(A) Running on MT (1/1)

A1.

	Incorrect word	Correct replacement
1.	angry	cross
2.	facade	front
3.	supply	arm
4.	deceased	late
5.	polished	shone
6.	departs	leaves
7.	ignite	light
8.	confront	face
9.	changed	turned
10.	stabilize	steady
11.	arrived	came
12.	buying	getting
13.	deceased	late
14.	ahead	before
15.	construct	make
16.	house	home
17.	thin	fine
18.	departed	left
19.	support	back
20.	house	home

Grading:

A1: 10/19 points per correct answer.

Total: 10 points
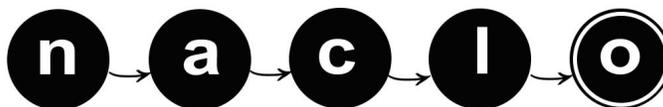
(B) Mix Up on the Farm (1/3)

B1.

The following can be observed from the data below:

Word Order: Tohono O'odham allows many orders of subject, object, and verb. In order to simplify the data for this problem, the verb or the negative particle *pi* comes first in each sentence. In sentences that have subjects and objects, we have chosen to illustrate the word order of subject before object, although the other order is possible in naturally occurring sentences. The second word in the sentence is always an auxiliary particle ('o, 'ac, or 'añ, in this problem). The particle *g* precedes each noun that is not a pronoun.

Agreement between the auxiliary element and the subject: The auxiliary *'o* is used when the subject is third person (not *I*, *we*, or *you*). The auxiliary *'añ* is used when the subject is first person and singular. The auxiliary *'ac* is used when the subject is first person and plural.

Plural nouns: The nouns *wakial* (cowboy) and *wisilo* (calf) are made plural by adding a *p* after the first vowel. The word *ceoj* (man) is made plural by adding a *c* after the first vowel. A linguist would describe the *p* and the *c* as *reduplicative infixes*. The *c* mirrors the initial *c* of *ceoj*. The *p*, which is made by putting your lips together, mirrors the initial *w* of *wakial* and *wisilo*, because *w* is made by rounding the lips.

Verbs with plural subjects: When the subject of *ñeok* (speak) is plural, the verb becomes *ñeñok*. When the subject of *cipkan* (work) is plural, it becomes *cickpan*. A more general way of describing this is that the first consonant is *reduplicated* after the first vowel.

Verbs with plural objects: This was a tricky part of this problem. The verb *ceposid* (brand) has a subject (*wakial*, cowboy) and an object (*wisilo*, calf). The first consonant is reduplicated after the first vowel when the *object* is plural. Also, when the object is plural, *ha-* is added to the beginning of the verb. *Ha-cecposid 'o g wakial g wipsilo* means *The cowboy is branding the calves.*

Here are the Tohono O'odham sentences with their English translations in order:

1. Ha-cecposid 'o g wakial g wipsilo.
2. Pi 'ac ñeñok 'a:cim.
3. Ceposid 'o g wakial g wisilo.
4. Pi 'o cickpan g cecoj.
5. Pi 'o ceposid g wapkial g wisilo.
6. Cipkan 'añ 'a:ñi.
7. Ñeok 'o g ceoj.
8. Ñeok 'añ 'a:ñi.

H. The cowboy is branding the calves.
E. We are not speaking.
G. The cowboy is branding the calf.
F. The men are not working.
D. The cowboys aren't branding the calf.
C. I am working.
B. The man is speaking.
A. I am speaking.
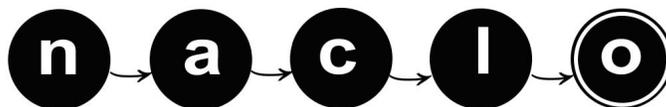
(B) Mix Up on the Farm (2/3)

How might you arrive at the solution? You might start by noticing that three of the English sentences contain the word *not*. You might guess that *pi* means *not* because it occurs in three Tohono O'odham sentences. The three English sentences containing not are *The men are not working*, *We are not speaking*, and *The cowboys are not branding the calf*. You could match up the longest English sentence with the longest Tohono O'odham sentence.

> Pi 'o ceposid g wapkial g wisilo.   The cowboys are not branding the calf.

