

# Barriers to Reasoning

- 9-Functional Fixedness
- Thinking of an object as only functioning in its usual way.
- As a result, individuals often do not see unusual or innovative uses for familiar objects
- **Examples:**
- Ransacking the house for a screw driver when a dime would have turned the screw.

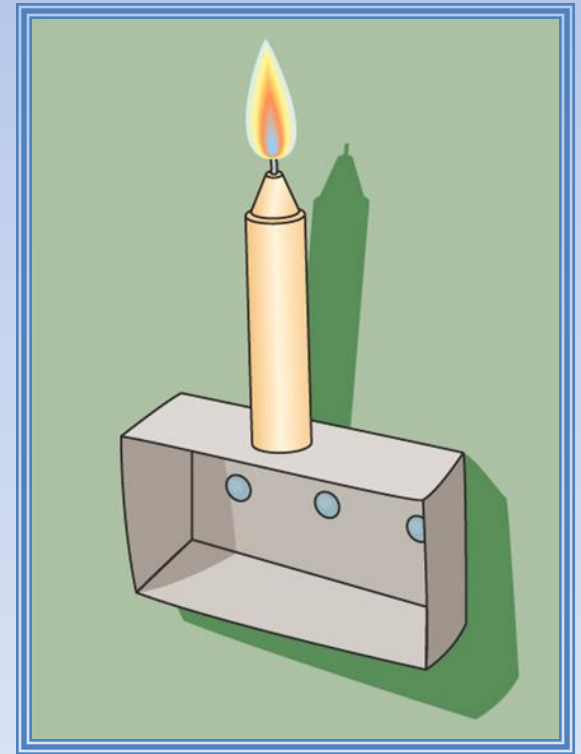


Can you use these supplies to mount the candle on the wall so that it can be lit in a normal way without toppling over?

# Thinking—Five Key Barriers to Problem Solving

(Functional Fixedness Continued)

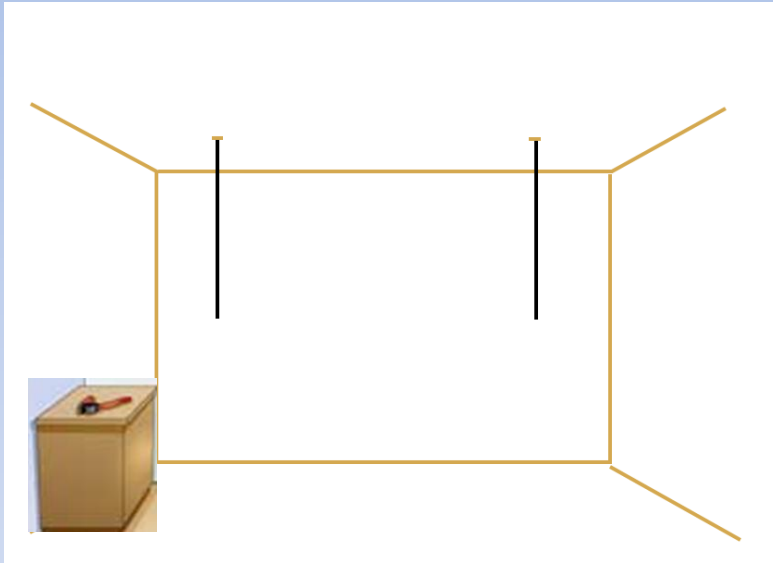
- To overcome functional fixedness, you must think of the matchbox, tacks, and candle all functioning in new ways.



