Introduction to Linguistics and Problem-Solving

Topic 1
Linguistics Module

What this presentation covers

- **Brief introduction to the overall Linguistics Module**

  - Funding

  - Benefits of doing this module

  - Who worked on it

  - List of 10 topics

  - Why is AILO doing this?

- **Introduction to Linguistics**

  - The areas of linguistics

  - Introduction to linguistic problem-solving

Introduction to the overall Linguistics Module

Linguistics Module (funded by Post-Primary Languages Ireland (PPLI)

The benefits of doing this module

- Develop language awareness

- Increase uptake of Modern Foreign Languages

- Improve Modern Foreign Languages learning

- Improve reading and writing skills

- Cross- cultural understanding

- Critical thinking abilities

- Improve team-working and communication skills

Who worked on this module

- Dr Bettina Knipschild (language teacher, Old Bawn Community School Tallaght)
- Ms Wilma Slevin (language teacher, Ashbourne Community School)
- Prof Harold Somers (AILO Puzzles)
- Prof Maja Popović (Assistant Professor ADAPT DCU, Machine Translation)
- Dr Theodorus Fransen (ADAPT, NUIG)
- Prof Andy Way (Deputy-Director ADAPT DCU)
- Dr Cara Greene (AILO, Education and Public Engagement ADAPT DCU) and the EPE team of ADAPT
- Dr Kènia Puig Post-Primary Languages Ireland (PPLI)

- Thank you to everyone who tested materials
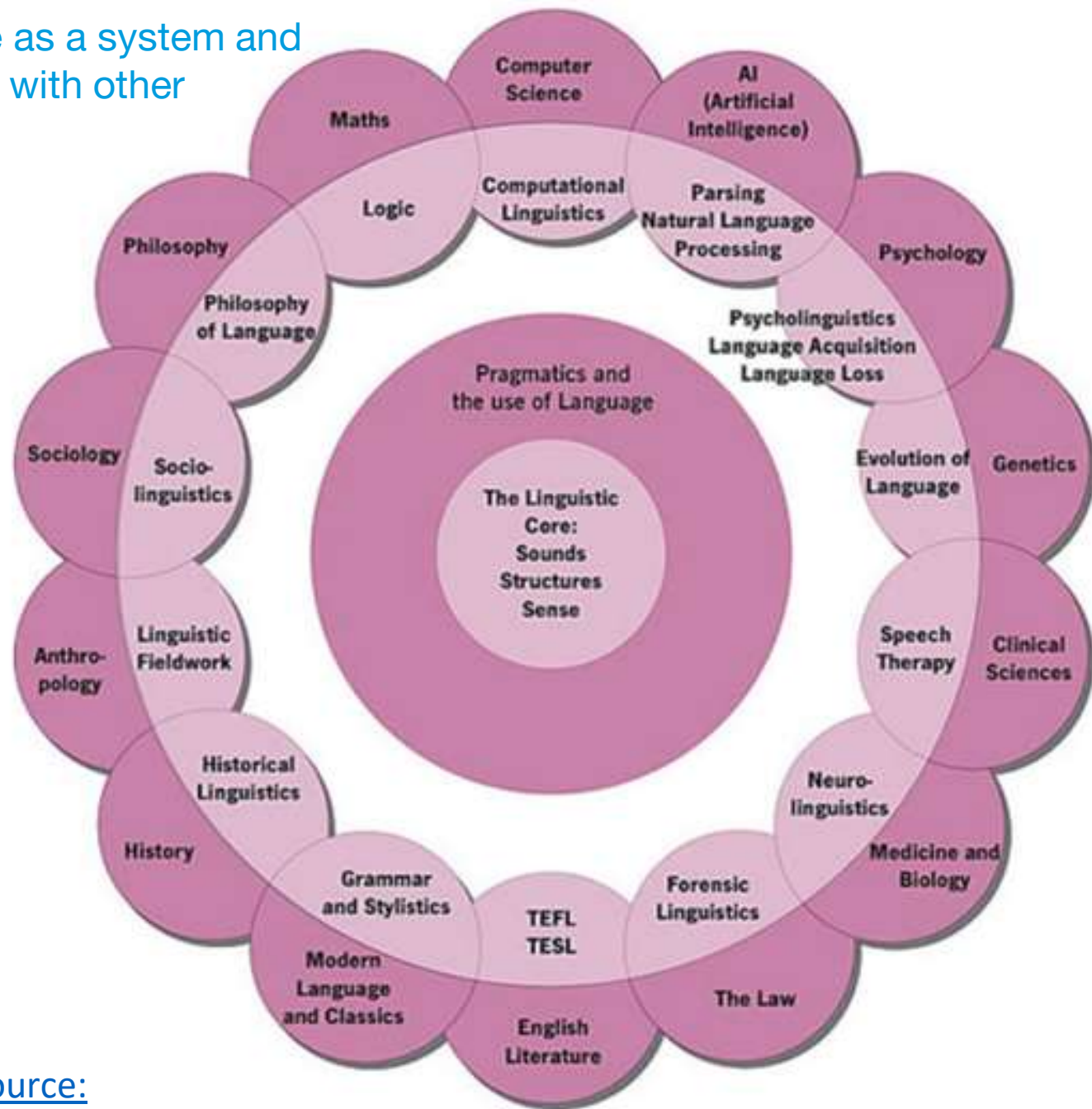
Overview of this Linguistics Module

