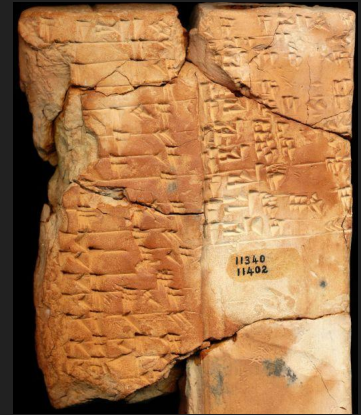


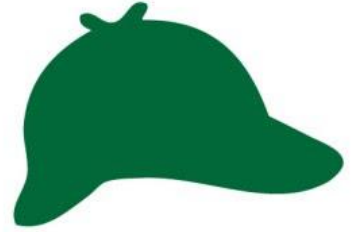
Fem de Sherlock Holmes al museu

Desxifrem tauletes mesopotàmiques

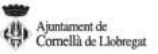


David Pinyol i Enric Brasó (MMACA)
Palau Mercader de Cornellà, maig 2024.

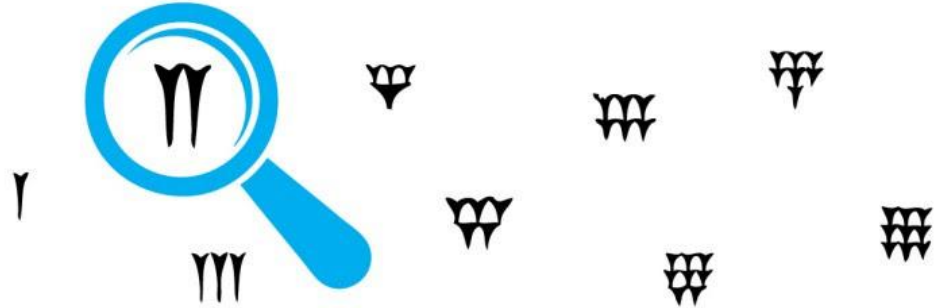
Sherlock Holmes al museu



Amb el suport de:



desxifrem tauletes mesopotàmiques



Conferència
a càrrec de David Pinyol i Enric Brasó

Dimecres 15 de maig de 2024 a les 18:00
Palau Mercader - Parc Can Mercader - Cornellà de Llobregat
Inscripció a: <http://tiquets.mmaca.cat>





S'han conservat restes arqueològiques



The first library to contain all knowledge



The fragments of the tablets found in the library of Ashurbanipal, king of Assyria (688-627 BC). The fragments are arranged in a grid, with labels below each fragment. The text on the labels is small and difficult to read, but it appears to be a list of the fragments and their locations.

S'han conservat moltes restes arqueològiques



Una invenció fantàstica



- Amb el material a l'abast: fang i canyes.
- Reutilitzable
- Gairebé etern.

Esriptura cuneiforme

T = Clau, < = espiga





Museu de Pergam (Berlin)



Excavació a JAR l'any 1973

Transcripció d'una tauleta del 2000 aC

Escolar, digues, on vas ara, un cop superada la infància més tendra?

Vaig a la casa de les tauletes.

I què hi fas?

Recito la meva tauleta. Esmorzo. Preparo una tauleta nova. L'omple d'escriptura fins a acabar-la. Després m'assignen els deures.

A la tarda, em posen un exercici d'escriptura. En acabat, me'n vaig cap a casa on trobo el pare assegut. Li explico que hem escrit una tauleta i la hi recito. Els pares se n'alegren molt...

Quan em desperto, vaig a la mare i li dic: "Dona'm l'esmorzar que haig d'anar a la casa de les tauletes". La mare em dona dos panets i torno a anar a la casa de les tauletes.

A l'escola, el supervisor em diu: "Per què arribes tard?". Me'n vaig al meu lloc amb el cor bategant i faig una inclinació al mestre.

Extret del llibre "La història empieza en Sumer" de Samuel Noah Kramer (editat el 1956, disponible en línia)



S'han interpretat totes?





1800 aC, Larsa



Com s'ha aconseguit desxifrar aquesta escriptura?

Segle XIX



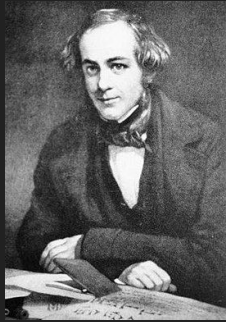
Georg F.
Grotefend



**Inscripció XPe a Persèpolis
900 km al sud de Teheran**

Un segon protagonista que va aconseguir desxifrar aquests idiomes.

Segle XIX



Henry
Rawlinson



Muntanya de Behistun

Línia del temps dels primers registres històrics matemàtics



44200 to 43000 BCE: Lebombo bone (markings suggest counting)

4000 BCE: Numbers and counting begin in Sumer

1900 to 1600 BCE: Babylonian tablets contain integer divisions



1900 to 1600 BCE: Babylonian tablets contain integer reciprocals



1400 BCE to 1500 CE: Wax tablets employed as writing surfaces



1000 to 1100: Venerable Bede describes hand counting



1500: Native North Americans use dots to indicate counting numbers

1679: Leibniz discovers binary arithmetic

18000 to 2000 BCE: Ishango bone (marks interpreted as tallies)

2600 to 2500 BCE: Earliest reliably dated mathematical tablet



1900 to 1600 BCE: Babylonian tablets contain integer multiplication



1550 BCE: Egyptian Rhind papyrus contains tables of $2/n$ and divisions



305 BCE: Oldest known decimal multiplication table written in China



1400 to 1532: Incas use quipus as recording devices



1541: Codex Mendoza includes Aztec calendrical dates



1800: Ojibwe ritual use of counting depicted on birchbark scroll



Tauleta babilònica, Nippur, 1400- 1100 aC

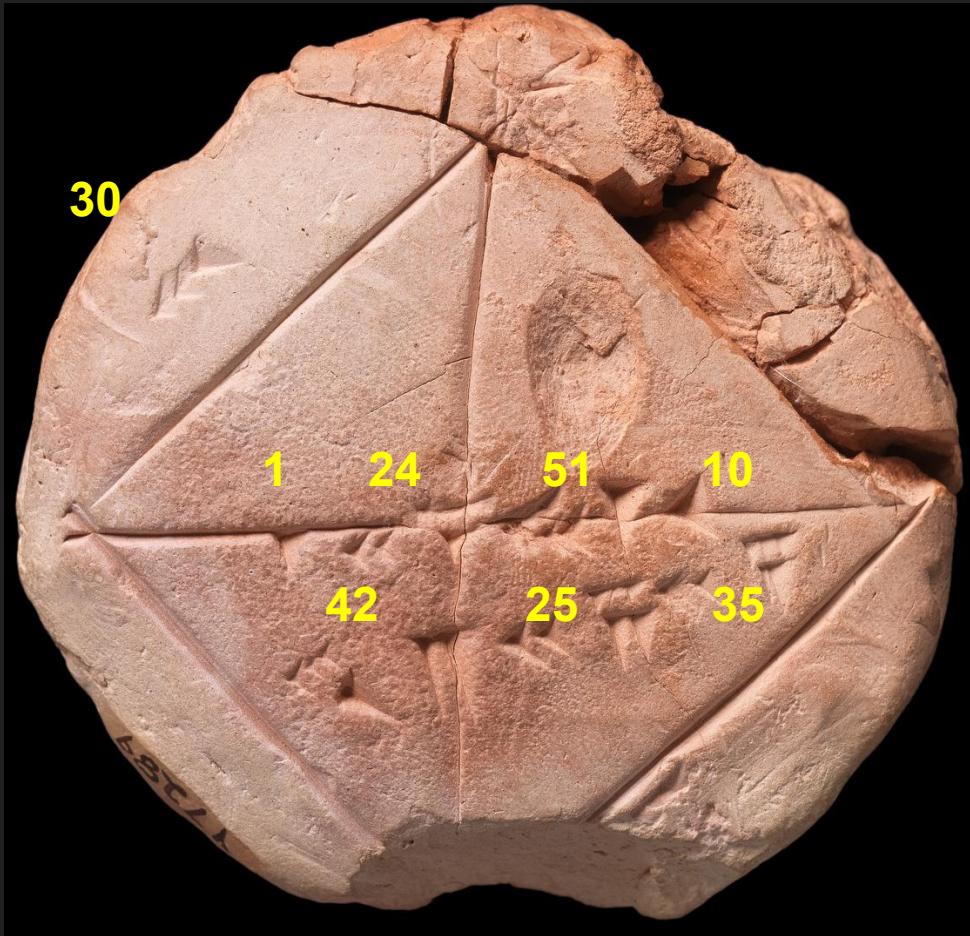


1	9
2	18
3	27
4	36
5	45
6	54
7	$63=60+3$
8	$72=60+12$
9	$81=60+21$
10	$90=60+30$
11	$99=60+39$
12	$108=60+48$
13	$117=60+57$
14	$126=2*60+6$



