

(A) Lines in the Sand (1/1) [Solution]

Like many texts written in Avoiuli, the sign follows a *boustrophedon* direction: the first line reads left-to-right, the second right-to-left, and so on, alternating horizontal direction. The lines of text on this sign are ordered top-down, although bottom-up vertical text direction is also common in Avoiuli.

A1. a. 9 b. 4 c. 3 or 6

A2. a. 14 (vilij) b. 2 (senta) c. 7 (tijim) d. 10 (teknoloji) e. 12 (hiumaniti)

A3. Melanesia (word number 5).

The full inscription reads: *sab senta blong melenisian instituiut blong tijim saen filosofi hiumaniti mo teknoloji lisa vilij lolovini*

Sap Centre of the Melanesian Institute for teaching science, philosophy, humanity and technology, Lisaa village, Central Pentecost

Image credit (map):

https://commons.wikimedia.org/wiki/File:Oceania_UN_Geoscheme_Regions.svg — based on:

https://commons.wikimedia.org/wiki/File:Oceania_ISO_3166-1.svg



(B) Who Saw the Bear? (1/1) [Solution]

Answers:

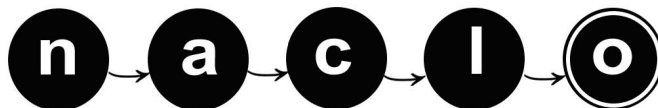
B1.

Turkish	English
Balık yüzdü.	The fish swam.
Zürafa atladi.	The giraffe jumped.
Fil koştu.	The elephant ran.
Kaplan kaplumbağa için atladi.	The tiger jumped for the turtle.
Balık kaplan gibi yüzdü.	The fish swam like the tiger.
Fil ayı gibi yüzdü.	The elephant swam like the bear.
Fil atladi.	a. The elephant jumped.
b. Kaplumbağa balık için koştu.	The turtle ran for the fish.

B2.

Kurbağa zürafayı gördü.	The frog saw the giraffe.
Zürafa martıyı gördü.	The giraffe saw the seagull.
Arı kurbağayı gördü.	The bee saw the frog.
Kim martıyı gördü?	Who saw the seagull?
Kim arıyı gördü?	Who saw the bee?
Arı kimi gördü?	Whom did the bee see?
Balina kimi gördü?	Whom did the whale see?
Martı kaplumbağayı gördü.	a. The seagull saw the turtle.
b. Kim ayıyı gördü?	Who saw the bear?
c. Ayı kimi gördü?	Whom did the bear see?

Consultant: Asli Celikyilmaz



(C) To Make a Long Story Short (1/3) [Solution]

C1. Note that (d) and (e) can be swapped, and that (f) and (g) can be swapped.

- a. italicized word
- b. 10
- c. number
- d. adjective
- e. common noun
- f. first
- g. last

Sticky Situation — unscrambled:

Sentence	Features						Sum of Scores
	F1	F2	F3	F4	F5	F6	
SS1	0	4	0	1	1	1	7
SS2	0	2	0	2	2	0	6
SS3	1	2	0	2	1	0	6
h. SS4	0	1	0	1	2	0	4
i. SS5	0	0	-1	0	0	0	-1
k. SS6	0	0	-2	0	2	0	0
j. SS7	1	1	0	0	2	1	5

Sticky Situation — scrambled:

Sentence	Features						Sum of Scores
	F1	F2	F3	F4	F5	F6	
h. SS4	0	1	0	1	2	0	4
SS1	0	4	0	1	1	1	7
i. SS5	0	0	-1	0	0	0	-1
SS3	1	2	0	2	1	0	6
j. SS7	1	1	0	0	2	1	5
k. SS6	0	0	-2	0	2	0	0
SS2	0	2	0	2	2	0	6



(C) To Make a Long Story Short (2/3) [Solution]

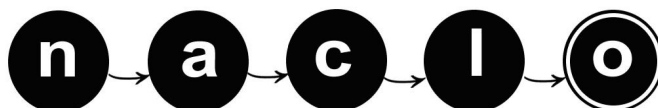
C1. (continued) Filling in the blanks:

- h. SS4
- i. SS5
- j. SS7
- k. SS6

C2.