- Topic 1 Introduction to areas of linguistics and problem-solving
- Topic 2 Historical Linguistics
- Topic 3 Phonetics
- Topic 4 Sociolinguistics
- Topic 5 Writing systems
- Topic 6 Language Acquisition and Second Language Acquisition
- Topic 7 Morphology
- Topic 8 Syntax
- Topic 9 Psycholinguistics / Neurolinguistics
- Topic 10 Machine Translation

About the Module

- Designed to be flexible to schools e.g. do all topics or choose a few

- Open to the whole school (all second level) and the whole island

- 20 hours of materials (or more!) but you choose when and where it fits

- Teacher-led

Linguists study language as a system and interfaces of that system with other disciplines

Source:
https://sites.middlebury.edu/linguistics101/category/uncategorized/

Why is AILO doing this?

- AILO aims to improve linguistic and language awareness and students' linguistic problem-solving skills
  - keys skills for careers in language, linguistics and computation

- 36,000 secondary schools all over the island have taken part since 2009 ⬜ Sign up at https://ailo.adaptcentre.ie/

- Free puzzles and workshops in preparation for first round in schools in January and National Final in March every year

- AILO also selects the Irish International Linguistics Olympiad (IOL) team

Overview of this Linguistics Module

- **Topic 1 Introduction to areas of linguistics and problem-solving**
- Topic 2 Historical Linguistics
- Topic 3 Phonetics
- Topic 4 Sociolinguistics
- Topic 5 Writing systems
- Topic 6 Language Acquisition and Second Language Acquisition
- Topic 7 Morphology
- Topic 8 Syntax
- Topic 9 Psycholinguistics / Neurolinguistics
- Topic 10 Machine Translation

Topic 1.1

Introduction to Linguistics

What is language?

- The principal method of human communication, consisting of words used in a structured and conventional way and conveyed by speech, writing, or gesture.

- A system of communication used by a particular country or community.

