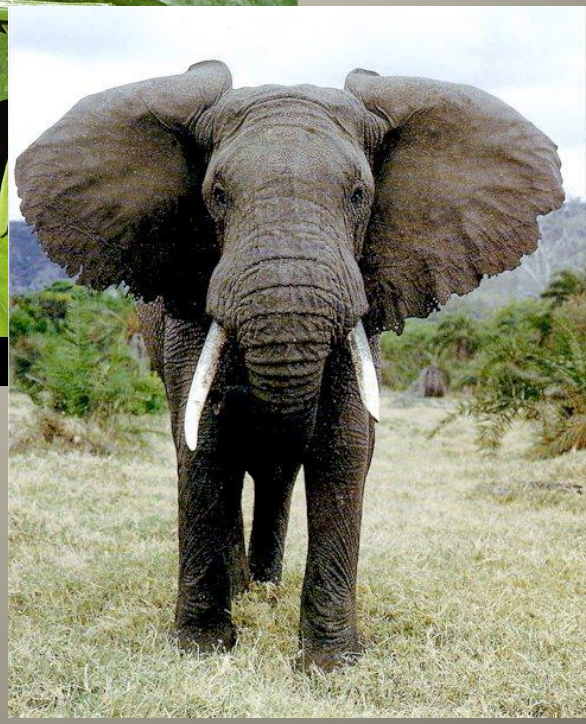
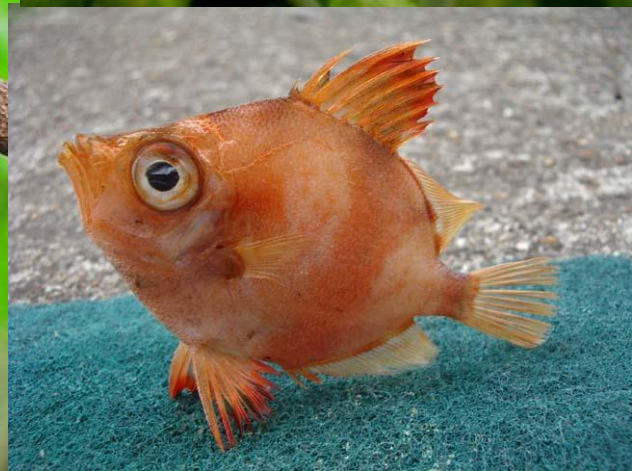
Taxonomy



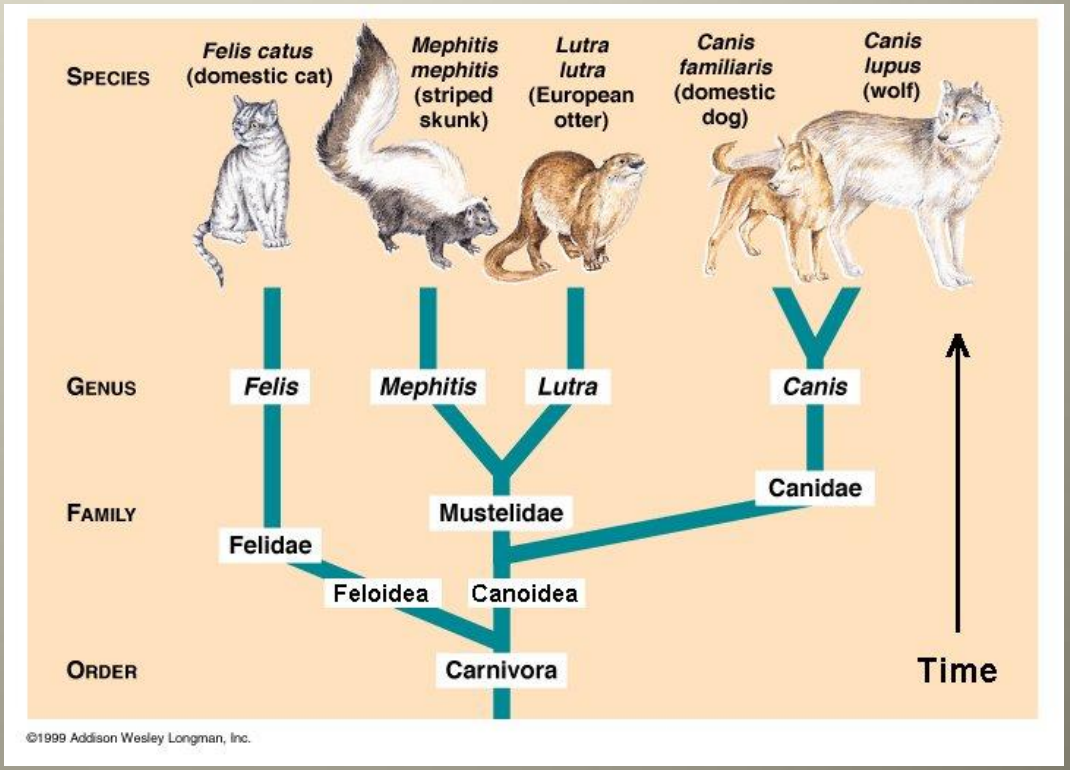
Name the animal:



Diversity in within species

What is taxonomy?

The science of naming organisms and assigning them into groups called taxa (singular: taxon)



What is the biosphere?

- The part of the earth inhabited by living organisms

How does the biosphere relate to taxonomy?

Taxonomy attempts to classify all organisms within the biosphere

How does the biosphere relate to taxonomy?

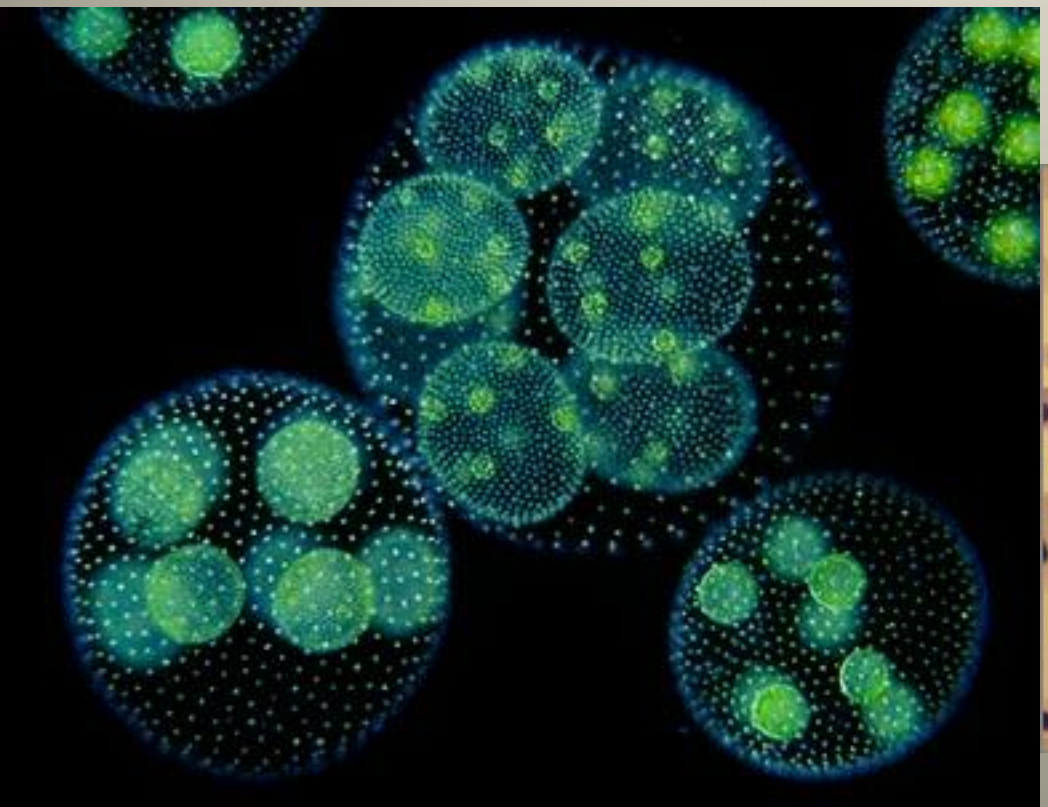
Taxonomy attempts to classify all organisms within the biosphere based on observed characteristics such as morphology, behaviour and sometimes even geographic location.

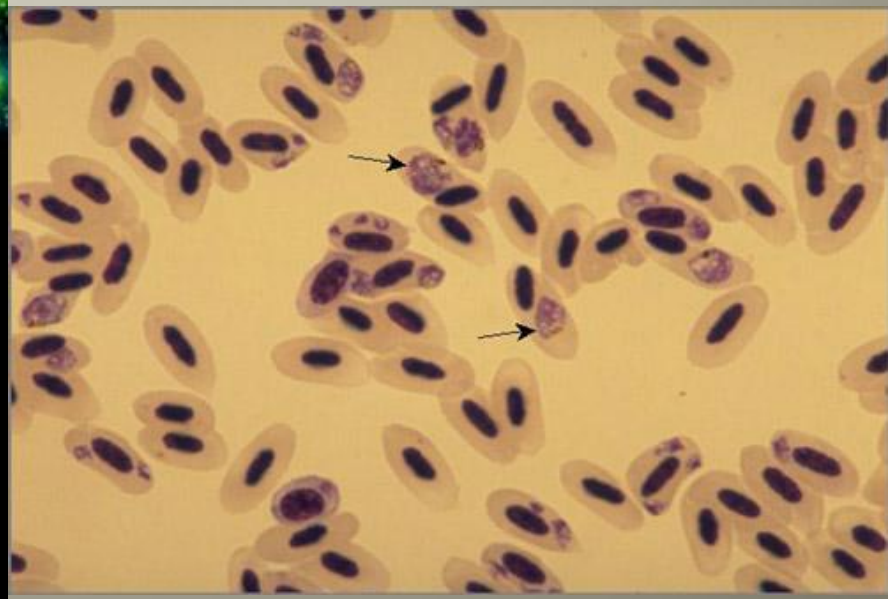
Approximately how many types of living organisms are there on earth?

