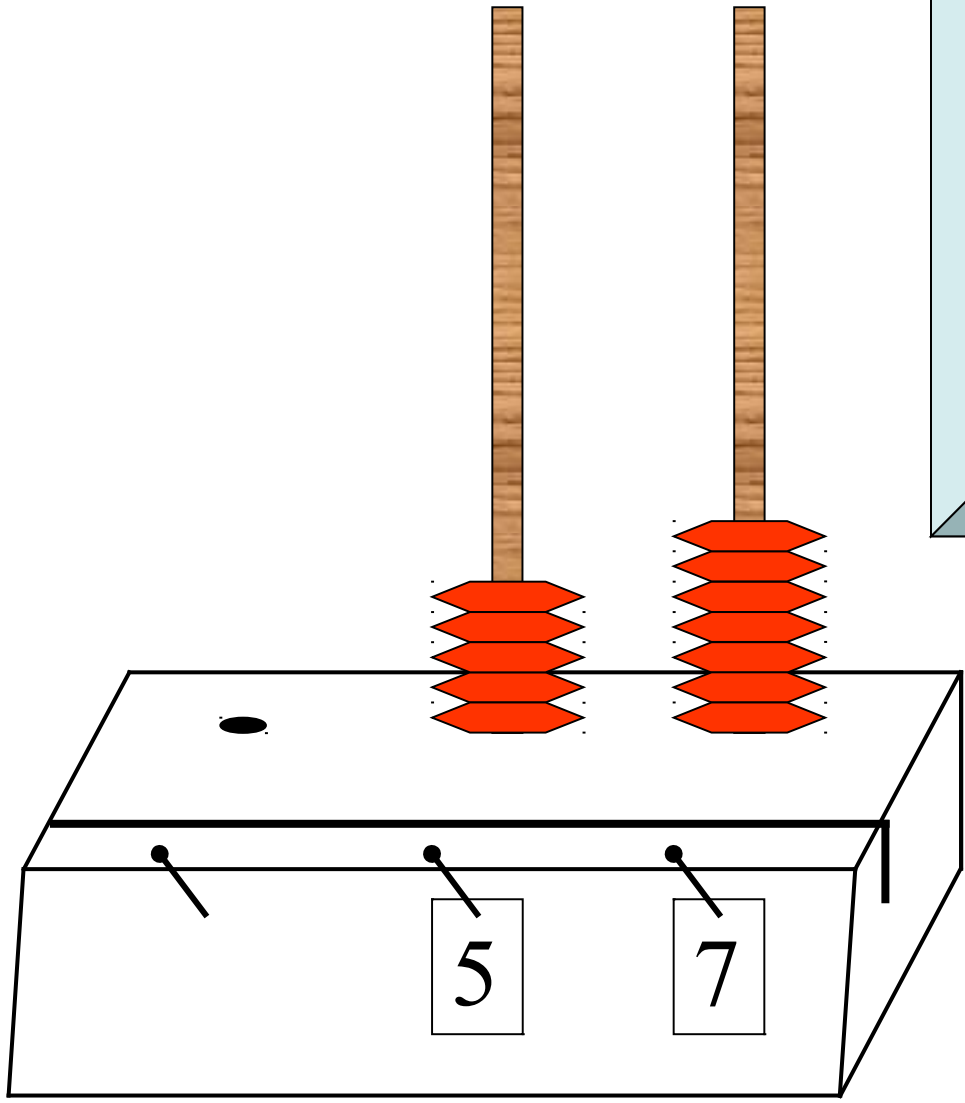


$$\begin{array}{r} 14 \\ +43 \\ \hline 57 \end{array}$$

Restructuration opératoire : l'addition

Travailler en aveugle
En faire plusieurs

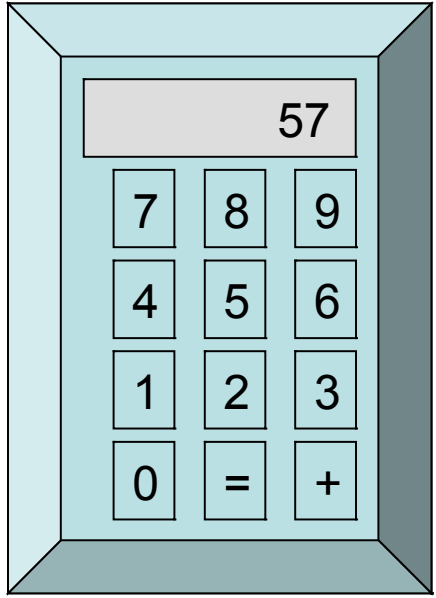
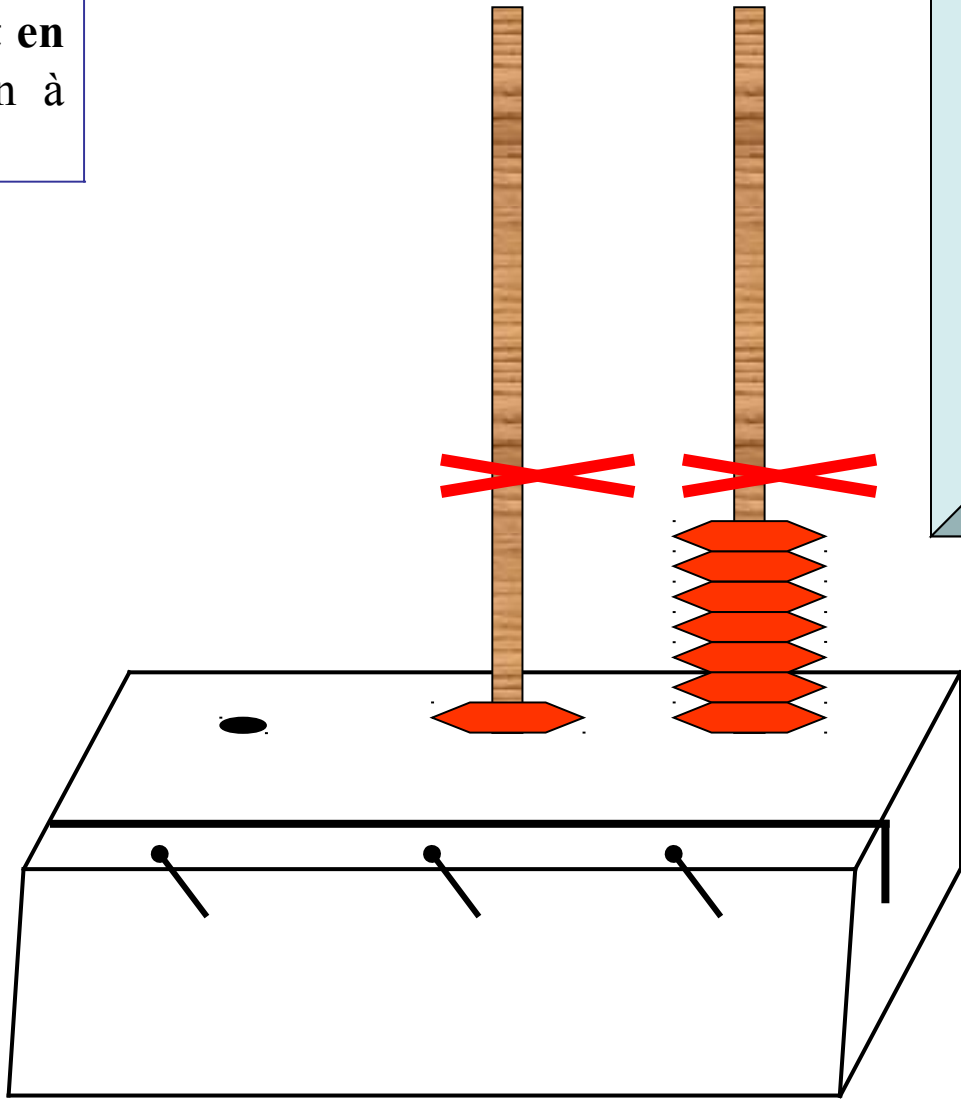
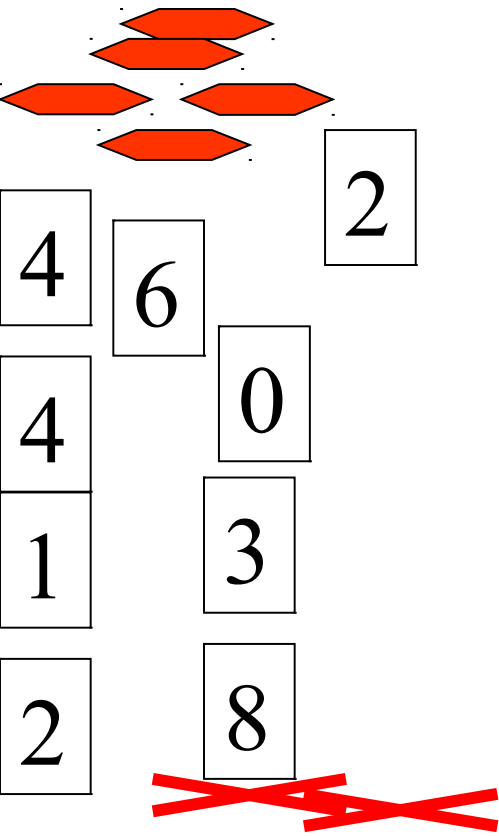
A collection of red hexagonal tiles and numbered cards. There are four red hexagons at the top. Below them are several numbered cards: a '2' in a box, a '4' in a box, a '6' in a box, a '4' in a box, a '0' in a box, a '1' in a box, a '3' in a box, a '2' in a box, and an '8' in a box. The '2' and '8' cards are crossed out with red X's.