- **Linguistics is the scientific study of language and its structure**
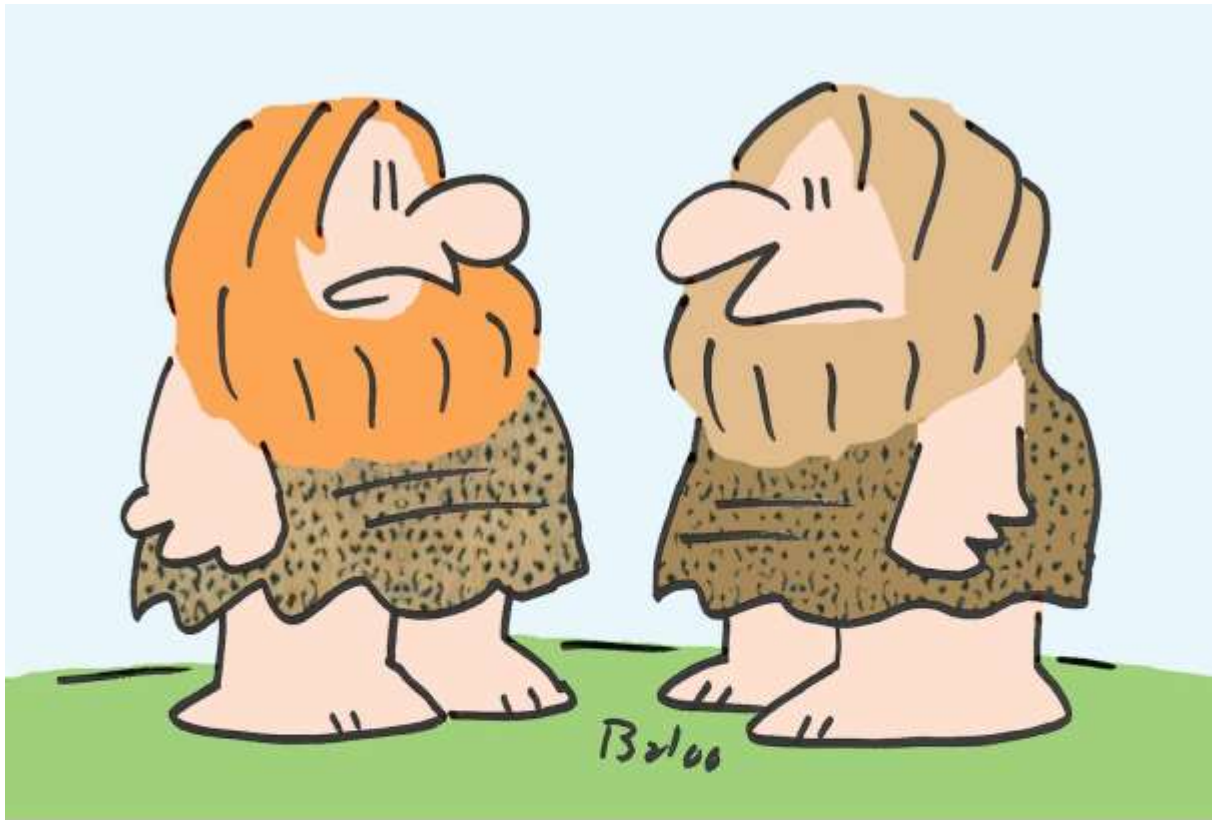
"Now that we've invented language, we'll have to be careful about eavesdroppers."

CartoonStock.com

Areas of Linguistics

Phonetics

Morphology

Psycholinguistics

Sociolinguistics

Semantics

Neurolinguistics

Semantics

Second language acquisition

Machine Translation

Syntax

Historical Linguistics

First language acquisition

Pragmatics

Sociolinguistics (Topic 2)

"This is Daddy, honey. That was Daddy's office voice."

CartoonStock.com

Sociolinguistics (Topic 2)

- Relationship between society and language
- The way we use language in different social situations

- e.g. Which one of the following greetings would you use in a formal letter?

Heya

Dear Sir / Madam

Hi there

Yo!

Phonetics (Topic 3)

"They've been phonetically modified."

Phonetics (Topic 3)

- **Phonetics** is the study of human sounds and **phonology** is the classification of the sounds within the system of a particular language or languages

						John & Sarah Free Materials 1996
Iː READ	**I** SIT	**ʊ** BOOK	**uː** TOO	**Iə** HERE	**eI** DAY	
e MEN	**ə** AMERICA	**ɜː** WORD	**ɔː** SORT	**ʊə** TOUR	**ɔI** BOY	**əʊ** GO
æ CAT	**ʌ** BUT	**ɑː** PART	**ɒ** NOT	**eə** WEAR	**ɑI** MY	**aʊ** HOW
p PIG	**b** BED	**t** TIME	**d** DO	**tʃ** CHURCH	**dʒ** JUDGE	**k** KILO
f FIVE	**v** VERY	**θ** THINK	**ð** THE	**s** SIX	**z** ZOO	**ʃ** SHORT
m MILK	**n** NO	**ŋ** SING	**h** HELLO	**l** LIVE	**r** READ	**w** WINDOW