- 30 to 100 million
- Only 1.75 million have been described so far

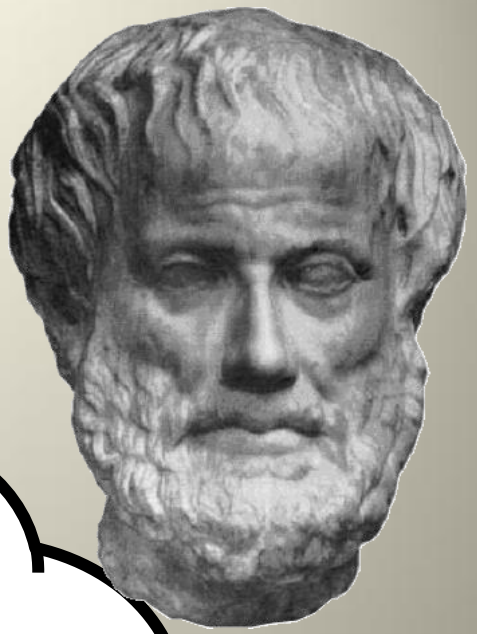
How did the invention of the microscope affect taxonomy?

- More organisms were discovered, therefore, more organisms to classify





Aristotle



I categorized according to habitat:

-water dwellers

-land dwellers

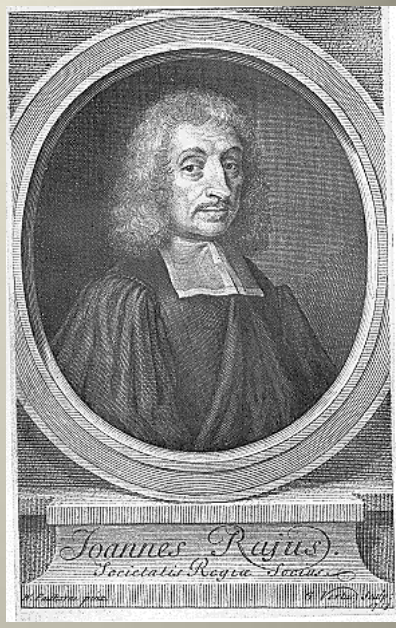
-air dwellers

St. Augustine

I categorized based on
a human centered view

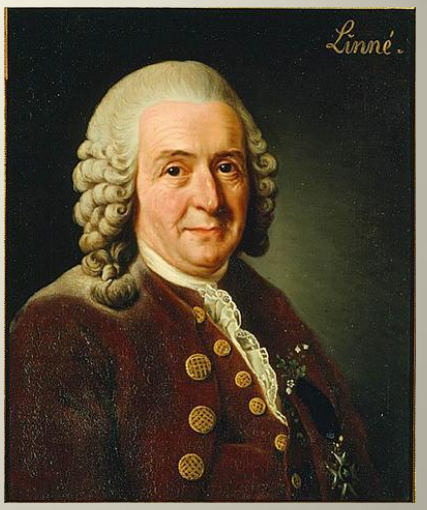
- Useful, harmful, superfluous (not necessary)
  - Didn't consider certain animals necessary in the environment

John Ray



- John Ray was born on November 29, 1627, in the village of Black Notley, Essex, England
- His father was a blacksmith and his mother was a healer and herbalist
- John Ray liked nature and especially plants.
- Coined the term **Species** – organisms similar in shape and structure and could reproduce with each other

Carl Linnaeus
1707-1778



- Considered the father of taxonomy
- Grouped organisms according

to their structural similarities and shared characteristics.

- invented the Binomial nomenclature to classify organisms. Used genus and species based on the Latin names of the organisms

-Latin was the language of scholars at the time.

-*Canis familiaris* is the scientific name for a dog.

(domestic dog)

Traditional taxonomical Ranks of Classification

- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species

- Memory aid (mnemonic device)
  - King Phillip called out for good soup

Classification System

	Brown Bear	House cat	Dog	Killer whale	Wolf
Kingdom	Animalia	Animalia	Animalia	Animalia	Animalia
Phylum	chordata	chordata	chordata	chordata	chordata
Class	mammalia	mammalia	mammalia	mammalia	mammalia
Order	carnivora	carnivora	carnivora	cetacea	carnivora
Family	ursidae	felidae	canidae	delphinidae	canidae
Genus	ursus	felis	canis	orcinus	canis
Species	arctos	catus	familiaris	orca	lupus

Binomial Nomenclature

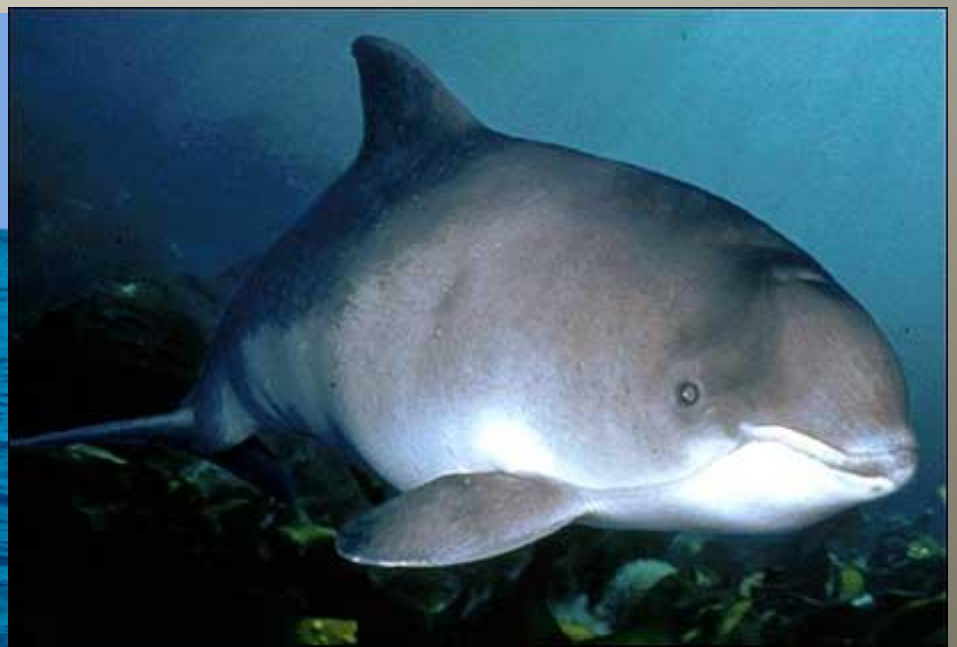
- A two word system of uniquely naming organisms according to their genus and species
- First letter of genus name is capitalized
- Both words italicized
  - i.e. *Homo sapien*

Binomial Nomenclature

BINOMIAL NOMENCLATURE OF SOME COMMON PLANTS AND ANIMALS	
COMMON NAME	**BINOMIAL NOMENCLATURE**
A. PLANTS	
1. Pea plant	*Pisum sativam*
2. Onion plant	*Allium cepa*
3. Mango plant	*Mangifera indica*
4. Wheat plant	*Triticum aestivum*
5. Banyan tree	*Ficus bengalensis*
6. Soya bean	*Glycine max*
B. ANIMALS	
1. Frog	*Rana hexadactyla*
2. Cat	*Felis domestica*
3. Dog	*Canis familiaris*
4. Housefly	*Musca domestica*
5. Cobra	*Naja naja*
6. Commom crap (Fish)	*Cyprinus carpio*

Advantages of using the binomial nomenclature system

1. Universal scientific communication
2. Unique for every living thing
3. Show relationship between closely related organisms



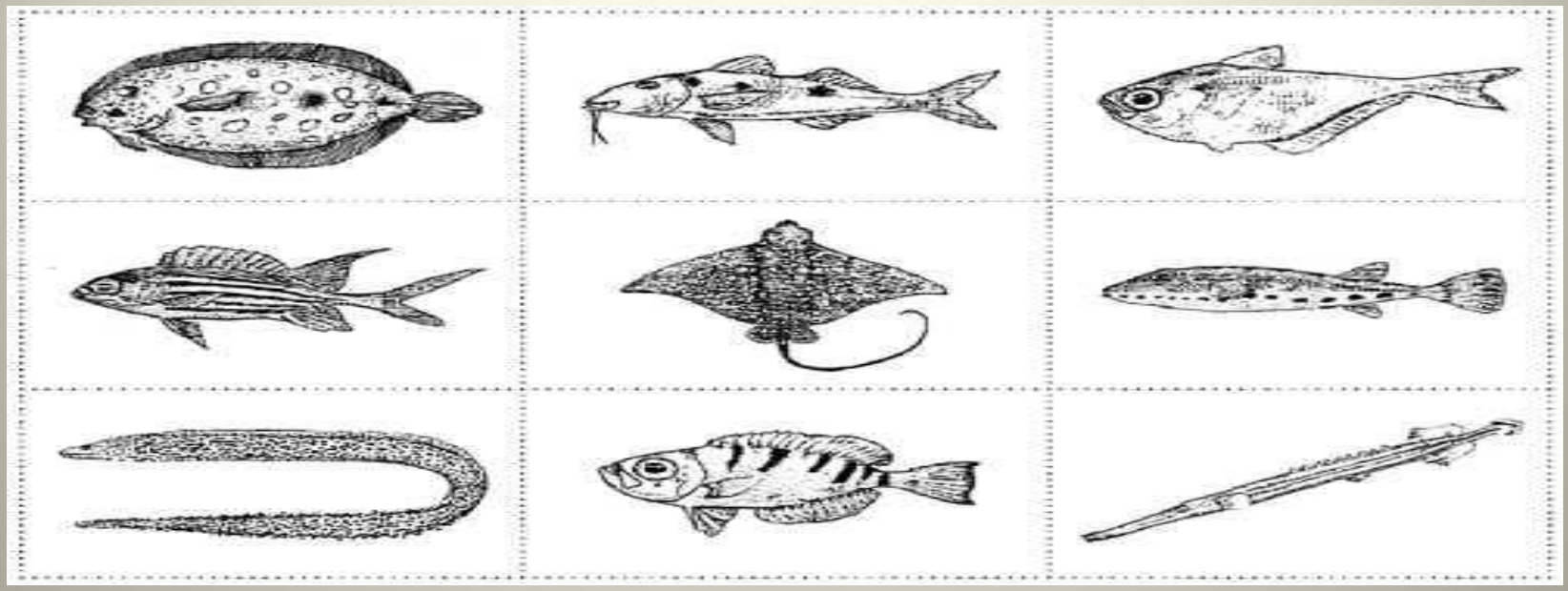
Dichotomous Key

Di - two

Dichotomy

- Splitting of a whole into exactly two mutually exclusive parts
- (example: “good” versus “bad”)

