Basic Parts of Speech

- **Parts of Speech Classes:** adjective, adverb, article, conjunction, noun, verb, preposition, pronoun, etc.

- A **closed class** contains a relatively fixed set of words; new words are rarely introduced into the language.
  
  *articles, conjunctions, pronouns, prepositions, etc.*

- An **open class** contains a constantly changing set of words; new words are often introduced into the language.
  
  *adjectives, adverbs, nouns, verbs*

Nouns

- **Nouns:** represent objects, places, concepts, events.
  
  *dog, city, idea, marathon*

- **Count nouns:** describe specific things or sets of things.
  
  *dogs, cities, ideas, marathons*

- **Mass nouns:** describe composites or substances. Verb agreement is singular. Ex: “Dirt is …”
  
  *dirt, water, garbage*

Some words can be used as both count and mass nouns, such as *deer* and *fish.*

Examples of Closed Classes

- **Articles:** a, an, the

- **Conjunctions:** and, but, or, because, when, if, …

- **Demonstratives:** this, that, these, …

- **Prepositions:** to, for, with, between, at, of, …

- **Pronouns:** I, you, he, she, him, her, myself, …

- **Quantifiers:** some, every, most, any, both, …

Articles

- ‘a’, ‘an’ are **indefinite** articles; ‘the’ is a **definite** article

Most singular noun phrases begin with an article.

*Ex: a newspaper, an apple, the movie*

But exceptions pose challenges for language generation:

<table>
<thead>
<tr>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bowl was full of rice.</td>
<td><em>The bowl was full of apple.</em></td>
</tr>
<tr>
<td>They go to college.</td>
<td><em>They go to university.</em></td>
</tr>
<tr>
<td>She went on vacation.</td>
<td><em>She went on trip.</em></td>
</tr>
<tr>
<td>He fell asleep in class.</td>
<td><em>He fell asleep in room.</em></td>
</tr>
<tr>
<td>She sat up in bed.</td>
<td><em>She sat up in chair.</em></td>
</tr>
<tr>
<td>I heard the news on television.</td>
<td><em>I heard the news on radio.</em></td>
</tr>
</tbody>
</table>
Modifiers

**Adjectives**: words that attribute qualities to something.

-wet, loud, happy, funny

**Noun modifiers**: nouns that modify other nouns.

dog food, aluminum can, song book

**Head noun**: typically the rightmost noun of a base (simple) noun phrase; the main concept.

dog food, smelly beef dog food, smelly beef dog food coupon

Prepositions and Particles

**Prepositions** represent relationships, such as time, location, modification, and complements.

- He put the book on the table.
- Sam gave the book to Mary.
- Jane walked up the stairs.

**Particles** follow verbs and create a new verbal meaning.

- Greg passed out.
- Charlie threw up his lunch.

Sometimes there can be preposition/particle ambiguity:

- Sarah looked over the paper.

Verbs

**Verbs**: represent actions, commands, assertions.

Types of verbs:

- **main verbs**: walk, eat, believe, claim, ask, ...
- **auxiliary verbs** (used with a main verb):
  - be, do, have, ...
- **modals**: would, should, could, can, will, may, ...

Verb Forms and Tenses

| Base (root): | walk, be, go |
| Infinitive: | to walk, to be, to go |
| Simple Present: | walks, is, goes |
| Present Participle: | walking, being, going |
| Simple Past: | walked, was, went |
| Past Participle: | walked, been, gone |

There are also more complex tenses, for example:

- Future: will + Base Verb
- Present Progressive: is/are + Present Participle
Voice

Passive voice consists of a form of “be” followed by a past participle.

<table>
<thead>
<tr>
<th>Active Voice</th>
<th>Passive Voice</th>
</tr>
</thead>
<tbody>
<tr>
<td>I saw Elvis.</td>
<td>Elvis was seen by me.</td>
</tr>
<tr>
<td>I will find him.</td>
<td>He will be found by me.</td>
</tr>
<tr>
<td>I have found him.</td>
<td>He has been found by me.</td>
</tr>
</tbody>
</table>

**Important:** the roles are reversed in active and passive voice.

*John killed Sam.*
Subject is killer.
Direct Object is victim.

*Sam was killed by John.*
Subject is victim.
Object of “by” PP is killer.

