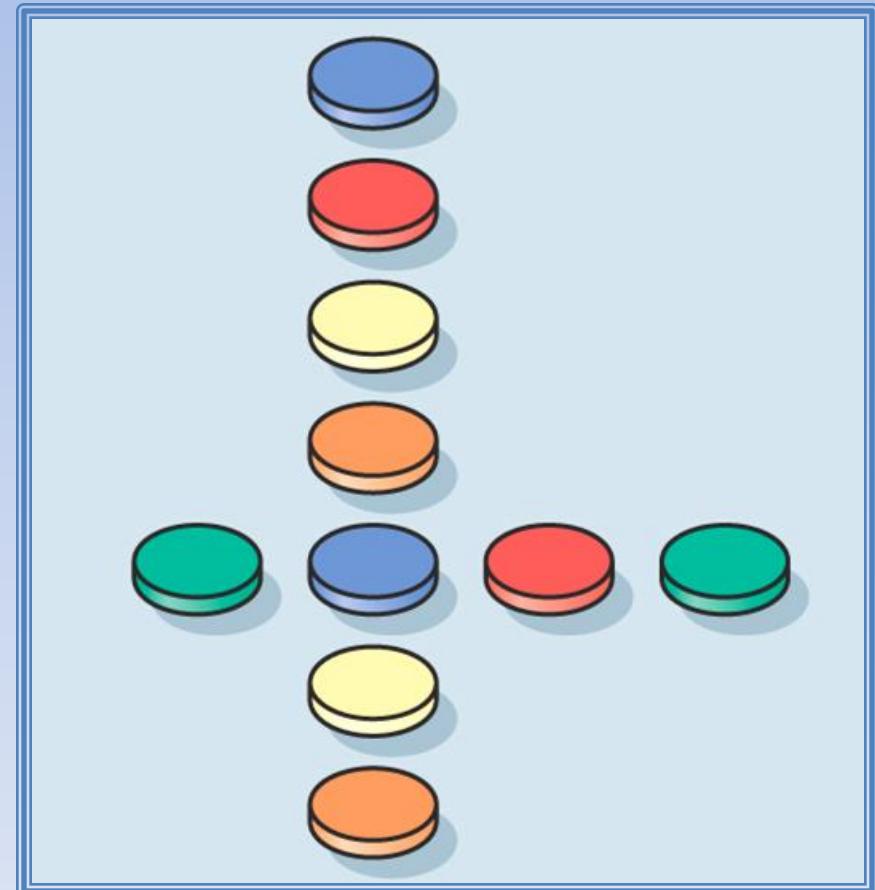


Thinking—Creativity

- Want to test your creativity?

Arrange 10 coins in the configuration shown here. Then, by only moving two coins, create two rows of 6 coins.

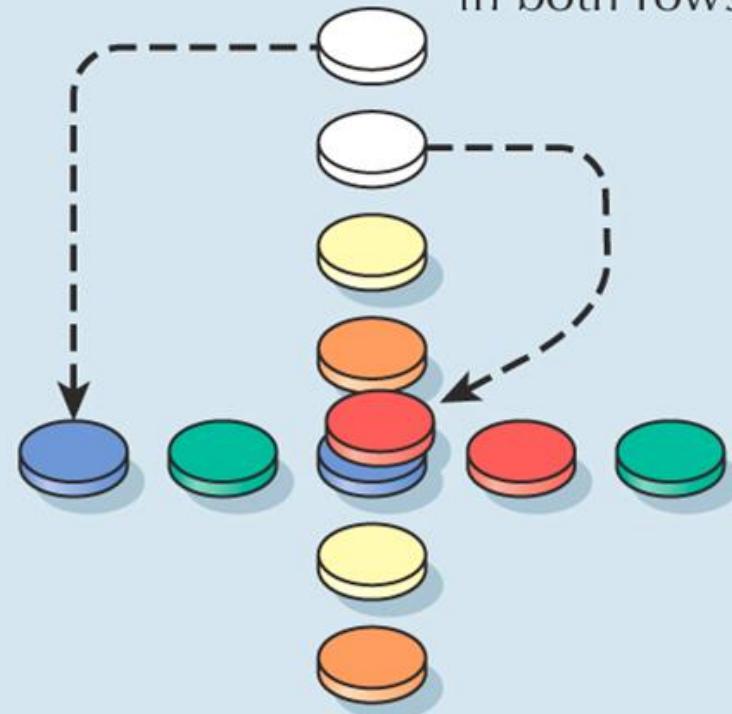


Thinking—Creativity

- Can you see how this is a *creative* solution to the 10 coin problem?

