



Sample Set Two - October 2019

Teacher / Student Guide

Students should do the five puzzles from the preliminary round from January 2019 (previous years are here also):

<https://ailo.adaptcentre.ie/sample-puzzles-2019-2/>

This pack includes:

Preliminary Round level puzzles (2014 Level)

- This includes 4 puzzles and solutions / marking schemes.

Last year's samples, workshops and competition papers:

<https://ailo.adaptcentre.ie/sample-puzzles-2019-2/>

Career Profile

- Abigail Walsh, Irish Language Technology PhD Student, ADAPT Centre, Dublin City University.

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Question A: Visible speech (10 pts)

Alexander Melville Bell (father of Alexander Graham Bell) invented “Visible Speech” as a more detailed and systematic writing system for English, to help deaf students learn to pronounce spoken language more accurately.

A1: The following words in Visible Speech represent *boot*, *cogs*, *peaks*, and *tap*, but not in that order. Which is which? (4 pts)

(a) ʌ|ɑʊ

(b) ɒ|ɔ

(c) ɔ|ɒ

(d) ɑ|jɛʊ

A2. What English words are represented by the following? (3 pts)

(a) ɒ|ɑ

(b) ʌ|ʊ

(c) ʊ|jɛ

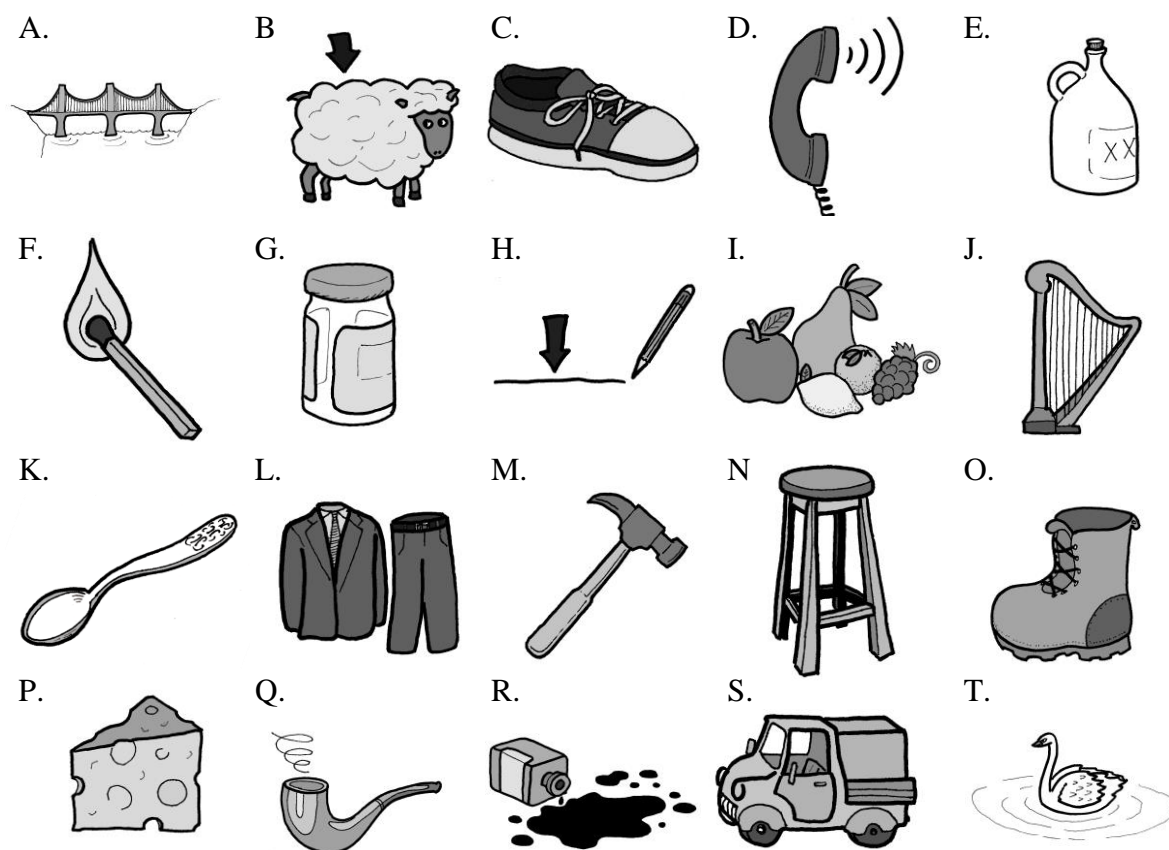
A3. Write the following words in Visible Speech: (3 pts)