# (Functional Fixedness Continued)

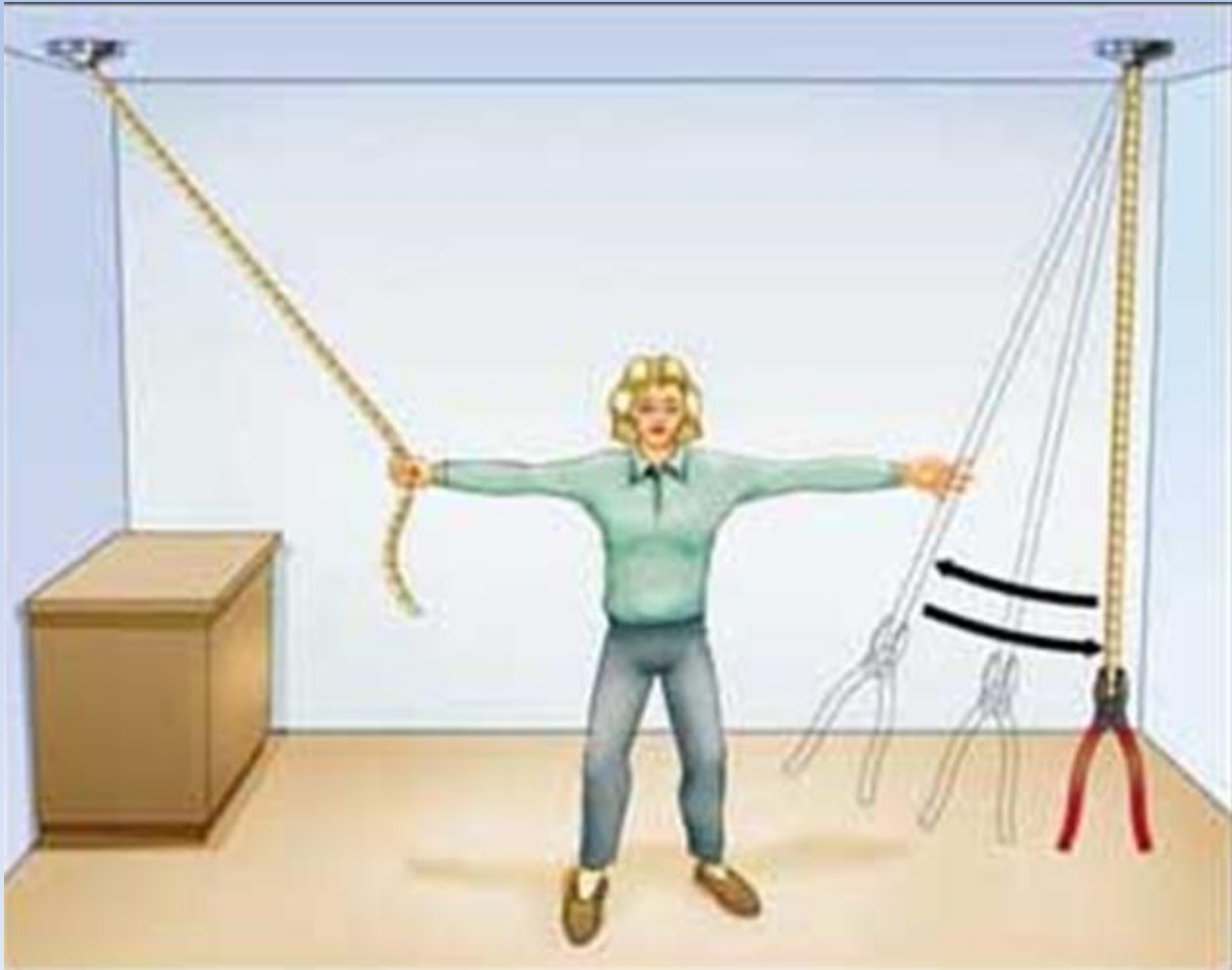
Maier (don't need to know that name,) asked participants to tie the two strings together.

(There were a number of objects available in the room.)



# (Functional Fixedness Continued)

- Maier found it was possible to facilitate insight by 'accidentally' brushing against the string.
- Those who solved it rarely reported noticing this cue.
- Unconscious cues can lead to problem restructuring and then to insight.



This person has overcome  
*functional fixedness*



# Barriers to Reasoning

- 10 - Overconfidence
- The tendency to overestimate the accuracy of our beliefs and judgments. (one's ability to predict the future.)

- **Examples:**

At a stock market, both the seller and the buyer may be confident about their decisions on a stock.