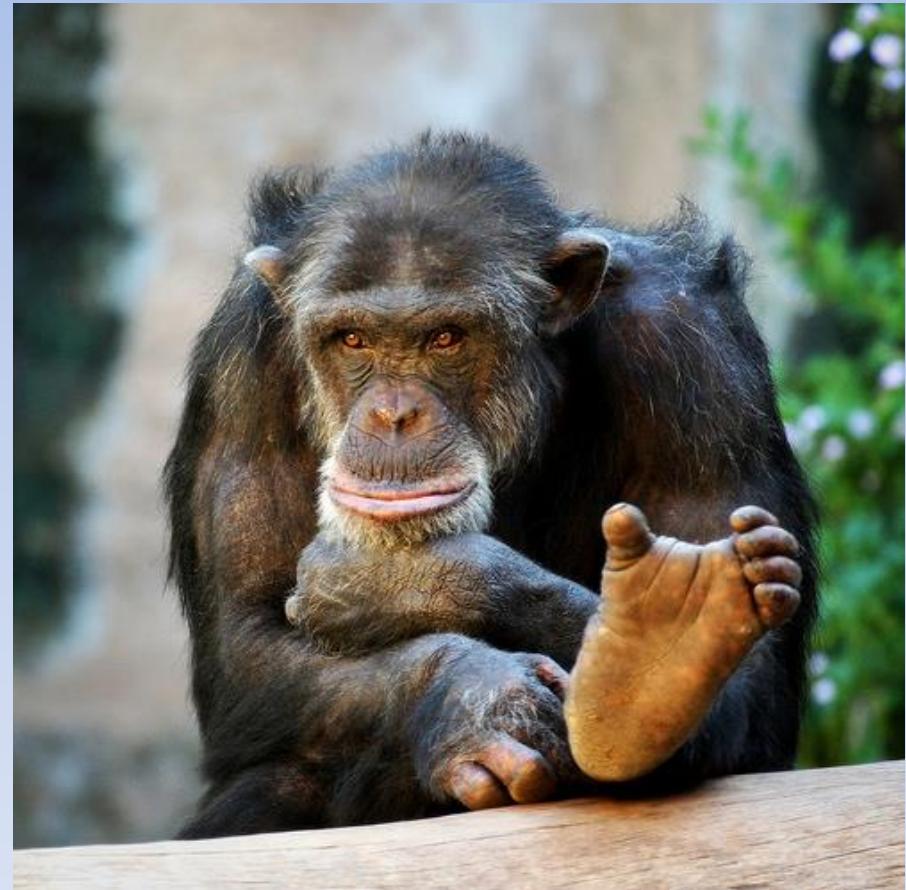
Move this coin to the other row.

Stack this coin on top of the middle coin so that it is in both rows.