(Additional column: **g** GO, **ʒ** CASUAL, **j** YES)

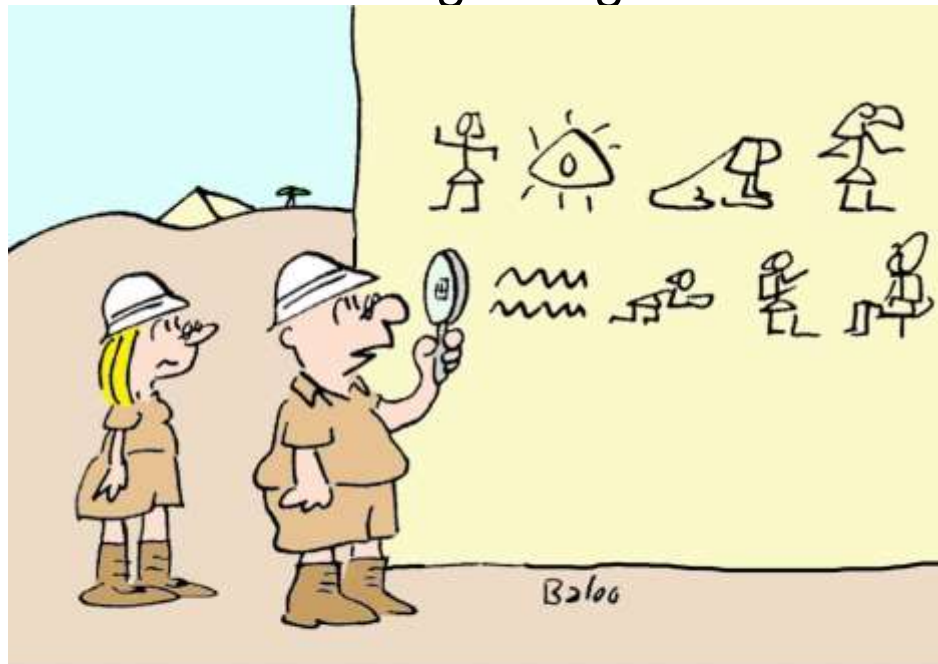# Historical Linguistics (Topic 4)

- How language changes over time

"Did you know that 'decimate' means kill just one out of every ten?"

CartoonStock.com

Writing Systems (Topic 5)

- Methods of visually representing verbal communication, based on a script and a set of rules regulating its use.

"It seems to be a *grant application!*"

Language Acquisition (Topic 6)