Now, one of these means *We are not speaking* and one means *The men are not working*.

> Pi 'ac ñeñok 'a:cim.
> Pi 'o cickpan g cecoj.

We occurs in only one English sentence, and *'ac …'a:cim* occurs only in one Tohono O'odham sentence. You might then conjecture that *Pi 'ac ñeñok 'a:cim* means *We are not speaking*. In that case, *Pi 'o cickpan g cecoj* would mean *The men are not working*.

> Pi 'ac ñeñok 'a:cim.   We are not speaking.
> Pi 'o cickpan g cecoj.   The men are not working.

Which words mean *speaking*, *working*, and *men*? *Speaking* occurs in three English sentences and *working* occurs in two. If you notice that *ñeñok* is related to *ñeok,* you can see that those words occur in three sentences.

> Ñeok 'o g ceoj.
> Ñeok 'añ 'a:ñi.
> Pi 'ac ñeñok 'a:cim.   We are not speaking.

The three English sentences with speaking are *We are not speaking*, *I am speaking*, and *The man is speaking*. If you match *ceoj* in *Ñeok 'o g ceoj* with *cecoj* in *Pi 'o cickpan g cecoj,* you can conclude that *Ñeok 'o g ceoj* means *The man is speaking*.

> Ñeok 'o g ceoj.   The man is speaking.
> Ñeok 'añ 'a:ñi.   I am speaking.
> Pi 'ac ñeñok 'a:cim.   We are not speaking.

You can also match up the sentences with the words cikpan and cickpan with the two English sentences that are about working:

> Pi 'o cickpan g cecoj.   The men are not working.
> Cipkan 'añ 'a:ñi.   I am working.

That leaves the three longer sentences:

(B) Mix Up on the Farm (3/3)

Ha-cecposid 'o g wakial g wipsilo.
Ceposid 'o g wakial g wisilo.
Pi 'o ceposid g wapkial g wisilo.   The cowboys are not branding the calf.

Which word means *cowboy* and which word means *calf*? You have already observed that a plural noun can be made by adding an extra letter (*ceoj/cecoj*, man/men). You also know that the plural noun *cowboys* occurs in *Pi 'o ceposid g wapkial g wisilo*. This might lead you to match up *wapkial* with *wakial* (Spanish *vaquero*) meaning *cowboys/cowboy*. *Wisilo/wipsilo* would then mean *calf*.

Ha-cecposid 'o g wakial g wipsilo.   The cowboy is branding the calves.
Ceposid 'o g wakial g wisilo.   The cowboy is branding the calf.
Pi 'o ceposid g wapkial g wisilo.   The cowboys are not branding the calf.

The tricky part is that *ha-cecposid* (branding with reduplication of the initial *c*) doesn't go with the plural subject (cowboys), but with the plural object (calves).

B2.

		Correct	Mistake
1.	Ha-cecposid 'o g wakial g wisilo. Brand-plural cowboy calf		X
2.	Cickpan 'añ 'a:ñi. Work-plural I		X
3.	Cickpan 'ac 'a:cim Work-plural we.	X	

The first sentence must be wrong because the verb contains the reduplicative *c*, but both nouns are singular.

The second sentence is wrong because *'a:ñi* means *I* and is singular, but the verb contains the reduplicative *c*.

The third sentence is correct.

Grading:

B1: 5/7 points per correct answer.

B2: 10/7 points per correct answer.

Total: 10 points

(C) The War of the Dots (1/3)

C1.

We can first note that the leftmost letters in the New York Point words are all unique, and occur nowhere else in the problem. Meanwhile the rightmost letters show a limited number of letters which can occur anywhere. From this, we can conclude that the leftmost letters are the "distinct series of capital letters" mentioned in the problem description.

From here, a number of observations can quickly lead to a solution. For example, realizing that lowercase "a" is the most common letter in these names, and very common as the second letter, and realizing that ●● is equally common and occurs equally often as the second letter, lets us know that this symbol equals "a". From this we can know that (b) is Elena, which gives us the very useful letters "l", "e", and "n", and so on.

In solving, we also discover some interesting properties of the system.

