National Language Competition (NLC)

Sample Challenge 2

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Set-Up

The NLC sample challenge is a printable document (*NLC Sample Challenge 2*) containing two puzzles which can be printed out and given as a worksheet to students.

Depending on ability, the two puzzles can take anywhere between 30 minutes to an hour. The idea is that you can get them working in teams to try and complete the puzzles and get a sense for the kind of things the NLC will involve.

If you have any questions about the NLC Sample Challenge or about the NLC itself, then please feel free to contact the NLC mailbox (nlc@gchq.gov.uk) and we'd be happy to answer any queries and provide help in whatever way we can.

Accessible Alternative

Although all the material in the NLC Sample Challenge 2 file has alternative text provided as descriptions, this document also contains text-based descriptions which can be shared with students should they find it useful.

Since some of the written aspects of one of the challenges uses a made-up script, some students may require a text-based machine-readable alternative. Below is a text-only summary of all the information included in the file including a version of the made-up script challenge which has been converted to letters in the English alphabet.

As a linguist, you have been posted to an unknown remote location. You have been briefed that two tribes, who use very different languages, have come into contact for the first time on the banks of a lake. It is your job to help them communicate. Can you work out what each tribe is saying using the translations we already know?

Hint: The forest-dwelling tribe use a made-up language with European roots. In contrast, the water-dwelling tribe use a made-up character-based system where more complex words are created by merging simpler ones.

A member of the forest-dwelling tribe says the following to a member of the water-dwelling tribe: wirf neull khoteca dolschag tue; kommstowirfe zcemi archessolen wossaquat neutee obr wirntrep fasemilier ae animavot.

A member of the water-dwelling tribe says the following to a member of the forest-dwelling tribe: upw x pkmw ty rpw. upw m ie mtsq sv ohmw cmoupwu.

Forest-dwelling tribe vocabulary:
- we want a family = wirf khoteca fasemilie
- you want a family = khotectuea fasemilie
- we want an animal = khotecwirfa animavo
- you don't want animals = tue neull khoteca animavot
- the animals wanted food and water = animavot khotecstoa maedie ae wossaquat
- our family has water = wirntrep fasemilie habimet wossaquat
- our family had food = wirntrep fasemilie habimetsto maedie
- fresh food for a family = maedie neutee obr fasemilie
- we got an animal for you = wirf archessolensto animavo obr tue
- you are coming here = kommtuee zcemi

- the animal didn't hurt the families = animavo neull dolschagsto fasemilier

Water-dwelling tribe vocabulary:
- person = p
- internal/ownership = u
- me = up
- external = r
- you/him/her/them/it = rp
- plural = w
- object = o
- non-existence = x
- movement = m
- process = mw
- knowledge = k
- mind = pk
- happiness = q
- largeness = v
- excitement = qv
- sadness = y
- harm = t
- serious harm = tv
- location = i
- there = ixe
- area/region = iv
- nearby area = iev
- plant = s
- field = sj
- my field = sjupu
- your [plural]/their field = sjrpwu
- connection = h
- water = c
- lake = cj
- sea = cjv
- tears = pyc
- vehicle = mo

If there is any other way that we can make this challenge pack more accessible for specific students, please reach out to us on the NLC mailbox (nlc@gchq.gov.uk).

Solution

To help direct students if they are struggling, we have included here a detailed walkthrough of how to complete each of the two puzzles. Please use these resources to encourage students or point them in the right direction if they are stuck.

Note that the document sets the scene with two groups of people, speaking different languages, who have come into contact with each other. The students must study their two distinct made-up languages and then decipher what each are saying to help them communicate with each other? Hence the task can be split into two parts corresponding to the two different sentences which need to be translated.