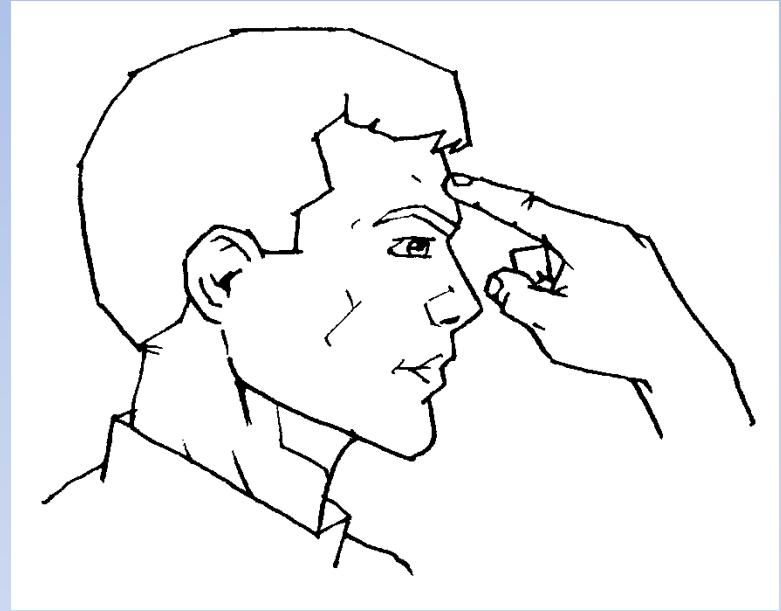
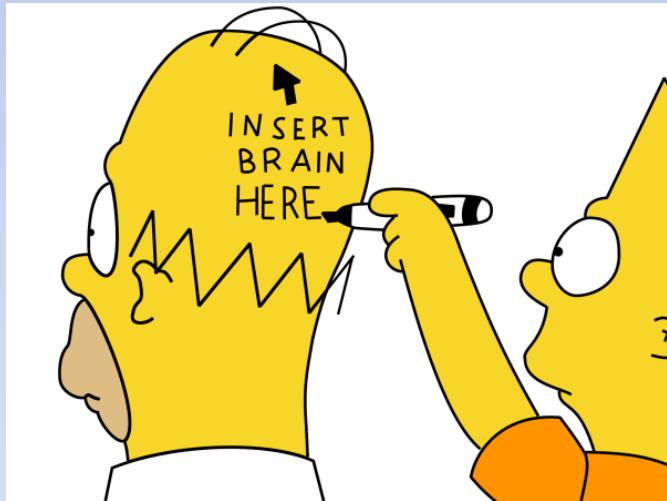


1. A bat and ball cost \$1.10 in total. The bat costs \$1 more than the ball. How much does the ball cost?
2. A man bought a horse for \$60 and sold it for \$70. Then he bought the same horse back for \$80 and sold it again for \$90. How much did he make in the horse business?

Cognitive psychology
is the study of
mental processes
by which people
process and
remember info,
develop language,
solve problems,
and think.



Cognition - Mental activities involved in acquiring, retaining, and using knowledge



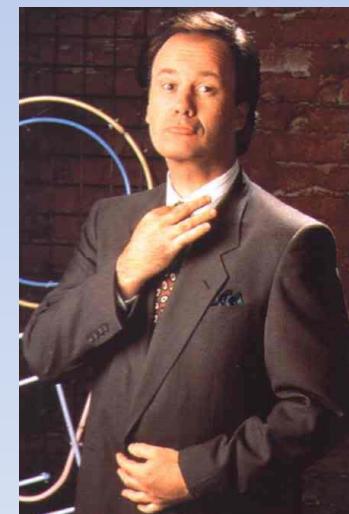
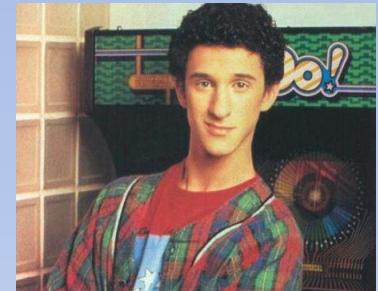
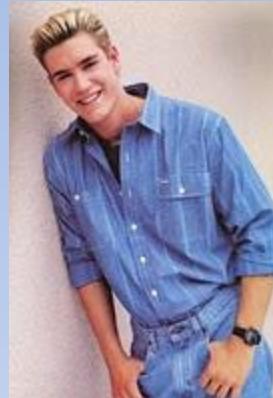
Can a man marry his widow's sister?

What is thought?

- There are basically two types of thought...

1. Concepts
(schemas)...usually based on *prototypes*.

2. Images



Our concept of men may include all of the following guys....

But they are based on our prototype (ideal) male.....