15	$159=2*60+15$
16	$144=2*60+24$
17	$153=2*60+33$
18	$162=2*60+42$
19	$171=2*60+41$
20	$180=3*60$
30	$270=4*60+30$
40	$360=6*60$
50	$450=7*60+30$

𠃉	1	𠃊	11	𠃋	21	𠃌	31	𠃍	41	𠃎	51
𠃏	2	𠃐	12	𠃑	22	𠃒	32	𠃓	42	𠃔	52
𠃕	3	𠃖	13	𠃗	23	𠃘	33	𠃙	43	𠃚	53
𠃛	4	𠃜	14	𠃝	24	𠃞	34	𠃟	44	𠃠	54
𠃡	5	𠃢	15	𠃣	25	𠃤	35	𠃥	45	𠃦	55
𠃧	6	𠃨	16	𠃩	26	𠃪	36	𠃫	46	𠃬	56
𠃭	7	𠃮	17	𠃯	27	𠃰	37	𠃱	47	𠃲	57
𠃴	8	𠃵	18	𠃶	28	𠃷	38	𠃸	48	𠃹	58
𠃼	9	𠃽	19	𠃾	29	𠃿	39	𠄀	49	𠄁	59
𠄂	10	𠄃	20	𠄄	30	𠄅	40	𠄆	50		



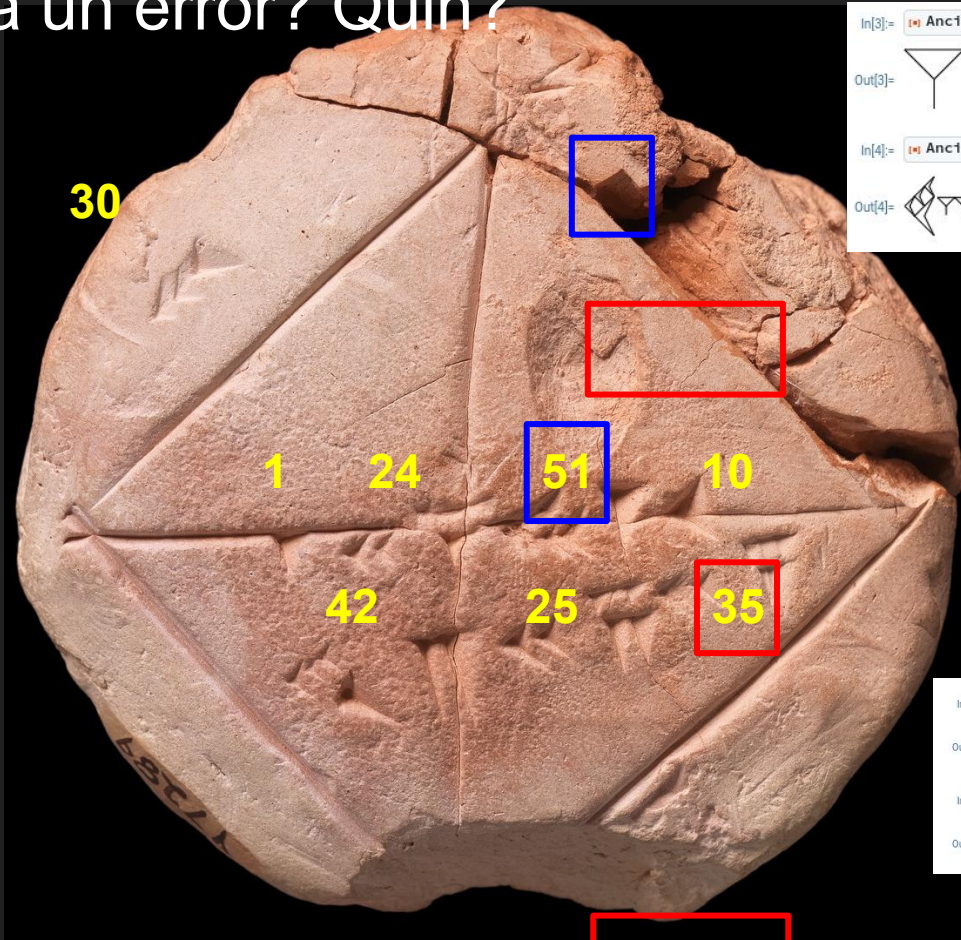
$$=1+24/60+51/60^2+10/60^3$$
$$=1,414\ 212\ 962\ \dots$$

el valor exacte de l'arrel de 2 és
1,414 213 562 ...

$$=42+25/60+35/(60*60)$$
$$=42,426\ 388\ \dots$$

el valor exacte és
42,426 406 ...

Hi ha un error? Quin?



In[3]:= AncientNumberRepresentation [1.41421356237309504880168, "Babylonian"]
Out[3]=

In[4]:= AncientNumberRepresentation [30 * 1.41421356237309504880168, "Babylonian"]
Out[4]=

In[29]:= AncientNumberRepresentation [30 * (1 + 24 / 60 + 51 / 60^2 + 17 / (60)^3), "Babylonian"]
Out[29]=

In[30]:= AncientNumberRepresentation [30 * (1 + 24 / 60 + 51 / 60^2 + 10 / (60)^3), "Babylonian"]
Out[30]=

Hi ha un error? Quin?



1900-1600 aC, Nippur

Corregim els deures de fa 3000

Hi ha un error? Quin?



Hi ha un error? Quin?