Sentence	Features						Sum of Scores
	F1 (italics)	F2 (proper nouns)	F3 (sentence length - 10)	F4 (num)	F5 (shared N + ADJ)	F6 (first / last)	
(a = HW5)	0	2	(b = 0)	1	4	0	6
HW4	(c = 0)	0	0	1	2	(d = 0)	(e = 3)
(f = HW3)	0	0	(g = -1)	(h = 1)	1	0	1
HW6	1	(i = 1)	0	0	1	1	(j = 4)
(k = HW1)	1	2	0	0	3	(l = 1)	(m = 7)
(n = HW2)	1	1	0	(o = 1)	4	0	(p = 7)

Sentence	Features						Sum of Scores
	F1	F2	F3	F4	F5	F6	
(q = SSC5)	0	0	0	1	0	1	2
(r = SSC3)	0	1	0	0	0	0	1
(s = SSC2)	0	0	-1	0	0	0	-1
(t = SSC1)	0	1	0	0	0	1	2
(u = SSC4)	0	1	0	1	0	0	2



(C) To Make a Long Story Short (3/3) [Solution]

C3.

HW1, HW2, HW5

C4.

SSC1, SSC4, SSC5

C5.

- a. Vice
- b. Made to Stick, Bigger Bubble
- c. February should be replaced with January


C6.


SSC4. "He" (in the summary, it refers to Ronald McBubble, when in the original text it referred to Chicle "Colonel" Sanders)




(D) Real Numbers (1/2) [Solution]

D1.

(a) 

(b) 

(c) 

D2. (a) piņasut (b) qulit atausiq (c) iñuiññaq malğuk

D3. (a) 1 (b) 5 (c) 19





















D4. a. 2022-1-27 b. 4000

The writing is the date – in this version January 27, 2022 (date of the Open Round). The Kaktovik Iñupiaq numerals read 2022-1-27, with $2022 = (5 \cdot 400 + 1 \cdot 20 + 2)$; the Iñupiaq says “January twenty-seven, two thousand twenty-two”.

The suffix -agliaq (meaning *400), shown in the date, is applied to base qulit to form quliagliaq, 4000.

The word for “January” has nothing numeric in it; it refers to the appearance of the brightness of the new/returning sun. (This is not intended/possible to be deduced.)

The Kaktovik Iñupiaq numerals are formed with (relatively) vertical lines indicating ones, and (relatively) horizontal lines indicating fives, up to nineteen. After that, a base-20 positional notation begins (using zero as needed):

				
0	1	2	3	4
				
5	6	7	8	9
				
10	11	12	13	14
				
15	16	17	18	19



(D) Real Numbers (2/2) [Solution]

The Iñupiaq is similarly base-20 with a sub-base of 5:

1: atausiq	6: itchaksrat	11: qulit atausiq	16: akimiaq atausiq
2: malguk	7: tallimat malguk	12: qulit malguk	17: akimiaq malguk
3: piņasut	8: tallimat piņasut	13: qulit piņasut	18: akimiaq piņasut
4: sisamat	9: quliņugutaiļaq	14: akimiagutaiļaq	19: iñuiññağutaiļaq
5: tallimat	10: qulit	15: akimiaq	20: iñuiññaq

The sub-base and base words are formed from body part/position words: tallimat means hand/arm, qulit means top (upper body digits), akimiaq means (roughly) “it goes across”, and iñuiññaq means “complete/entire person”, with the iñu- root (person) shared with Iñupiaq (mentioned in the footnote). (This root is cognate with those in “Inuit”, in which the -it is cognate with the -t in Iñupiat (i.e., a plural marker), inukshuk/inuksuk, and many others.)

Numbers words 20-38 are formed with the iñuiññaq base, followed by the remainder; 40 is malgukipiaq and 39 is malgukipiağutaiļaq; higher multiples of 20 are formed like malgukipiaq with -ipiaq. Multiples of 400 use the suffix -agliaq, as in tallimaagliaq (2000). Very large numbers can be formed by appending multiple suffixes.

In Arabic numerals, the equations on the blackboard are:

$$4 - 3 = 1$$

$$2 \times (a) = 8$$

$$4 + 8 = 12$$

$$(b) - 1 = 14$$

$$20 - 4 = 16$$

$$56 \div 7 = 8$$

$$5 \times (c) = 30$$

Sources:

Consultation from Edna Ahgeak MacLean, Kirk Miller, and Myles Creed.

https://en.wikipedia.org/wiki/Iñupiaq_language#Numerals

https://en.wikipedia.org/wiki/Kaktovik_numerals

<http://www.ankn.uaf.edu/sop/SOPv2i1.pdf>

https://library.alaska.gov/hist/hist_docs/docs/anlm/200078.pdf

<https://www.uaf.edu/anlc/languages/inupiaq.php>



(E) Sleeping in the Shade (1/2) [Solution]

E1. Match the Ik sentences and phrases to their English translations.