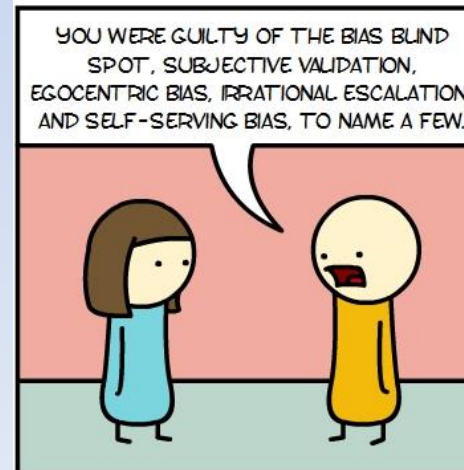
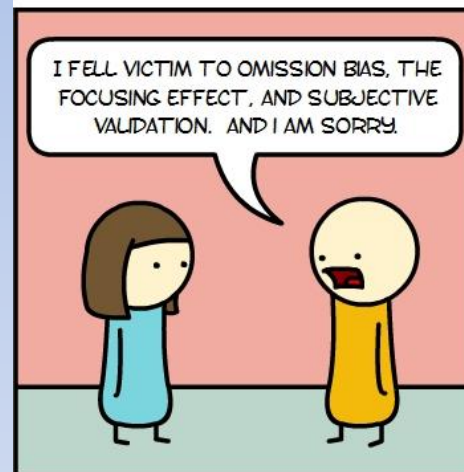
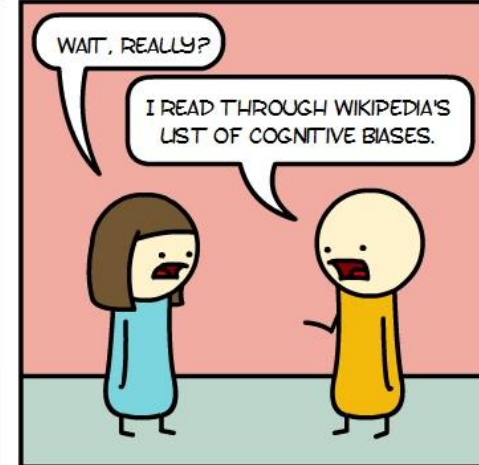


93 percent of the U.S. students estimated to be "above average" drivers. And 68 percent of the faculty at the University of Nebraska rated themselves in the top 25 percent for teaching ability.



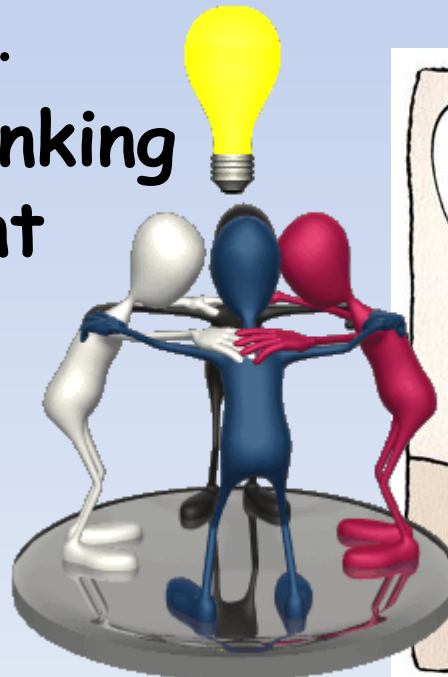
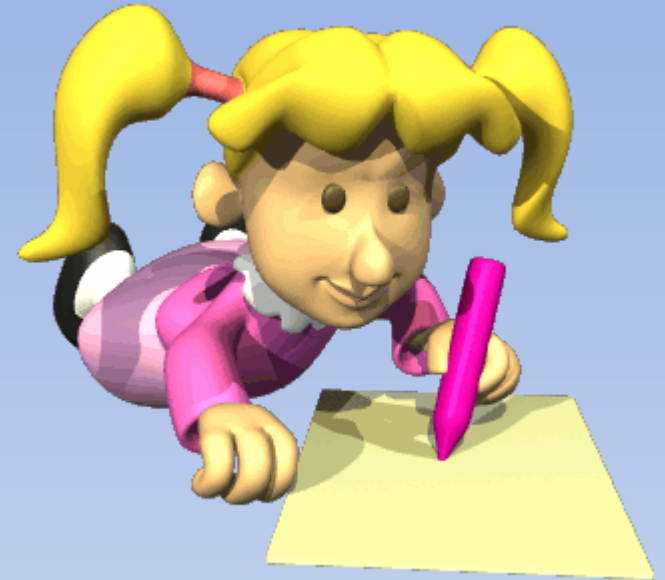
Do you like this stuff? There are a lot more forms of bias out there to study if you go into cognitive psychology!!!