Wacky people dichotomy



Step 1 If fish shape is long and skinny then go to step 2 If fish shape is not long and skinny go to step 3	Step 5 If fish has spots, go to step 6 If fish does not have spots, go to step 7
Step 2 If fish has pointed fins, it is a trumpet fish If fish has smooth fins, it is a spotted moray eel	Step 6 If fish has chin whiskers, it is a spotted goat fish If fish does not have chin whiskers, it is a band-tail puffer
Step 3 If fish has both eyes on top of head, go to step 4 If fish has eye on each side of the head, go to step 5	Step 7 If fish has stripes, go to step 8 If fish does not have stripes, it is a glassy sweeper
Step 4 If fish has long whip like tail, it is a spotted eagle ray If fish short blunt tail, it is a peacock flounder	Step 8 If fish has a V-shaped tail, it is a squirrel fish If fish has a blunt tail, it is a glass eye snapper

What is a dichotomous key used for?

- Used to help place organisms into an appropriate classification group

What are the 2 conditions for a properly written dichotomous key?

- 2 choices for each characteristic
- Unique ending for each individual item

(think of the fish example)

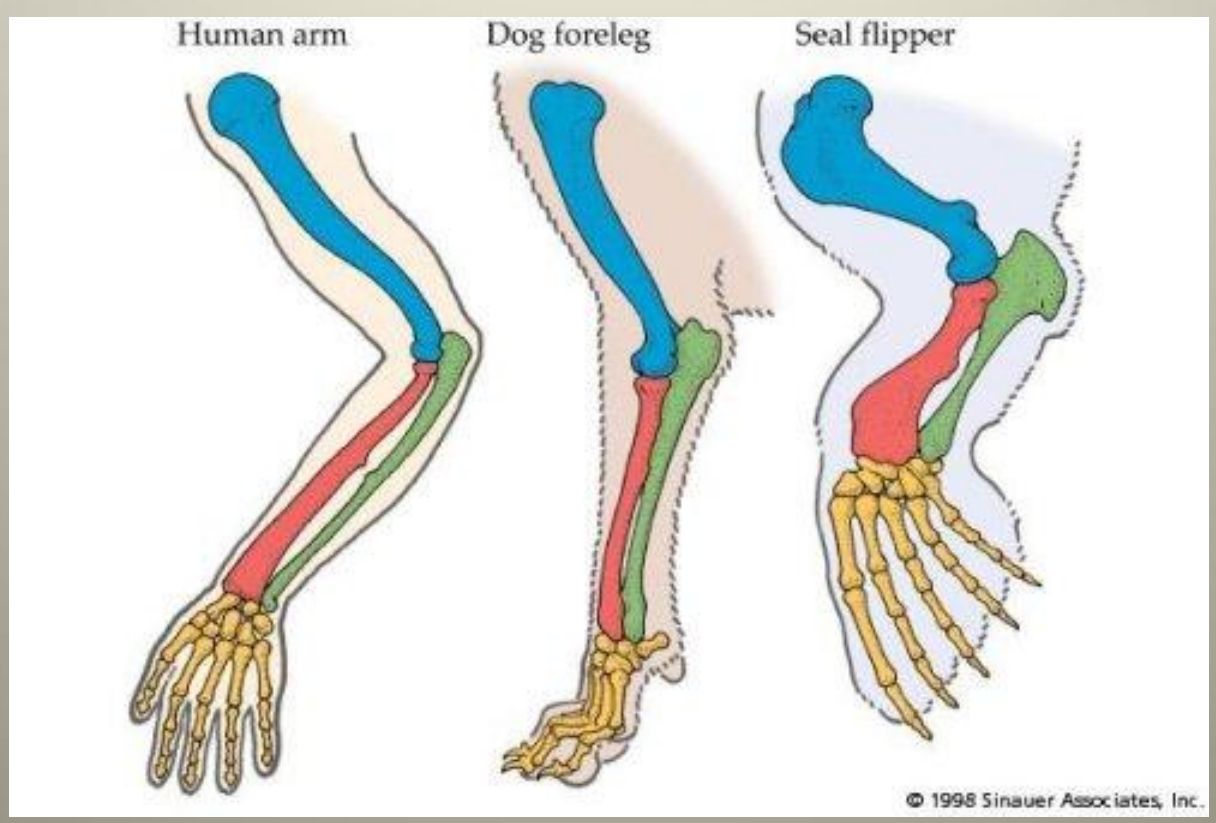
Two ways a dichotomous key can be represented?

- Diagrammatically (tree/flow chart)
- With words

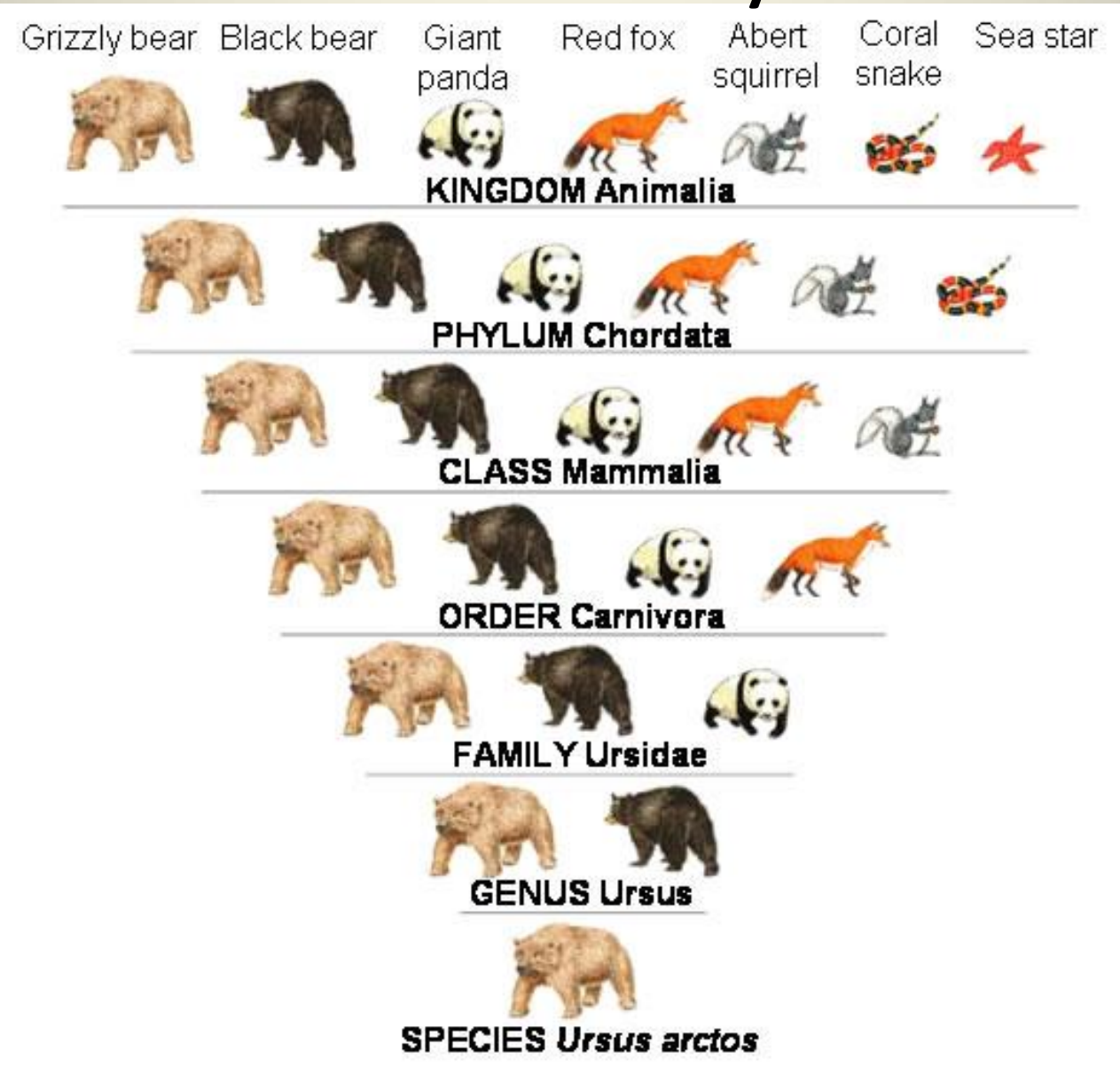
How does a dichotomous key relate to the 7 taxa and binomial nomenclature?