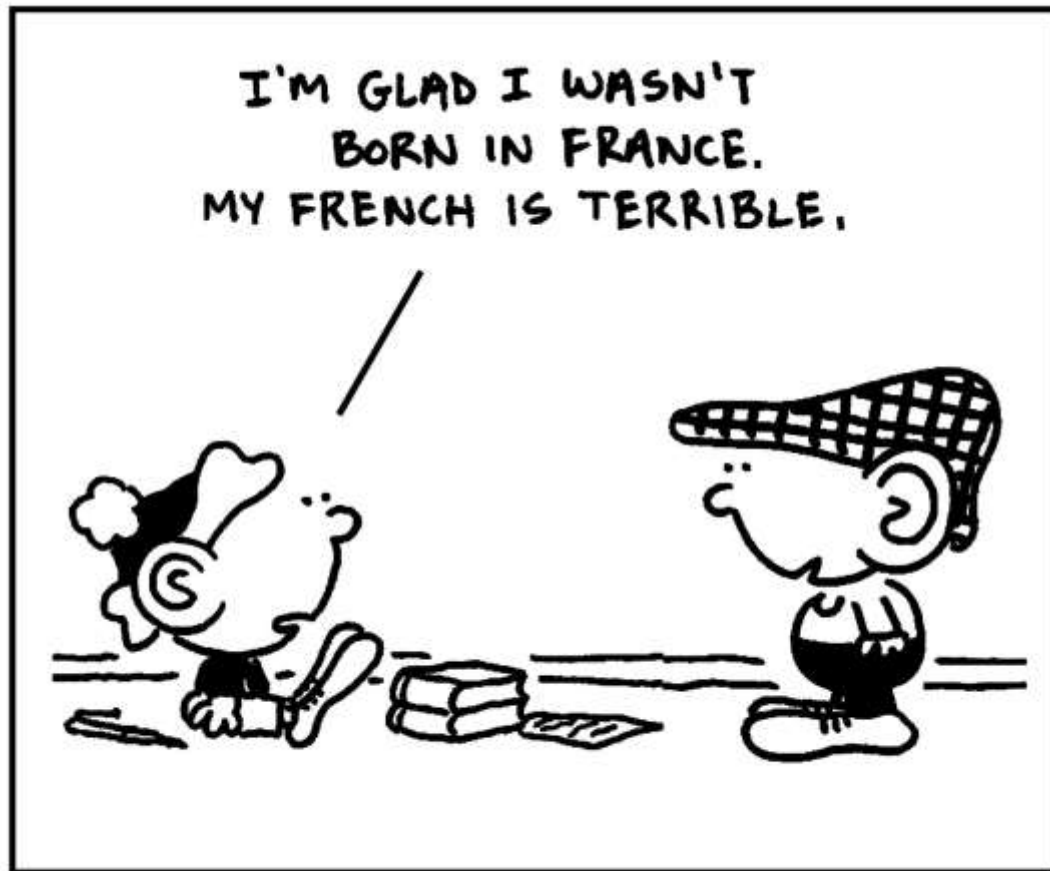- How babies acquire language

"WHAT'S THE BIG SURPRISE? ALL THE LATEST THEORIES OF LINGUISTICS SAY WE'RE BORN WITH THE INNATE CAPACITY FOR GENERATING SENTENCES."

Language Acquisition (Topic 6)

- How we learn a second language

Morphology (Topic 7)

- Study of the structure of words

  Cleanliness = clean (Root Word) + ly (D noun→adjective) + ness (D adjective→noun 'the quality of being an N)

Syntax (Topic 8)

- The structure of sentences / study of grammar

Psycholinguistics (Topic 9)

- The psychology of language. Iit aims to help us understand how language is used to communicate ideas and feelings.

Neurolinguistics (Topic 9)

- Neurolinguistics is the relationship between language and the structure and functioning of the brain.
- What happens when language is compromised and how language disorders can give us clues about how language is represented and processed in the brain.

Machine Translation (Topic 10)

- Using a computer (or app) to translate between one language (Source) and another language (Target)

"This translation app isn't working."

CartoonStock.com

Semantics (not covered here)

- Study of the meaning of words

Pragmatics (not covered here)