It is great for your relationships!!!



# CREATIVITY

- Almost impossible to define.
- Little correlation between creativity and intelligence.
- **Convergent Thinking versus Divergent Thinking**





# Divergent thinking, Convergent thinking

- Divergent thinking is thinking in which multiple solutions are desired. (creativity tests - areas in frontal lobe.)
- Convergent thinking is more conforming but just as good. Sometimes the standard way is the best. (school success, intelligence tests)

Doctors who work together to come up with a treatment plan for a person with multiple serious health issues.

# Example of Divergent Thinking

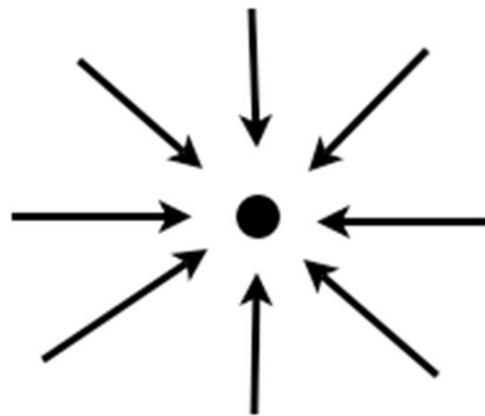
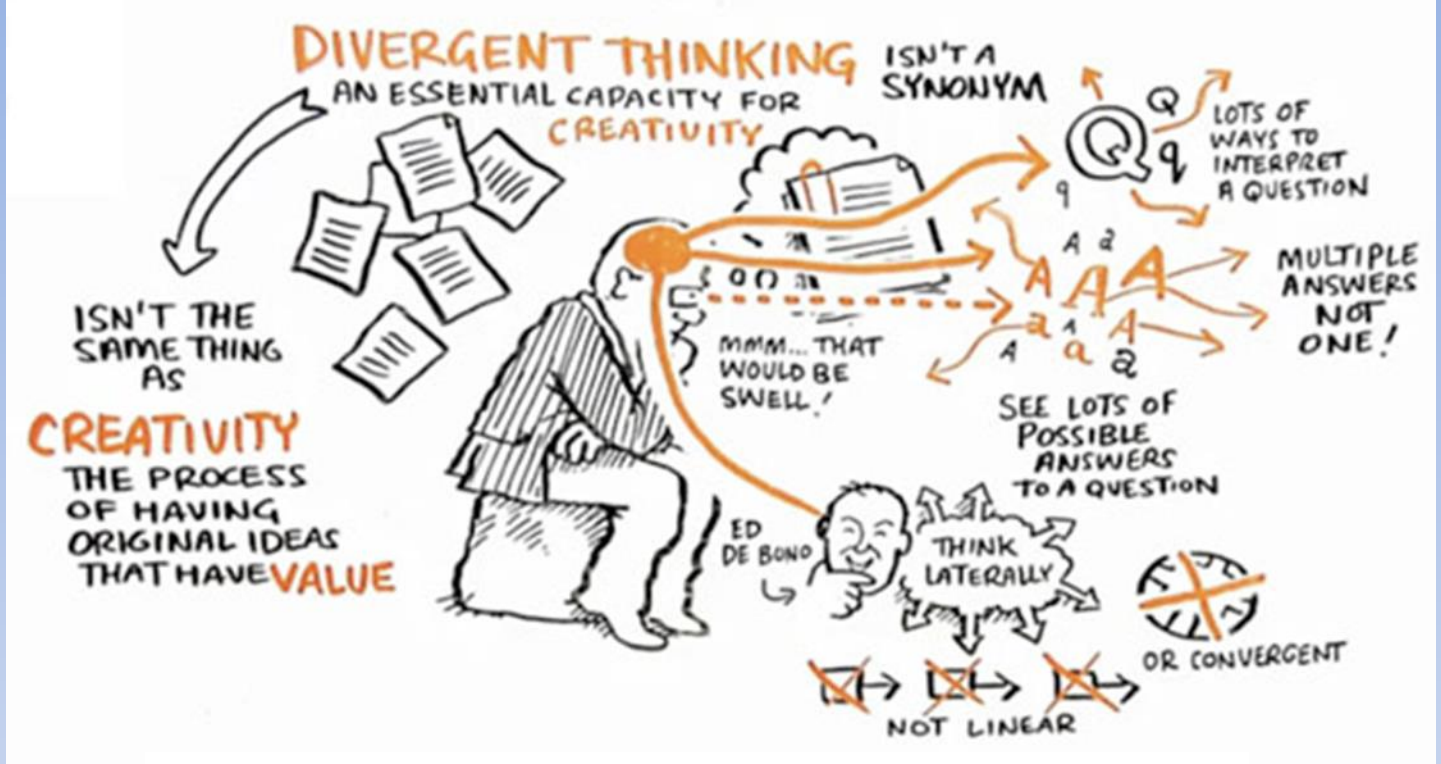
A man who lived on the 10<sup>th</sup> floor of an apartment building took the elevator to the ground floor every summer morning in order to get to work. When coming home in the late afternoon, the man took the elevator to the 5<sup>th</sup> floor and walked up the stairs to his apartment on the 10<sup>th</sup> floor except on rainy days when the man took the elevator all the way to 10.