29-1

29-1

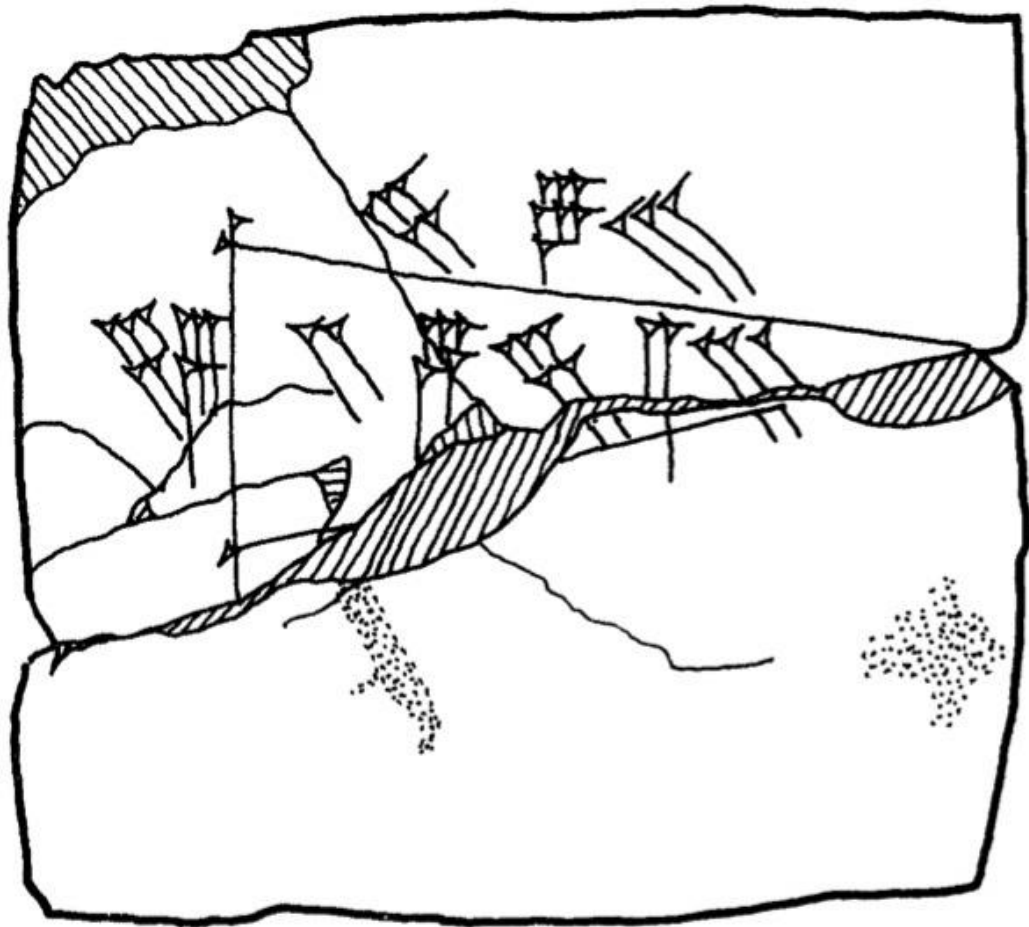
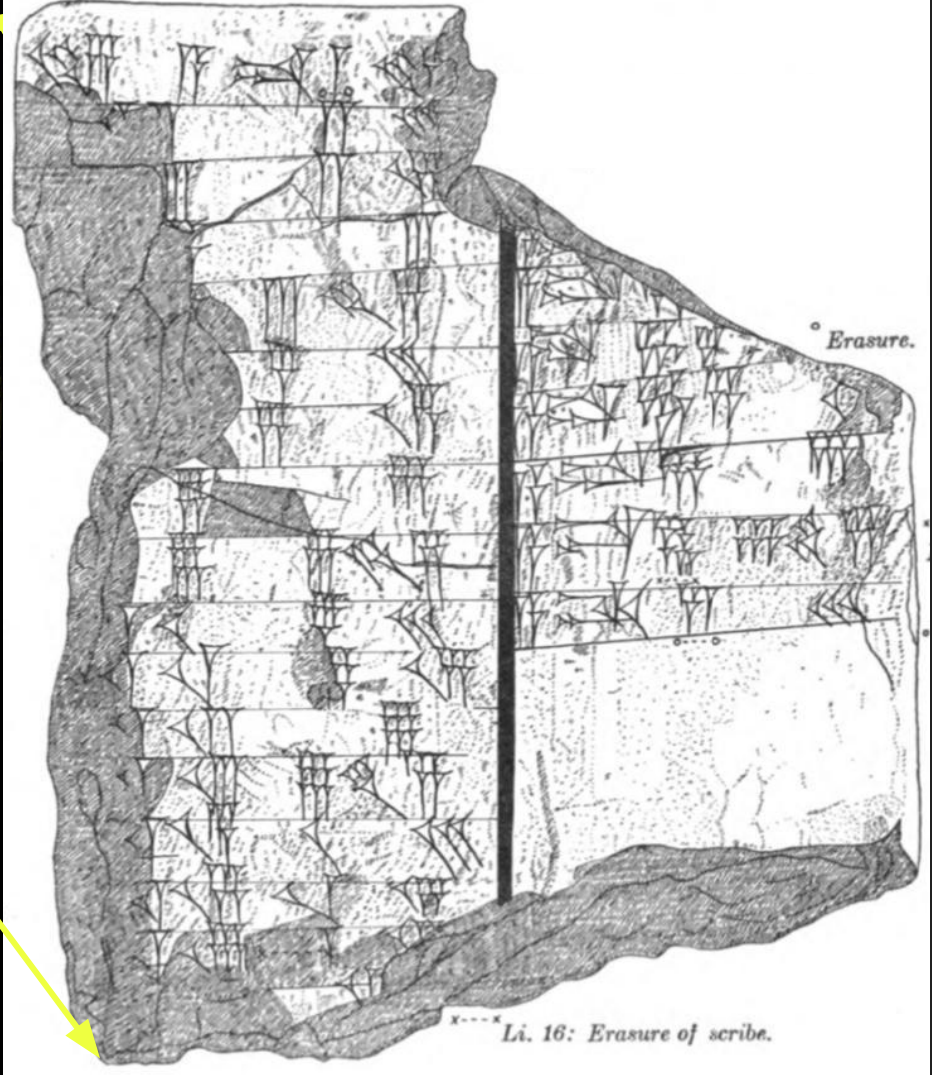


Figure 2. UM 29-15-709 (obverse). Drawing by the author



Hi ha un error?



Li. 16: Erasure of scribe.



10
11
12
13
14
15
16







2 30

2 15

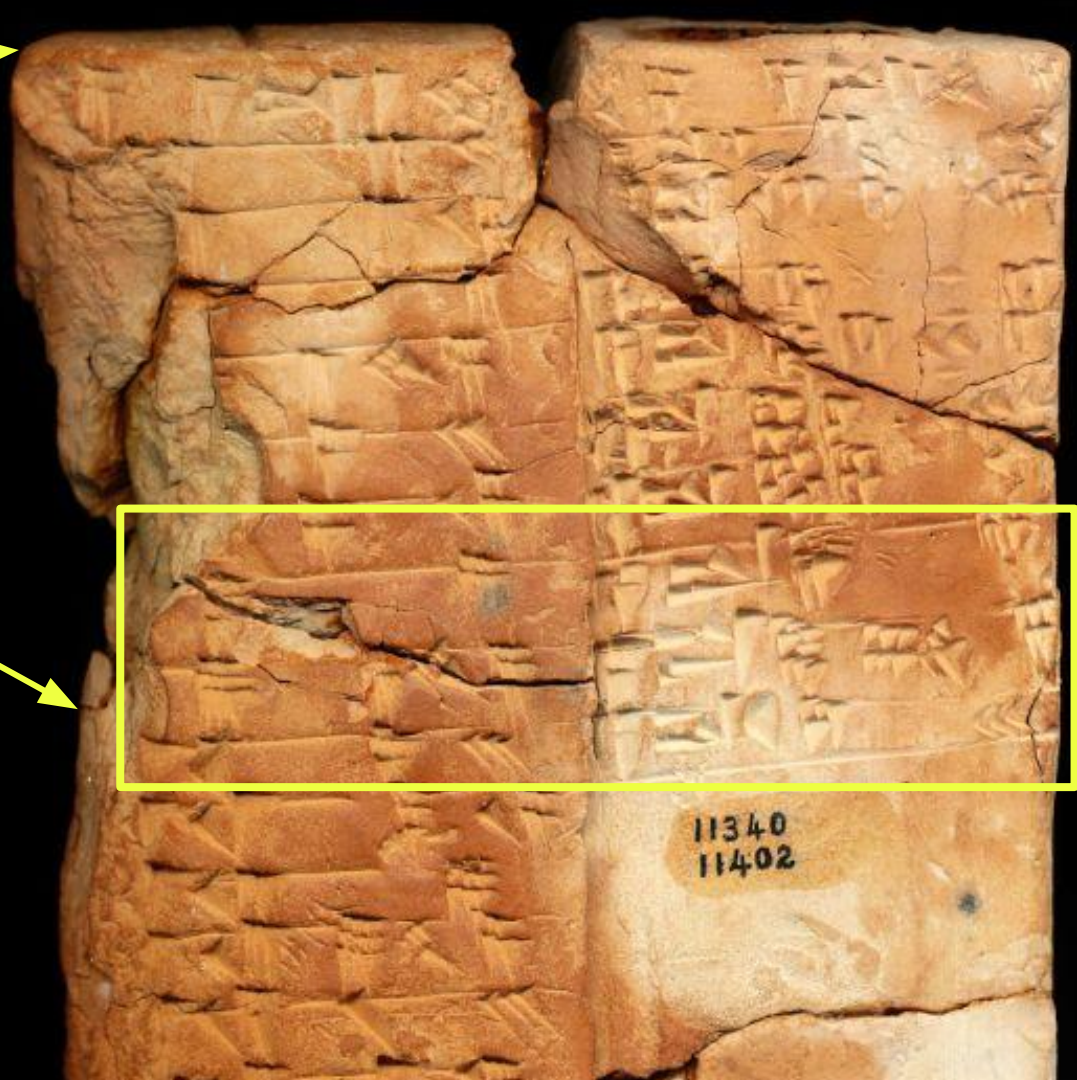
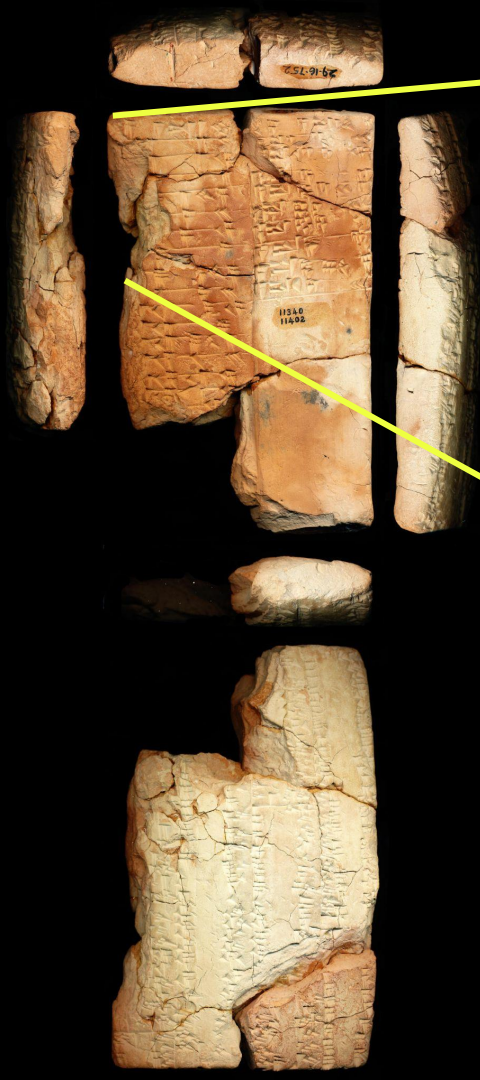
3