- Study of meaning in context

514
SEMANTICS
A CLASSROOM IN WHICH MEANINGS ARE DISCUSSED
(Actually, This is just a door. The classroom is on the other side of the door)
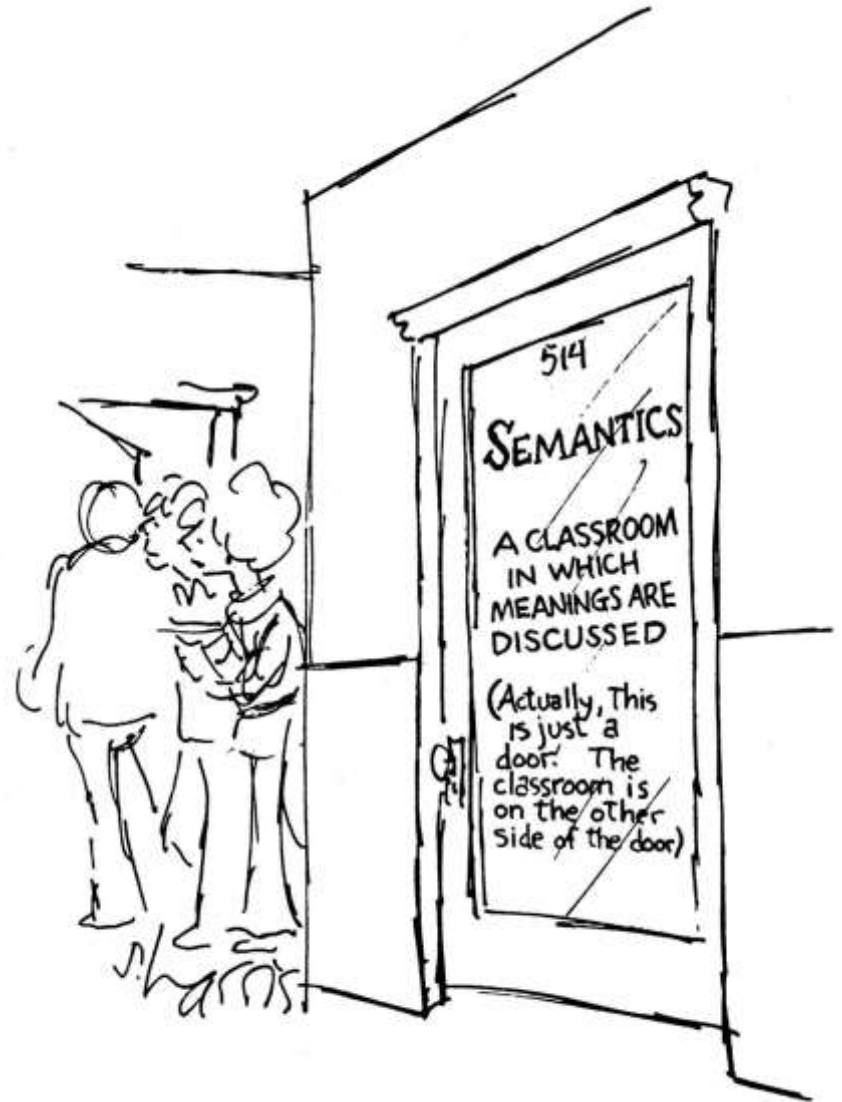
Exercise 1.1

- Split the students into pairs to work on the Worksheet 1.1 Introduction to Linguistics. Students should think about examples of language and communication.

- The students will then match the areas of linguistics with their description.

Topic 1.2

Introduction to linguistic problem-solving

Language is rule-based

- In linguistics puzzles, we try figure out the rules of new languages we encounter.

- We analyse the data we are given in a systematic way

- What patterns do we see

- Note these features we see in a table

Language is rule-based
What are the rules in this simple script?

Man is writing a letter.

Woman is writing a letter.

Man wrote a letter.

Man sees a letter.

First of all, what is word order?

- Word order is the order in which words appear in sentences across different languages e.g. subject, objects and verbs

- English is subject, verb object (SVO)
  The cat eats the food.

- What other languages do you know with other word orders?
- Irish, French, German, Spanish orders?
- What is the Irish word order? e.g. D'ith an madra an bia.

- What word order is this script?

Look closely. Note what you can learn about the script.

Man is writing a letter.

Woman is writing a letter

Man wrote a letter.

Man sees a letter.

Have a go at writing these in the script:

Woman saw a letter.

Man saw a woman.

What have we learnt about this language?

- What kind of writing system is this (what each symbol represents)?

- What is the direction of writing?

- Are there any additional rules for symbols?

Solution

Woman saw a letter.