Forest Tribe

The forest tribe live on land and have gathered near the banks of the lake – as detailed in the illustration. The language they use is a made-up language inspired by some European languages that students may have come across before. In this challenge, students are given some translated sentences:

1. We want a family = wirf khoteca fasemilie
2. You want a family = khotectuea fasemilie
3. We want an animal = khotecwirfa animavo
4. You don't want animals = Tue neull khoteca animavot
5. The animals wanted food and water = animavot khotecstoa maedie ae wossaquat
6. Our family has water = wirntrep fasemilie habimet wossaquat
7. Our family had food = wirntrep fasemilie habimetsto maedie
8. fresh food for a family = maedie neutee obr fasemilie
9. We got an animal for you = wirf archessolensto animavo obr tue
10. You are coming here = kommtuee zcemi
11. The animal didn't hurt the families = animavo neull dolschagsto fasemilier

and then a sentence which they must translate:

> wirf neull khoteca dolschag tue; kommstowirfe zcemi archessolen wossaquat neutee obr wirntrep fasemilier ae animavot

Students must use the given list of translations to work out the grammar structure and vocabulary to be able to translate the unknown sentence.

The first thing to note here is that students don't necessarily need to tackle this challenge as detailed below. Instead, students may be able to translate the individual words from the untranslated sentence by simply looking for where similar words appear in the translated sentence and seeing which English word is common amongst them.

We can start by comparing sentences 1 and 2, the only difference in the English translation is the subject being "we" in sentence 1 and "you" in sentence "2" and the difference in the made-up language is "wirf khoteca" and "khotectuea" so we can infer that:
        "wirf" = "we"
        "tue" = "you"
Note that we could assume that "fasemilie" means "family" and "khoteca" means "to want" but we can't know for sure yet.
These two sentences also a highlight that there might be multiple ways of structuring a sentence in this language because of the fact there are only two distinct words in sentence 2 compared to three in sentence 1.

Now comparing sentences 2 and 3, there is more evidence that there are multiple sentence structures allowed, since "khotecwirfa" in sentence 3 contains the "wirf" word we translated as "we" in the same position as the word "tue" in sentence 2's "khotectuea". This is our first sign of a grammar rule whereby the personal pronoun seems to place itself inside another word.
Also, this time the English translations also differ in the fact that sentence 2 mentions "a family" whereas sentence 3 mentions "an animal". The difference of "wirf" and "tue" are due to the fact sentence 2 and 3 reference "we" and "you" respectively so the only other difference implies that:
        "fasemilie" = "a family"
        "animavo" = "an animal"

Now, we can also go back to sentence 1 and 2, and confidently conclude that:
  "khoteca" = "to want"
And that:
  "wirf khoteca" = "khotecwirfa" = "we want"
  "khotectuea" = "you want"

Next let's compare sentences 3 and 4. Ignoring the difference in structure which we covered above, the new unknowns are the words "neull" and the additional letter "t" in "animavot" in sentence 4. Looking at the English translation, we know that the subject change from "we" to "you" has been accounted for by the swap from "wirf" to "tue", so the only other differences are the fact sentence 4 references "don't want" rather than "want" and "animals" rather than "animal". Quickly checking sentence 5, you can see that is the only other time the plural "animals" is used and is the only other time we see this additional "t" in "animavot" so we can conclude that:
  "animavot" = "animals"
And thus the only other difference must imply the negation of the verb:
  "neull" = "not"

Moving onto sentence 5, we know all the words except "maedie", "ae" and "wossaquat" and they must correspond to the words "food", "and" and "water" but notice that we are also now talking in a different tense and using the word "wanted" which seems to correspond with the additional "sto" letters in "khotecstoa". Note that although we could assume which matches with which, we can quickly check by comparing sentence 5 with 6 and 8 respectively. Both 6 and 8 have no similar English words with 5 bar "water" and "food" respectively and no similar words in the made-up language bar "wossaquat" and "maedie" respectively. Hence:
  "maedie" = "food"
  "wossaquat" = "water"
Also, if you compare sentence 5 to sentence 7, there might initially seem like the only common English word is "food", but the made-up language has the additional similarity of the added "sto" letters in "habimetsto". Looking a bit closer and looking at sentence 6 to help compare, there is also another similarity – the tense, hence:
  "sto" must be added [in the same position a personal pronoun would take] to imply past tense e.g.
      "khoteca" = "to want"
      "khotecstoa" = "to have wanted"
The final unknown word in sentence 5 must be the only English word left untranslated:
  "ae" = "and"

With these new words in our bank, we can also figure out some other new words by looking at sentence 6 and 7. Being aware of this rule of how to make a verb past tense, allows us to compare the unknown words in sentences 6 and 7 and decide that "habimet"/"habimetsto" must be the verbs i.e.
  "habimet" = "to have"
  "habimetsto" = "to have had"
Note that this time, our present tense verb ended in a "t" and "sto" got added on the end rather than with "khoteca" where "sto" was added just before the final "a".
This then leaves only one unknown word common in those sentences:
  "wirntrep" = "our"