- Characteristics that define the choices (dichotomy) are often based on the characteristics that subdivide each taxa (e.g. vertebrate vs. invertebrate)
- A true key ends with a scientific name of the organism using the binomial nomenclature system

Similar structures are referred to as homologous structures



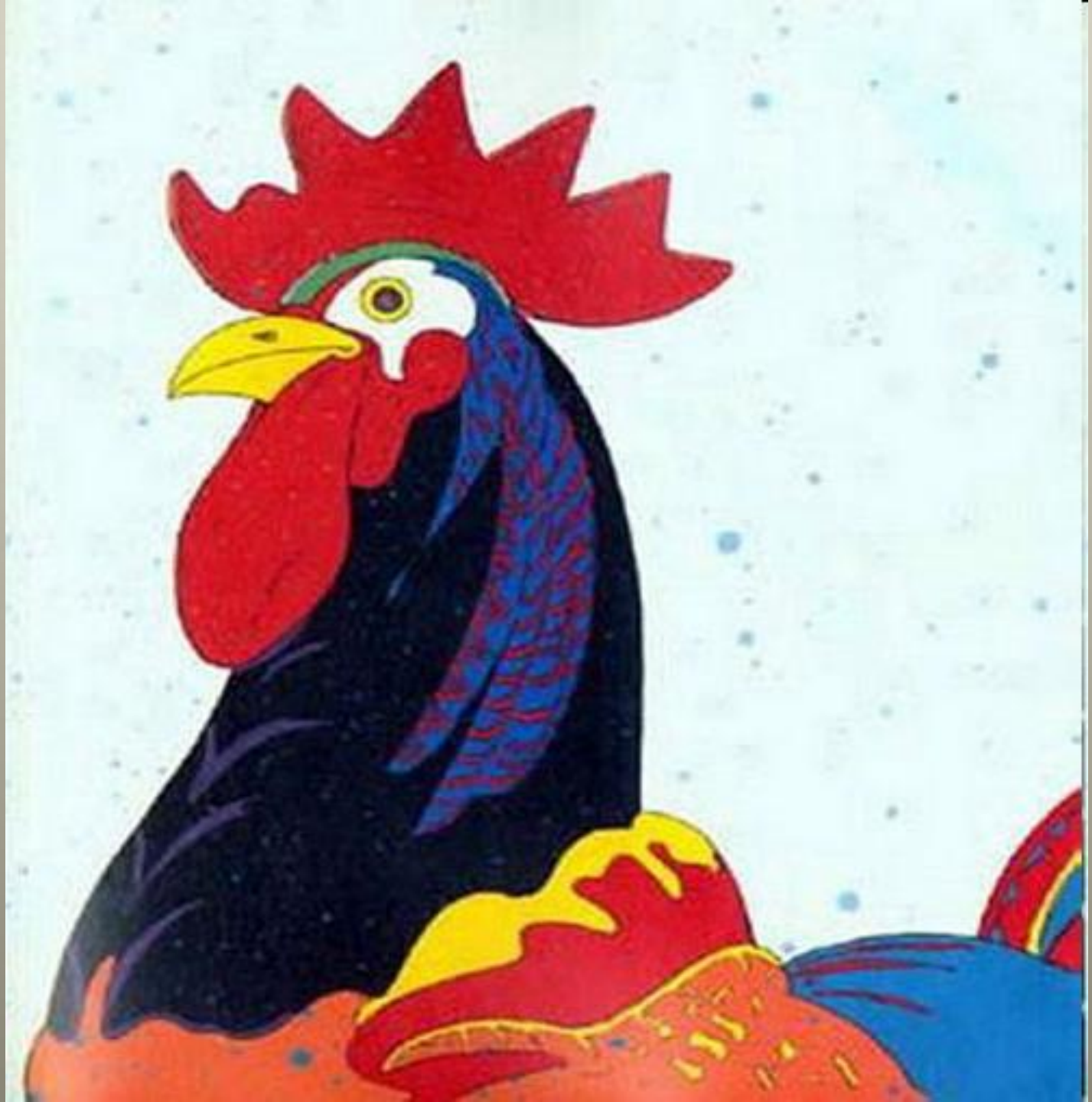
Classification System