- (a) *keep*
- (b) *tease*
- (c) *spook*

Question B: Maori loanwords (20 pts)

The Maori language, or “te reo Māori”, is the language of the Maori, the indigenous people of New Zealand. It is one of the official languages of New Zealand, along with English and NZ Sign Language, and over several centuries it has borrowed many English words. These words are often adapted to fit the sounds of the Maori language.

B1. Below are 20 Maori words that have been adapted from English words. In your answer book, match each word to the picture that illustrates it. The macron (line) over a vowel indicates that it is long. (5 pts)



- | | | | | |
|---------------|-----------------|------------------|---------------------|-------------------|
| 1 <i>hāma</i> | 5 <i>iniki</i> | 9 <i>pūnu</i> | 13 <i>terewhono</i> | 17 <i>tūru</i> |
| 2 <i>hāpa</i> | 6 <i>māti</i> | 10 <i>pūtu</i> | 14 <i>tiā</i> | 18 <i>wāna</i> |
| 3 <i>hū</i> | 7 <i>paipa</i> | 11 <i>raina</i> | 15 <i>tiaka</i> | 19 <i>whurutu</i> |
| 4 <i>hūtu</i> | 8 <i>pīriti</i> | 12 <i>taraka</i> | 16 <i>tīhi</i> | 20 <i>wūru</i> |

B2. Many English loanwords in Maori deal with concepts introduced from the West. To what English words, indicating jobs or ranks, do the following Maori words correspond? (4 pts)

- (a) *hekeretari* (b) *pirinihehe* (c) *pirihimana* (d) *tiati*

Continued on next page
(3 pts)

B3. What countries are these?

- (a) *Iharaira* (b) *Kiupa* (c) *Peina* (d) *Tiamani* (e) *Tiapana*

B4. For each of these English words, predict what the Maori loanword form would be. (8 pts)

- (a) beef
- (b) bull
- (c) cart
- (d) clock
- (e) lease
- (f) meat
- (g) seal
- (h) street
- (i) time
- (j) watch

Question C: Turkish bath time (25 pts)

Turkish is spoken by about 63 million native speakers located mainly in Turkey, with smaller groups in other parts of Europe, the Caucasus and Central Asia. Turkish words are built up by adding one or more endings (affixes) to a root word; the vowels in most word endings vary depending on the vowels in the root word ("vowel harmony").

Here are some sentences in Turkish, with their English translations. Words in [square brackets] are needed in English but have no equivalent in the Turkish sentence.

Arkadaşlarım şehirde mutlu. My friends [are] happy in [the] city.

Baban İstanbul'u seviyor mu? Does your father like Istanbul?

Fakirler Ankara'dan İstanbul'a gelmek istiyor. Poor [people] want to come from Ankara to Istanbul.

İstanbul en büyük şehir. Istanbul [is the] biggest city.

Eve geliyorlar. They come home.

"Gel, arkadaşımız ol", diyor. [She/he] says "Come [and] be our friend".

Evimizde büyük pencereler var. There are big windows in our house.

Pencereden atlıyoruz. We jump from [the] window.

Bir ev almak mı istiyorsun? Do you want to buy a house?