 Next is sentence 8 which has two unknowns: "neutee" and "obr". If we compare sentences 8 and 9, they are only share the word "obr" in the made-up language and the preposition "for" in English so we have:
  "obr" = "for"
Which leave only one unknown word in sentence 8:
  "neutee" = "fresh"

By realising that last fact, we've also come across another grammar point since the adjective, "fresh", used to describe the object, "food", came after the object in the made-up language – which is worth noting.

Now, finishing off sentence 9, the only unknown word is "archessolensto" which must mean "got":
  "archessolensto" = "to have gotten"

Sentence 10 is next, and if we apply our knowledge of merging pronouns with verbs, we know that "kommtuee" must be our pronoun-verb package as we can spot the "tue" within there and we know we need that pronoun somewhere; this leaves "zcemi" meaning "here", hence:
  "zcemi" = "here"
  "kommtuee" = "you come"

Finally we have sentence 11 where the only unknown is the word "dolschagsto" which we know must mean "to have hurt" as it's the only unknown part of the English sentence:
  "dolschagsto" = "to have hurt"
However there is also the slight difference in the word "fasemilier" which has an additional "r" at the end. The only difference in the English translation is that we are referring to the plural "families" rather than "family", hence:
  "fasemilier" = "families"

To summarise we have the following vocab list:
- "wirf" = "we"
- "tue" = "you"
- "fasemilie" = "a family"
- "animavo" = "an animal"
- "khoteca" = "to want"
- "animavot" = "animals"
- "neull" = "not"
- "maedie" = "food"
- "wossaquat" = "water"
- "khoteca" = "to want"
- "khotecstoa" = "to have wanted"
- "ae" = "and"
- "habimet" = "to have"
- "habimetsto" = "to have had"
- "wirntrep" = "our"
- "obr" = "for"
- "neutee" = "fresh"
- "archessolensto" = "to have gotten"
- "zcemi" = "here"
- "kommtuee" = "you come"
- "dolschagsto" = "to have hurt"
- "fasemilier" = "families"

And we have identified some potential grammar rules:
- Pronoun-verb structure can follow two formats:
  - Pronoun verb … [e.g. "wirf khoteca" = "we want"]
  - Verb + pronoun (+ rest of the verb) … [e.g. "khotecwirfa" = "we want"]
- Add "sto" to the end or near the end of a verb to make it past tense [e.g. "khotecstoa" = "to have wanted"]
- Add a letter such as "t" to the end of a noun to make it plural [e.g. "animavot"]

Now it's time to apply what we've learnt to translate the sentence required. Breaking down each word, we have:

wirf = we
neull = not
khoteca = to want
dolschag = to hurt
    Note: it looks similar to "dolschagsto" which we knew meant "to have hurt" and if we remove the "sto" for past tense we would get "dolschag" = "to hurt"
tue = you
kommstowirfe = we came
    Note: it looks similar to "kommtuee" which we knew meant "you come" and if we switch the "tue" with "wirf" to switch pronouns from "you" to "we" and add in the word "sto" for pas tense, we get "we came"
zcemi = here
archessolen = to get
    Note: it looks similar to "archessolensto" which we knew meant "to have gotten" and if we remove the "sto" for past tense we would get "archessolen" = "to get"
wossaquat = water
neutee = fresh
obr = for
wirntrep = our
fasemilier = families
ae = and
animavot = animals

Putting this all together, students will get the correct translation.

Students will have successfully completed this part of the puzzle if they get one of the following translations:
- **We don't want to hurt you; we have come here to get fresh water for our families and animals.**
- **We don't want to hurt you; we came here to get fresh water for our families and animals.**

Forest Tribe – Vocabulary/Grammar Index

See below a complete list of vocabulary used in this challenge with its corresponding translation.