Table | 7.1

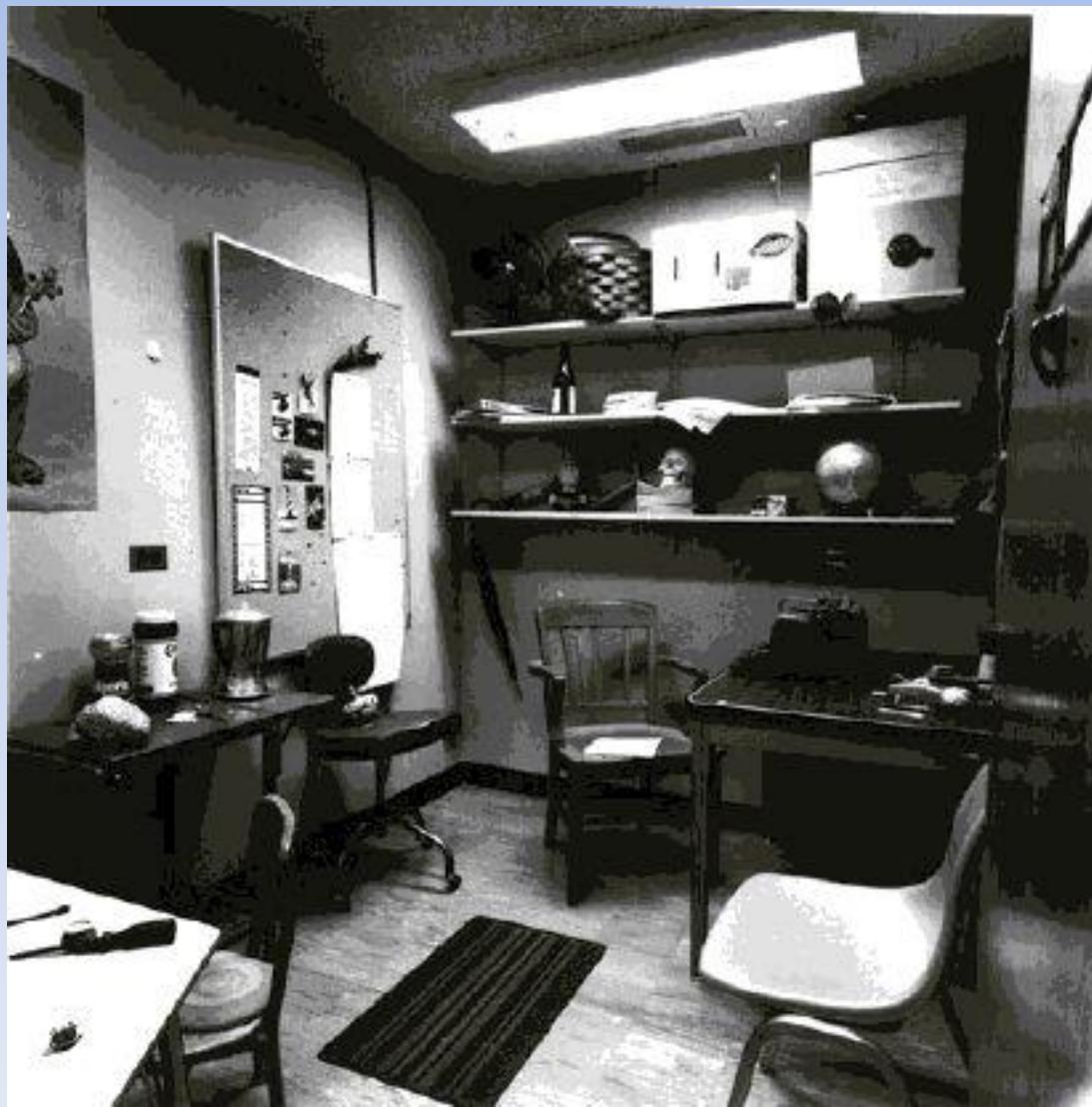
From Prototypes to Atypical Examples

Vehicles	Fruit
car	orange
truck	apple
bus	banana
motorcycle	peach
train	pear
trolley car	apricot
bicycle	plum
airplane	grape
boat	strawberry
tractor	grapefruit
cart	pineapple
wheelchair	blueberry
tank	lemon
raft	watermelon
sled	honeydew
horse	pomegranate
blimp	date
skates	coconut
wheelbarrow	tomato
elevator	olive

SOURCE: Rosch & Mervis (1975).