C1. Translate the following into English. (10 pts)

- (a) *Baban büyük mü?*
- (b) *"Evimize gel", diyoruz.*
- (c) *Doktor olmak istiyor.*
- (d) *Fakir arkadaşımı seviyorlar mı?*
- (e) *Ankara'dan geliyoruz.*

C2. Translate the following into English; they have a new affix you have not seen before, but it does not indicate a different tense. (15 pts)

- (a) *Geldiğimde "merhaba" diyorlar.*
- (b) *Fakir olduğunu diyorlar.*
- (c) *Baban geldiğimizden mutlu mu?*
- (d) *Geldiğin şehir büyük mü?*
- (e) *En mutlu olduğum şehir, İstanbul.*
- (f) *Fakir olduğumuz halde mutluyuz.*

Question D: Kairak verb forms (25 pts)

Kairak is spoken by about 750 people on the New Guinea Islands, off the Papua New Guinea mainland. It is a member of the Baining (Papuan) language family.

The data below (slightly simplified) illustrate how Kairak speakers express the past, present, and future tenses with different types of verbs. Your job is to identify the patterns involved, then answer the questions below.

1/2/3 indicate 1st, 2nd and 3rd person; 'sg' is singular, 'pl' is plural, 'du' is dual, i.e. when two people are involved (translated here as 'both'). Kairak distinguishes masculine ('m') and feminine ('f'), and also human vs non-human.

Pronunciation notes: *ǎ* is a low central vowel sound a bit like the 'u' in (British English) 'cup'; *ŋ* represents the 'ng' in 'sing'; *ɲ* represents the 'ny' sequence in 'canyon'.

Type 1 Example *tsup* 'to smoke'

	present		future		past	
1sg	<i>ŋut sup</i>	I smoke	<i>ŋu sup</i>	I will smoke	<i>ŋa sup</i>	I smoked
2sg	<i>ɲit sup</i>	you (sg) smoke	<i>ɲi sup</i>	you (sg) will smoke	<i>ɲa sup</i>	you (sg) smoked
3sg m	<i>kǎt sup</i>	he smokes	<i>kǎ sup</i>	he will smoke	<i>ka sup</i>	he smoked
3sg f	<i>yit sup</i>	she smokes	<i>yi sup</i>	she will smoke	<i>ya sup</i>	she smoked
1du	<i>unit sup</i>	we both smoke	<i>uni sup</i>	we both will smoke	<i>un sup</i>	we both smoked
2du/ 3du	<i>anit sup</i>	you / they both smoke	<i>ani sup</i>	you / they both will smoke	<i>an sup</i>	you / they both smoked
1pl	<i>urit sup</i>	we smoke	<i>uri sup</i>	we will smoke	<i>ut sup</i>	we smoked
2pl	<i>ŋǎnit sup</i>	you (pl) smoke	<i>ŋǎni sup</i>	you (pl) will smoke	<i>ŋǎni sup</i>	you (pl) smoked
3pl	<i>rit sup</i>	they smoke	<i>ri sup</i>	they will smoke	<i>ra sup</i>	they smoked
3pl non-human	<i>ŋǎrit sup</i>	they (non-human) smoke	<i>ŋǎri sup</i>	they (non-human) will smoke	<i>ŋǎri sup</i>	they (non-human) smoked

Other type-1 verbs:

tsek 'to raise'
tvǎstǎmna 'to meet'
tsiqut 'to try'

tŋes 'to dig'
tkur 'to show'

Continued on next page

Type 2: Example *yam* ‘to swing’

	present		future		past	
1sg	<i>ŋu yam</i>	I swing	<i>ŋu yam</i>	I will swing	<i>ŋa yam</i>	I swung
2sg	<i>ŋi yam</i>	you (sg) swing	<i>ŋi yam</i>	you (sg) will swing	<i>ŋa yam</i>	you (sg) swung
3sg m	<i>kǎ yam</i>	he swings	<i>kǎ yam</i>	he will swing	<i>ka yam</i>	he swung
3sg f	<i>yi yam</i>	she swings	<i>yi yam</i>	she will swing	<i>ya yam</i>	she swung
1du	<i>uni yam</i>	we both swing	<i>uni yam</i>	we both will swing	<i>un yam</i>	we both swung
2du/ 3du	<i>ani yam</i>	you/they both swing	<i>ani yam</i>	you/they both will swing	<i>an yam</i>	you / they both swung
1pl	<i>uri yam</i>	we swing	<i>uri yam</i>	we will swing	<i>ut yam</i>	we swung
2pl	<i>ŋǎni yam</i>	you (pl) swing	<i>ŋǎni yam</i>	you (pl) will swing	<i>ŋǎn yam</i>	you (pl) swung
3pl	<i>ri yam</i>	they swing	<i>ri yam</i>	they will swing	<i>ra yam</i>	they swung
3pl non-human	<i>ŋǎri yam</i>	they (non-human) swing	<i>ŋǎri yam</i>	they (non-human) will swing	<i>ŋǎ yam</i>	they (non-human) swung