- "sh" and "th" are represented by single letters.
- "e" is represented by a single dot, and in general more-frequent letters really do take up less space than infrequent ones.
- Capital letters are always four columns long and are formed by appending dots to the lowercase letter until it is four columns long, according to the following pattern.
    - If the last column of the lowercase letter has a dot in the upper row, add the extra dots to the lower row.
    - If the last column of the lowercase letter has a dot in the lower row, add the extra dots to the upper row.
    - If the last column of the lowercase letter has a dot in both rows, add the extra dots to the upper row.

In other words, fill up the opposite row from the last dot (defaulting to the top row when both are filled).

This system of capitalization is one of the few ways Walt could have created a capital series so that the capitals are predictable, but never lead to ambiguity. Adding just one dot or two dots would lead to ambiguity, because a capital could be mistaken for a lowercase letter. (For example, if you only added one dot, "E" would be identical to "s".) So you have to add enough dots that each capital is longer than any lowercase letter.

Meanwhile, if you added the extra dots to the *same* row, as opposed to the *opposite* row, the capitals of two letters could end up being identical. For example, both "e" and "a" would add their dots to the top row, and so "E" and "A" would end up identical. (And so would "F".)

Walt's solution is thus a quite clever solution within the design constraints of his system. (However, it was possibly a bit too clever for its own good—the system isn't particularly intuitive, and in practice, most people writing in NYP ignored capital letters entirely.)

n → a → c → l → o
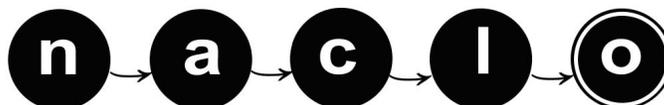
(C) The War of the Dots (2/3)

Answer:

a.	⠿ braille	K
b.	braille	E
c.	braille	I
d.	braille	C
e.	braille	J
f.	braille	G
g.	braille	L
h.	braille	F
i.	braille	H
j.	braille	B
k.	braille	A
l.	braille	D

C2.

We begin by forming names for which we already have all the letters, "Billy" and "Ethan". (The second of these tests whether you realized that "th" is one letter.)

a.	**Billy**	braille
b.	**Ethan**	braille

The next name, "Iggie", requires a lowercase "g", which is not provided in C1. If we've figured out the capitalization scheme, we can deduce it from "G".

n → a → c → l → o
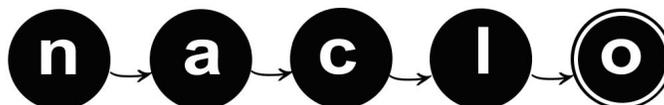
(C) The War of the Dots (3/3)

c.	**Iggie**	

"Orson" is more complicated—we know neither "O" nor "o". "o" doesn't occur anywhere in this puzzle… except for one place: Hellen Keller mentions she keeps mistaking capital "Y" for double "o". If we capitalize "Y", we notice that it's the same pattern repeated twice, and that this pattern is also not any of the letters we've seen. This is the "o".

d.	**Orson**	

"Sasha" involves no special tricks, except that we need to know that "sh" is one letter and how to capitalize "s".

e.	**Sasha**	

"Tim", on the other hand, requires a very thorough understanding of the system (as well as a willingness to look for clues in unusual places). That chart on the first page wasn't there just to take up space—it also gives you enough information to deduce "T" and "m". Knowing the numbers of dots in the letters we've deduced already, and the total numbers of dots in these names, we can eventually calculate that "t" must contain 1 dot and "m" must contain 3 dots but only be 2 columns wide. There are only two remaining dot patterns that fit these criteria, so they are "t" and "m". (But remember to capitalize that "T"!)

f.	**Tim**	

Grading:

C1: 15/38 points per correct answer.

C2: 15/38 points per letter correct and in the correct box.
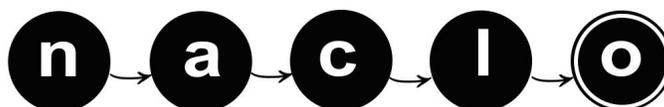
Total: 15 points

(D) Double or Quit in Caterpillar Country (1/3)

D1.