How important are concepts (schemas) in our understanding of the world?

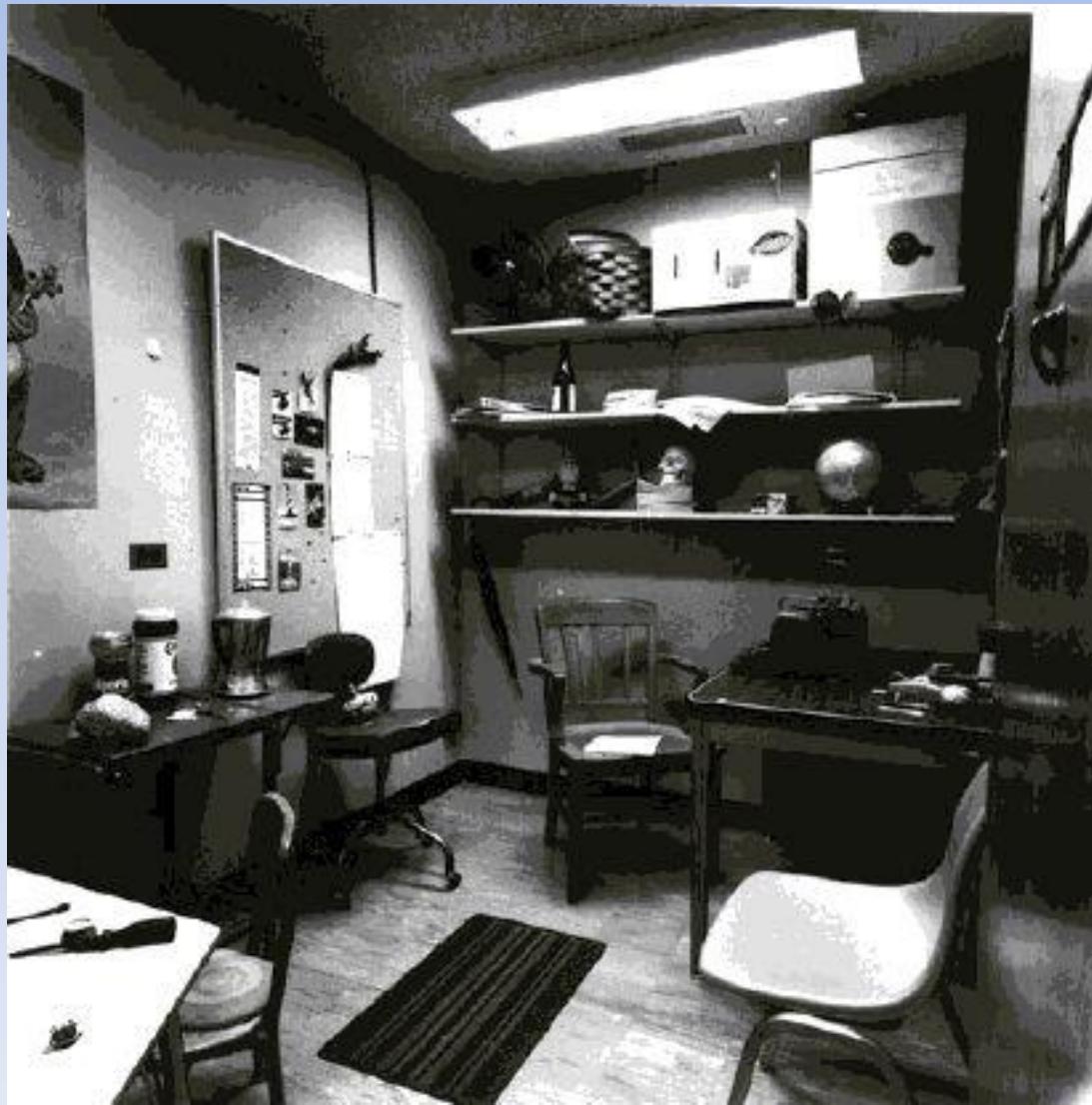
- Our mental pictures of places, objects, etc. are a result of our concepts of those places, objects, etc.
- What is your schema of an office?