$$\begin{array}{r} 14 \\ +43 \\ \hline 57 \end{array}$$

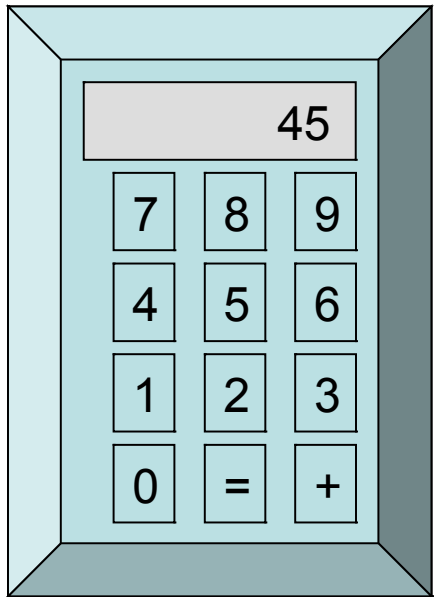
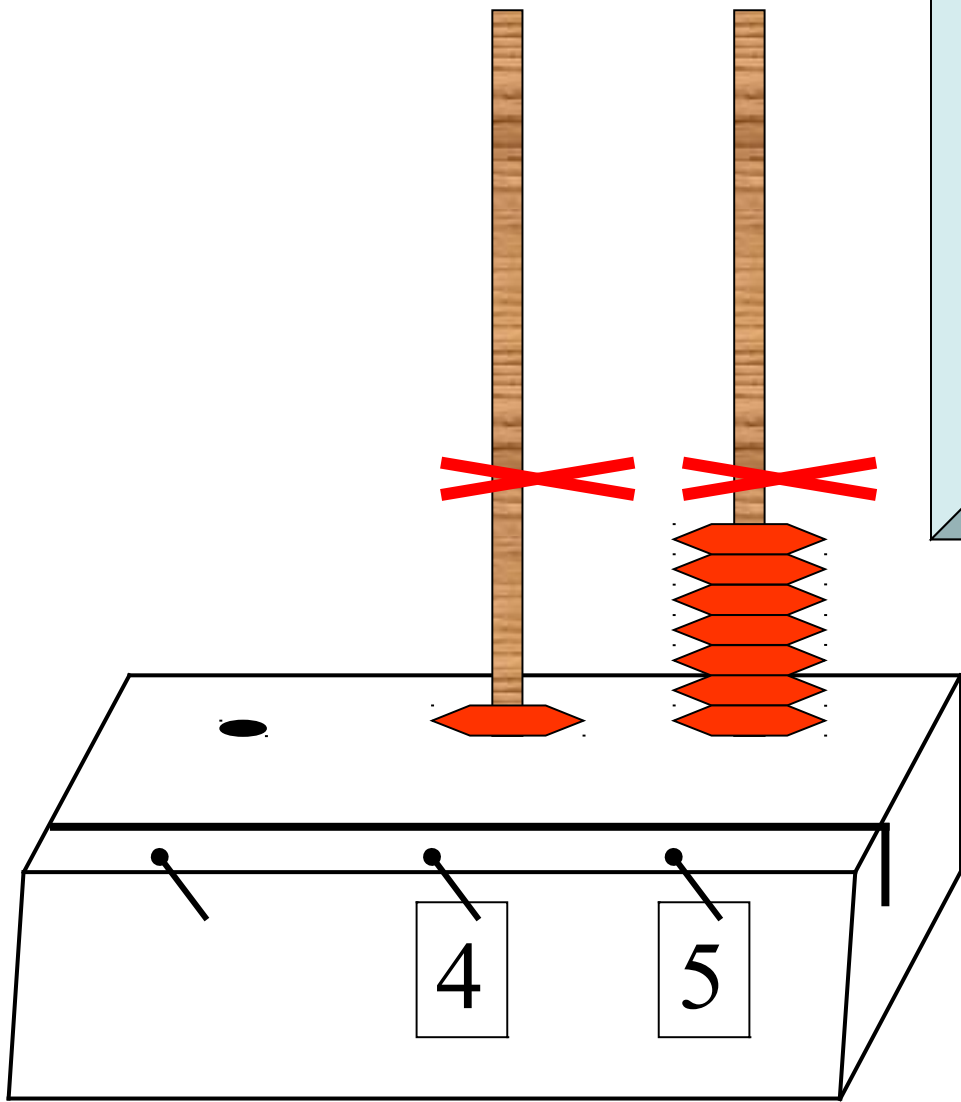
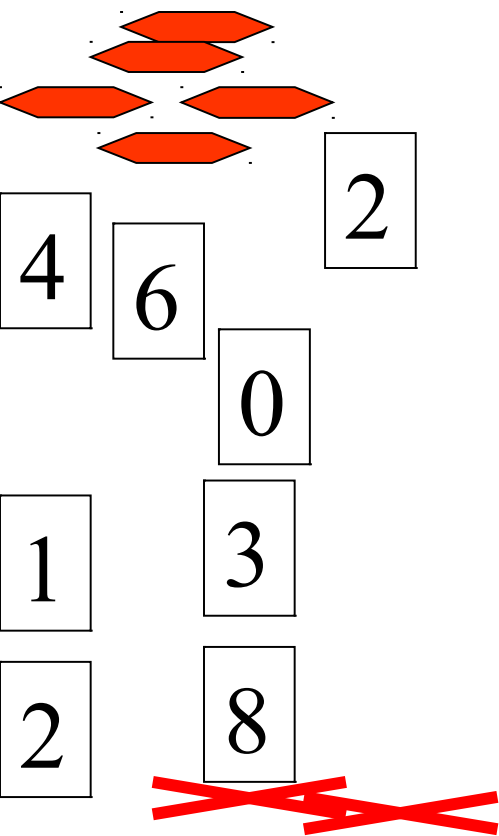
Restructuration opératoire : l'addition

Selon le public poursuivre le travail **soit en direct soit en aveugle** pour l'addition à retenue



$$\begin{array}{r} 17 \\ +28 \\ \hline \end{array}$$

Restructuration opératoire : l'addition



$$\begin{array}{r} 17 \\ +28 \\ \hline 45 \end{array}$$

Restructuration opératoire : l'addition

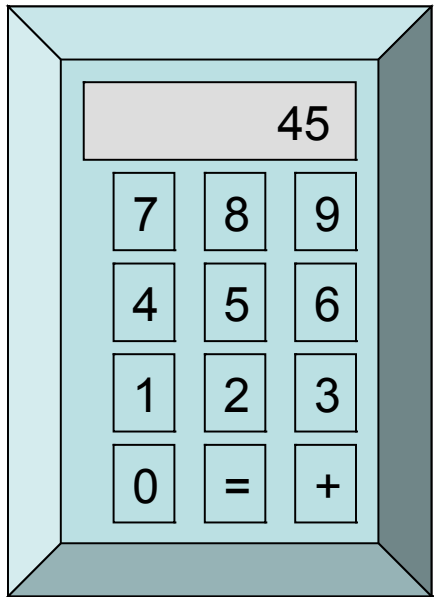
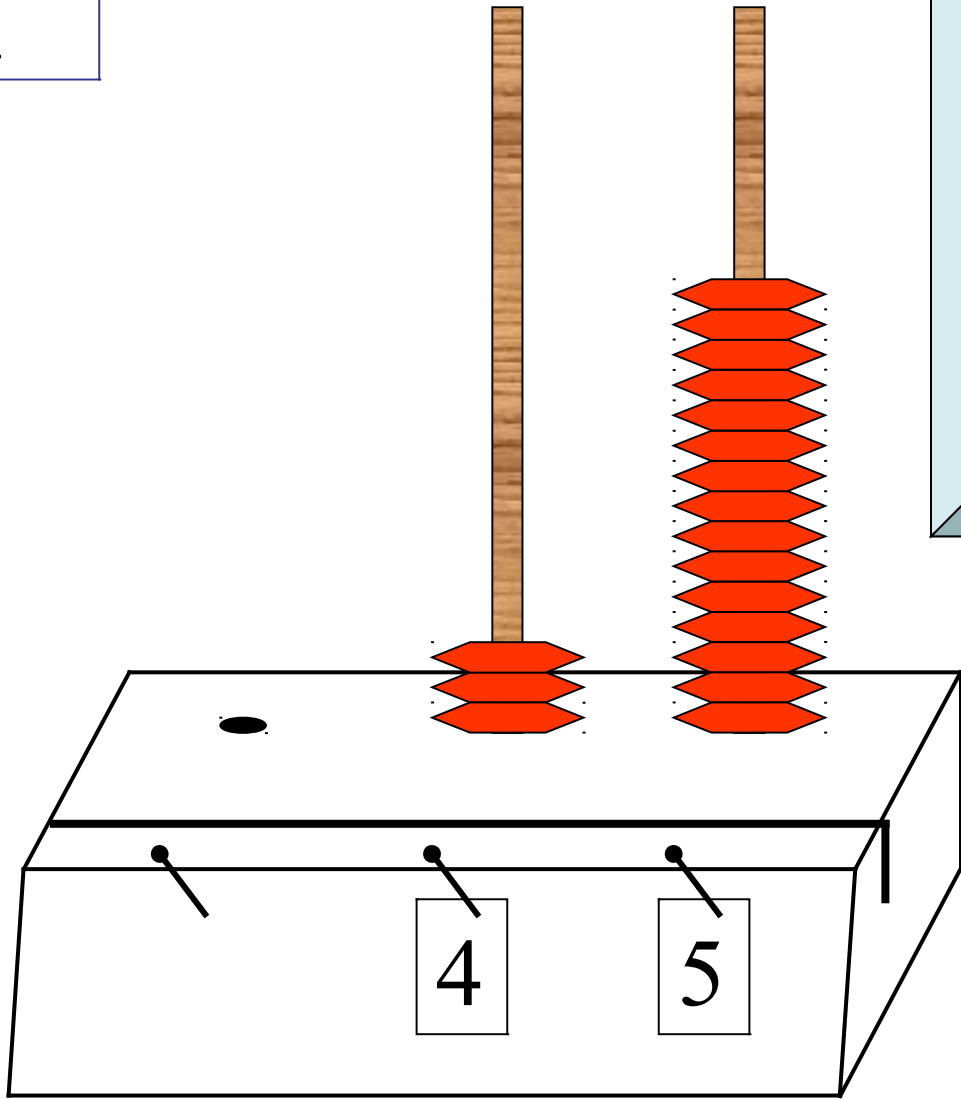
Faire parallèle abaque et opération 15 jetons...