(i)

Notice that all words in the list end in either *-eme* or *-eke*. These endings are found on the same verb stem, e.g., *ath* 'grind', and they correspond to a difference in the TIME of the grinding event relative to the time of the utterance in which the verb is used. Similarly, the contrasting pair *unthepuntheme* and *unthepuntheke* both refer to continued 'going', and whether reference is to a present or past event is conveyed by the choice of suffix. Given that these suffixes are found on all verbs, irrespective of their meaning, eliminates the possibility that they express differences in 'type of action'. That they are found on simple verbs as well as 'start action' and 'continue action' verbs eliminates the possibility that they express differences in either 'start of action' or 'duration of action'.

Answer: B. ☑ Time of action

(ii) a.

To answer this question, one needs to compare the 'simple' verb form with the corresponding 'frequent' form. Starting with the first contrasting pair, *atherreme* 'is laughing' and *atherreperreme* 'keeps laughing', one needs to isolate the basic stem. Given what we know from the previous question, we can remove the 'time' or 'tense' suffix *-eme* common to both verb forms, which gives us *atherr-* as the stem. In the 'frequent' form, this is followed by *-ep,* which is in turn followed by the final vowel and consonant of the basic stem, giving *atherr-ep-err-*. This is the 'frequent' stem to which the 'tense' suffix is then added.

To verify if this procedure works for all of the 'frequent' verbs in the list, one needs to compare them with the corresponding simple form:

mpwar-eme 'is making' *mpwar-ep-ar-eme* 'keeps making'
atak-eme 'demolishes' *atak-ep-ak-eme* 'keeps demolishing'
unth-eme 'is going along' **unth**-*ep*-**unth**-*eme* 'keeps going along'

The final pair shows us that all consonants following the stem-final vowel (which happens to be the same as the stem-initial vowel, because there is only *one* vowel in this stem) are duplicated after *-ep*. By lining up all the verbs, we can see that the hypothesis we made on the basis of the first pair we examined holds, but we need to include the final vowel of the stem and any/all consonants which follow it in the part that is copied.

Answer: Add __ep__ to the verb stem followed by duplication of the __last/final__ vowel and consonant(s) of the verb stem.

(ii) b.

We proceed in the same way as for a.

ath-eme vs *ath-elp-ath-eme*

(D) Double or Quit in Caterpillar Country (2/3)

mpwar-eme vs *mpw-elp-empwar-eme*
ar-eme vs *ar-erlp-ar-eme*
atak-eme vs *at-erlp-atak-eme*

We can see that the 'commencing' form takes the first consonant or consonants of the basic stem and the preceding vowel if it exists, adds *elp* or *erlp* (the latter after *r* or *t*), and then adds the basic stem. This then forms the complex stem to which the 'tense' suffix is added.

Answer: Add __*elp*__ or __*erlp*__ (the latter after *r* or *t*) after the __first/initial__ consonant(s) of the verb stem followed by the whole __(verb) stem__.

(iii)

If we check to see if this procedure or 'rule' gives us the attested forms in our list, we notice that we would expect *mpw-elp-mpwar-eme* and not the actual form, which has the vowel *-e-* between *-elp* and the verb stem. We could 'tweak' our rule in a couple of different ways: one way would be to stipulate that *-elp* or *-erlp* must be followed by a vowel, so that if the stem does not start with a vowel, then *-e-* is inserted before the stem. Another possibility is to assume that all stems are underlyingly vowel-initial, but that word initial *e* is not pronounced, but is pronounced inside a word. This would give us:

empwar-eme (pronounced *mpwareme*) > *empw-elp-empwar-eme* (pronounced *mpw-elp-empwar-eme*)

Answer:

m	p	w	e	l	p	e	m	p	w	a	r	e	m	e			

(iv)

In our list of 'commencing verbs', we can see that *-e(r)lp* is always followed by a vowel.

Answer: B. ☑ vowel

D2.