How important are concepts (schemas) in our understanding of the world?

- Who remembers seeing books?
- Who remembers seeing a chair?
- Who remembers seeing a desk?
- Who remembers seeing a skull?

- Memories for location are influenced by our concepts for that location.



Cognition

Concepts (mental representation of a group or category that shares similar characteristics)

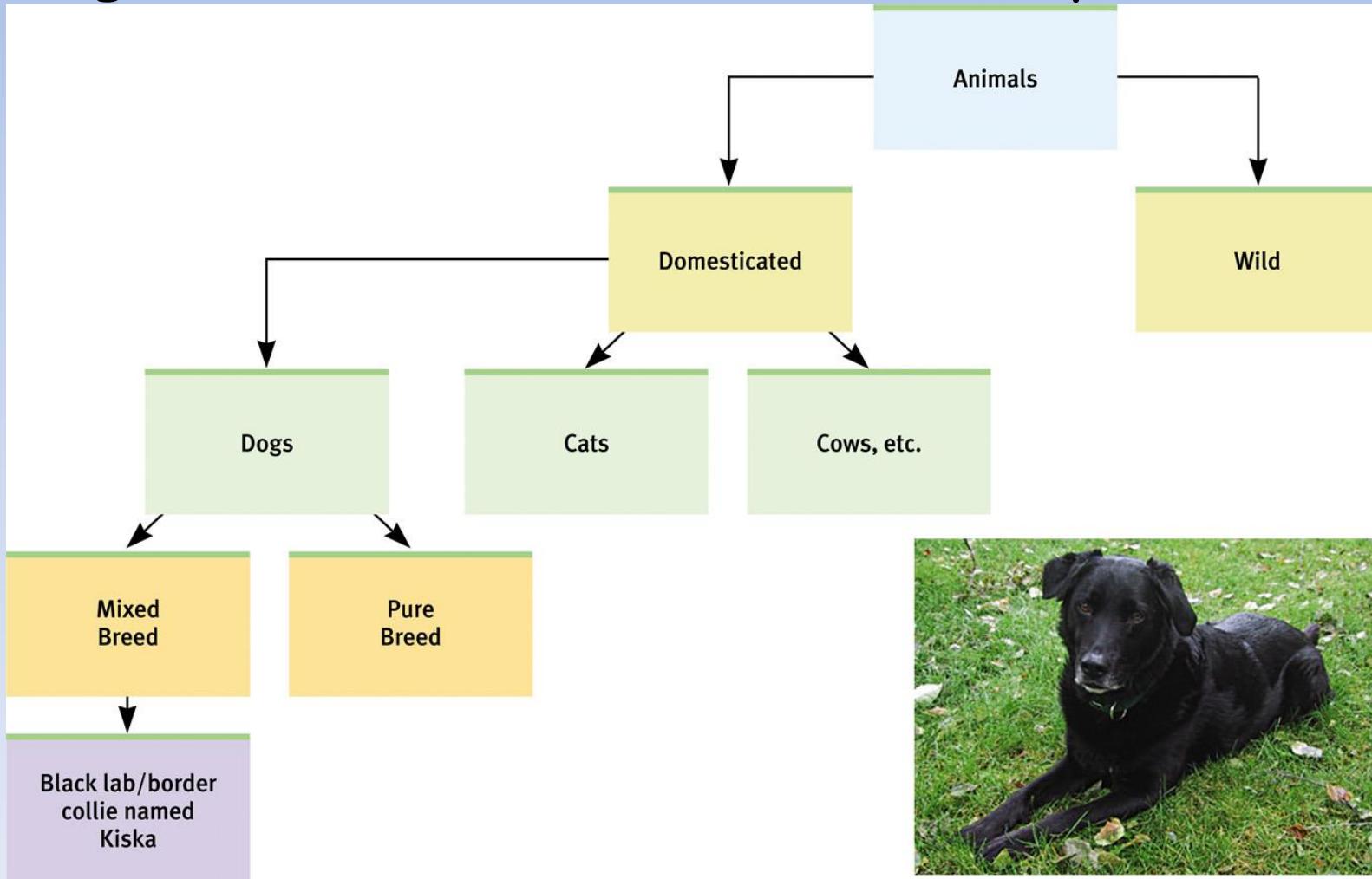
Which bird is a prototypical bird?