4 6 2

0

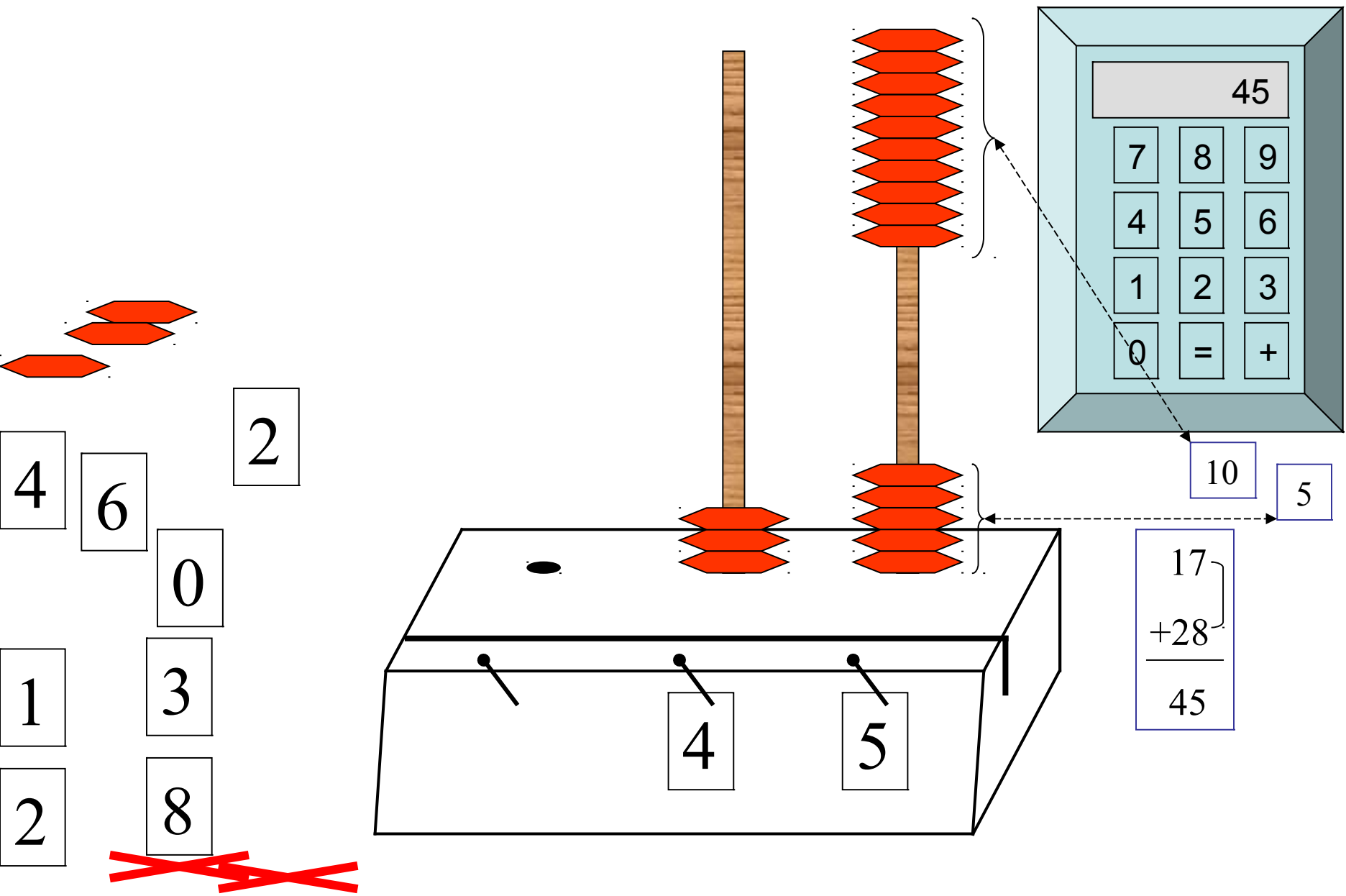
1 3

2 8

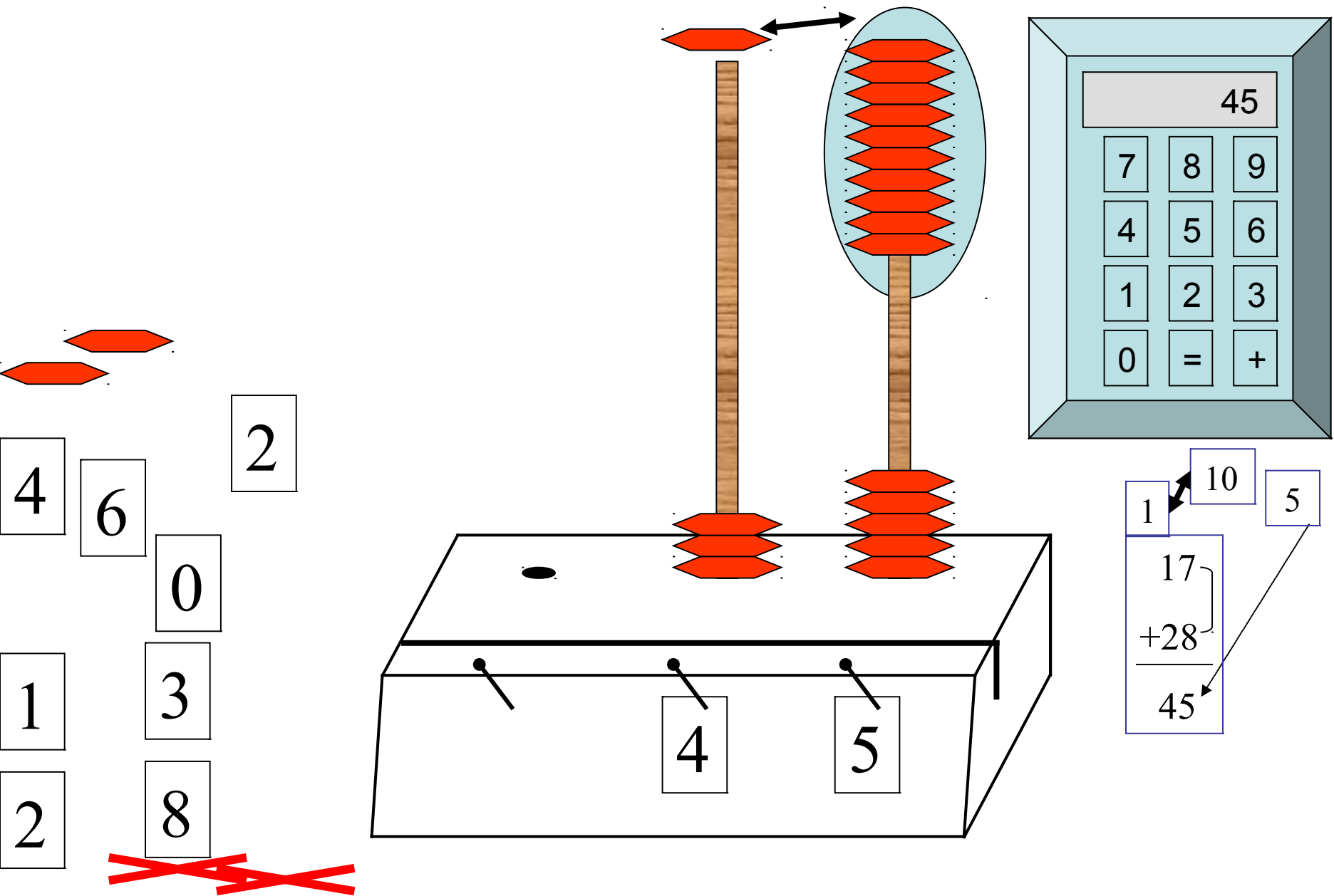


$$\begin{array}{r} 17 \\ +28 \\ \hline 45 \end{array}$$

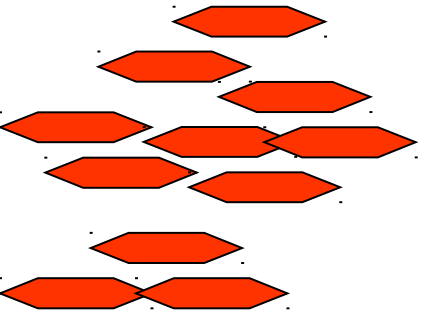
Restructuration opératoire : l'addition



Restructuration opératoire : l'addition



Restructuration opératoire : l'addition

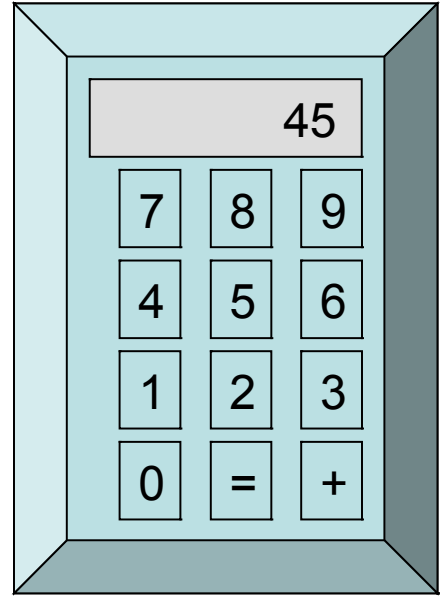
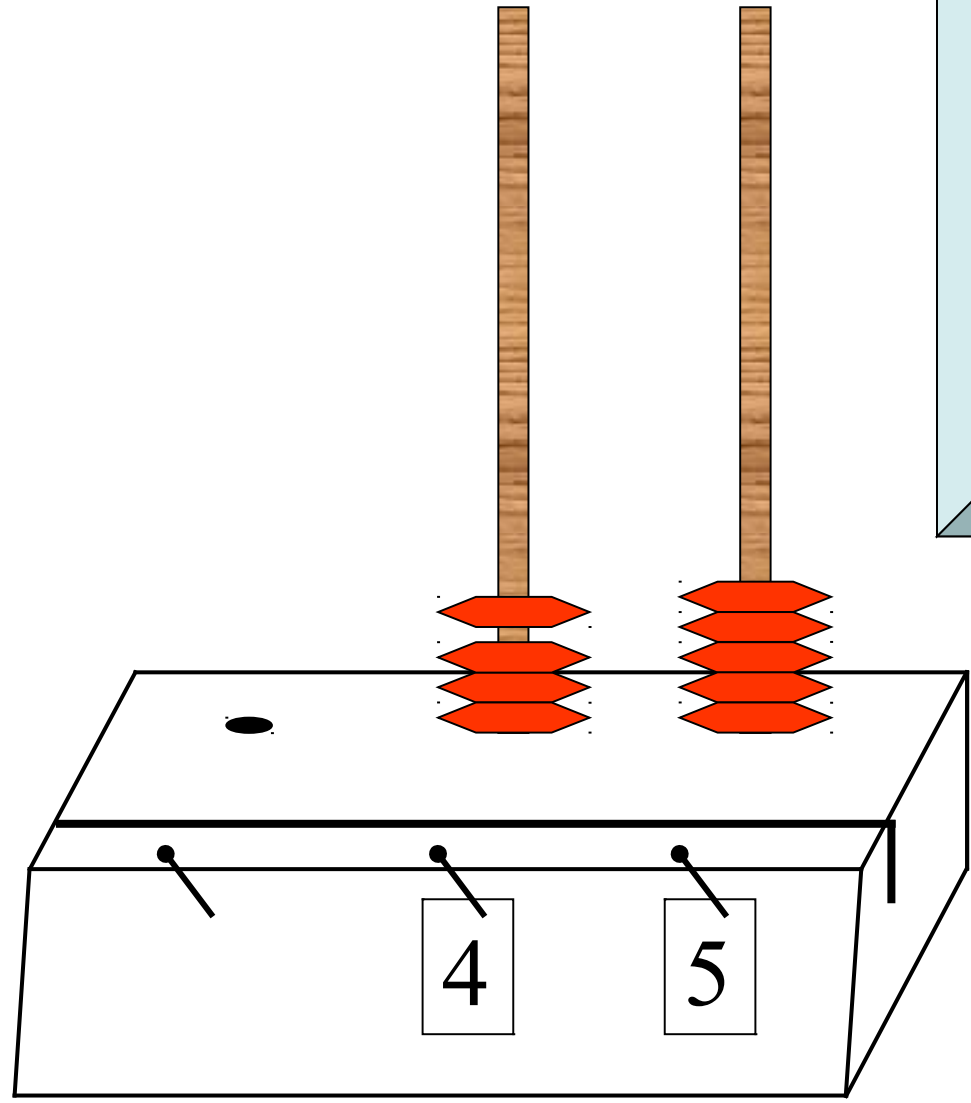