We already have the information we need to create new verbs, as long as we can identify the stem.

arlkw-eme 'is eating': to form the 'past' form, we replace the suffix *-eme* with *-eke*.
kwern-eme 'is swallowing': to form the 'past' 'frequent' form, we need to apply our rule from D1 (ii) a:

       stem + *ep* + final VCs of stem + tense suffix
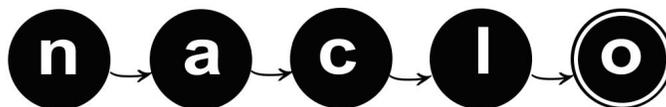
(D) Double or Quit in Caterpillar Country (3/3)

kwern-ep-ern-eke

itirr-eme 'is thinking': to form 'present' 'commencing' form, we apply the rule in D1 (ii) b:

first consonant(s) and preceding vowel + *erlp* + stem + suffix
it-erlp-itirr-eme

Answers:

(a)   was eating

a	r	l	k	w	e	k	e						

(b)   kept swallowing

k	w	e	r	n	e	p	e	r	n	e	k	e	

(c) starts to think

i	t	e	r	l	p	i	t	i	r	r	e	m	e

Grading:

D1i: 45/38 points for the correct answer.

D1ii: 15/19 points per correctly filled in blank.

D1iii: 75/38 points for the correct answer.

D1iv: 45/38 points for the correct answer.

D2: 75/38 points per correct answer.
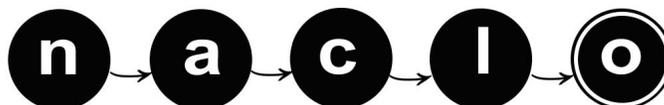
Total: 15 points

(E) BrokEnglish! (1/3)

E1.

It's quite clear what happened to Spencer's message. Letter sequences in his message which correspond to the codes in his program were replaced by language names. One thing that stands out right away is that once a code is replaced by a language name, if the language name contains the code for some other language name, that code is sometimes (but not always!) replaced with the corresponding language name.

Working backwards, we can see that the original message was:

h	e	y	,		c	h	r	i	s	!		w	h	e	n		y	o	u		g	e	t
	a		f	r	e	e		m	o	m	e	n	t	,		c	h	e	c	k		o	u
t		t	h	i	s		n	i	c	e		l	i	t	t	l	e		p	r	o	g	r
a	m		i		w	r	o	t	e	.		-	-	s	p	e	n	c	e	r			

(Spacing, capitalization, and punctuation were irrelevant to your score on this question.)

E2.

The key to finding the answer is to realize that when a code is replaced by a language name, if the language name contains the code for some other language name, that code is sometimes replaced with a language name, but it is **not always** replaced by a language name. To figure out the order, we need to look at words in which one or more substitution has already occurred, and look for additional sequences which could have been substituted but have not been substituted, or at words in which one of two substitutions could have occurred, and note which substitution was given precedence

The first thing to notice is that in 'FrEnglishcHebrewe', 'is' was not substituted for 'Icelandic.' From this, it is clear that 'is' is substituted before 'en', because if 'is' were substituted after 'en', the substitution for 'Icelandic' would have occurred.

It is also clear that one of the steps in the formation of 'FrEnglishcHebrewe' was 'Frenchee', which contains both the sequences 'ch' and 'he.' From this we can see that the substitution of 'he' occurs before the substitution of 'ch.'

Next, notice that the word 'when' became 'whEnglish', although 'wHebrewn' was also a possibility. This shows that 'en' is substituted before 'he'.

Examining the longest word in the message, 'ChamorRomanianrICHebrewcHebrewnlandic', three things are clearly evident:
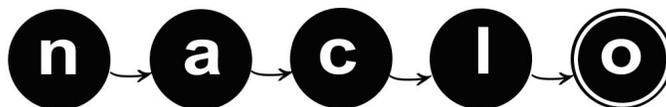
(E) BrokEnglish! (2/3)

1. 'ch' is substituted before 'ro'
2. 'is' is substituted before 'ce'
3. 'ce' is substituted before 'he'

Closer consideration of this word also reveals that 'en' is substituted before 'ce.' It can be hypothesized that one of the steps of the formation of this word would have been 'ChamorRomanianrIChechenlandic', in which the sequence 'en' occurs. We already know that 'en' is substituted before 'he', so the fact that 'en' is not substituted here must mean that 'en' is substituted before 'ce.'

The order has now been determined.