Other type-2 verbs:

<i>monǎk</i>	‘to cook’
<i>sameŋ</i>	‘to speak out’
<i>vǎlǎŋ</i>	‘to kill’
<i>mǎnatǎm</i>	‘to sleep’

Type 3: Example *tet* ‘to go’

	present		future		past	
1sg	<i>ŋa tet</i>	I go	<i>ŋa ret</i>	I will go	<i>ŋa met</i>	I went
2sg	<i>ŋa tet</i>	you (sg) go	<i>ŋa ret</i>	you (sg) will go	<i>ŋa met</i>	you (sg) went
3sg.m	<i>ka tet</i>	he goes	<i>ka ret</i>	he will go	<i>ka met</i>	he went
3sg.f	<i>ya tet</i>	she goes	<i>ya ret</i>	she will go	<i>ya met</i>	she went
1du	<i>un tet</i>	we both go	<i>un ret</i>	we both will go	<i>un met</i>	we both went
2du/ 3du	<i>an tet</i>	you / they both go	<i>an ret</i>	you / they both will go	<i>an met</i>	you / they both went
1pl	<i>ut tet</i>	we go	<i>ut ret</i>	we will go	<i>ut met</i>	we went
2pl	<i>ŋǎni tet</i>	you (pl) go	<i>ŋǎni ret</i>	you (pl) will go	<i>ŋǎni met</i>	you (pl) went
3pl	<i>ra tet</i>	they go	<i>ra ret</i>	they will go	<i>ra met</i>	they went
3pl non-human	<i>ŋǎri tet</i>	they (non-human) go	<i>ŋǎri ret</i>	they (non-human) will go	<i>ŋǎri met</i>	they (non-human) went

Other type-3 verbs:

<i>tǎn</i>	‘to come’
<i>ton</i>	‘to go inside’
<i>dudǎbǎt</i>	‘to set fire to the bush’

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D1. Translate the following into Kairak.

(8 pts)

- (a) I tried
- (b) They both dig
- (c) We cooked
- (d) They [the dogs] will kill
- (e) You (sg) sleep
- (f) He came
- (g) You (pl) will go inside
- (h) She sets fire to the bush

D2. Translate the following into English:

(8 pts)

- (a) *rit vāstāmna*
- (b) *ani kur*
- (c) *rat sek*
- (d) *ṅān sameṅ*
- (e) *ra monāk*
- (f) *un ton*
- (g) *ṅa rān*
- (h) *ut mudābāt*

D3. Provide the translations as indicated.

(3 pts)

- (a) If *yit sal* means ‘she gives birth’, what is ‘to give birth’?
- (b) If *ra ru* means ‘they will put’, translate ‘he put’.
- (c) If *unit nari* means ‘we both feel’, what does *ani nari* mean?

D4. Some of the forms are ambiguous, i.e. they do not fully distinguish the person or tense. Besides the ambiguity between 2nd and 3rd person dual (‘you both’ / ‘they both’), which other forms are ambiguous? In your answer book, complete the following statements: (6 pts)

- (a) In type-1 verbs [verb form] can be either [tense] or [tense] with [person], and also
- (b) [verb form] shows the same ambiguity with [person].
- (c) In type-[x] verbs, [tense] and [tense] are the same for [which person].