Man saw a woman.
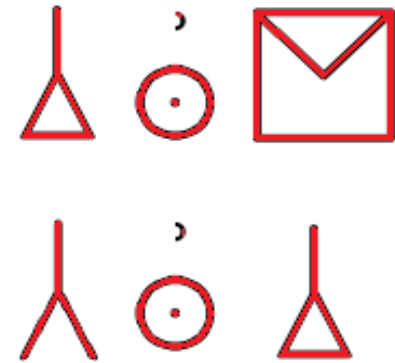
Writing down the rules of this language:

Writing system type: Symbol = word

Direction – Left to Right

Word order: Subject Verb Object (SVO)

Present tense - hat ^, past tense ʼ big apostrophe/comma

Tips for the Solving Problems

- Write down everything you notice about the language structure in a systematic way

- Don't recap the steps you took in finding the answer

- The fine detail matters, look for patterns

- Look for clues in the title and the description

- Build on what you already know

Puzzle 1.2 Trying a problem together: Slovenian - 15 minutes

- [Slovenian Puzzle](#) and Solution

- Slovene (or Slovenian) is the language of Slovenia, a small country bordering on Austria, Croatia, Hungary and Italy.

- Slovenian is spoken by almost two million people and is related to other Slavic languages such as Russian and Czech.

- Agnes, Gregor, and the twins Darija and Darko are students from Bežigrad Grammar school in Ljubljana, the capital of Slovenia.

- Slovenian does not have articles such as "the" and "a".

How we do start?

	Slovenian Sentences	English Translation
1.	Dvojčka delata domačo nalogo.	The twins do the homework.
2.	Darija pravi: "Darko in jaz delava domačo nalogo".	Darija says: "Darko and I do the homework".
3.	Mi tri delamo domačo nalogo.	We three do the homework.
4.	Darija in Darko hodita v šolo.	Darija and Darko walk to school.
5.	Včasih, Agnes in dvojčka hodijo v šolo.	Sometimes, Agnes and the twins walk to school.
6.	Darko pravi: "Včasih, Darija in Agnes in jaz hodimo v šolo".	Darko says: "Sometimes, Darija and Agnes and I walk to school".
7.	Darija pravi: "Darko in jaz hodiva v šolo".	Darija says: "Darko and I walk to school".
8.	Dvojčka hodita v šolo.	The twins walk to school.

What is happening in the English text?

	Slovenian Sentences	English Translation
1.	Dvojčka delata domačo nalogo.	The twins do the homework.
2.	Darija pravi: "Darko in jaz delava domačo nalogo".	Darija says: "Darko and I do the homework".
3.	Mi tri delamo domačo nalogo.	We three do the homework.
4.	Darija in Darko hodita v šolo.	Darija and Darko walk to school.
5.	Včasih, Agnes in dvojčka hodijo v šolo.	Sometimes, Agnes and the twins walk to school.
6.	Darko pravi: "Včasih, Darija in Agnes in jaz hodimo v šolo".	Darko says: "Sometimes, Darija and Agnes and I walk to school".
7.	Darija pravi: "Darko in jaz hodiva v šolo".	Darija says: "Darko and I walk to school".
8.	Dvojčka hodita v šolo.	The twins walk to school.

Look at the English verbs

	Slovenian Sentences	English Translation
1.	Dvojčka delata domačo nalogo.	The twins do the homework.
2.	Darija pravi: "Darko in jaz delava domačo nalogo".	Darija says: "Darko and I do the homework".
3.	Mi tri delamo domačo nalogo.	We three do the homework.
4.	Darija in Darko hodita v šolo.	Darija and Darko walk to school.
5.	Včasih, Agnes in dvojčka hodijo v šolo.	Sometimes, Agnes and the twins walk to school.
6.	Darko pravi: "Včasih, Darija in Agnes in jaz hodimo v šolo".	Darko says: "Sometimes, Darija and Agnes and I walk to school".
7.	Darija pravi: "Darko in jaz hodiva v šolo".	Darija says: "Darko and I walk to school".
8.	Dvojčka hodita v šolo.	The twins walk to school.

Who is doing the action in each of these?