Gerunds (or gerundives)

Gerunds are present participle (-ing) verb forms that syntactically **function as nouns.**

- drinking fountain
- moving sale
- dining room

*Skiing is popular in Utah.*
*Drinking and driving is dangerous.*
*My singing in the shower bothers my roommate.*
*Winning races is exciting.*
*The killing in Bosnia is still going on.*

Adverbs and Adverbial Phrases

**Adverbs** qualify the meaning of verbs, adjectives, adverbs, clauses … nearly anything other than a noun!

*She sings well.*
*He runs very fast.*
*He left a present here yesterday.*
*She drove slowly.*
*John frequently went to the doctor.*
*Mary sings often.*
*Then Gary will go back to school.*
*The computer crashes almost every day.*

Transitivity

Transitive verbs require **syntactic** objects.

- An intransitive verb has no object.
  *she laughed, he lied*

- A transitive verb has a **direct object.**
  *she ate an apple, he read a book*

- A ditransitive/bitransitive verb has two objects: a **direct object** and an **indirect object.**
  *he gave Mary a gift*
  *she sang the baby a song*
Subcategorization Frames (syntactic complement patterns)

<table>
<thead>
<tr>
<th>Verb</th>
<th>Subcat. Frame(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>laugh</td>
<td>--</td>
<td>She laughed.</td>
</tr>
<tr>
<td>find</td>
<td>NP</td>
<td>She found a kitten.</td>
</tr>
<tr>
<td>give</td>
<td>NP NP</td>
<td>She gave the dog a bone.</td>
</tr>
<tr>
<td></td>
<td>NP PP(to)</td>
<td>She gave a bone to the dog.</td>
</tr>
<tr>
<td>reside</td>
<td>PP(in)</td>
<td>She resides in Utah.</td>
</tr>
<tr>
<td>put</td>
<td>NP PP(on)</td>
<td>She put the book on the shelf.</td>
</tr>
<tr>
<td></td>
<td>NP PP(in)</td>
<td>She put the book in a drawer.</td>
</tr>
<tr>
<td>try</td>
<td>VP(to)</td>
<td>She tried to sleep.</td>
</tr>
<tr>
<td></td>
<td>NP</td>
<td>She tried sushi.</td>
</tr>
<tr>
<td>believe</td>
<td>S</td>
<td>She believed that ...</td>
</tr>
</tbody>
</table>

Sentence Complements

Some verbs accept an entire sentence structure (S) as a complement.

- He believed that the world would end tomorrow.
- She knows that Elvis is still alive.
- He claimed that there was life on Mars.
- They hope their lottery ticket will be a winner.
- Jim does not know why the dinosaurs died.
- She wondered whether it will rain tomorrow.

Relative Pronouns and Clauses

Relative Pronouns: who, which, that, ...

- The man who saw Elvis ...
- The UFO that landed in Toledo ...
- The Rolling Stones concert, which I attended ...

Relative Clauses: (relative pronoun may be omitted)

- The man who saw Elvis ...
- The man I saw in Boston was wearing a purple hat.

Reduced Relative Clauses: relative pronoun and “be” omitted

- The boy run over by the car was sent to the hospital.
- The doctor arrested for fraud is still practicing medicine.

Sentence Moods

- Declarative (assertion)
  Elvis is alive.

- Yes/No question
  Is Elvis alive?

- WH-question
  Where is Elvis?

- Imperative (command)
  Forget about Elvis!
Sentence Structure

A **Parse Tree** represents sentence structure.

> The lost boy was quickly found.

Multiple Parse Trees

> John walked the dog with fleas.

Attachment Ambiguities

**Prepositional Phrases**
- *The box on the table with the pencils.*
- *The robbery of McDonald's in Boston by men with guns.*
- *The man on the hill with the telescope.*

**Conjunctions**
- *The antics of Rover, my dog, and Rufus, my cat, ...*
- *The antics of Rover, my dog and Fido ...*
- *The antics of Rover, Rufus, my cat, and Fido ...*
- *Fred, the mayor of the town that was devastated by a tornado, and John, the governor of ...*

Internal Noun Phrase Bracketing

Nouns and modifiers within a noun phrase can be bracketed to disambiguate the intended meaning of the NP.

*red plastic cat food can cover*

*winter computer science department course schedule*