- 1 – P
- 2 – F
- 3 – J
- 4 – K
- 5 – R
- 6 – L
- 7 – Q
- 8 – A
- 9 – C
- 10 – N
- 11 – B
- 12 – S
- 13 – D
- 14 – O
- 15 – E
- 16 – H
- 17 – M
- 18 – G
- 19 – I

E2. You matched the two Ik sentences below to their well-formed English translations above in E1. Your new task is to translate them word-for-word into English in a way that reveals the meaning each Ik word, as we have started doing for S1.

- S1. *Epa ŋoka kuruo na daḡ* *Sleeps dog in-shade which nice/is-nice*
S2. *Epa ŋoka na βets'ḡ* *Sleeps dog which white/is-white*

E3. Translate into Ik.

- a. these *dii*
- b. my huts *hoika ŋciḡ / hoika na ŋciḡ*
- c. I love my wife. *Mina cekia ŋciḡ. / Mina cekia na ŋciḡ.*
- d. Father is coming from the nice hut. *Atsa abanḡ hoo na daḡ.*

E4. Translate into English.

- a. *Zekwata oŋorika kuruo.* The elephants are sitting in the shade.
- b. *Mina ŋoka ɔkaka ntsiḡ.* The dog loves his bone.
- c. *Minima oŋorika ni epḡ.* We love sleeping elephants. / We love elephants who sleep.
- d. *ŋoka na ŋciḡ* my dog



(E) Sleeping in the Shade (2/2) [Solution]

E5. Correct answer: (c) Both P1 and P2 are grammatical.

E6. Rule: *Ik* speakers devoice all vowels except for [i] in utterance-final position.

E7. Any two of: sentences/phrases 3, 11, 13.

Credits:

Based on *The Ik Language: Dictionary and Grammar Sketch* by Terrill B. Schrock

Figure by Monica Feinen



(F) Splash to Save (1/2) [Solution]

Answers

F1.

E (7) It blew down and broke the tree.

(E) **Llo de duduabnegnän a dattkaemnegnän.**

C (8) The wind tore Ant's house and threw Ant into the river.

(C) **Ankom bo ma de wel a dapisamän a ankom bom daspunän walle we.**

F (9) When Small Fish saw, he moved closer to him.

(F) **Tärko da angde ikop dägagän, obo dowae e guinggolän.**

D (10) But some big fish were trying to kill him.

(D) **Be ddob kollba ulleulle da gäz e de ada däganeyo.**

A (11) A catfish was about to swallow him.

(A) **Bunkuttang a mäse ngänygäny e dängkamän.**

B (12) Small Fish quickly splashed with his tail, and with water threw Ant on top of the grass, and he was saved.

(B) **Tärko da mängalae källa gokätaemän a ine peyang ankom bom towall toko we daspunän a ttam gogän.**

F2. Please provide English translations for the following Ende words:

- tärko **small fish**
- walle **river**
- daspunän **(it) threw (it)** (other forms of the verb *throw* were also accepted)
- gongkamän **(it) began** (other forms of the verb *begin* were also accepted)
- yäbäd **(the) sun**

F3. Please provide Ende translations for the following words:

- Ant **ankom**
- and **a**
- tree **llo**
- catfish **bunkuttang**



(F) Splash to Save (2/2) [Solution]

F4. The translation would include *toko* and *we* but none of the other words. “On top of” is translated as *toko me* when it refers to sitting still on top of something, as in (2), but it is translated as *toko we* when it means moving to the top of something, as in (12). Note that *me* means “in” while *we* means “into”: hence *toko me* is “on top of” while *toko we* is more like “onto top of.” The sentence says “got on top of,” which involves motion to the top of something, so the translation would use *toko we*. The other provided words mean “small fish” (*tärko*), “fish” (*kollba*), “tree” (*llo*), “grass” (*towall*), “big” (*ulleulle*), and “wind” (*wel*).

Other notes:

The problem does not test for these facts, but they help to explain the structure of the sentences:

- *da* and some instances of *a* are markers that follow the subject of a clause.
- *de* and *bom* are markers that follow the object of a clause.