Answer:

_f_ _r_ then _i_ _s_ then _e_ _n_ then _c_ _e_ then _h_ _e_ then _c_ _h_ then _r_ _o_ .

E3.

This question is very simple: it just asks us to substitute the codes in the order discovered in E2. However, if the correct order was not discovered in E2, it was impossible to answer this question correctly.

Answer:

F	r	E	n	g	l	i	s	h	c	H	e	b	r	e	w	s	h		f	l	C	H	e
b	r	e	w	c	H	e	b	r	e	w	n	l	a	n	d	i	C	h	a	m	o	r	R
o	m	a	n	i	a	n		F	r	E	n	g	l	i	s	h	C	h	a	m	o	r	R
o	m	a	n	i	a	n	o	m		c	o	n	c	E	n	g	l	i	s	h	t	r	a
t	e																						

(Spacing, capitalization, and punctuation were irrelevant to your score on this question.)

E4.

The key to answering this question is to consider which replaceable sequences are contained in which language names, and to order them in such a way so that in any case, the maximum number of possible substitu-
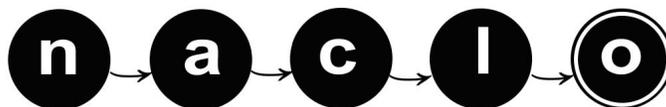
(E) BrokEnglish! (3/3)

tions will occur.

It is given that 'ro' is substituted last.

'ce' needs to be substituted after 'is,' because 'Icelandic' is the only language which contains 'ce.'

Both 'he' and 'ch' need to be substituted after 'ce', because 'Chechen' contains both of these sequences, but 'ch' must be substituted before 'he', because the result, 'CHebrewChamorRomanianen', is longer than 'CHebrewcHebrewn.'

'is' needs to be substituted after 'en', because 'is' is contained in 'English.'

'fr' needs to be substituted before 'en', because 'en' is contained in 'French.'

The order has now been determined.

Answer:

<u>**f**</u> <u>**r**</u> then <u>**e**</u> <u>**n**</u> then <u>**i**</u> <u>**s**</u> then <u>**c**</u> <u>**e**</u> then <u>**c**</u> <u>**h**</u> then <u>**h**</u> <u>**e**</u> then <u>r</u> <u>o</u> .

Grading:

E1: 5/2 points for the correct answer.

E2: 1/3 point per pair of languages in the correct order, -1/3 per pair in the wrong order (0 if either piece of the pair was unlisted). Minimum 0.

E3: 5/2 points for the correct answer.

E4: 1/3 point per pair of languages in the correct order, -1/3 per pair in the wrong order (0 if either piece of the pair was unlisted). Minimum 0.

Total: 15 points

(F) Tiger Tale (1/3)

This problem requires a rather different kind of reasoning—jumping into real (and somewhat messy) data with few guideposts to mark your way—than most NACLO problems, but it is a kind of reasoning that is increasingly important in international-level Linguistics Olympiad competitions.

As a general strategy, you need not know exactly what a word means to determine something about it. (You can, for example, pick out which things in a sentence seem to be verbs, which things are noun phrases, etc., even if you don't know what they refer to.) This sort of reasoning —by the distribution and co-occurrence of words rather than by their meaning —is central to the way computers figure out the structure of texts. (After all, your computer wouldn't be able to match up the word *llama* with a real llama, and your grandmother probably may not know what a Pikachu is, but both can work out that these words refer to things rather than actions by the kinds of words that can go around them.)

In this problem, the most important insights come not from comparing the English and Indonesian texts, but by looking carefully at word co-occurrences in the Indonesian text. Certain words, like *di* and *pada* and *pukul* and *kata*, systematically co-occur with phrases of certain types (like dates, places, names, etc.).

The English text was given not because you could match up the Indonesian and English—you can't. You can tell pretty quickly that they're not translations of one another; they clearly contain different facts about the case. The English text just gives you some facts to start from: knowing that Palembang is a place, Udin Bolu is a person, that September 3rd was a Thursday, that the tiger's name is Sheila, etc.

F1.

From the parallel phrases "*Syamsuddin alias Udin Bolu*" and "[****], known better as Udin Bolu", we can conclude that [****] should be replaced by **Syamsuddin.**

F2.