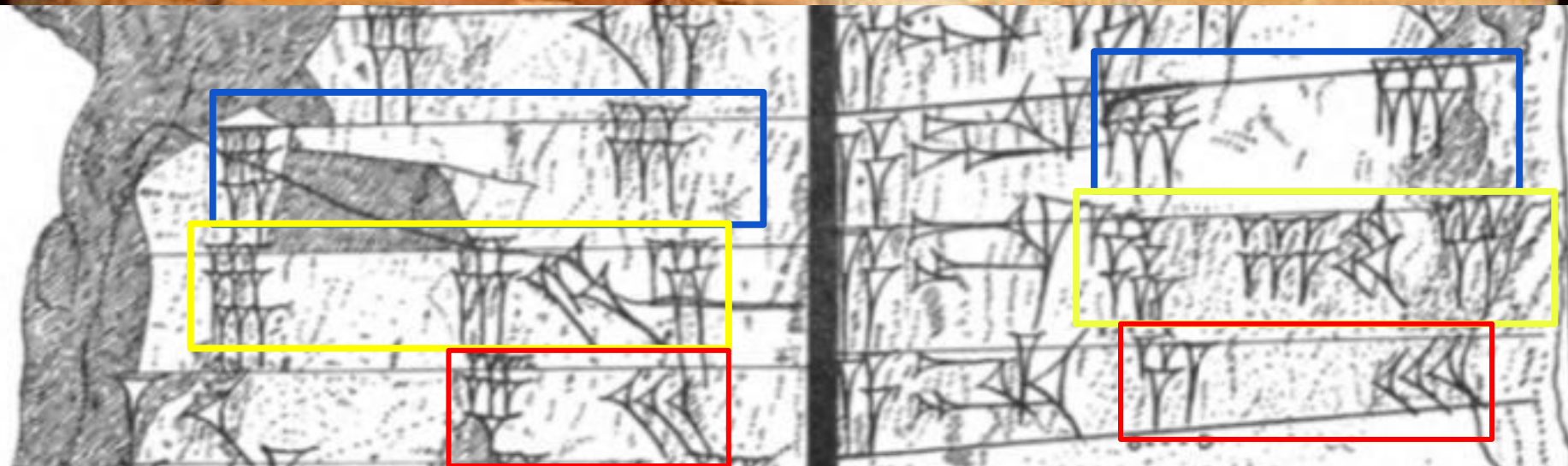
3 45

4 30

5 15







En voleu més?



1900–1600 aC,
Nippur (avui Afak, Al-qadisiyah, Iraq)

Tauleta N3914,
al Penn Museum de Filadèlfia

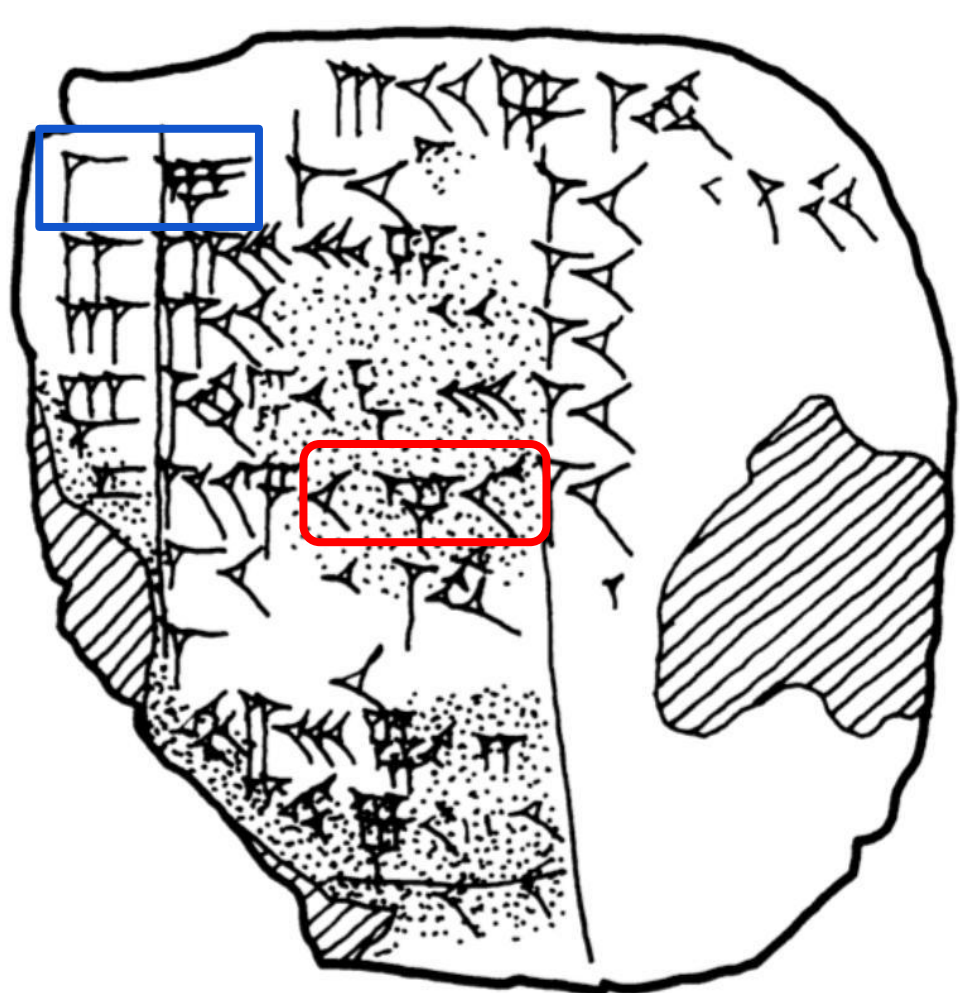
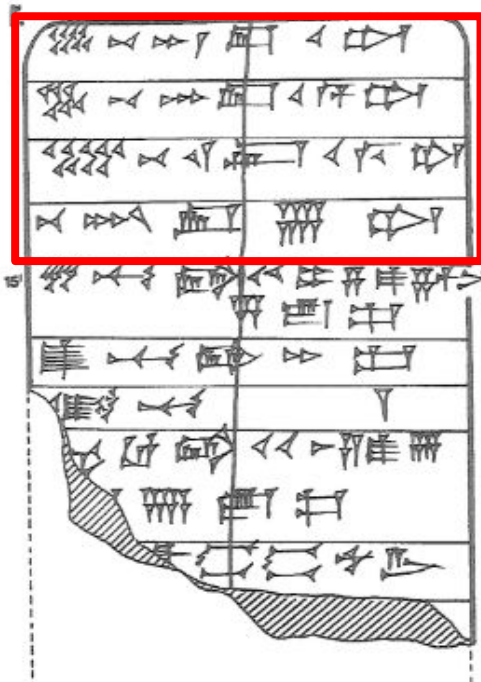
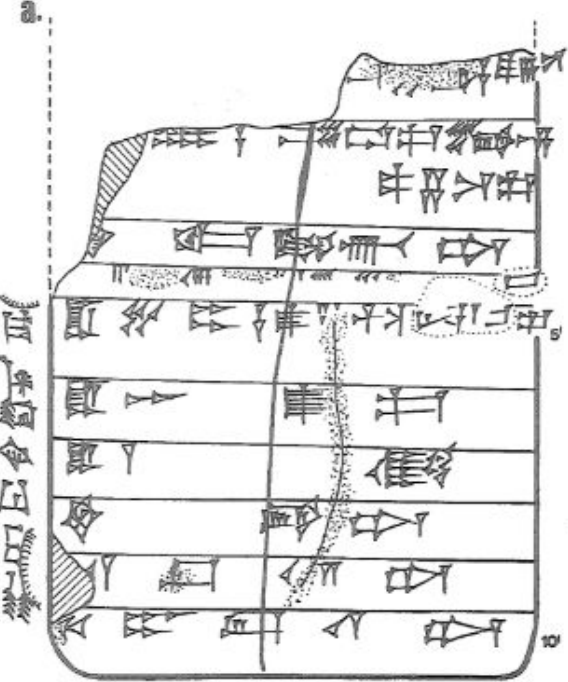