Vocabulary from the given translated sentences:
- wirf = we
- khoteca = to want
- fasemilie = a family
- khotectuea = you want
- khotecwirfa = we want
- animavo = an animal
- tue = you
- neull = not
- animavot = animals
- khotecstoa = to have wanted
- maedie = food
- ae = and

- wossaquat = water
- wirntrep = our
- habimet = to have
- habimetsto = to have had
- neutee = fresh
- obr = for
- archessolensto = to have gotten
- kommtuee = you come
- zcemi = here
- dolschagsto = to have hurt
- fasemilier = families

Additional vocabulary from the untranslated sentence:
- dolschag = to hurt
- kommstowirfe = we came
- archessolen = to get

Also, see below a summary of the grammar points that could be useful to note when completing this challenge:
- For a pronoun and a verb, you can use the structure of pronoun followed by verb or switch the order and merge the words – note that this merge sometimes means adding the pronoun to the end of the verb if it ends in a consonant or before the last vowel if it ends in a vowel.
- To pluralise a noun, add "r" to nouns ending in an "e", add "t" to nouns ending in an "o" and "a", and add "e" to nouns ending in an "i".
- The "sto" ending transforms a verb into the past tense.

Water Tribe

The water tribe live on rafts on the lake – as detailed in the illustration. The language they use involves a made-up script which is similar to that of Chinese, Japanese and other languages which make use of radicals (components of a character) to create a word. In this challenge, students are given a list of translations of characters:

- person = ⟨symbol⟩ (p)
- internal/ownership = ⟨symbol⟩ (u)
- me = ⟨symbol⟩ (up)
- external = ⟨symbol⟩ (r)
- you/him/her/them/it = ⟨symbol⟩ (rp)
- plural = ⟨symbol⟩ (w)
- object = ⟨symbol⟩ (o)
- non-existence = ⟨symbol⟩ (x)
- movement = ⟨symbol⟩ (m)
- process = ⟨symbol⟩ (mw)
- knowledge = ⟨symbol⟩ (k)
- mind = ⟨symbol⟩ (pk)
- happiness = ⟨symbol⟩ (q)
- largeness = ⟨symbol⟩ (v)
- excitement = ⟨symbol⟩ (qv)

- sadness = ᘯ (y)
- harm = ⅋ (t)
- serious harm = ⅋⟨⟩ (tv)
- location = ⊥ (i)
- there = ⊥ᚹᴄ (ixe)
- area/region = ⊥⟨⟩ (iv)
- nearby area = ⊥ᴄᴠ (iev)
- plant = ⊢ᑯ (s)
- field = ⊢ᑯ— (sj)
- my field = ⊬ᴄᴜᴠ (sjupu)
- your [plural]/their field = ᴜ (sjrpwu)
- connection = ⋌ (h)
- water = ᴼ (c)
- lake = ᴼ— (cj)
- sea = ᴼ—⟨⟩ (cjv)
- tears = ᴼᴠᴜ (pyc)
- vehicle = ⅀ᴼ (mo)

and then a sentence which they must translate:

ᴜᴘᴡ ✝ ᴘᴋᴍᴡ ⅋ᘯ ᴧᴘᴡ
ᴜᴘᴡ ⋦ ⊥ᴄ ᴊᴠᴧᴘ ᑯᴄᴠ oᴋᴧ ᴄᴍ

(upw x pkmw ty rpw. upw m ie mtsq sv ohmw cmoupwu)

Students must use the given list of translations to work out the individual meanings of the radicals and then infer the meaning of the untranslated characters in the sentence.

The first step is to notice that radical composition is a key part of this language and that can be noticed by looking at a variety of groups of words e.g. we are given the following basic characters,

person = ᑫ (p)
internal/ownership = ᴜ (u)
external = ᴧ (r)
water = ᴼ (c)
largeness = ⟨⟩ (v)

and these can be found within the more complicated characters,

me = ᴜᑫ (up) = ᴜ (u) + ᑫ (p) = internal/ownership + person (i.e. the inside person)
you/him/her/them/it = ᴧᑫ (rp) = ᴧ (r) + ᑫ (p) = external + person (i.e. the outside person)
lake = ᴼ— (cj) = ᴼ (c) + — (j) = water + [unknown radical]
sea = ᴼ—⟨⟩ (cjv) = ᴼ (c) + — (j) + ⟨⟩ (v) = water + [unknown radical] + largeness = lake + largeness (i.e. a big lake)

It also might be helpful to note that this language, or at least the way it has been presented to the reader, seemingly expresses all concepts using nouns exclusively.