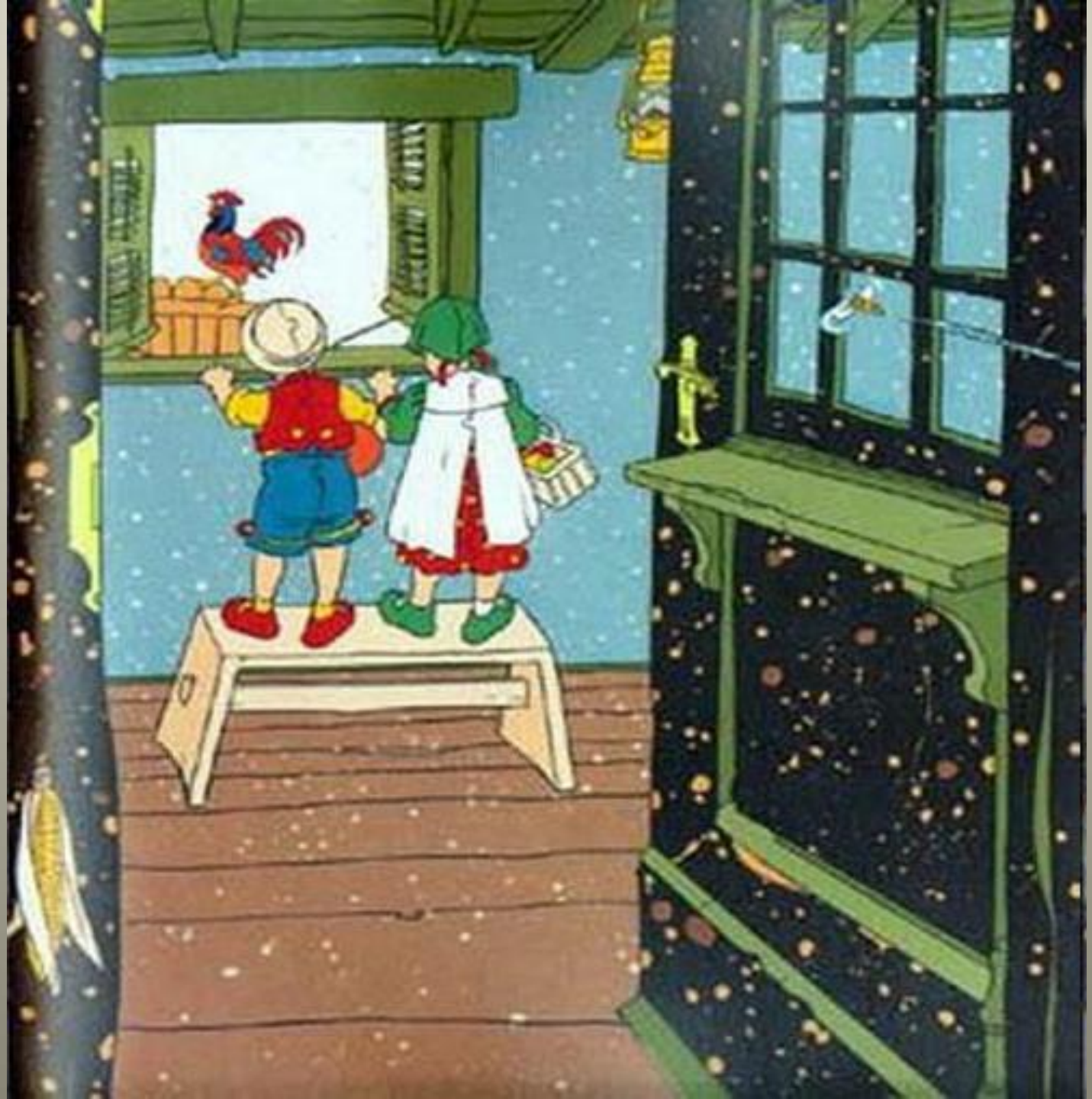


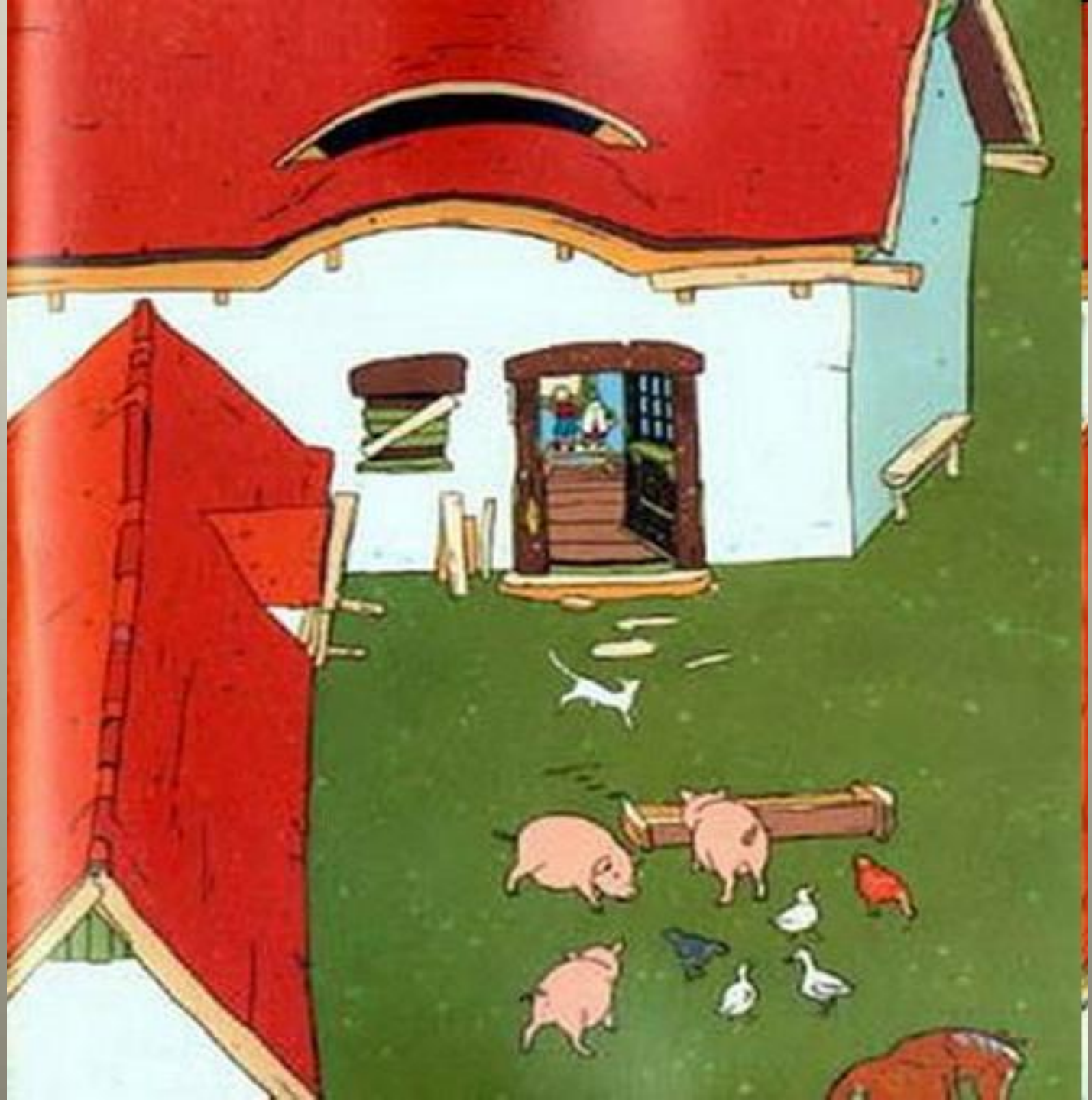
Classification System

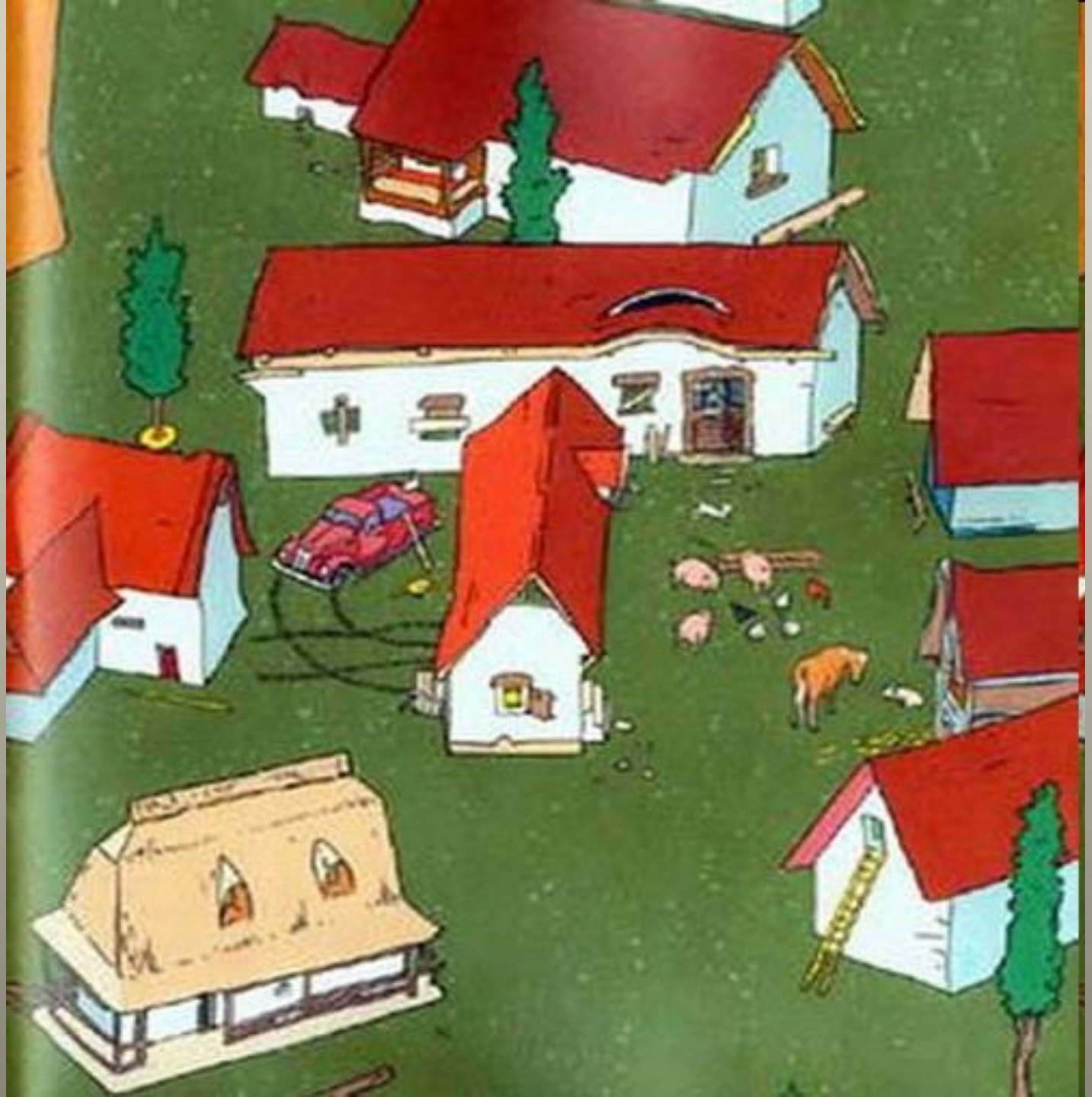
Where you live, from broad to specific:

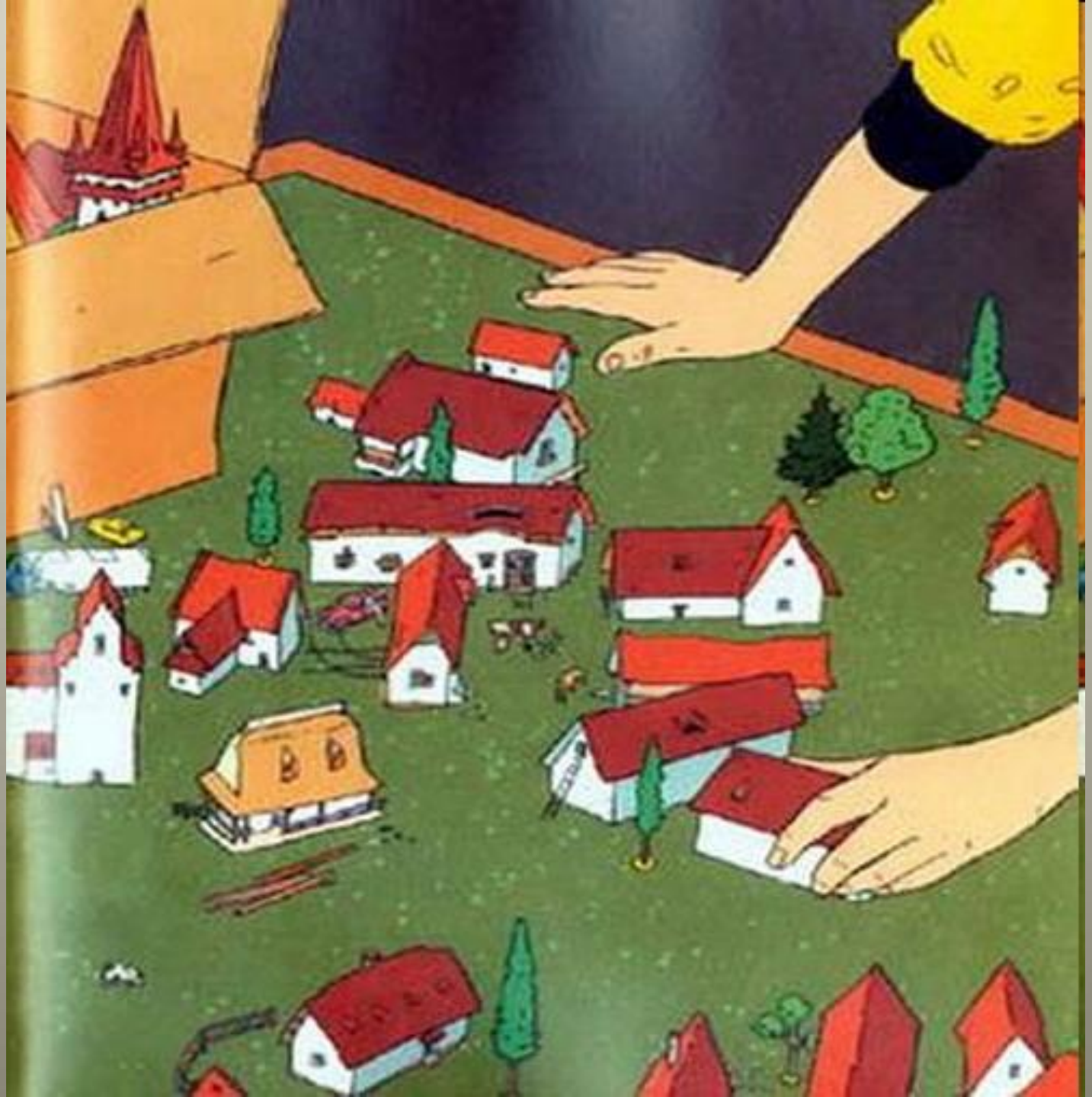
- The Universe
- The Milky Way Galaxy
- The Solar System
- Planet Earth
- North American Continent
- Canada
- Ontario
- Toronto
- North York
- Your address