Figure 10: N 3914 obverse (reverse blank)

		3 25 01 40	
1	7	1 10	1 10 1 40
2	3 30	35	1 10
3	2 20	[23] 20	1 10
4	1 45	[17] 30	1 10
[5]	1 24	14 «40»	1 10
[6]	1 10	11 40	<1 10>
[7]	1	10	<1 10>
[8]	52 30	8 [45]	<1 10>
[9]	4]6 40	7 [46 40]	<1 10>
[10]	42	7] ...	<1 10>

The purpose of the 1 40, written to the right of the first row, is unclear.

Els Sherlock Holmes del CSIC



339 (MM 183) Umma ŠS2 6 3/-
AnOr 7 339

- a. *Comienzo destruido*
[...]'x' 'še-bi' 0.2.3 6 sila₃
[x+]8.2.0 duh-gin gur še-bi 1.4/2 4 sila₃ gur
'ki' ka-gur₂-ta
Línea en blanco con cuentas del escriba
- 5' šu-nigin₂ 54.2.4 '5' 1/2 sila₃ (bor. sobre na, 1 ma') gur
šu-nigin₂ 2.0.0 ziz₂ gur
šu-nigin₂ 0.1.0 gig
ša₃-bi-ta
[1/18] '1/36' 1/72 (bur₃) iku 12-ta
- 10' '2' 5/18 (bur₃) iku 11-ta
- r. 8 1/3 2/18 1/72 (bur₃) iku 10-ta
6 1/3 3/18 (bur₃) iku 10-la₂-1/2-ta
9 1/3 1/36 1/72 (bur₃) iku 10-la₂-1-ta
1/3 3/18 1/36 (bur₃) iku 8-ta
- 15' še numun-bi 24.4.3 4 1/2 sila₃ / 5 gin₂ gur
ziz₂ numun-bi 2.0.0 gur
gig numun 0.1.0
[mur] gu₄ 5/6 -bi 21.3.4 8 / [2/3 sil]a₃ 9 gin₂ gur
[... ša₃-gal] amar-amar nu-tuku
Resto destruido
- b. [mu (us₂-sa)] ma₂ 'En-ki ba-'ab-du₃'

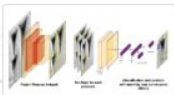
Tablilla tachada longitudinalmente en anverso y reverso.
Discusión y transliteración del texto en Pettinato - Waetzoldt, *StOr* 46 (1975) 264 s. Textos de Umma de este tipo los encontramos en *MVN* 1 86; Snell, *ASJ* 9 (1987) 251 n° 28; Maekawa, *ASJ* 11 (1989) 143 BM 106112; *SNAT* 343 y 363.
9'-18': para la comprensión de estas líneas, v. Maekawa, *ASJ* 11 (1989) 143 BM 106112. En el texto estudiado por Maekawa tenemos igualmente (a.20-r.4) extensiones de campo (con referencias al número de surcos por nindan'), cantidades de semilla de cebada, trigo y espelta y mur gu₄ 5/6-bi n; en este caso la proporción real entre las sumas de semilla y la de forraje es de 6:4.7, y en nuestro texto es de 6:4.8. Maekawa, sin embargo, calcula la cantidad de semilla según la extensión de los campos y su número de surcos, y

el total obtenido da una proporción exacta semilla:forraje de 6.5. La fórmula (obtenida a través del estudio de otros textos) es: 1 gin₂ x n surcos x n nindan² (= n iku x 100).
Aplicando esta fórmula a nuestro texto, e integrando en l. 9': [1/18] 1/36 1/72 (bur₃) iku 12-ta, obtenemos también la proporción 6.5 de semilla:forraje:

l.	n surcos x nindan ²	Tot. gin.
9'	1/8 1/36 1/72 (bur ₃) iku 12-ta	12 x 675 = 2.100 gin.
10'	2 5/18 (bur ₃) iku 11-ta	11 x 4.100 = 45.100 gin.
11'	8 1/3 2/18 1/72 (bur ₃) iku 10-ta	10 x 15.225 = 152.250 gin.
12'	6 1/3 3/18 (bur ₃) iku 10-la ₂ -1/2-ta	9.5 x 11.700 = 111.150 gin.
13'	9 1/3 1/36 1/72 (bur ₃) iku 10-la ₂ -1-ta	9 x 16.875 = 151.875 gin.
14'	1/3 3/18 1/36 (bur ₃) iku 8-ta	9.5 x 800 = 7.600 gin.
		470.075 gin.
		= 26.03.4 1/2 sila, 5 gin.
		56 = 391.729 gin.