- How do we learn concepts?
 - a. Artificial concepts (definitions) are formed by logical, specific rules.
 - b. Natural concepts/prototypes are formed by our experiences in everyday life.
 - c. Hierarchies help us group concepts into subcategories within broader categories.

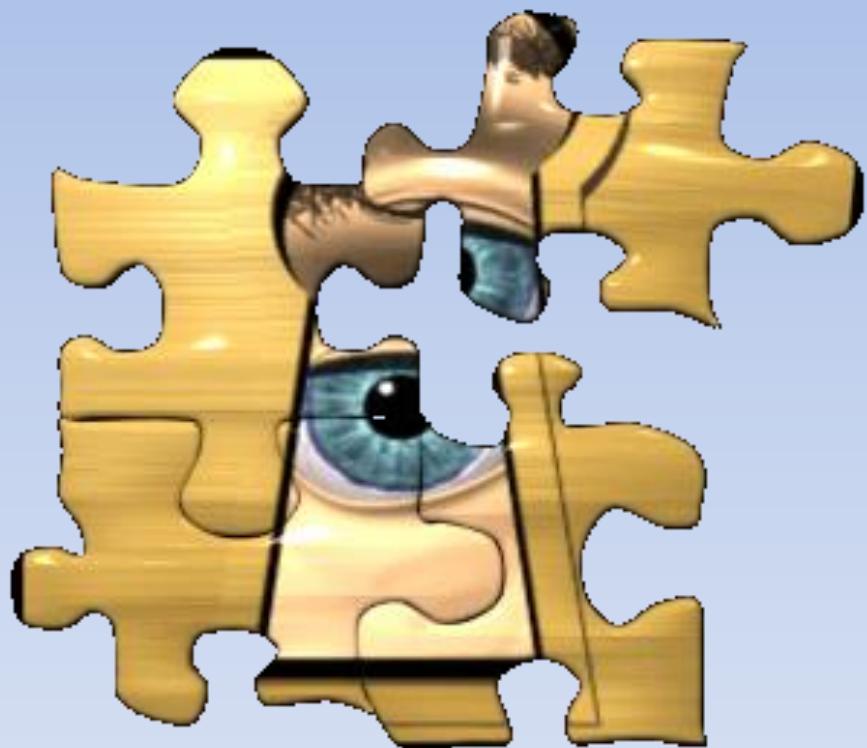


Hierarchies

- We develop hierarchies for concepts to organize information in our memory

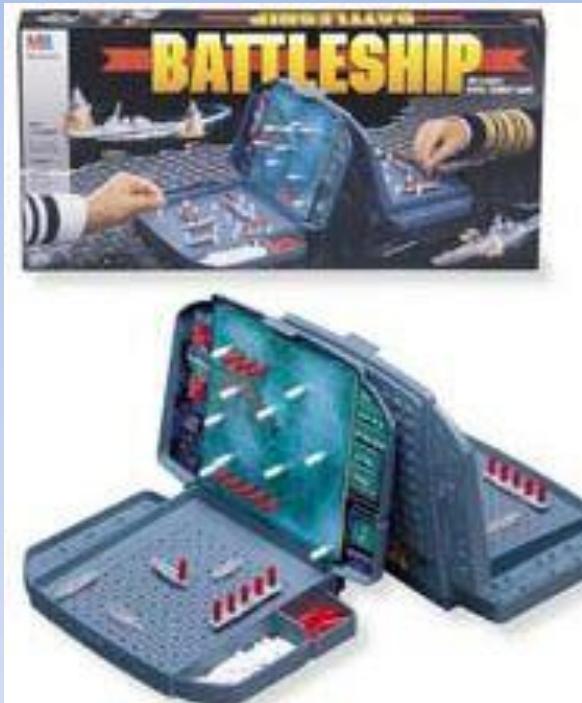


How do we solve problems?