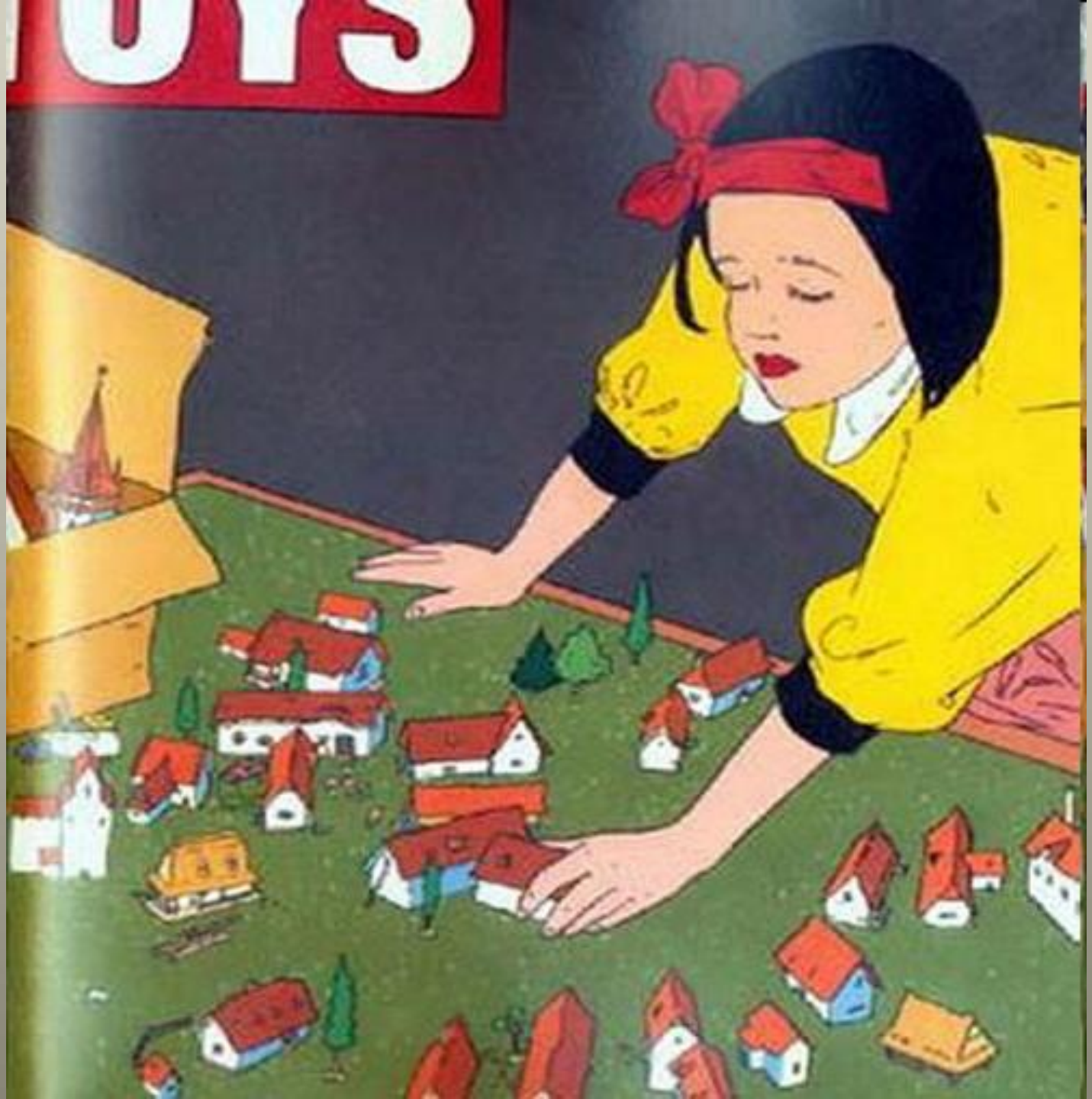








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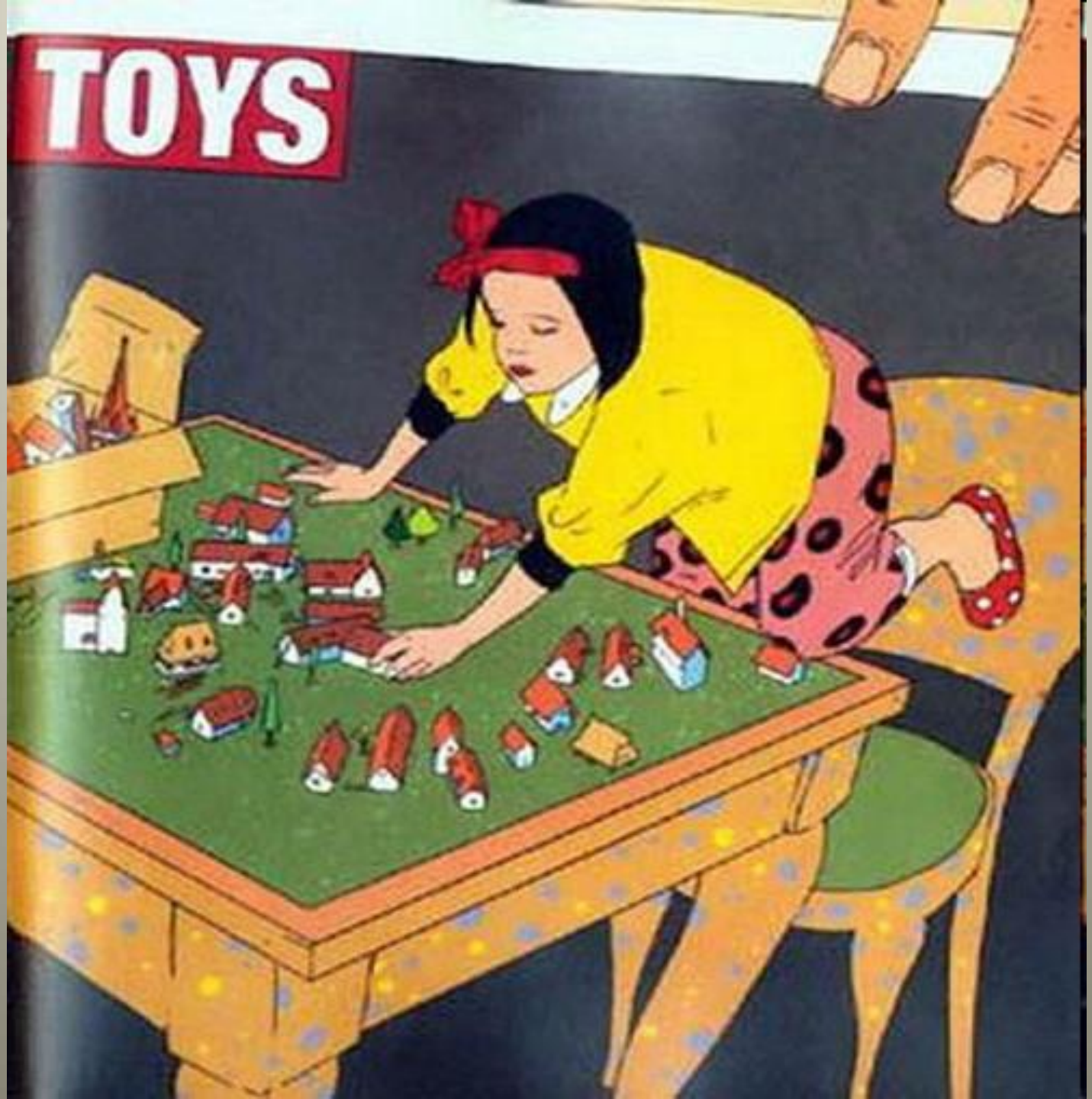
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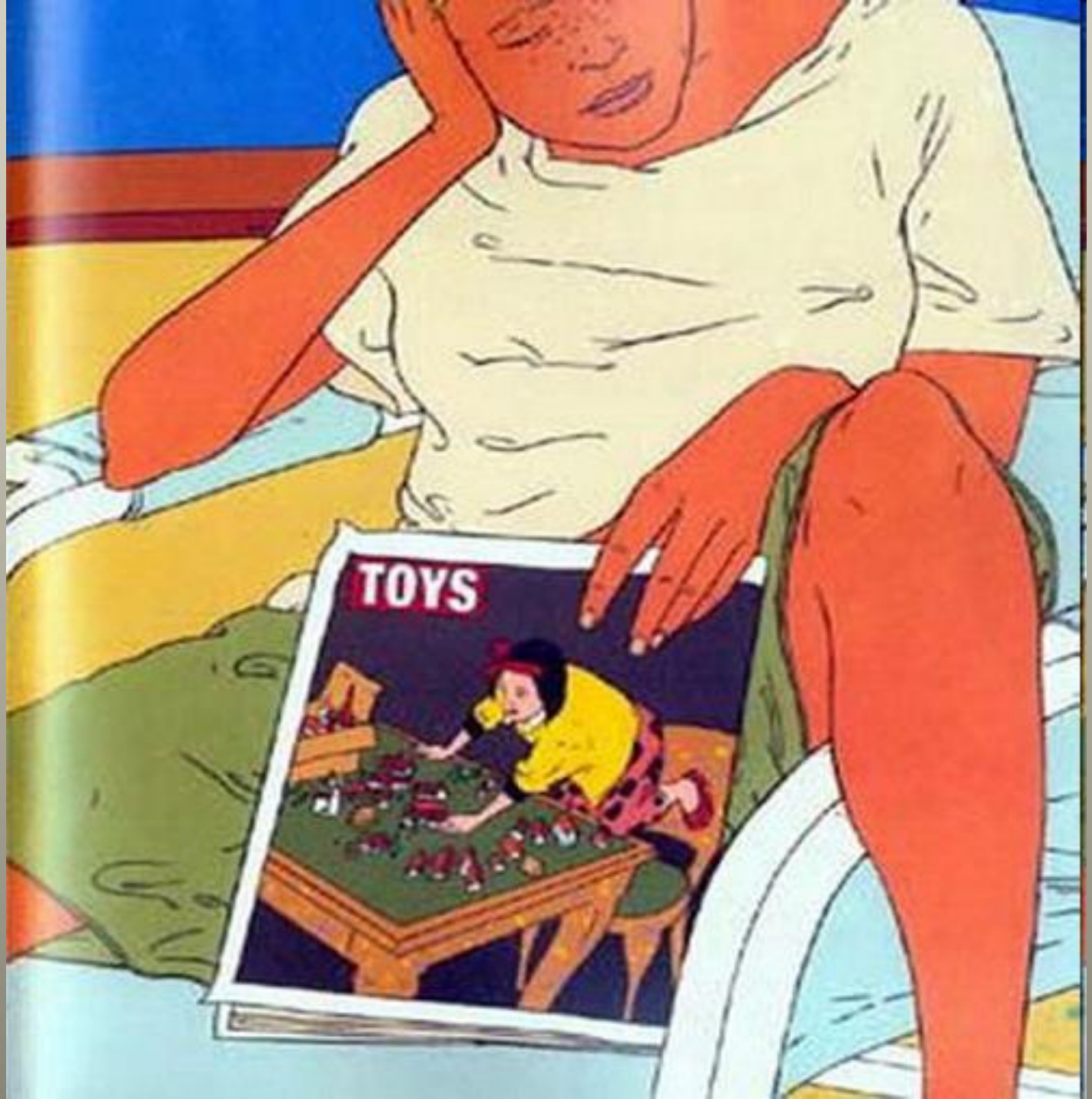