340 (MM 372) Umma []
AnOr 7 340

- a. *Perdidas 1 ó 2 líneas*
gub-ba-[am₃]
'sig₂'-bi 3[+x] [gu₂ ...]
[...]
[...]
- 5' [...] 'u₈' [...]
1[+x ...]
9 [...] 'x' [...]
8 sil[aa₃-nit]a₂ 'x' [...]
Kaš₄ i₂-[dab₃]
- 10' 36 u₈
6 udu-nita₂
5 kir₁₁
5 sila₃-nita₂
sig₂ kuš-bi 12 ma-na (sobre bor.)
- 15' ri-ri-ga-am₃
kišib Lu₂-kal-la
5 u₈
- r. 18 udu-nita₂
1 kir₁₁
- 20' 2 sila₃-nita₂



R-CNN based PolygonalWedge Detection Learned from Annotated 3D Renderings [stoetznr23a] and Mapped Photographs of Open Data Cuneiform Tablets (GCH23 Best Paper Award)

Ernst Stötzner and Timo Homburg and Jan Philipp Bullenkamp and Hubert Mara

GCH 2023 - Eurographics Workshop on Graphics and Cultural Heritage, Salento, Lecce, Italy, 4-6 September 2023

Lecce, Italy 2023

BibTeX: [stoetznr23a.bib](#)

DOI: [10.2312/gch.20231157](#)

URL: [Publication](#)



3D Data Derivatives of the Haft Tappeh Processing Pipeline [homburg22b]

Timo Homburg, Robert Zwick, Kai-Christian Bruhn und Hubert Mara

CDLI Journal

2022

BibTeX: [homburg22b.bib](#)

URL: [CDLI Journal](#)



Breaking the Code on Broken Tablets: The Learning Challenge for Annotated Cuneiform Script in Normalized 2D and 3D Datasets [mara19c]

Hubert Mara and Bartosz Bogacz

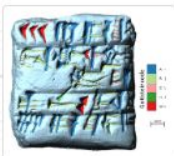
Proc. of 15th Int. Conf. on Document Analysis and Recognition (ICDAR/IEEE-IAPR), in print

Sydney, Australia 2019

BibTeX: [mara19c.bib](#)

DOI: [10.1109/ICDAR.2019.00032](#)

URL: [https://icdar2019.org](#)



Annotated 3D-Models of Cuneiform Tablets [homburg22a]

Timo Homburg, Robert Zwick, Hubert Mara und Kai-Christian Bruhn

Journal of Open Archaeology Data

2022

BibTeX: [homburg22a.bib](#)

DOI: [10.5334/joad.92](#)



- GigaMesh Tutorial 01 - First Steps (3D Mesh Inspection,...**
GigaMesh Software Framework
- GigaMesh Tutorial 02 - Cone Unwrapping**
GigaMesh Software Framework
- GigaMesh Tutorial 03 - Sphere Unwrapping**
GigaMesh Software Framework
- GigaMesh Tutorial 04 - Pottery Profiles**
GigaMesh Software Framework
- GigaMesh Tutorial 05 - Profile Cuts (general)**
GigaMesh Software Framework
- GigaMesh Tutorial 06 - Screenshot Rendering**
GigaMesh Software Framework
- GigaMesh Tutorial 07 - Rapid hill shading of geospatial data**
GigaMesh Software Framework
- GigaMesh Tutorial 08 - GigaMesh on Windows + Point Cloud...**
GigaMesh Software Framework
- GigaMesh Tutorial 09 - Unpacking a Cuneiform Tablet**
GigaMesh Software Framework
- GigaMesh Tutorial 10 - Voronoi Cells & Geodesic Distances -...**
GigaMesh Software Framework
- GigaMesh Tutorial 11 - MSII Filtering: Cuneiform Characters ...**
GigaMesh Software Framework

GigaMesh

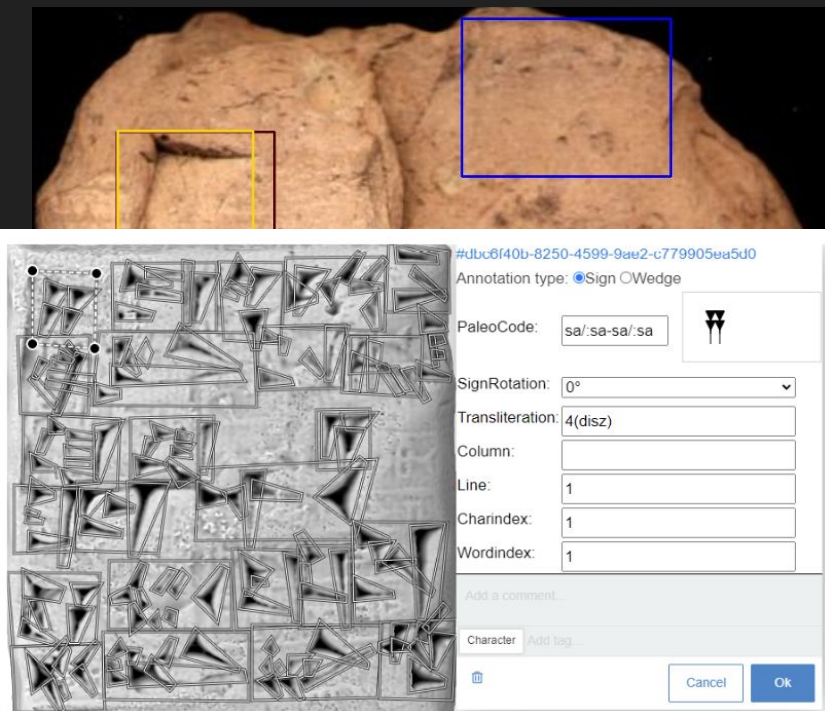
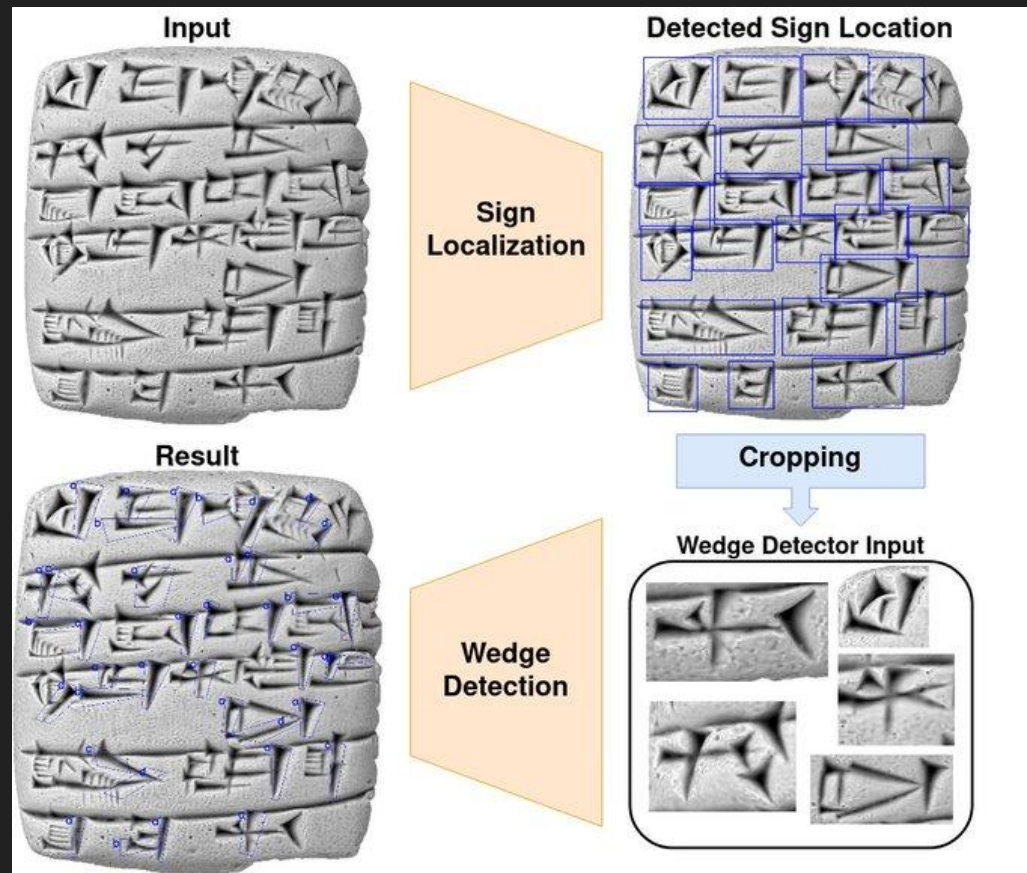


Figure 3: Sign annotations as created in the Cuneiform Annotator for the corpus used in this publication, as exemplified on tablet HS 1001. The PaleoCode on the picture is shown for illustration purposes and has not been annotated for every cuneiform sign.



Sherlock als museus

Connecta la teva classe al Museu Britànic per a un taller interactiu en directe gratuït.