SOLUTIONS SAMPLE SET TWO OCT 2019

Question A: Visible speech

A1. Write one of (a)-(d) next to each word: **(4 points)**

boot ...**b**... cogs ...**d**... peaks ...**a**... tap ...**c**...

A2. Write the English word as requested **(3 points)**

(a) Back

(b) Peace/ piece

(c) Dog

A3. Write the following words in Visible Speech: **(3 points)**

(d) *keep* aɪp

(e) *tease* tɪz

(f) *spook* spuk

Question B: Maori loanwords

B1. Match the words 1-20 to the pictures A-T. (5 points = ¼ each)

1	M	6	F	11	H	16	P
2	J	7	Q	12	S	17	N
3	C	8	A	13	D	18	T
4	L	9	K	14	G	19	I
5	R	10	O	15	E	20	B

B2. What are the English words? (4 points)

- (a) *hekeretari* secretary
- (b) *pirinihehe* princess
- (c) *pirihimana* policeman
- (d) *tiati* judge

B3. What are the countries? (3 points = 0.6 each)

- (a) *Iharaira* Israel
- (b) *Kiupa* Cuba
- (c) *Peina* Spain
- (d) *Tiamani* Germany
- (e) *Tiapana* Japan

B4. What is the Maori loanword? (8 points = 0.8 each)

- (a) beef *pīwhi*
- (b) bull *pūru*
- (c) cart *kāta*
- (d) clock *karaka*
- (e) lease *rīhi*
- (f) meat *mīti*
- (g) seal *hīri*
- (h) street *tirīti*
- (i) time *taima*
- (j) watch *wāti*

Question C: Turkish bath time

C1. Translate into English (10 points = 2 points each)

- (a) Is your father happy?
- (b) We say “Come to our city”
- (c) My friend wants to be(come) a doctor
- (d) Do they like my poor house?
- (e) We come from Ankara

C2. Translate into English (15 points = 2.5 points each)

- (a) When I come, they say “Hello”
- (b) They say (that) you are poor
- (c) Is your father happy that we come/are coming?
- (d) Is the city you come from big?
- (e) The city I am happiest in is Istanbul
- (f) Although we are poor, we are happy

Question D: Kairak verb forms

D1. Translate into Kairak (8 points)

- | | |
|-----------------------|-----------------------|
| (a) <i>ŋa siqut</i> | (f) <i>ka mǎn</i> |
| (b) <i>anit ŋes</i> | (g) <i>ŋǎni ron</i> |
| (c) <i>ut monǎk</i> | (h) <i>ya dudǎbāt</i> |
| (d) <i>ŋǎri vǎlǎŋ</i> | (i) |
| (e) <i>ŋi mǎnatǎm</i> | (j) |

D2. Translate into English (8 points)

- (a) They meet
- (b) You both will show
- (c) MISPRINT in question so accept they raise/they raised
- (d) You (pl) spoke out
- (e) They cooked
- (f) We both go inside
- (g) You (sg) will come
- (h) We set fire to the bush [past tense]

D3. (3 points)

- (a) *tsal*
- (b) *ka mu*
- (c) you/they both will feel

D4. Complete the statements (6 points; a and b can be reversed)

- (d) In type-1 verbs ...*ḡāni* can be either future or
verb form tense
past ... with you (pl) and also
tense person
- (e) *ḡāri* shows the same ambiguity with they (non-human)
verb form person
- (f) In type- 2 verbs, present and future are the same
number tense tense
 for all persons [allow any phrasing of this]

Career Profile

	<p>Name: Abigail Walsh</p> <p>Job title: Irish Language Technology PhD Student</p> <p>Current Study: ADAPT Research Centre, Dublin City University https://www.adaptcentre.ie/</p> <p>Industry: Natural Language Processing (NLP)</p>
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Education and Work Experience

Undergraduate

I finished my undergraduate degree in Computer Science and Language at Trinity College Dublin in 2016. After graduating, I was employed as a research assistant at the ADAPT Centre, before starting my PhD here. I also did several research internships in the areas of NLP and Machine Learning, one of which was the ADAPT Internship.