4 6 2

1 0

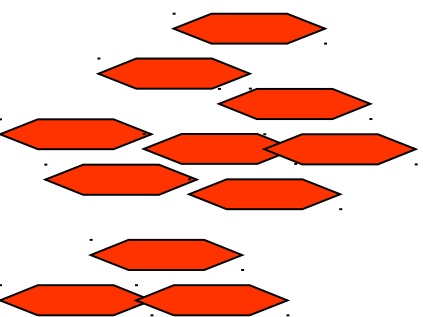
1 3

2 8



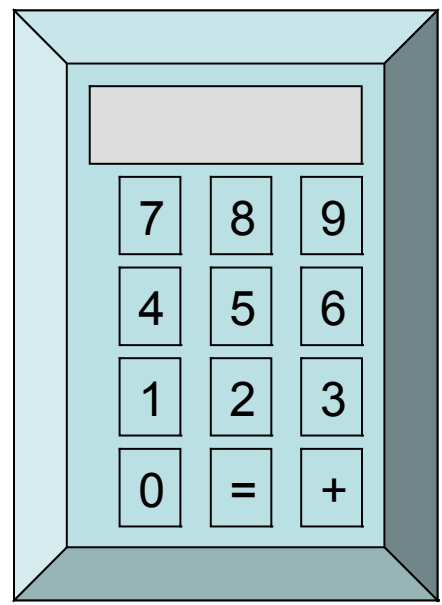
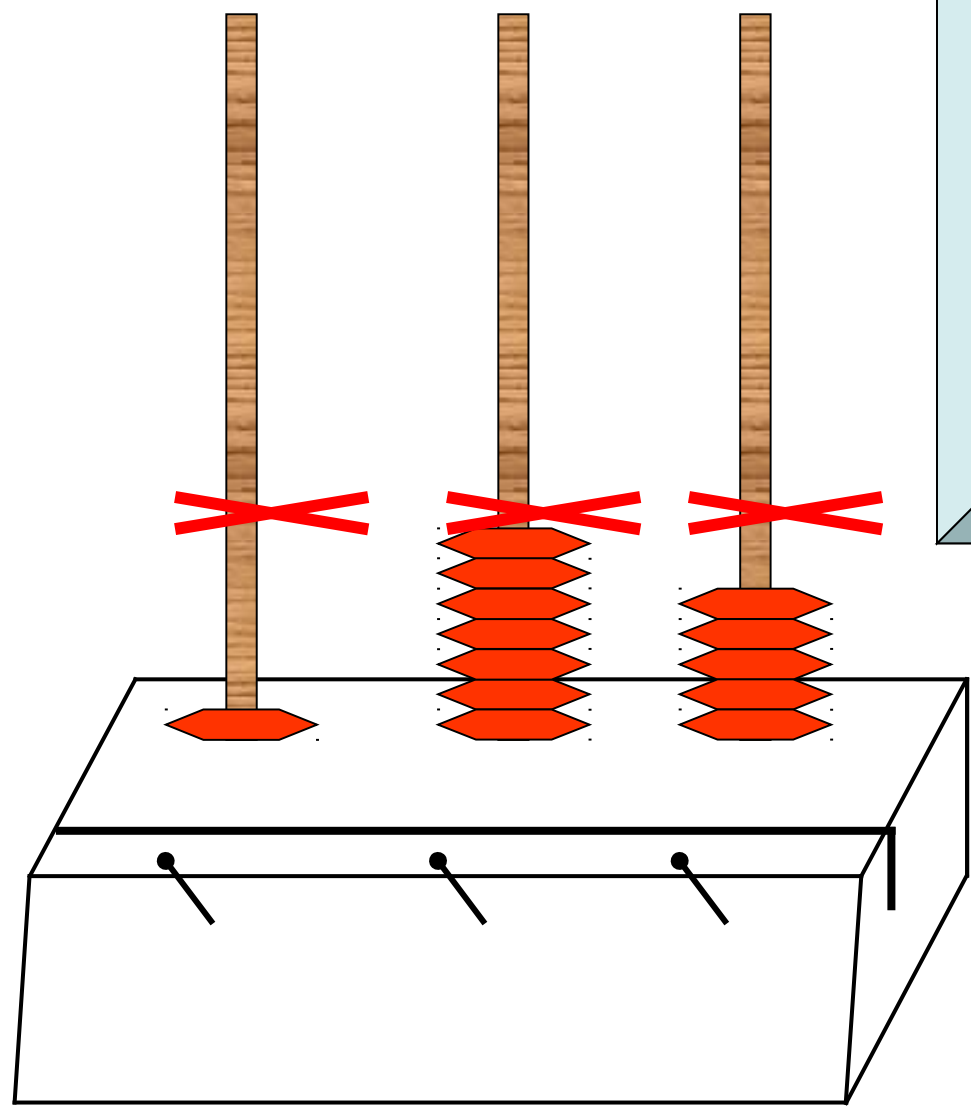
$$\begin{array}{r} 1 \\ 17 \\ +28 \\ \hline 45 \end{array}$$

Restructuration opératoire : l'addition



4	6	2
1	3	0
2	8	

~~2~~



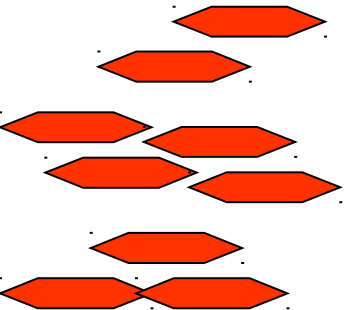
$$\begin{array}{r} 175 \\ +268 \\ \hline \end{array}$$