Reserva aquest taller i els teus alumnes seran ensenyats a distància per un expert del Museu Britànic. A través d'activitats en directe, qüestionaris interactius i preguntes que inciten a la reflexió, la teva classe millorarà el seu coneixement i comprensió del passat. L'expert els ajudarà a desenvolupar les seves habilitats d'investigació històrica i els desafiarà a pensar de manera crítica.

Els estudiants investiguen la civilització de l'Indus que va florir fa uns cinc mil anys a una part del Pakistan modern, l'Índia i una petita part de l'Afganistan. La seva curiositat s'inspirarà mentre exploren els objectes de l'antiga civilització. Esbrinaran que no tot s'ha revelat i que queda molt per descobrir els futurs experts, inclosa l'escriptura Indus no desxifrada.

Edats: 7-11 (KS2)

Enllaços del currículum: Història

Temps de sessió: 60 minuts

HISTORY OF MATHEMATICS PROJECT

A virtual interactive exhibit being developed for the National Museum of Mathematics in New York City

INTERACTIVE EXHIBITS

Counting
The modern use and development of numbers and counting began with the rise of cities as a result of the need to organize people and allocate goods and resources.

Arithmetic
Addition, subtraction, multiplication and division of numbers are important to trade and have been employed by civilizations for thousands of years.

Algebra
Algebra deals with solving problems that involve mathematical symbols. The simplest of such problems were studied as long ago as 1900 BCE.

Pythagorean Theorem
The Pythagorean theorem relates the side lengths of a right triangle and was known to the ancient scholars and builders of Babylonia, Egypt, Greece, China and India.

Geometry
Geometry focuses on the properties of space and the size and shape of objects. Its investigation dates back to the earliest recorded civilizations.

Primes
Primes are numbers having exactly one divisor other than 1. They are the building blocks of all counting numbers and were studied as early as 250 BCE.

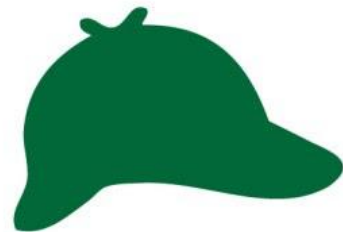
Pi
The computation of π , the ratio of a circle's circumference to its diameter, has been of practical and mathematical interest in both the ancient and modern world.

Polyhedra
Polyhedra are solids consisting of polygons joined at their edges. They were known to the ancients from nature and used in art, architecture and games of chance.

Mathematics Education
While the Greeks studied mathematics for its own sake, it has also been seen as needed only for certain trades. It is now a central part of school curricula.

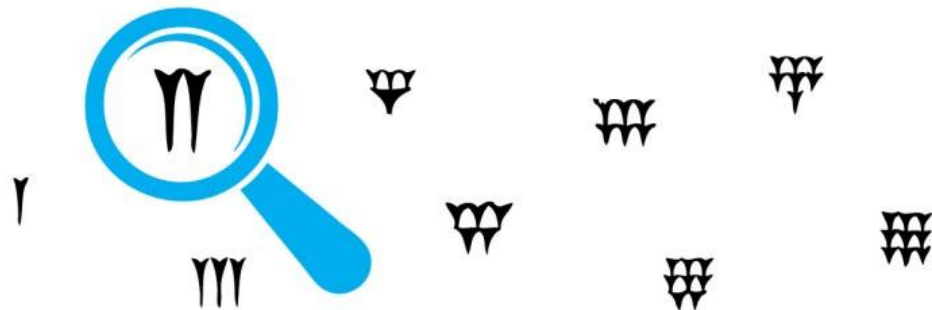
Hi ha un error? Quin?

Sherlock Holmes al museu



Amb el suport de:
 Ajuntament de
Cornellà de Llobregat

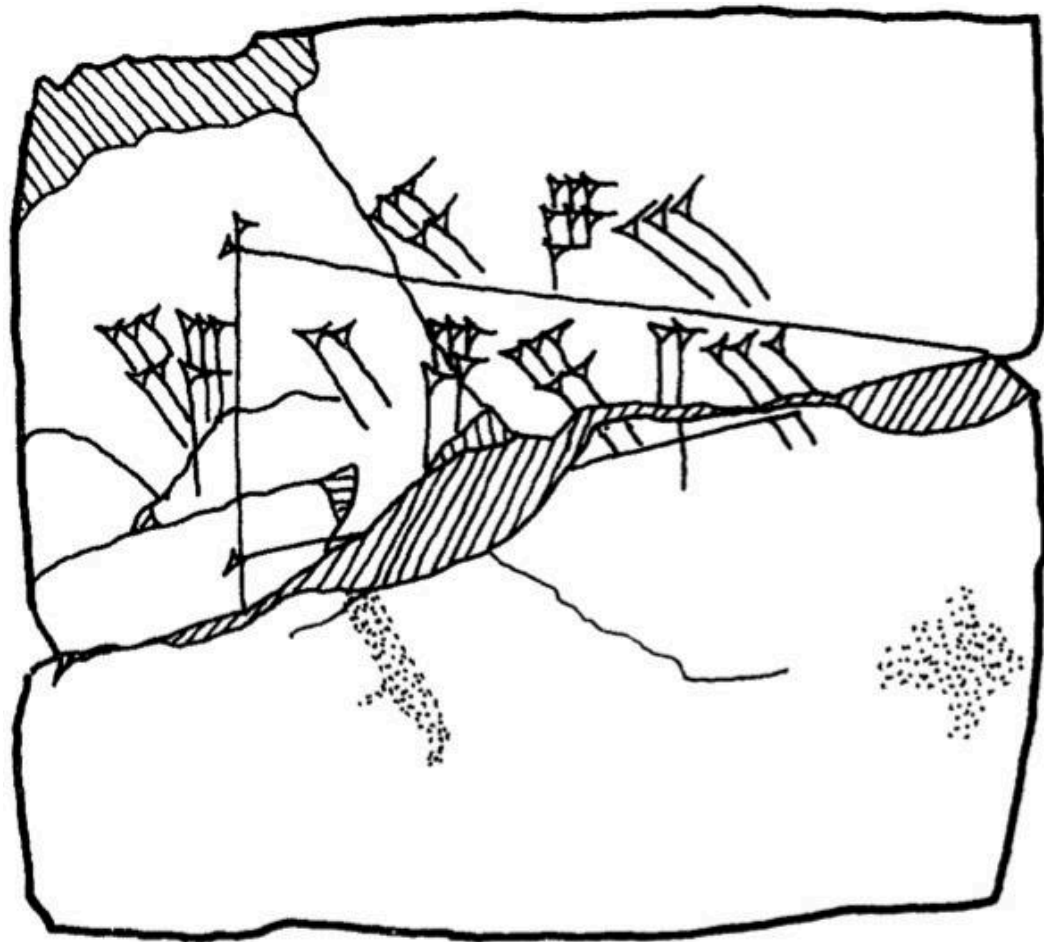
desxifrem tauletes mesopotàmiques



Conferència
a càrrec de David Pinyol i Enric Brasó

Dimecres 15 de maig de 2024 a les 18:00
Palau Mercader - Parc Can Mercader - Cornellà de Llobregat
Inscripció a: <http://tiquets.mmaca.cat>