Source for the story:

Kate L. Lindsey (collector), Kate L. Lindsey (editor), Tonny (Tonzah) Warama (editor), Jubli (Joe) Sowati (author), Mathias Dugal (participant), Warama Kurupuel (Suwede) (editor), 2016. Tärko ankom bom ttam dägagän. XML. LSNG08-WE_PN030-01_20200113.flextext at catalog.paradisec.org.au. <https://dx.doi.org/10.26278/5e3c2baf833cc>

https://catalog.paradisec.org.au/collections/LSNG08/items/WE_PN030

Consultants:

Jack Dipa, Mathias Dugal, Tonny Warama, Warama Kurupel

Source for introductory paragraph:

<https://www.cambridge.org/core/journals/journal-of-the-international-phonetic-association/article/abs/ende/8EFEC79687F73B691A1D6C91ABE93E4B>

Image credits:

Ant: <https://pixabay.com/vectors/ant-insect-animal-silhouette-6585114/>

Small fish: <https://pixabay.com/vectors/fish-animal-line-art-scales-5965349/>



(G) Out of Order (1/1) [Solution]

G1. FORTYFIVE

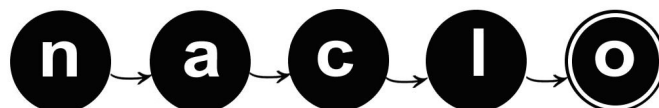
G2. IVEMADEMYPOSITIONCLEAR

G3. BACKUPPLAN

(The positions are in reverse: You have to start with the highest-valued position, 10, and then count down to 1, instead of counting up from 1 to 10).

G4. BRANCHINGOUT

G5. PAYATTENTIONTOYOURSURROUNDINGS



(H) From Soup to Nuts (1/2) [Solution]

H1. **chili pepper (ʔich)** is classified as a meat.

H2. **la jtiʔ sk'in wakax** = I ate cow kidney.

H3. Translate the following sentences into Tseltal:

- | | |
|---------------------------------------|---------------------------------------|
| a. We ate the peanuts. | la jk'uxtik te kaxlan chenek'e |
| b. You (pl.) ate cow stomach. | la atiʔik stsukum wakax |
| c. They ate meat. | la stiʔik tiʔbal |
| d. You (sg.) ate your (pl.) avocados. | la aloʔ awonik |
| e. I ate my honey. | la jweʔ jchab |
| f. She ate cooked greens. | la sloʔ bok |
| g. She ate bean soup. | la xchik' yaʔlel chenek' |

H4. **jloʔ** (used with soft things)

H5. **sk'ux** (used with hard/individuated things)

H6. **wheat** (lit. “non-indigenous corn”, also parallel between **kaxlan waj** (bread) : **kaxlan ixim** (wheat) :: **waj** (tortilla) : **ixim** (corn))

For alternate answer to H2, H3b, and H3g, see the first “note” on the next page.

Explanation

- There are several different words for “eat”:
 - **tiʔ** for meats (meat, liver, kidney, chicken comb, heart, and also chili peppers — also mushrooms, although that’s not in the problem!)
 - **loʔ** for mushy things (boiled greens, avocado, banana, honey)
 - **k'ux** for hard, crunchy and/or individuated things (radish, panela chunks, nuts, toasted tortilla, corn, popcorn, beans)
 - **weʔ** for breads (tamale, tortilla, bread). It can also sometimes be used as a more general verb for eating, but that is not relevant to this problem.
 - **chik'** for soups and things soaked and eaten (meat soup, bean soup, bread soaked in coffee)
 - and also **buts'** for things that dissolve in your mouth and **ts'uʔ** for chewy things with pulp (only sugar cane and corn stalks), neither featured here
 - Some nouns, such as “greens” and “mango”, take **loʔ** when they are cooked/ripe, and therefore soft, and **k'ux** when they are raw/unripe, therefore hard/crunchy/individuated.
- **la** = perfective [cannot deduce]
- Inflection:
 - Verbs (specifically, transitive ones) and direct objects are given the same suffixes/affixes to denote the person/number of the subject or of the possessor, for the verb and direct object respectively.
 - 1st person: **j-**, with **jʔ > k**
 - 2nd person: **a-**, with **aʔ > aw**
 - 3rd person: **s-**, with **sʔ > y, sch > xch**
 - Number: 1st person plural is **-tik**, 2nd/3rd person plural is **-ik**, unpossessed plural is **-etik**
- Definiteness: **te** NP-e