Temps 5

Restructuration
opératoire de la
soustraction à partir de
l'abaque

Restructuration opératoire : la soustraction

Travail en direct

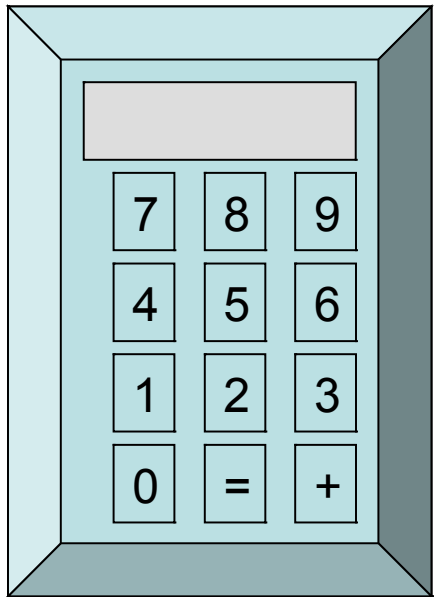
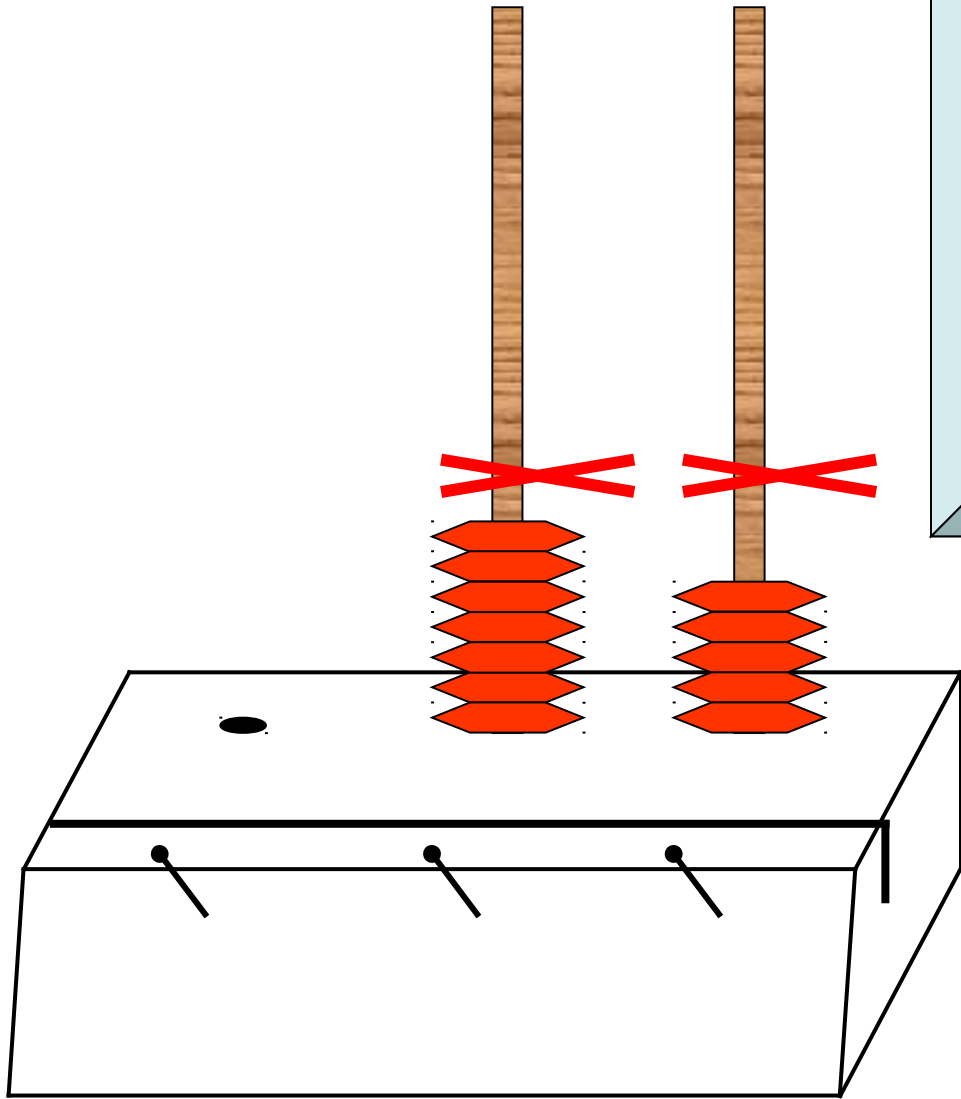


4 6 2

1 0

2 3

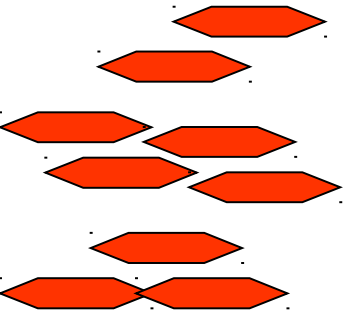
~~2 8~~



$$\begin{array}{r} 75 \\ - 23 \\ \hline \end{array}$$

Restructuration opératoire : la soustraction

Travail en direct

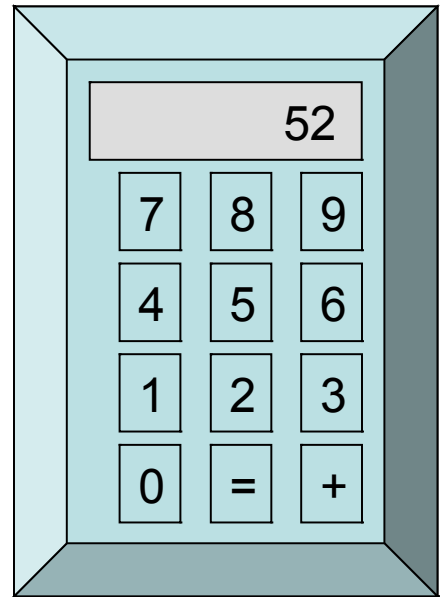
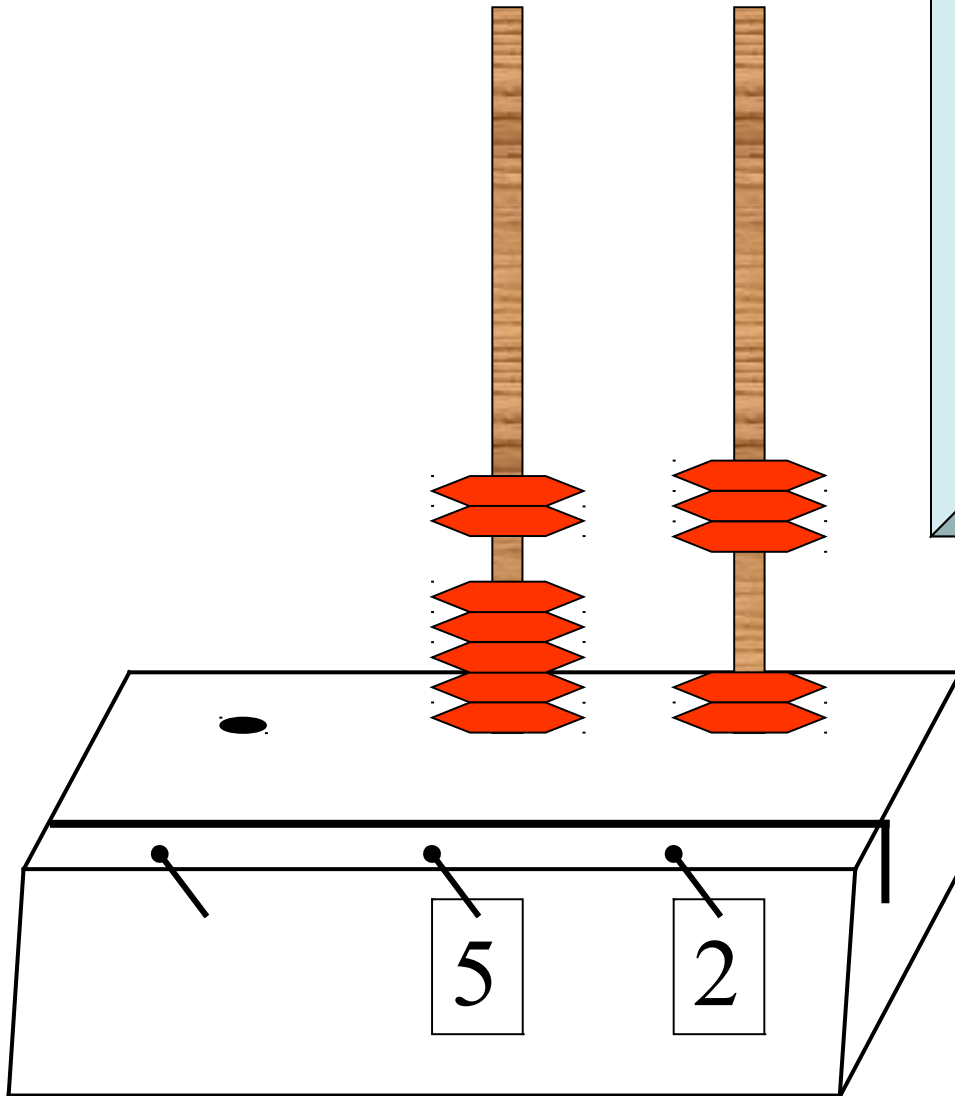