mmaca
 @mmaca_cat  mmaca.cat

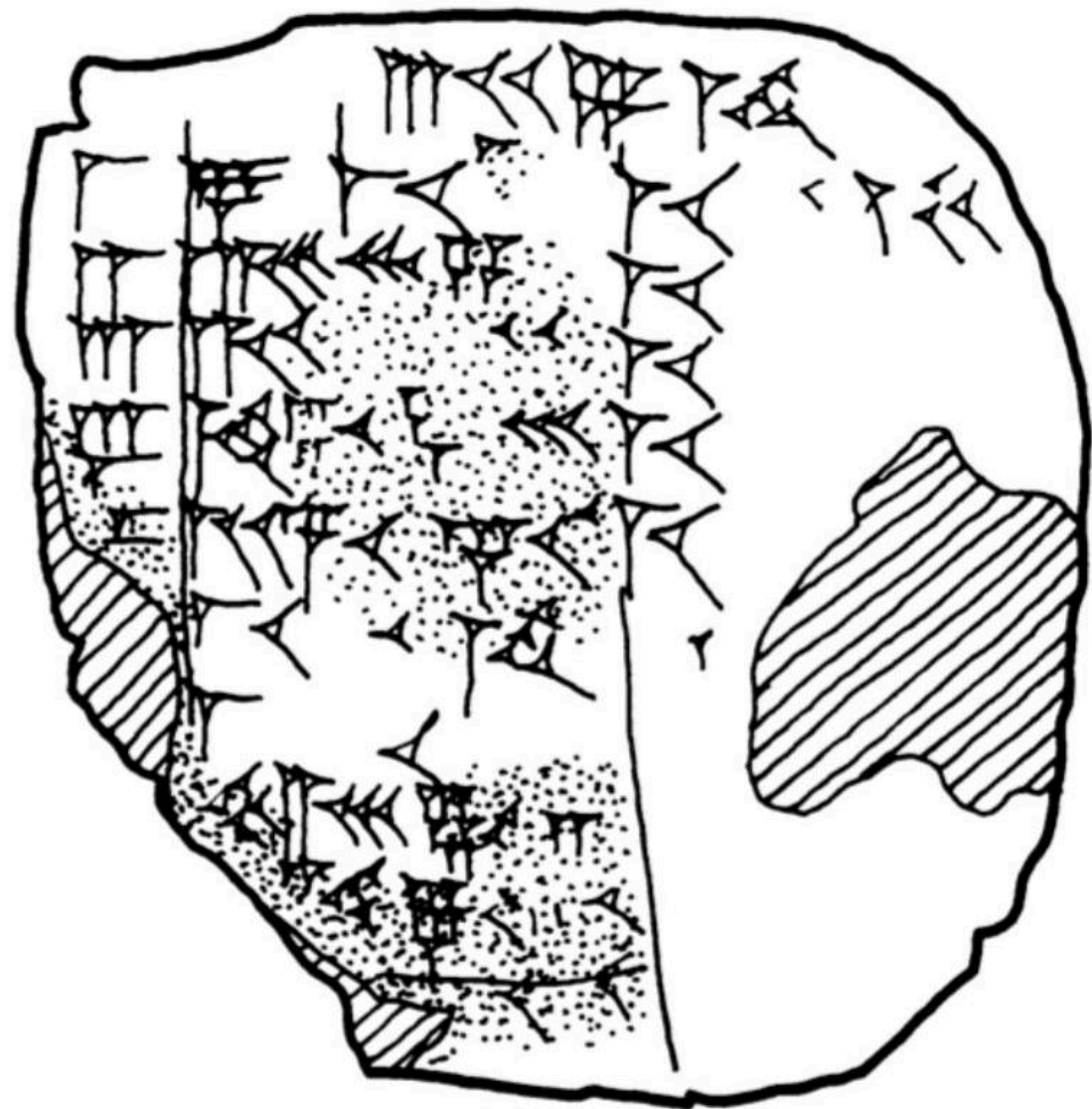


UM 29-15-709 (CDLI: P256427)

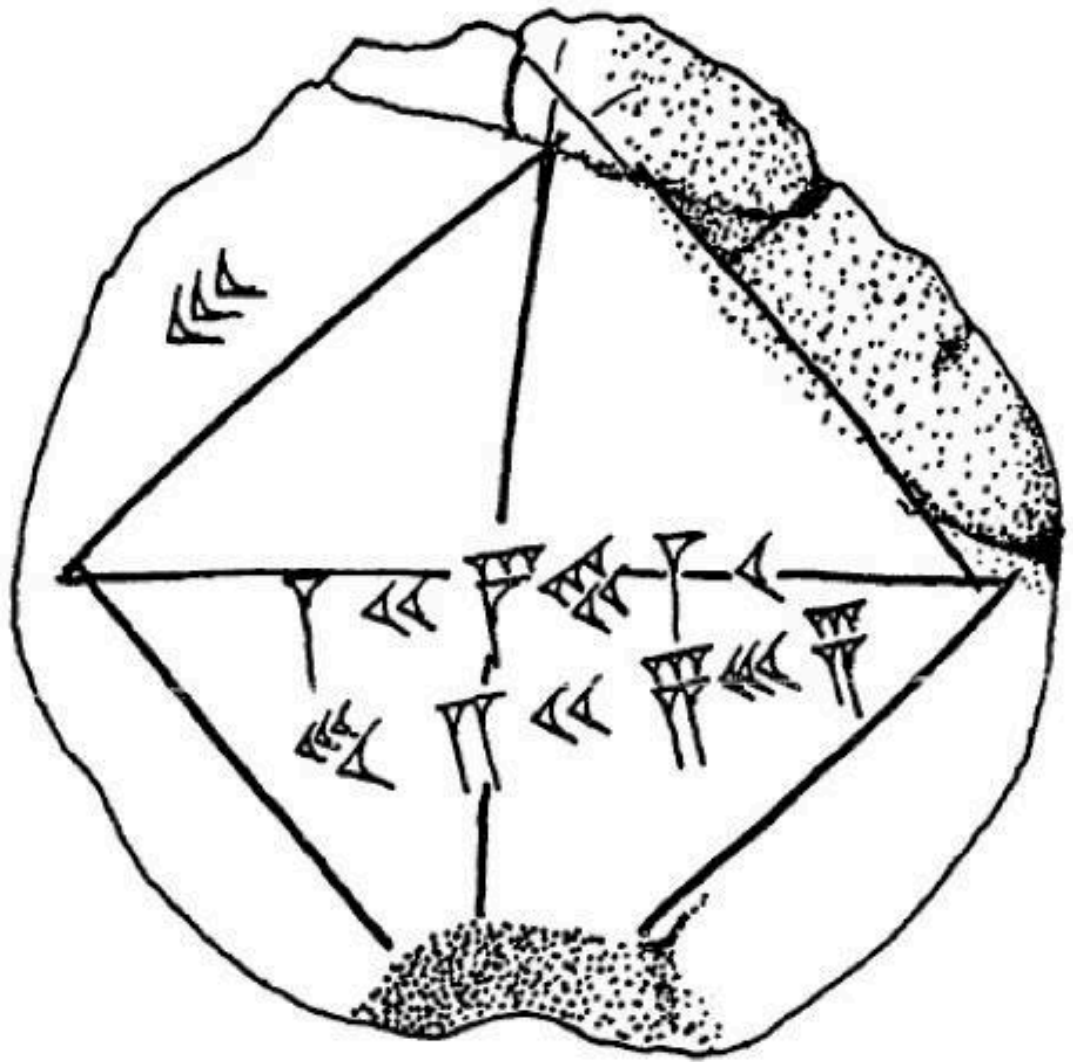
Nippur, 1900-1600 aC



UM 29-16-752 (CDLI: P230019)
Nippur, 1900-1600 aC



N3914 (CDLI: P278884)
Nippur, 1900-1600 aC



YBC 021354

?, 1900-1600 aC



HS 0217a (CDLI: P254585)
Nippur, 1400-1100 aC

Cuneiform Digital Library Initiative té catalogades més de 360.000 tauletes i un glossari a partir de 120.000 textos inscrits.



Llista amb algunes tauletes catalogades



Articles de Robson, Eleanor sobre diverses tauletes, per exemple Plimpton 322 i UM 29-15-709



UM 29-16-752 (CDLI: P230019) Nippur, 1900-1600 aC



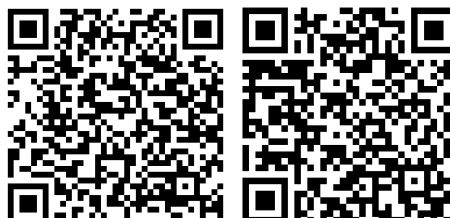
N3914 (CDLI: P278884) Nippur, 1900-1600 aC



HS 0217a (CDLI: P254585) Nippur, 1400-1100 aC



YBC 021354 ?, 1900-1600 aC



UM 29-15-709 (CDLI: P256427) Nippur, 1900-1600 aC



Gilgamesh



GigaMesh.eu