Given that the police are so central to this story, we expect there to be some word corresponding to English **police**; luckily it's the direct loan *polisi*. *Harimau* is, by its occurrence in the title, also a central concept in the story, and the parallelism between Sumatran tiger and *harimau Sumatera* (followed by the species name *panthera tigris Sumatrae*) is a dead giveaway that *harimau* is **tiger**. Since we know that the tiger was named Sheila, the phrase *harimau bernama Sheila* means that *bernama* probably means something like **named**. (And it does; *nama* = name.) *Jumat* is clearly a day of the week from Jumat 28 Agustus 2009, but which day is it? We know, however, that September 3rd was a Thursday, and thus the **Friday** before that was August 28th.

Answer:

a.	polisi	police
b.	harimau	tiger
c.	bernama	named
d.	Jumat	Friday
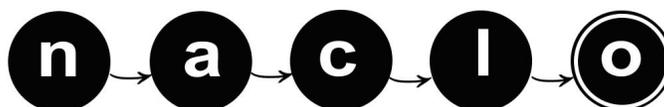
(F) Tiger Tale (2/3)

F3.

We know from the English article that there is a place called Palembang, South Sumatra, so *Palembang, Sumatra Selatan* tells us that "south" is probably **Selatan**. For "said", a good place to look in a newspaper article is in between what look like people's names and quotations, and there is just such a word in this position, **kata**. Using the same reasoning as in F2. d. (*Jumat*), we can deduce from *Rabu, 2 September 2009*, that Wednesday is **Rabu**. Finally, **juta** is only used after currency numbers, and given that we know we're dealing in sums at or over one million Rp, it is the most likely word for *million*.

Answer:

a.	south	Selatan
b.	said	kata
c.	Wednesday	Rabu
d.	million	juta

F4.

Palembang is obviously a location; we can tell that just from the English. *Sabtu* is, like *Rabu* and *Jumat*, also a day of the week, as we can see from *Sabtu (22/8)*. *Kapoltabes Jambi* is a person—more specifically, it is Mr. Addoe's title in the Jambi police force. (The probability tips towards it being a person rather than a place because Kapoltabes Jambi says (*kata*) something at the end of the article.) *Minggu dinihari* is another time or date, specifically the early "Sunday morning" when the killing took place. The clues here are the preposition *pada*, which is used with the other dates, and *pukul,* which occurs with times. (It means "hour" or "o'clock".) *Syamsuddin*, as discovered above, is a person. *Sungai Maram, Kota Jambi* suggests that Sungai Maram is a place in Kota Jambi; that this phrase is preceded, like other places, by the preposition *di* is another reason for believing it to be a place. *Kebun Binatang* is clearly the name of something, but what? That it is likewise preceded by *di*, and followed again by *Kota Jambi*, suggests that it is another place. (It means, in fact, "zoo"; *Kebun Binatang Taman Rimba Kota Jambi* is the name of the Kota Jambi zoo.)

Answer:

		Persons	**Locations**	**Times or Dates**
a.	Palembang		X	
b.	Sabtu			X
c.	Kapoltabes Jambi	X		
d.	Minggu dinihari			X
e.	Sungai Maram		X	
f.	Syamsuddin	X		
g.	Kebun Binatang		X	
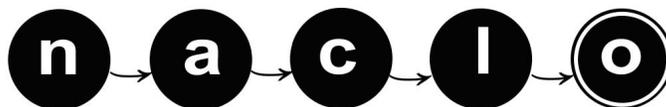
(F) Tiger Tale (3/3)

Grading:

<u>F1:</u> 25/7 points for the correct answer.

<u>F2:</u> 10/7 points per correct answer.

<u>F3:</u> 10/7 points per correct answer.

<u>F4:</u> 5/7 points per correct answer.

Total: 20 points

(G) Ulwa Possessives (1/2)

G1.