4 6 2

0

1 3 8

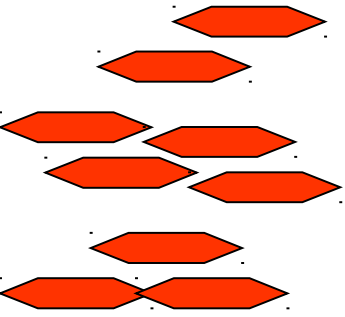
~~8~~



$$\begin{array}{r} 75 \\ - 23 \\ \hline 52 \end{array}$$

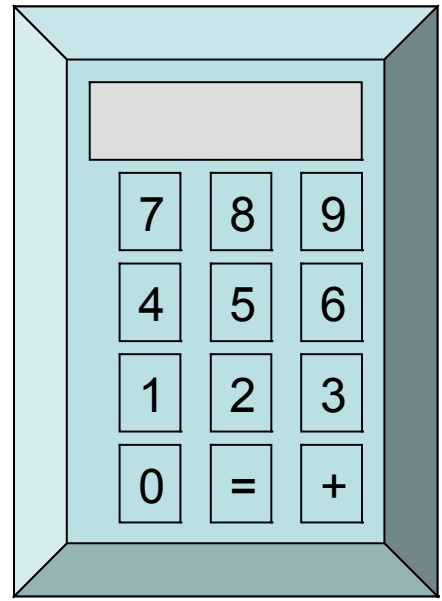
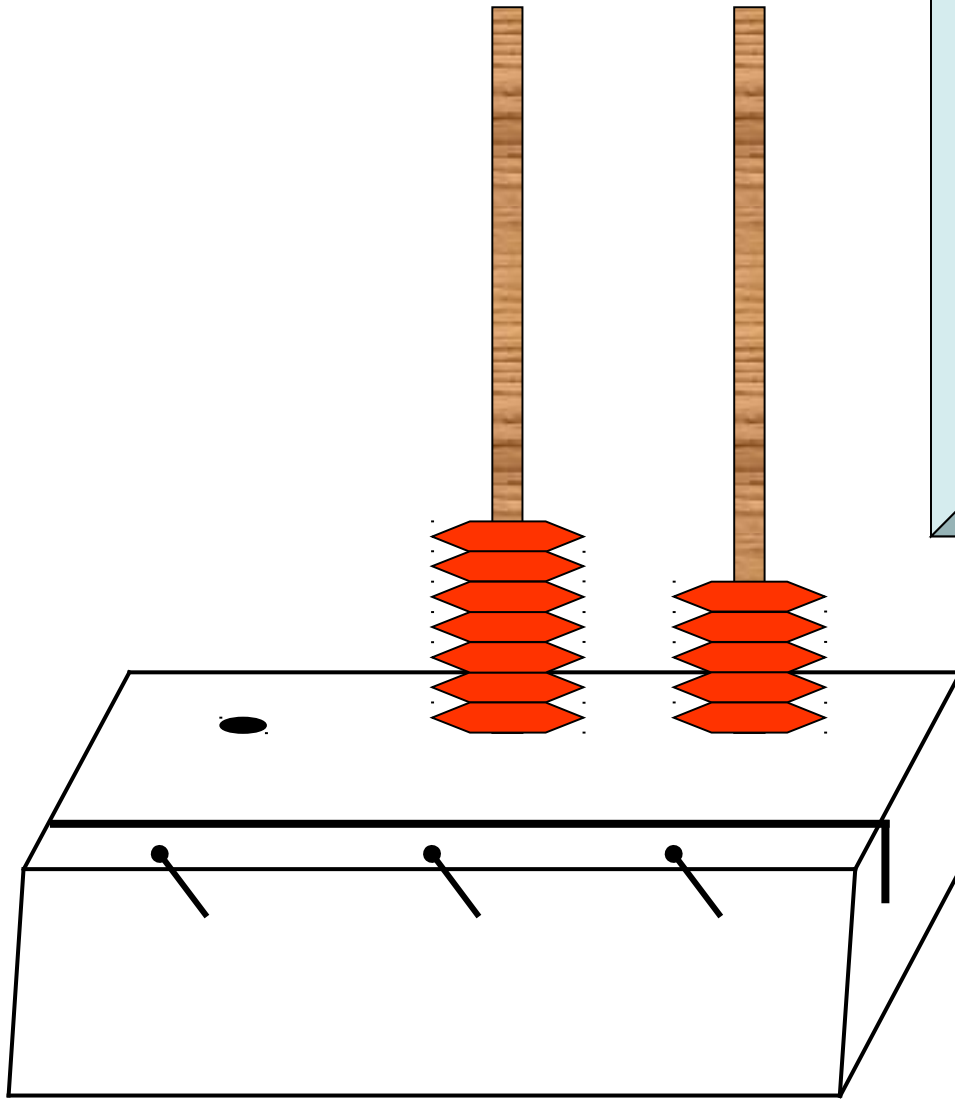
Restructuration opératoire : la soustraction

Travail en direct



4	6	2
1	0	
2	3	
	8	

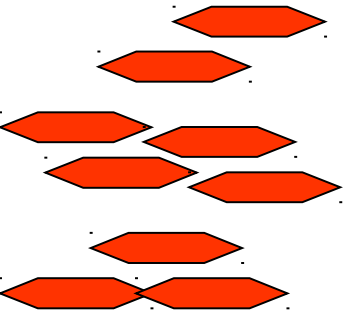
~~2~~
~~8~~



$$\begin{array}{r} 75 \\ - 18 \\ \hline \end{array}$$

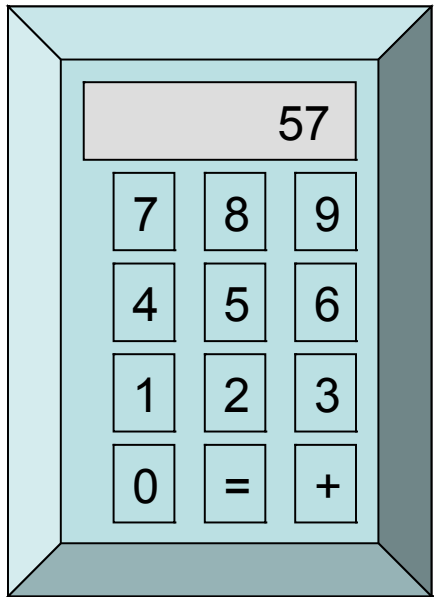
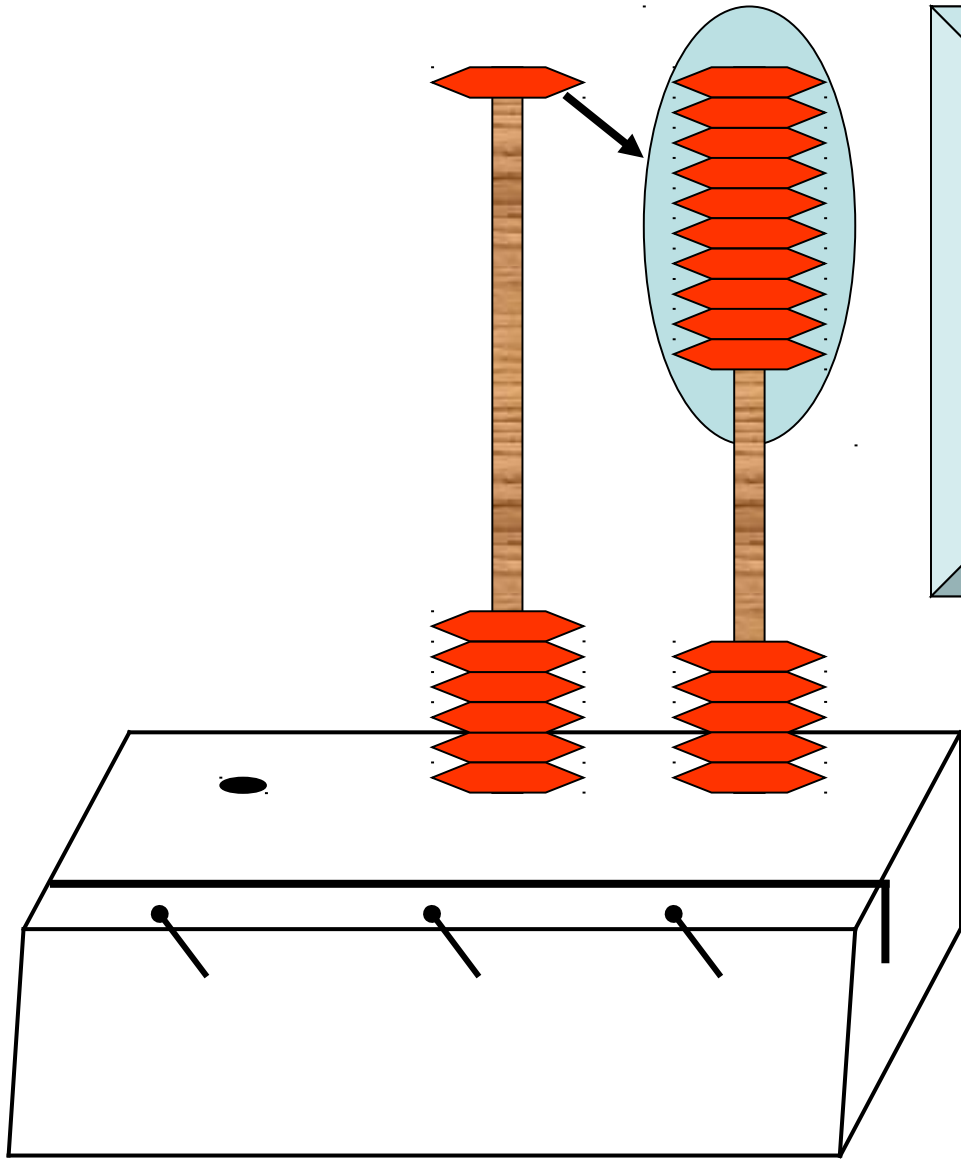
Restructuration opératoire : la soustraction