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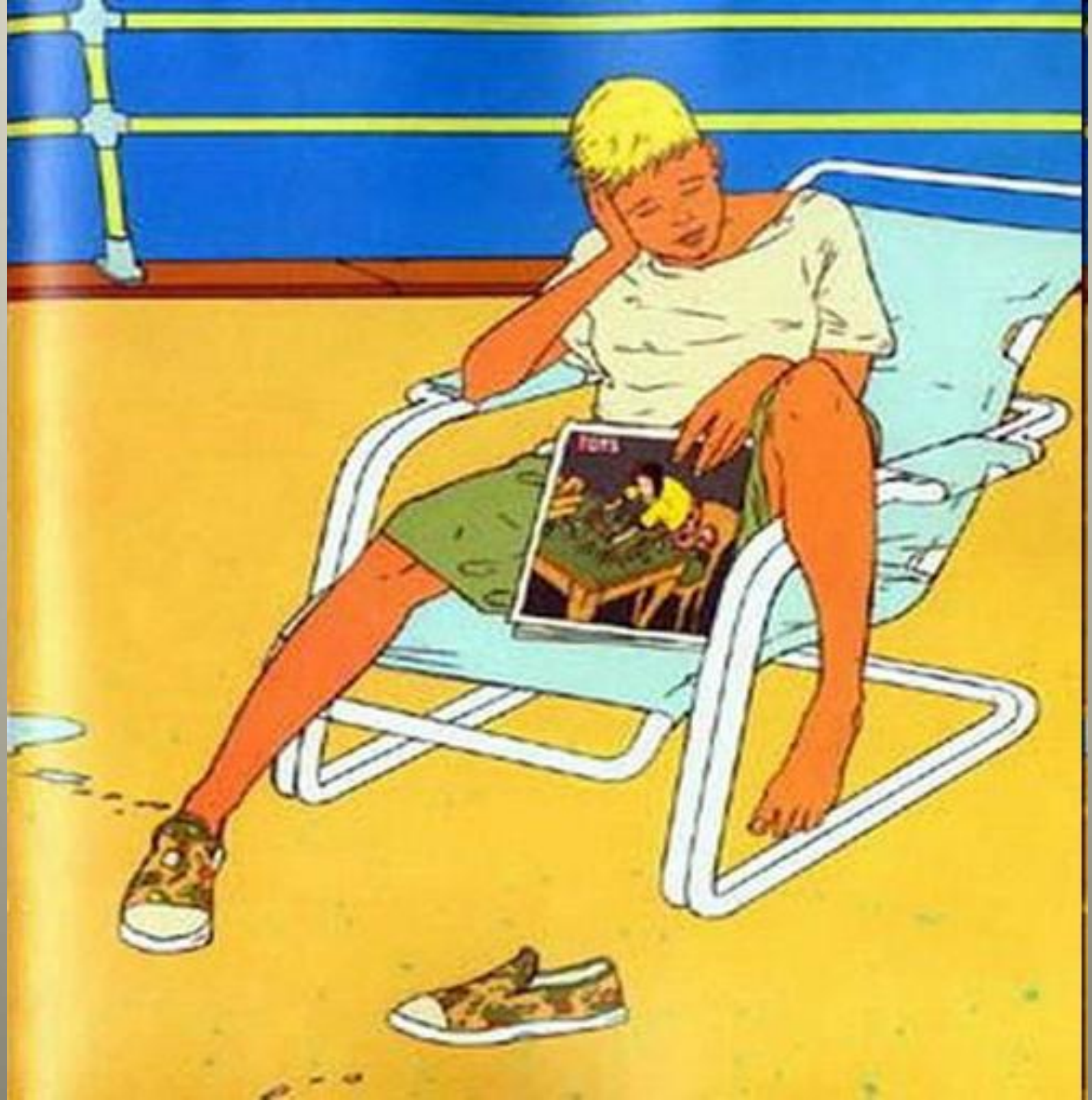
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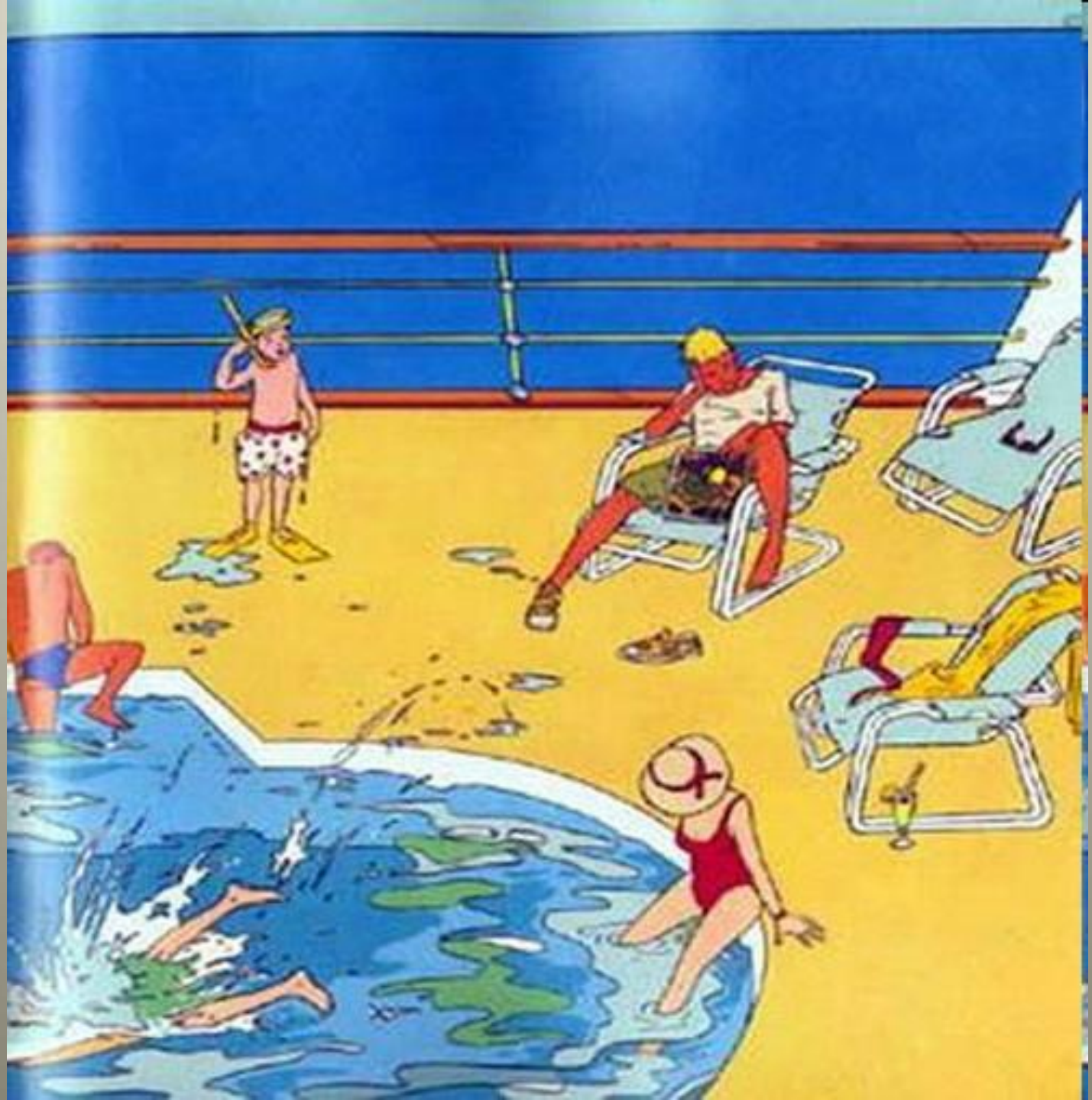