With the understanding that more complicated words can be written as a cumulation of other words, the students should break down each character from the untranslated sentence and infer each meaning as shown below.

Note that you should encourage students to infer; this language is designed to be a lot less rigid than others they may have previously studied, and the task requires that the students attempt to portray the overall meaning – they are not expected to get an exact translation since one doesn't exist.

ⵎ (upw) = us

> This character contains three parts, all which we have been given:
>> internal/ownership = ⵎ (u)
>>
>> person = ⵎ (p)
>>
>> plural = ⵎ (w)
>
> We have also been given that,
>> me = ⵎ (up) = ⵎ (u) + ⵎ (p) = internal/ownership + person
>
> So this character is,
>> me + plural
>
> Students should recognise that this seems to be referring to a collective noun of people including the writer i.e.,
>> us
>
> Students may find it easier to infer this by noting that "us (we)" is the first-person plural pronoun, where the first-person pronoun is "me (I)".

ⵜ (x) = non-existence

> This has already been given, no inferring required.

ⵎ (pkmw) = want

> This character contains four parts, all which we have been given:
>> person = ⵎ (p)
>>
>> knowledge = ⵎ (k)
>>
>> movement = ⵎ (m)
>>
>> plural = ⵎ (w)
>
> We have also been given that,
>> mind = ⵎ (pk) = ⵎ (p) + ⵎ (k) = person + knowledge
>>
>> process = ⵎ (mw) = ⵎ (m) + ⵎ (w) = movement + plural
>
> So this character is,
>> mind + process
>
> Students should recognise that this seems to be referring to a process which happens in the mind so could translate this character to any of:
>> want, thought, desire, aspiration, etc.

ⵎ (ty) = injury

> This character contains two parts, all which we have been given:
>> harm = ⵎ (t)
>>
>> sadness = ⵎ (y)
>
> So this character is,

harm + sadness
Students should recognise that this seems to be referring to some kind of harm that would make someone sad so could translate this character to any of:
injury, pain, hurt, wound etc.

∧♀̃ (rpw) = you [plural]/them
This character contains three parts, all which we have been given:
external = ∧ (r)
person = ♀ (p)
plural = ̃ (w)
We have also been given that,
you/him/her/them/it = ∧♀ (rp) = ∧ (r) + ♀ (p) = external + person
So this character is,
you/him/her/them/it + plural
Students should recognise that this seems to be referring to collective noun of people that is not including the writer or next to the writer i.e.,
you [plural]/them
Students may find it easier to assume this by noting that "you [plural] (you [plural])" and "them (they)" are the second-person and third-person plural pronouns respectively, where the second-person pronoun is "you (you)" and the third-person pronouns are "he/she/them/it (his/hers/theirs/its)".

ʊ♀̃ (upw) = us
Already inferred this meaning above.

⋧ (m) = movement
This has already been given, no inferring required.

⊥◡ (ie) = here
This character contains two parts, but only one has been given:
location = ⊥ (i)
[unknown radical] = ◡ (e)
However we have also been given that,
there = ⊥ϯ◡ (ixe) = ⊥ (i) + ϯ (x) + ◡ (e) = location + non-existence + [unknown radical]
nearby area = ⊥◡◊ (iev) = ⊥ (i) + ◡ (e) + ◊ (v) = location + [unknown radical] + largeness
Students should think about what word means 'nearby area' just not as large and is related in some way to the word 'there'. The biggest clue is the former and students should infer that the character translates to:
here, nearby, close by

⋧ꓨꞁꝗ (mtsq) = harvest
This character contains four parts, all which we have been given:
movement = ⋧ (m)
harm = ꓨ (t)
plant = ꞁ (s)
happiness = ꝗ (q)

Students should think about these words in the order given and associate this character with something which requires movement, causes harm to plants but yields a positive/happy outcome. Examples of how this word can be translated include:

> harvest, prune etc.

ᐢᐟᐣ (sv) = tree

This character contains two parts, all which we have been given:

> plant = ᐢᐟ (s)
>
> largeness = ᐸᐳ (v)

Students should recognise that this seems to be referring to some kind of large plant so could translate this character to any of:

> tree, bush, forest etc.