By organizing the given words by possessor, we can see the common element that means "my", "your", "his/her", etc.:

> **1ˢᵗ person singular**: none
> **1ˢᵗ person plural (exclusive):** *tai-kina-tai, wai-kina-ku*
> **1ˢᵗ person plural (inclusive):** *gaad-ni, sik-ni-bilh, pau-ni-mak*
> **2ⁿᵈ person singular:** *dii-ma-muih, uu-ma-mak*
> **2ⁿᵈ person plural:** *bilam-mana, suu-mana-lu*
> **3ʳᵈ person singular:** *as-ka-na, kapak-ka, kii-ka, sapaa-ka*
> **3ʳᵈ person plural:** *bilam-kana, dii-kana-muih, karas-kana-mak, wasa-kana-la*

This gives us *kina, ni, ma, mana, ka,* and *kana* as the common meaning elements (or "morphemes"). We don't know what the 1ˢᵗ person singular ("my") form is, yet. From the relationship between the singulars and plurals in the 2ⁿᵈ and 3ʳᵈ persons, we can hypothesize, though, that adding *na* to a singular makes a plural, and thus "my" is likely to be *-ki-*. This will be confirmed later on, when we find a leftover *-ki-* that has to mean "my" in "my cat".

The positioning of these morphemes is puzzling, however, often seeming to be placed at an unpredictable position *within* the word. (The word for this is "infix", by analogy with "prefix" and "suffix".) It looks as though there are two basic options: put it after the first syllable, or after the second. (The syllabification scheme of Ulwa can be deduced from what sequences of letters can be broken by these infixes, and by the way the words are broken down into puzzle pieces.) There are a number of words where the morpheme is apparently a suffix, but note that these are all words with 1- or 2-syllable bases—the generalization "after the 1ˢᵗ or after the 2ⁿᵈ" captures these as well.

If we reorganize the words according to the position of the infix, another pattern emerges:

> **After the 1ˢᵗ syllable:** *as-ka-na, dii-kana-muih, dii-ma-muih, gaad-ni, kii-ka, sik-ni-bilh, suu-mana-lu, pau-ni-mak, tai-kina-tai, uu-ma-mak, wai-kina-ku*

> **After the 2ⁿᵈ syllable:** *bi-lam-kana, bi-lam-mana, ka-pak-ka, ka-ras-kana-mak, wa-sa-kana-la*

These two groups, in addition to differing by the position of the possessive infix, also differ according to the shape of the first syllable. When the syllable has a double vowel, or ends in a consonant (that is, when it's of the shape CVV, CVC, or CVVC), the infix comes directly afterward. On the other hand, when the first syllable is just a short CV, the infix comes after the *next* syllable.

(What's happening behind the scenes: Linguists call these *heavy* and *light* syllables. Ulwa words get stressed on the initial syllable if it's heavy, and on the second syllable when the first is light, and the infix always comes right after the stressed syllable.)
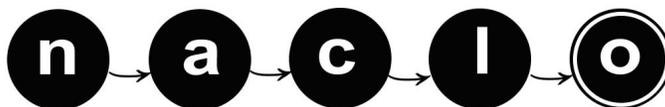
(G) Ulwa Possessives (2/2)

In G1, the words are pre-syllabified for you to make it easier to discern where syllable boundaries are. Following the two patterns above (which-infix-to-choose and where-to-put-it) gives us the following solutions:

Answer:

a.	"his/her grey squirrel"	**taikatai**
b.	"our (inclusive) heaven"	iinibin
c.	"your (plural) iguana"	kahmanama
d.	"his/her gun"	arakkabus
e.	"your (singular) lemon"	liimama
f.	"their woodpecker"	kulukanaluk
g.	"our (exclusive) time"	taimkina
h.	"my cat"	miskitu

na

pak

ki

ka
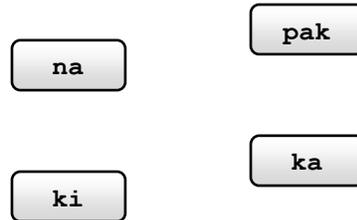
G2.

Four pieces should remain, and properly arranged they form:

Ulwa word	English Translation
kapakkina	our (exclusive) manner

Grading:

G1: 3/4 points per correct answer, with half credit if the possessive marker was placed a syllable off.

G2: 15/4 points for the correct word (no partial credit), 6 points for the correct translation.

Total: 15 points