Travail en direct



4	6	2
	0	
1	3	
2	8	

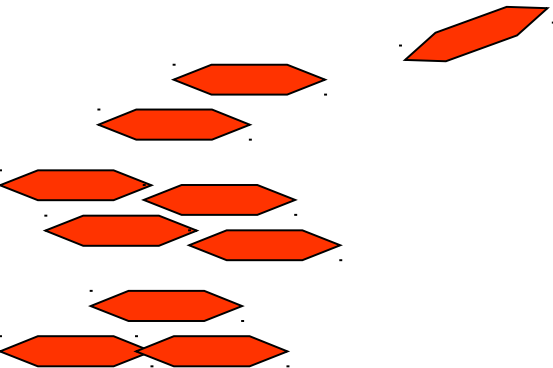
~~2~~



$$\begin{array}{r} 75 \\ - 18 \\ \hline 57 \end{array}$$

Restructuration opératoire : la soustraction

Travail en direct



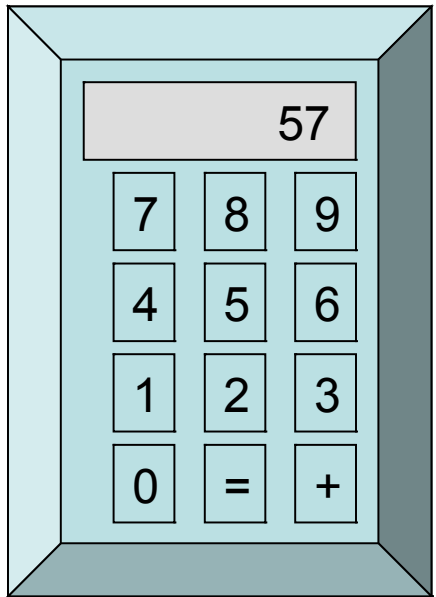
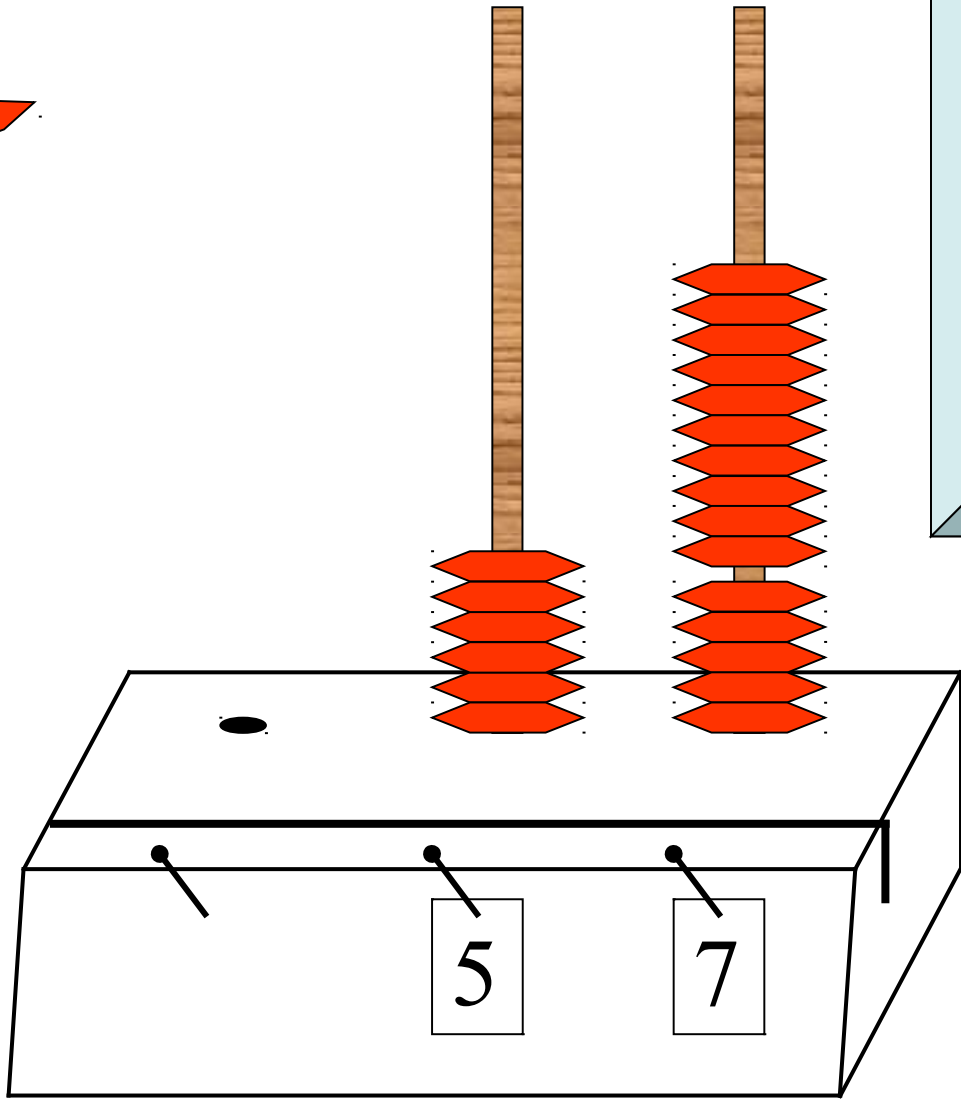
4 6 2

0

1 3

2 8

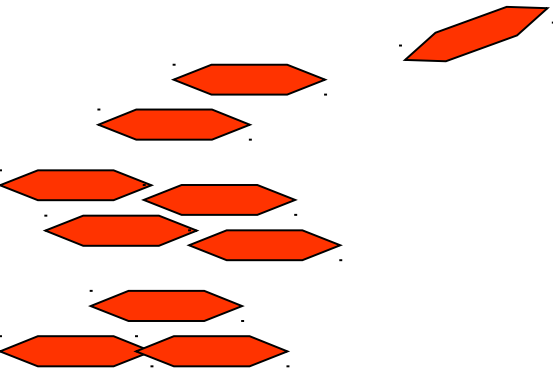
~~2 8~~



$$\begin{array}{r} 610 \\ \cancel{75} \\ - 18 \\ \hline 57 \end{array}$$

Restructuration opératoire : la soustraction

Travail en direct



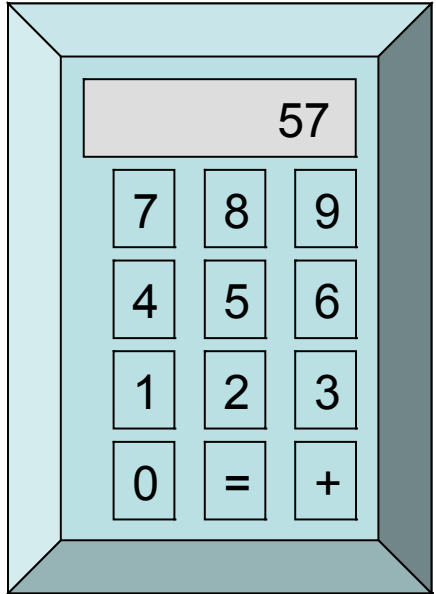
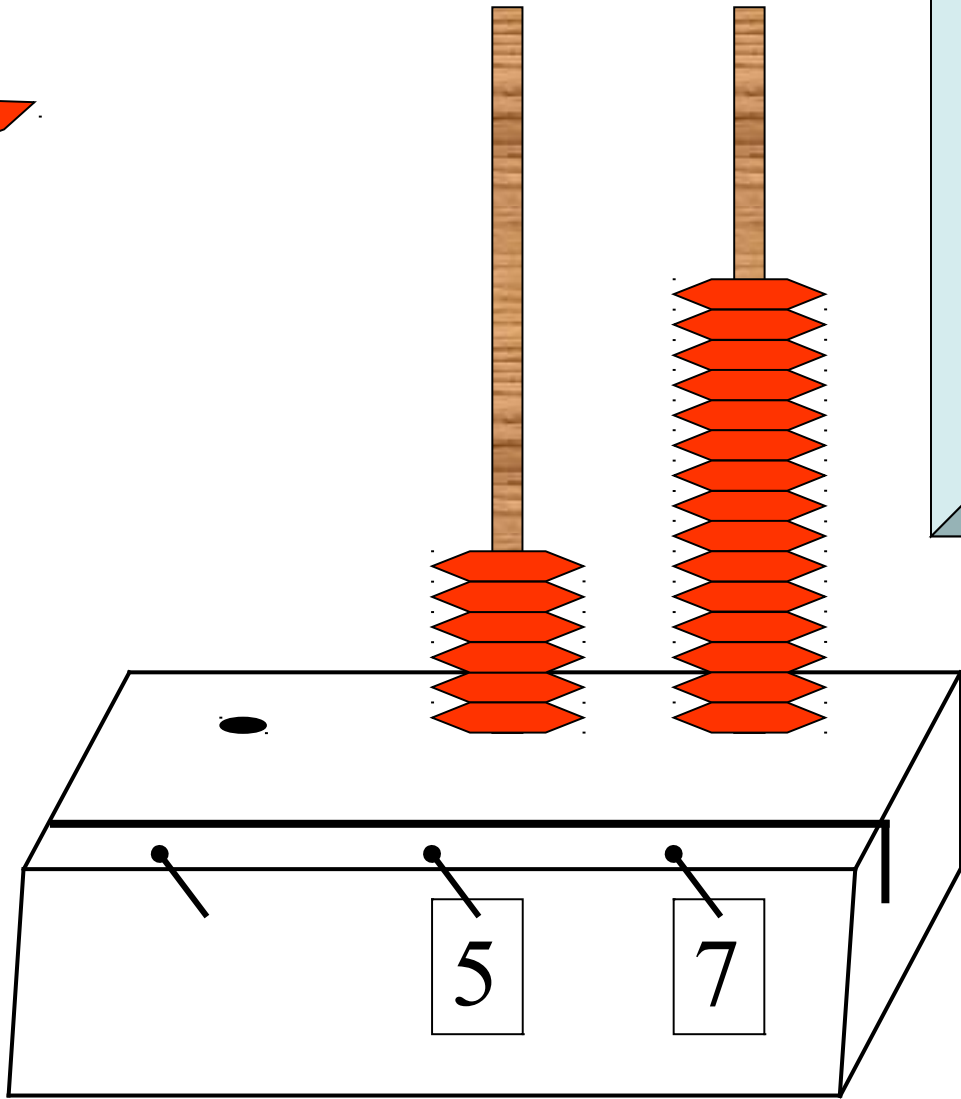
4 6 2