ᐤᐟᐧᐢ (ohmw) = building

This character contains four parts, all which we have been given:

> object = ◯ (o)
>
> connection = ᐟ (h)
>
> movement = ᐨ (m)
>
> plural = ᔛ (w)

We have also been given that,

> process = ᐨᔛ (mw) = ᐨ (m) + ᔛ (w) = movement + plural

Students should read these words in order and work out that the character seems to be referring to something which involves the process of objects connecting/coming together, so could translate this character to any of:

> building, assemblage, joint, pile etc.

ᐨᔛᐧᔛ (cmoupwu) = our raft

This is the hardest of the characters but is quite simple when broken down. The first thing to notice here is that there are two rows of radicals. If you look at the given list of characters, there is one other examples of this:

> your [plural]/their field = ᔛᔛ (sjrpwu)

breaking this character down we have:

> your [plural]/their field = ᔛᔛ (sjrpwu) = ᐢᐟ (s) + — (j) + ᐱ (r) + ᑫ (p)
> + ᔛ (w) + ᔝ (u) = ᐢᐟ_ (sj) + ᐱᑫ (rp) + ᔛ (w) + ᔝ (u) = field +
> you/him/her/them/it + plural + internal/ownership (i.e. the field that they own)

Note that the order of characters could be interpreted in a different way (this is not relevant if using the English alphabet adaptation of the puzzle), i.e.

> your [plural]/their field = ᔛᔛ (usjrpw) = ᔝ (u) + ᐢᐟ (s) + — (j) + ᐱ (r)
> + ᑫ (p) + ᔛ (w)

but a similar deduction can be made.

So, now we move onto this more complicated character which consists of ten parts, some of which we have already been given and are listed below:

> water = ᔝ (c)
>
> movement = ᐨ (m)
>
> object = ◯ (o)
>
> internal/ownership = ᔝ (u)
>
> person = ᑫ (p)

plural = ఌ (w)

internal/ownership = ౮ (u)

However we also know that,

us = ౮ᕀᎁ (upw) = ౮ (u) + ♀ (p) + ఌ (w) = internal/ownership + person + plural

vehicle = ⸖○ (mo) = ⸖ (m) + ○ (o) = movement + object

So this character is:

water + vehicle + us + ownership

Students may find it useful to now look back at the following character since the last few radicals are quite similar,

your [plural]/their field = ᕀᎁ (sjrpwu) = ᐧᎁ (s) + — (j) + ⋀ (r) + ♀ (p) + ఌ (w) + ౮ (u) = ᐧ— (sj) + ⋀♀ (rp) + ఌ (w) + ౮ (u) = field + you/him/her/them/it + plural + internal/ownership (i.e. the field that they own)

In that case, the final radicals were describing that the object belonged to them and in this case our character ends in "us" and "ownership" so this could be describing that the object the character represents is "owned by us".

So putting this together we get that this complex character is made up of:

water + vehicle + owned by us

Students should consider these words in order and then infer that this character is referring to some form of vehicle used on water which we own. Example translations include:

our raft, our boat etc.

Putting this all together, we get that the sentence loosely translates to:

Us non-existence want injury you [plural]/them.
Us movement here harvest tree building our raft.

If the students get something resembling this translation, then they should be able to infer some key things about the sentence:

- The writer and the people they are with don't want to injure the people they are talking to,
- The writer and the people they are with have moved to this location to harvest/take trees in order to build their rafts/boat.

Students will have successfully completed this part of the puzzle if they have loosely inferred those two points. See below some example translations of the sentence into grammatically correct English:

- **We don't want to hurt you. We have come here to harvest trees and build our rafts.**
- **We do not desire to cause you harm. We moved here to cut down trees and assemble our boats.**

Water Tribe – Vocabulary Index

See below a complete list of vocabulary used in this challenge with its corresponding translation.