(H) From Soup to Nuts (2/2) [Solution]

Notes:

- The solution shown on the previous page follows the grammar of Tzeltal, which includes a possessive prefix in the description of body parts (e.g., “cow kidney” = “sk’in wakax”, where the s- at the start is the 3rd person singular possessive prefix; this could be literally translated as “cow’s kidney”). While this is what Tzeltal actually does, it is also consistent with the data to conclude that there is no possessive prefix in such cases. Answers that consistently applied either conclusion were given full points. Under this alternative solution, H2 should be “I ate her cow kidney”, H3b should be **la ati?ik tsukum wakax**, and H3g should be **la schik’ ya?lel chenek’**.

- You may see a similarity in **ti?** eat meat > **ti?bal** meat and **lo?** eat mushy thing > **lo?bal** banana.

Sources:

[Categories of Eating in Tzeltal and Navaho \(uchicago.edu\)](#)

[Tzeltal \(Mayan\) Noun and Verb Morphology | International Journal of American Linguistics: Vol 14, No 2 \(uchicago.edu\)](#)

https://site.inali.gob.mx/publicaciones/diccionario_multidialectal_en_tzeltal.pdf

Consultation with Gilles Polian.



(I) A Cornish Conundrum (1/2) [Solution]

11. Answers:

Singular	Definite Singular	Plural	Definite Plural	Meaning
dama	an dhama	damyow	a. an damyow	'mother'
b. kasek	an gasek	c. kasegi	an kasegi	'mare' (female horse)
kulyek	an kulyek	kulyoges	d. an kulyoges	'cockerel' (young male chicken)
myghtern	e. an myghtern	myghternedh	an vyghternedh	'king'
myghternes	f. an vyghternes	myghternesow	g. an myghternesow	'queen'
tas	h. an tas	tasow	i. an dasow	'father'
bogh	j. an bogh	boghes	k. an boghes	'billy-goat' (male goat)
banow	l. an vanow	banowes	m. an banowes	'sow' (female pig)
badh	an badh	n. badhes	an badhes	'boar' (male pig)
tevesik	o. an tevesik	p. tevesigyon	an devesigyon	'adult man'
pons	an pons	ponsyow	q. an ponsyow	'bridge'
maw	an maw	r. mebyon	an vebyon	'boy'
s. tesen	an desen	tesennow	an tesennow	'cake'
t. tarow	an tarow	terewi	an terewi	'bull' (male cow)

12. Answers:

Cornish	English
u. an bys	'the finger'
v. war desen deg	'on a beautiful cake'
w. war dharas	'on a door'
an bal berfydh	x. the perfect spade
das	y. stack (or a stack)
war das	z. on a father



(I) A Cornish Conundrum (2/2) [Solution]

13. Animal: penguin

Answering 13: If you gather all of the color terms in the problem you get *glas* = blue, *glasrudh* = purple, *rudhvelyn* = orange, *melyn* = yellow, *gwynnrudh* = pink. From this, you can infer that *rudh* = red and that *gwynn* = white. Thus, “white head” would be *penn gwynn*, giving the answer *penguin*.

Notes on Cornish:

Like in all Celtic languages, Cornish nouns undergo mutations, which is the change in the initial consonant depending on how the noun is used or what form it appears in.

This problem is about the so-called second mutation, or soft mutation, which means that in certain occurrences these consonants change as follows:

B → V

D → Dh

Gw → W

K → G

M → V

P → B

T → D

Rules for soft mutations:

- feminine nouns in the definite singular are mutated
- masculine nouns in the definite plural are mutated only when they refer to people
- all nouns are mutated following *war* (“on”), regardless of gender or whether they are singular/plural
- adjectives are mutated following feminine singular nouns or plural masculine human nouns

References:

Chubb, R. (2013) *Skeul an Tavas. A Coursebook in Standard Cornish*. 2nd Ed. Cathair na Mart, Eire: Evertime.

George, K. (2015) *Gerlyver-poket Kernewek-Sowsnek/Pocket-dictionary English-Cornish*. Fouenant, France: Cornish Language Board & Yoran.

Page, J. (2002) *Cornish Grammar for Beginners and the Auxiliary Verbs*. Hayle: Cornish Language Board.