How do you explain this behavior?

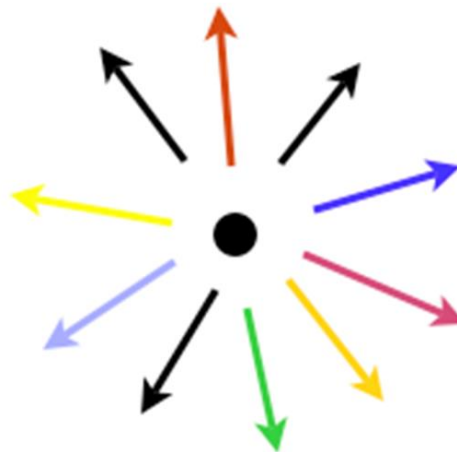
# Example of Divergent Thinking

1. The man enjoyed the exercise of walking up steps but could only manage 5 floors at a time. On rainy days he would create a muddy mess in the hallway so he took the elevator to 10 then.
2. The stairs from the 5<sup>th</sup> to 10<sup>th</sup> floor are outside and unprotected. The man took the stairs when convenient to enjoy the late afternoon sun and view overlooking the ocean. On rainy days that was out of the question.
3. The man was a little person and could only reach as high as the 5<sup>th</sup> floor button. On rainy days, though, he could use his umbrella to hit the 10<sup>th</sup> floor button.