Vocabulary from the given translated characters:

- person = ♀ (p)
- internal/ownership = ౮ (u)

- me = ＾𝑢𝑝 (up) = ＾𝑢 (u) + 𝑝 (p)
- external = ∧ (r)
- you/him/her/them/it = ∧𝑝 (rp) = ∧ (r) + 𝑝 (p)
- plural = ∿ (w)
- object = ○ (o)
- non-existence = ⊥ (x)
- movement = ⋨ (m)
- process = ⋨∿ (mw) = ⋨ (m) + ∿ (w)
- knowledge = ʊ (k)
- mind = 𝑝ʊ (pk) = 𝑝 (p) + ʊ (k)
- happiness = ℚ (q)
- largeness = ⟨⟩ (v)
- excitement = ℚ⟨⟩ (qv) = ℚ (q) + ⟨⟩ (v)
- sadness = ϑ (y)
- harm = ⁄ (t)
- serious harm = ⁄⟨⟩ (tv) = ⁄ (t) + ⟨⟩ (v)
- location = ⊥ (i)
- there = ⊥⊥ₑ (ixe) = ⊥ (i) + ⊥ (x) + ⊙ (e)
- area/region = ⊥⟨⟩ (iv) = ⊥ (i) + ⟨⟩ (v)
- nearby area = ⊥ₑ⟨⟩ (iev) = ⊥ (i) + ⊙ (e) + ⟨⟩ (v)
- plant = ꟼ (s)
- field = ꟼ— (sj) = ꟼ (s) + — (j)
- my field = ꟼ—＾𝑝＾ (sjupu) = ꟼ (s) + — (j) + ＾𝑢 (u) + 𝑝 (p) + ＾𝑢 (u)
- your [plural]/their field = ꟼ—∧𝑝∿＾ (sjrpwu) = ꟼ (s) + — (j) + ∧ (r) + 𝑝 (p) + ∿ (w) + ＾𝑢 (u)
- connection = ⋩ (h)
- water = ʘ (c)
- lake = ʘ— (cj) = ʘ (c) + — (j)
- sea = ʘ—⟨⟩ (cjv) = ʘ (c) + — (j) + ⟨⟩ (v)
- tears = 𝑝ϑʘ (pyc) = 𝑝 (p) + ϑ (y) + ʘ (c)
- vehicle = ⋨○ (mo) = ⋨ (m) + ○ (o)

Additional vocabulary from the untranslated characters:
- us = ＾𝑝∿ (upw) = ＾𝑢 (u) + 𝑝 (p) + ∿ (w)
- want = 𝑝ʊ⋨∿ (pkmw) = 𝑝 (p) + ʊ (k) + ⋨ (m) + ∿ (w)
- injury = ⁄ϑ (ty) = ⁄ (t) + ϑ (y)
- you [plural]/them = ∧𝑝∿ (rpw) = ∧ (r) + 𝑝 (p) + ∿ (w)
- here = ⊥ₑ (ie) = ⊥ (i) + ⊙ (e)
- harvest = ⋨⁄ꟼℚ (mtsq) = ⋨ (m) + ⁄ (t) + ꟼ (s) + ℚ (q)
- tree = ꟼ⟨⟩ (sv) = ꟼ (s) + ⟨⟩ (v)
- building = ○⋩⋨∿ (ohmw) = ○ (o) + ⋩ (h) + ⋨ (m) + ∿ (w)

- our raft = 𝄞𝄢 (cmoupwu) = Ծ (c) + ⋝ (m) + ◯ (o) + ʊ (u) + ♀ (p) + ∾ (w) + ʊ (u)

Also, see below a complete list of the individual radicals used in this exercise (*including the two not given explicitly to the students):

- person ♀ (p)
- ownership ʊ (u)
- external ⋀ (r)
- plural ∾ (w)
- object ◯ (o)
- non-existence ⋋ (x)
- movement ⋝ (m)
- knowledge Ծ (k)
- happiness ℅ (q)
- largeness ⟨⟩ (v)
- sadness ⅄ (y)
- harm ⁄ (t)
- location ⊥ (i)
- *proximity ℂ (e)
- plant ५ (s)
- *layer/flatness — (j)
- connection ⋨ (h)
- water Ծ (c)

Completed Sample Challenge

To summarise, having completed both challenges students will have translated the following…

> A member of the forest-dwelling tribe was saying:
> **We don't want to hurt you; we have come here to get fresh water for our families and animals.**

> A member of the water-dwelling tribe was saying:
> **We don't want to hurt you. We have come here to harvest trees and build our rafts.**

Hence, students can conclude that neither of the tribes are looking to confront each other.