- Trial and Error
- Formal Reasoning
(2 types)
- Informal
Reasoning
(2 types)
- Insight

Trial and Error



- Characterized by repeated, varied attempts which are continued until success, or until the agent stops trying.
- Typically good for problems where you have multiple chances to get the correct solution.
- However, this is not a good technique for problems that don't give you multiple chances to find a solution.

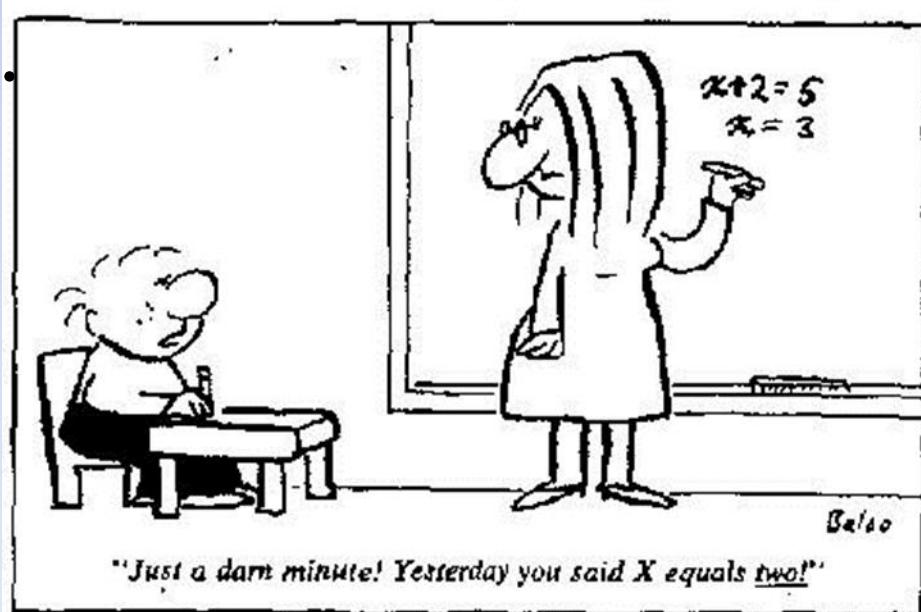
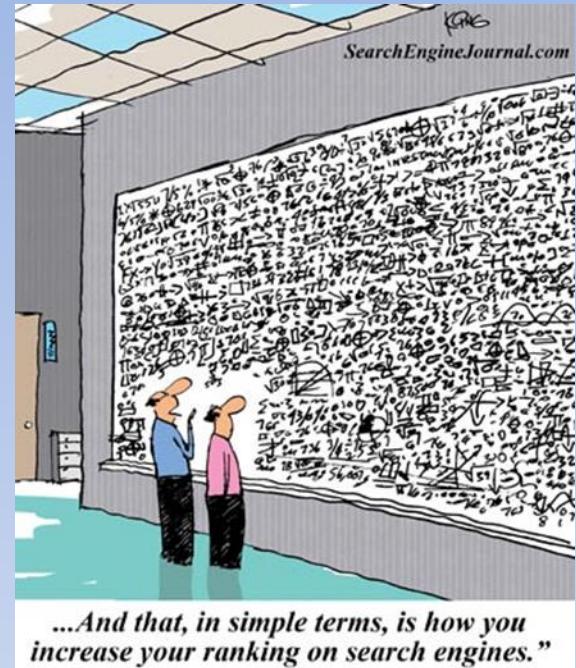
Formal Reasoning

- It is the kind of thinking you find in an intelligence test.
- The information needed for reaching a solution is specified clearly.
- There is a single right or best answer.

Formal Reasoning

1 - Algorithm

- A rule that guarantees the right solution to a problem.
 - Usually by using a formula.
 - They work but are sometimes impractical.
-
- **Example:**
 - To solve a problem in long division you just apply a series of operations that you have learned.



Formal Reasoning

1 - Algorithm

Algorithms, which are very time consuming, exhaust all possibilities before arriving at a solution. Computers use algorithms.

S P L O Y O C H Y G

If we were to unscramble these letters to form a word using an algorithmic approach, we would face 907,208 possibilities.