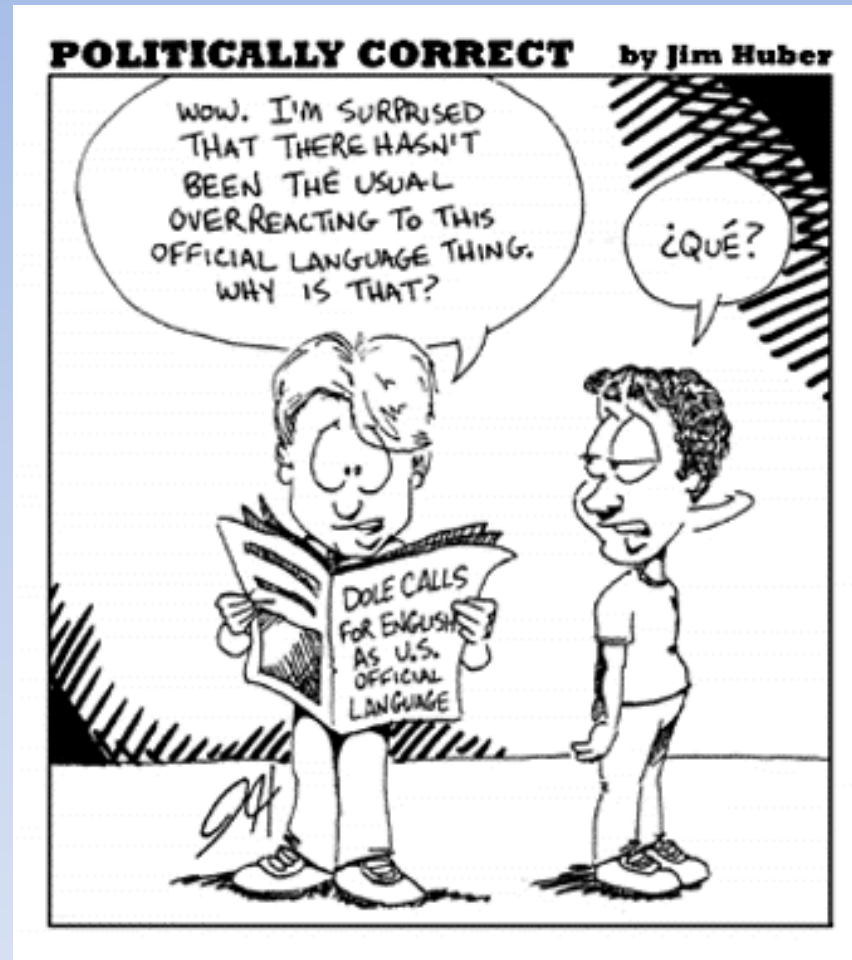


Convergent Thinking



Divergent Thinking

# Language



A means of communication.