Internship

My internship title was Semantic Fuzzy Matching for Translation Memory. At the time of my internship at ADAPT, I was questioning my career path and whether I was suited to academic work. I was also experiencing some burnout, after a stressful final year. My internship at ADAPT gave me a positive experience in setting my own goals and deciding which challenges I could tackle, within the framework of an existing research project. I discovered aspects of research I truly enjoyed, and other areas I was struggling in.

Current Role

Main Tasks and Responsibilities

As a PhD Candidate, I research the automatic processing of multiword expressions in Irish - this topic lies at the intersection of linguistics, machine learning, Irish language and technology.

What are the main skills you learned during your job at ADAPT?

Aside from learning practical research skills, and honing my knowledge of the topic and related fields; I have learned and am still learning some other very important life skills, such as maintaining a good work/life balance, exploring my passions, building my professional network, managing my time, and, most importantly, understanding my own strengths and

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weaknesses and working with those aspects of my personality. I believe this type of personal development comes from working in a positive, supportive and understanding environment.

My Typical Day

I usually start the day with administrative tasks, such as scheduling meetings or responding to emails; these tasks require excellent organisation skills and attention to detail. My work provides many opportunities for learning and development: the lectures and meetings I attend inform about developments in my field, and I enjoy tutoring other students and sharing my knowledge and experience with them. The bulk of my own PhD work is research and running experiments; only after I sufficiently understand the problem and how others in my field have tackled it, do I begin to plan my own approach. I relish the challenge of establishing a research questions, planning a method, and working towards a solution.

How important is problem solving in your role?

Many of my tasks I complete throughout the day require some level of problem-solving. Particularly as a computer scientist, much of my work revolves around taking complex and multifaceted problems and distilling them into simpler tasks. This technique is called divide-and-conquer and is particularly helpful when the problem at hand seems too complex to be solved at first glance.

What kinds of problems do you need to solve in your job on a day-to-day basis?

Some of the problems seem trivial, like how do I install this piece of software, or how do I locate a paper by a certain author. Other problems are more complex; for example, the question of how to automatically process MWEs in Irish. This complex issue actually incorporates several other tasks; such as research, coding, and linguistic analysis. I've found that regardless of whether the problem is simple or complex, the same problem-solving strategies can often be applied.

What is your favourite thing about your work?

I love the challenges presented by tackling a difficult research question and trying to discover something entirely new and unknown. I love to ask questions, and it's very gratifying to have the opportunity to answer them myself, particularly if nobody else can!

About me

What kind of puzzles/problems do you enjoy?

I've always enjoyed logic puzzles, abstract thinking and brain-teasers. For me, a career in computer science seemed a natural choice. I particularly enjoy the types of outside-the-box thinking required for creating a new piece of code, while also trying to work within the limitations of the language. Applying this logical and structured way of thinking to the very messy problems posed by language is fascinating and immensely satisfying to me.

What school subjects influenced your career path?

Choosing subjects to study at school was difficult, because I was interested in everything! My favourite subjects were maths, physics, technical graphics, music and English. Luckily my

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course allowed me to study both science and languages, and I've continued to work in both fields to this day.

Who inspired you?

My supervisor, Teresa Lynn, has been a big inspiration to me, particularly when I was deciding what to do next after graduating. I was burned out and felt apprehensive about returning to academic work. She reignited my confidence, my passion for research and my interest in Irish.

Work/life balance

As a full-time student, my hours are very flexible. This allows me to dictate my own schedule and work when I am most productive (I prefer to work in the evening time). However, it can be difficult to maintain this balance. Some days I struggle to be productive, while other days I can overwork myself. Overall, I really enjoy the freedom and flexibility.

Your top tips?

NLP and other related fields are typically at an intersection of science and humanities. Computer science in particular is a creative subject that allows for some very interesting and diverse applications. It is ideal for people who are logical, inventive and enjoy solving problems. That said, I think the number one quality you can possess as a potential researcher is curiosity. Find an area that fascinates you and start asking questions. If nobody else knows answer, then maybe you should find out what it is.

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