0

1 3

2 8

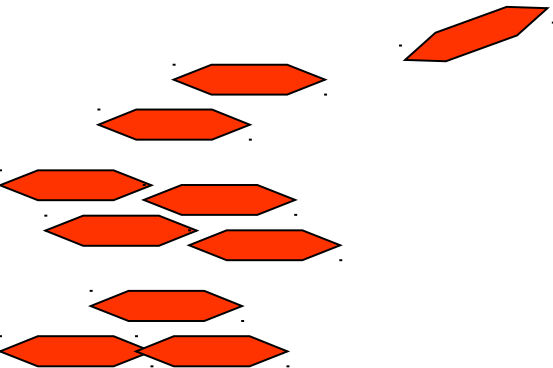
~~2 8~~



$$\begin{array}{r} \cancel{6}5 \\ - 18 \\ \hline 57 \end{array}$$

Restructuration opératoire : la soustraction

Travail en direct



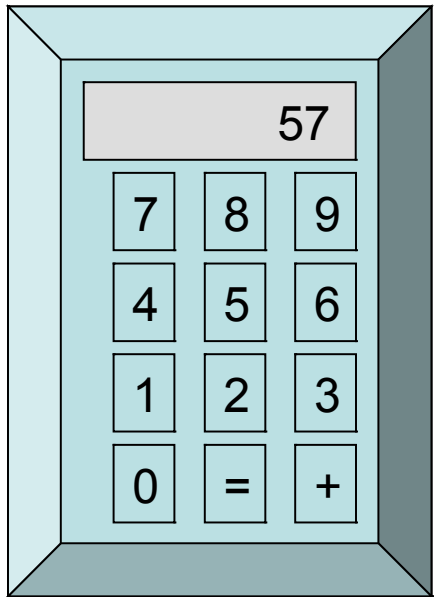
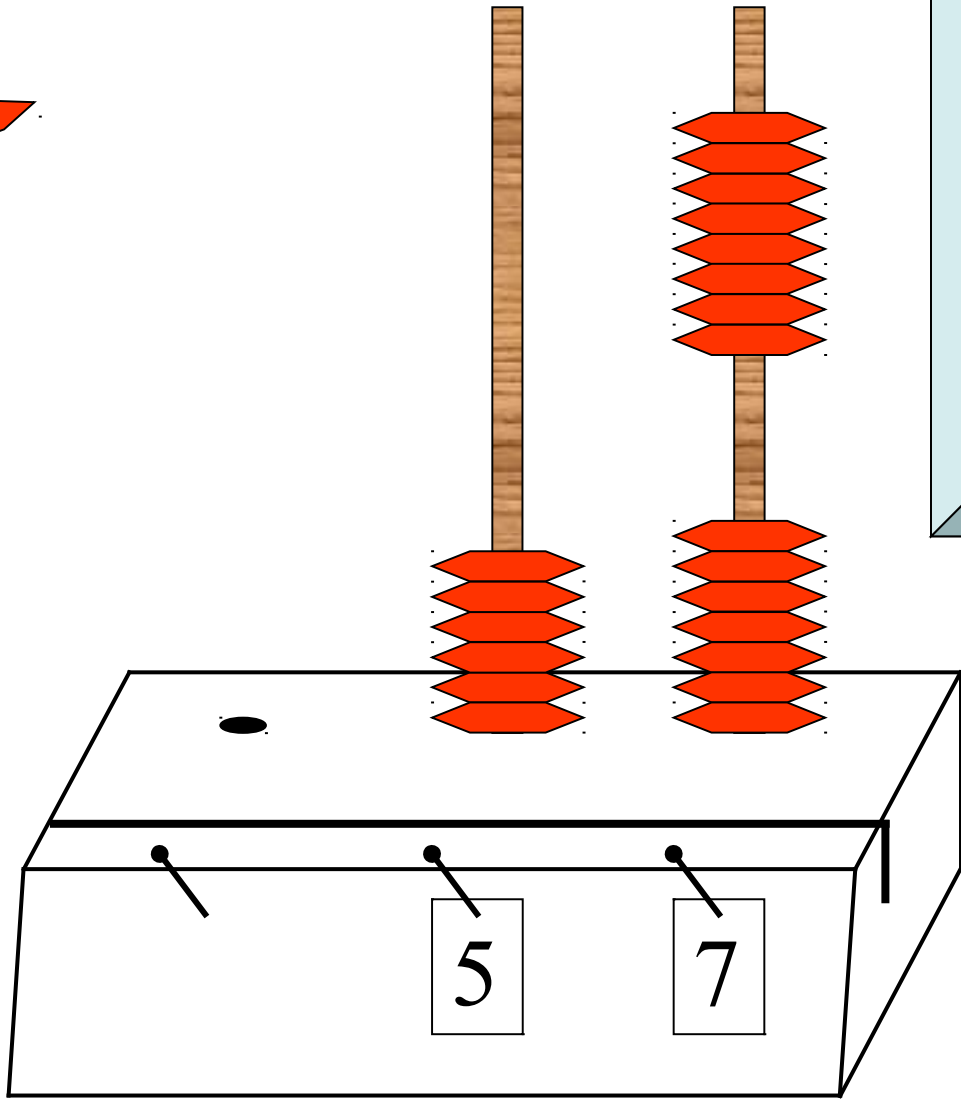
4 6 2

0

1 3

2 8

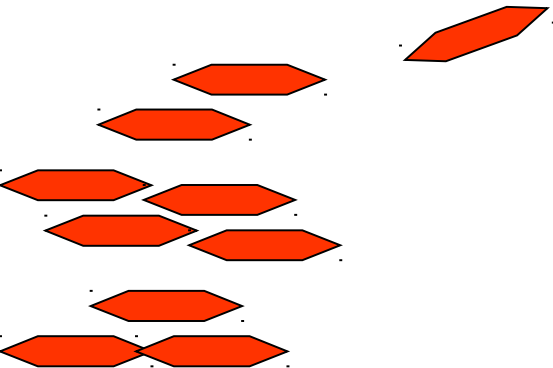
~~2 8~~



$$\begin{array}{r} \cancel{6}5 \\ - 18 \\ \hline 57 \end{array}$$

Restructuration opératoire : la soustraction

Travail en direct



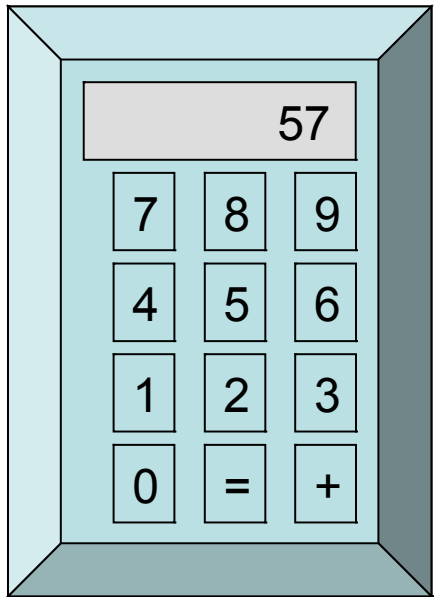
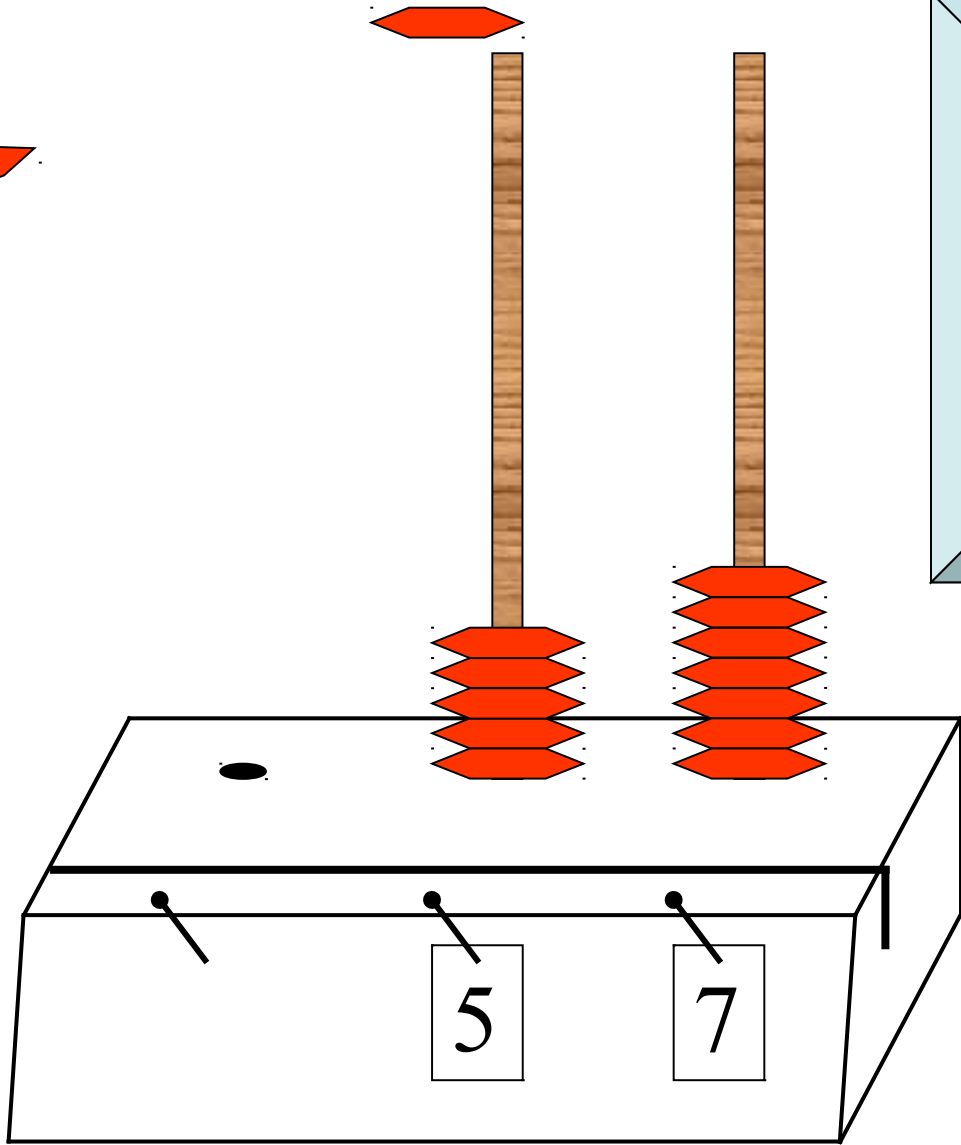
4 6 2

0

1 3

2 8

~~2 8~~



$$\begin{array}{r} \cancel{6}5 \\ - 18 \\ \hline 57 \end{array}$$