	Slovenian Sentences	English Translation
1.	Dvojčka delata domačo nalogo.	The twins do the homework.
2.	Darija pravi: "Darko in jaz delava domačo nalogo".	Darija says: "Darko and I do the homework".
3.	Mi tri delamo domačo nalogo.	We three do the homework.
4.	Darija in Darko hodita v šolo.	Darija and Darko walk to school.
5.	Včasih, Agnes in dvojčka hodijo v šolo.	Sometimes, Agnes and the twins walk to school.
6.	Darko pravi: "Včasih, Darija in Agnes in jaz hodimo v šolo".	Darko says: "Sometimes, Darija and Agnes and I walk to school".
7.	Darija pravi: "Darko in jaz hodiva v šolo".	Darija says: "Darko and I walk to school".
8.	Dvojčka hodita v šolo.	The twins walk to school.

Matching to the Slovenian

	Slovenian Sentences	English Translation
1.	Dvojčka delata domačo nalogo.	The twins do the homework.
2.	Darija pravi: "Darko in jaz delava domačo nalogo".	Darija says: "Darko and I do the homework".
3.	Mi tri delamo domačo nalogo.	We three do the homework.
4.	Darija in Darko hodita v šolo.	Darija and Darko walk to school.
5.	Včasih, Agnes in dvojčka hodijo v šolo.	Sometimes, Agnes and the twins walk to school.
6.	Darko pravi: "Včasih, Darija in Agnes in jaz hodimo v šolo".	Darko says: "Sometimes, Darija and Agnes and I walk to school".
7.	Darija pravi: "Darko in jaz hodiva v šolo".	Darija says: "Darko and I walk to school".
8.	Dvojčka hodita v šolo.	The twins walk to school.

Let's look at the two verbs

hodi (walk)

add - ta (Darija and Darko, the twins)

- mo (Darija and Agnes and I)

- va (Darko and I)

- jo (Agnes and twins)

dela (do)

add - ta (the twins)

- mo (we three)

- va (Darko and I)

How to structure a table with the same information

Slovenian distinguishes "dual" and "plural", for two or more than two respectively. The verb endings are as follows:

	singular	dual	plural
1st person "we"	(not shown)	-va	-mo
3rd person "he", "she", "they"	(stem only)	-ta	-jo

Similarly, nouns have different endings for dual "-a" and plural "-i"

Trojčki (triplets) Dvojčka (twins)

Topic 1.3

Trying an All Ireland Linguistics Olympiad (AILO) Puzzle

Topic 1.3 Let's try to find patterns in two similar languages

- Danish and Swedish puzzle

- Big Dog, Old Bull

- Try this puzzle in pairs for 20 minutes

- The solution is here to discuss on screen

- What rules do you notice?

All Ireland Linguistics Olympiad

The Problem Solvers' Challenge

Question 10: Big dog, old bull, strong horse
Author: Mike Swan

Danish, spoken in Denmark, and Swedish, spoken in Sweden, are closely related languages. This means that they have many similarities.

Read the Danish and Swedish phrases below, and look for patterns, similarities and differences. In particular, look at how articles (the words *the* and *a*) are used. Then complete the exercises below.

English	Swedish	Danish
a dog	en hund	en hund
a big dog	en stor hund	en stor hund
the dog	hunden	hunden
the big dog	den store hund	den stora hunden

A1. Identify which of these phrases are Danish and which are Swedish. Tick the appropriate box in the answer book. (8 pts)

a. *en tyr*	a bull
b. *en gammal tjur*	an old bull
c. *tyren*	the bull
d. *en gammel tyr*	an old bull
e. *den gamle tyr*	the old bull
f. *tjuren*	the bull
g. *den gamla tjuren*	the old bull
h. *en tjur*	a bull

A2. If the words for 'horse' are *häst* (Swedish) and *hest* (Danish), and the words for 'strong' are *stark* (Swedish) and *stærk* (Danish), complete the table below in your Answer book. (7 pts)

English	Swedish	Danish
a horse		
a strong horse		
the horse	hästen	
the strong horse		

Extra Resources

- We encourage every school and student to take part in the 2022/23 All Ireland Linguistics Olympiad (AILO).

- It's free and open to every secondary school student on the island.

- The preliminary round is held in your own school at the end of January with the National Final in Dublin City University in March 2023.

- Register at https://ailo.adaptcentre.ie/enter/ and try other puzzle at https://ailo.adaptcentre.ie/puzzles/.

Thank you