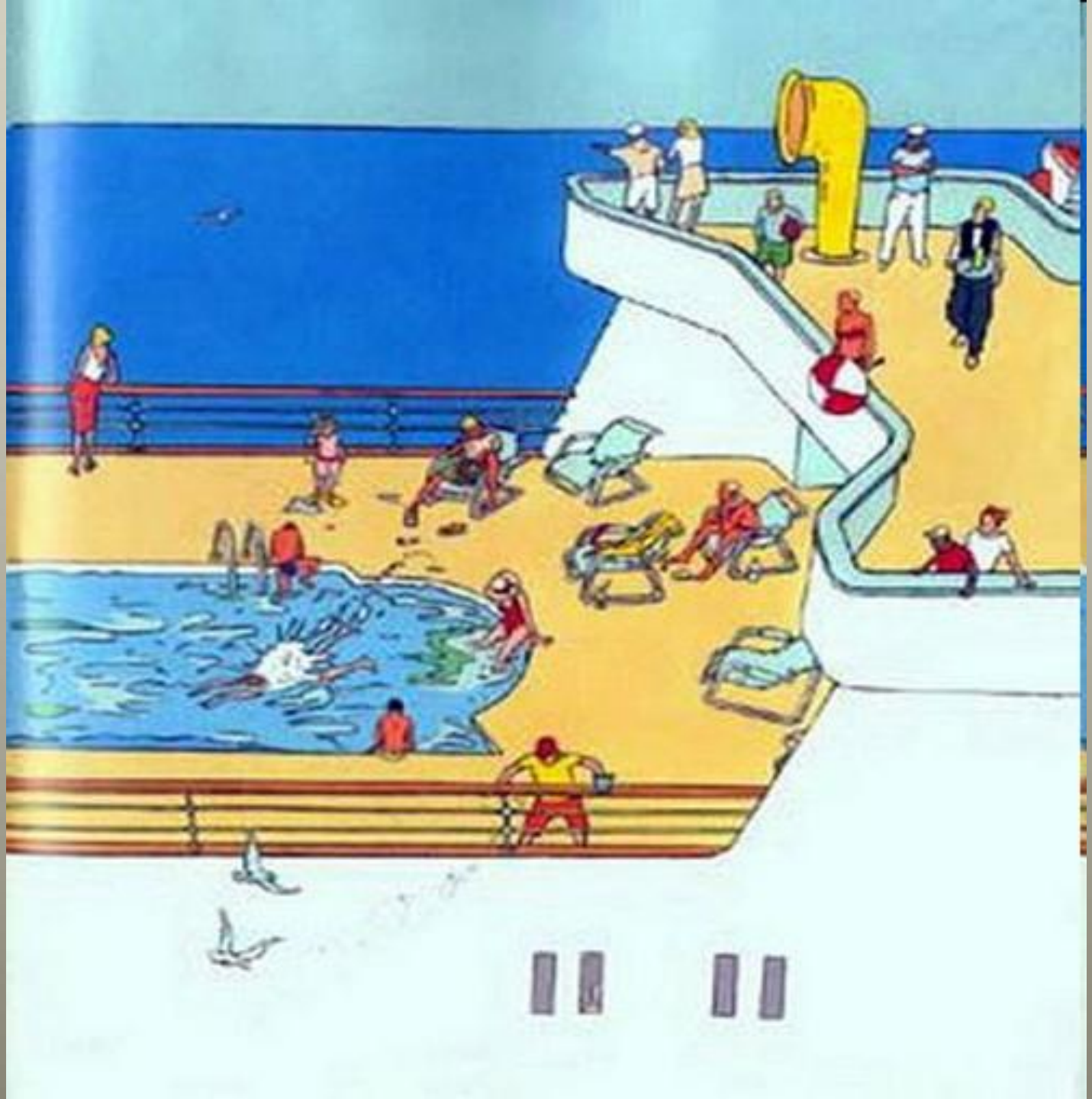

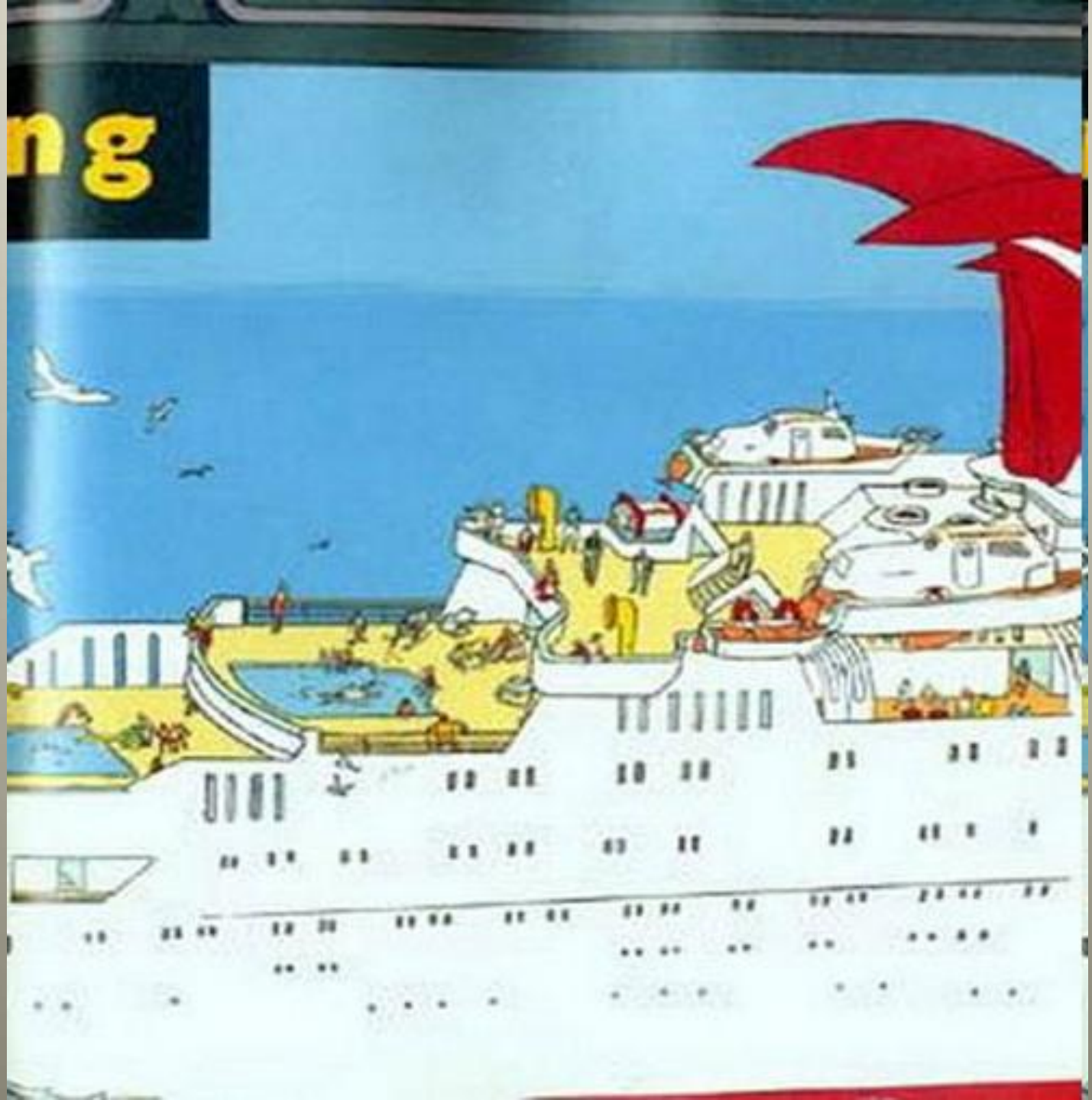
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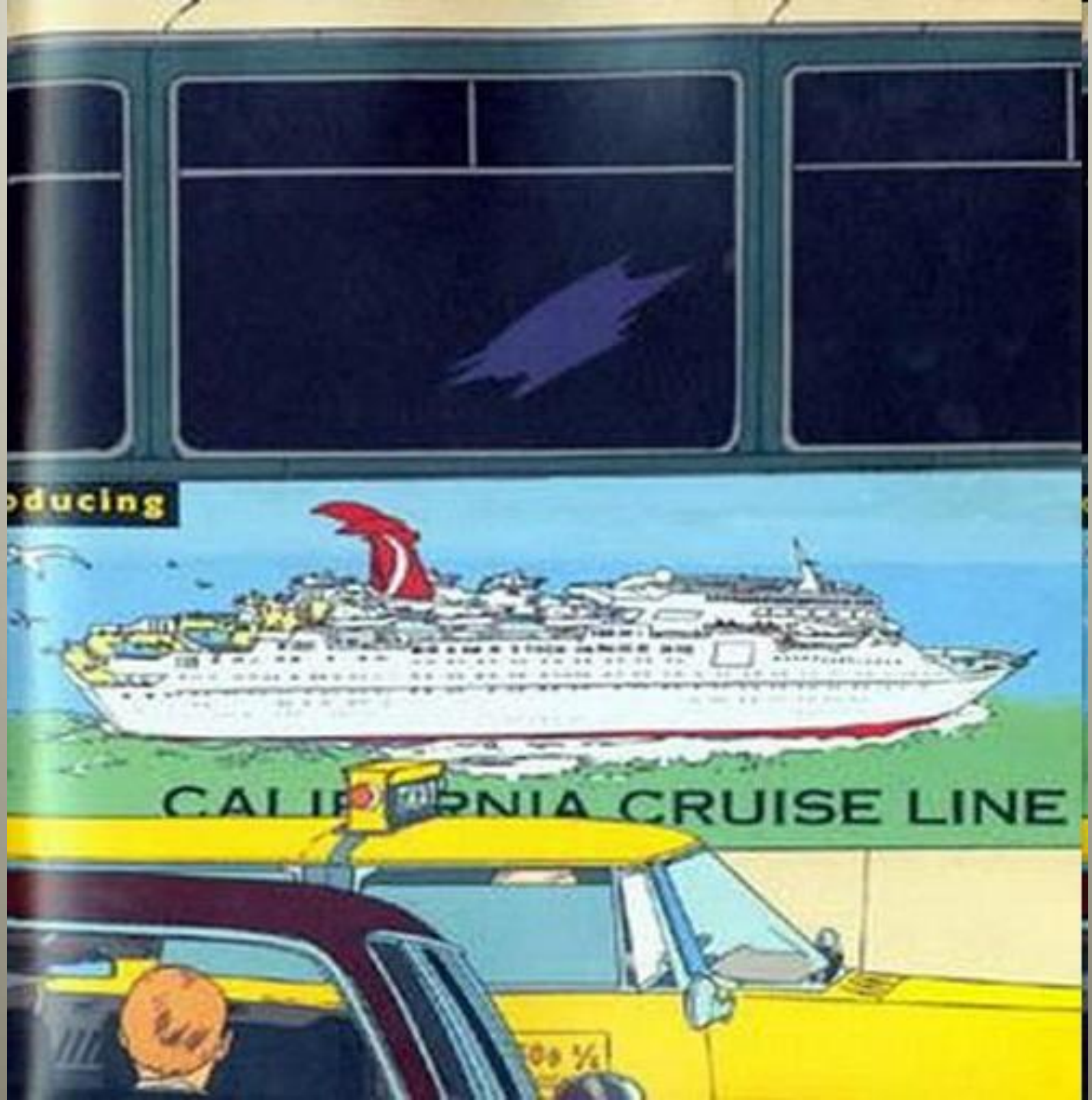
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