# Language can be.....



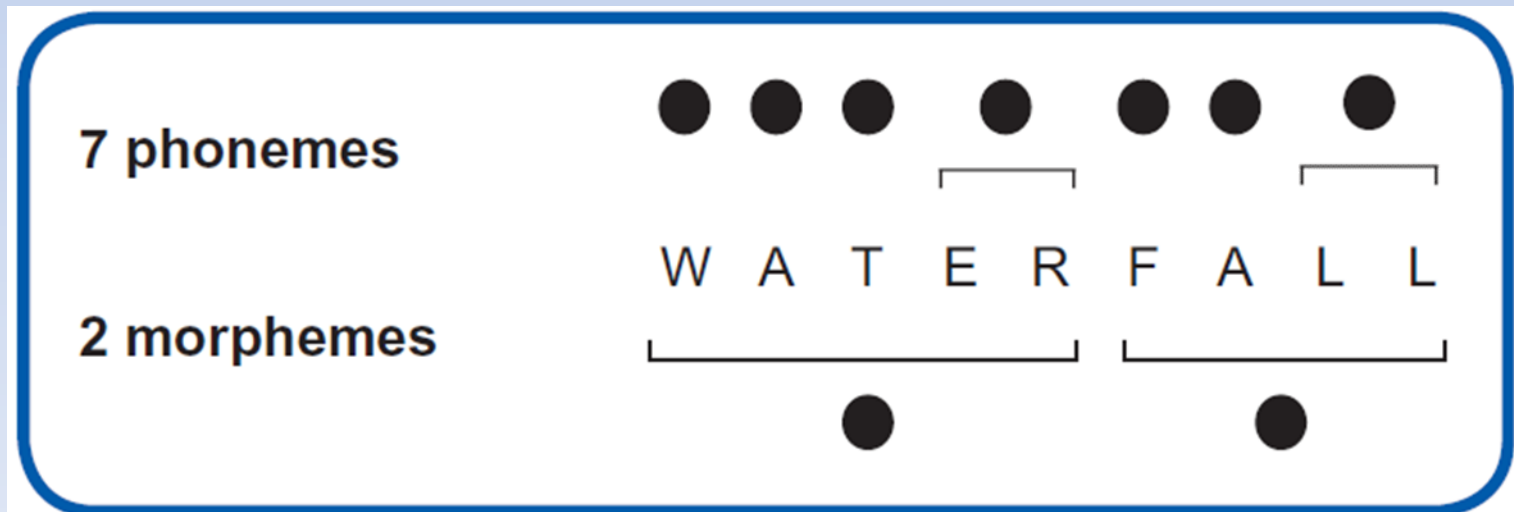


# Phonemes

- In a spoken language, the smallest distinctive sound unit.
- May be a word or part of a word
- English has about 40 phonemes.
- A young baby produces all the phonemes of all the languages of the world.
- How many phonemes does "chug" have?
- Chug has three phonemes, ch, u, g.

# Morphemes

- In a language, the smallest unit that carries meaning.
- Can be a word or part of a word
- Can be a prefix (pre) or suffix (ed).
- English has about 100,000 morphemes

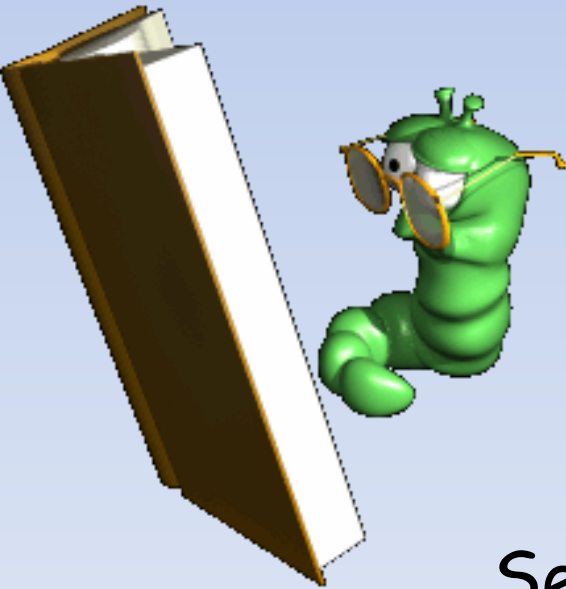


# Structuring Language

Phonemes	Basic sounds (about 40) ... <i>ea, sh.</i>
Morphemes	Smallest meaningful units (100,000) ... <i>un, for.</i>
Words	Meaningful units (290,500) ... <i>meat, pumpkin.</i>
Phrase	Composed of two or more words (326,000) ... <i>meat eater.</i>
Sentence	Composed of many words (infinite) ... <i>She opened the jewelry box.</i>

# Grammar

Grammar is the system of rules in a language that enable us to communicate with and understand others.



Grammar

Semantics

Syntax

# Grammar - Context

The artist painted me on the porch.



The artist painted me on the porch.



The artist painted me on the porch.



# Syntax

- The rules for combining words into grammatically sensible sentences.
- In English, adjectives come before nouns, but not in Spanish!!

"the girl the boy saw" - violates syntax



Is this the White House or the House White?



# Semantics

- The set of rules by which we derive meaning in a language.
- Adding *ed* at the end of words means past tense.

"the rapid freedom ran around the curious emptiness" - obeys syntax, but makes no sense due to meaning of the words

"Did Pat pat a caterpillar's back?"

Your knowledge of semantics tells you:

- 1<sup>st</sup> Pat: Noun, name of a person
- 2<sup>nd</sup> pat: verb, signals action

# Language Acquisition

Stages that we learn language...

1. **Babbling Stage** – 4 months
2. **Holophrastic Stage** (one word stage) – 12 months
3. **Telegraphic Speech Stage** (two word stage) – 24 months
4. **Sentences**  
4 years old – 3 to 8 words long.
  - After the telegraphic stage we get ***overgeneralization***.



# Overgeneralization

- Child will generalize grammar rules so they apply the rules too broadly.
- Example: "I digged in the sandbox" rather than "I dug in the sandbox"

