



TEACHING AND LEARNING GEOGRAPHY WITH MAPS: A CONCEPTUAL FRAMEWORK

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INTRODUCTION

Geographic thought is an intellectual process that is supported by one or many "pictures" of space.



In order to approach and then ascribe space there is a need for tools recording and depicting it, such as maps.



Geography and to a greater extent the education in geographic thought require familiarization in using and approaching space with maps.



Mapping is an appropriate cognitive tool in teaching and learning of geography.



PERCEPTION OF GEOGRAPHIC SPACE

- Geographic space is an “**abstract**” space in its description and **invisible** in its relations as opposed to the way it is recorded as a **concrete** and **visible** space.

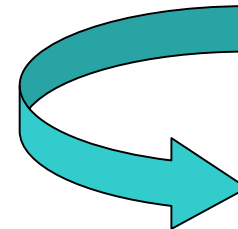
This double nature of space establishes cartography as a tool of depiction of geographic space.

- The term “ **space**” used to delineate the essence of geography is determined by the interaction of two different cognitive processes:
 - The **familiarization** with space using a rational tool such as a map.
 - The **creation** of a map in order to achieve the geographic conception of space.



PERCEPTION OF GEOGRAPHIC SPACE

- Because of its double nature, the map requires **two** different but simultaneous approaches:
 - The map as conceptual territorial creation (**space as a subject**).
 - The map as “object of knowledge” for the rational comprehension and rationalisation of geographic space (**space as object**).





PERCEPTION OF GEOGRAPHIC SPACE

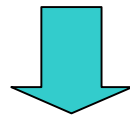
- The term geographic space, therefore, describes simultaneously:
 - The **real** space.
 - The **cognitive** space.

The map as tool of space includes these two complimentary cognitive processes.



COMPREHENSION OF GEOGRAPHIC SPACE

In order for geographic space to become perceptible, there is a need for a series of **processes-stages**.

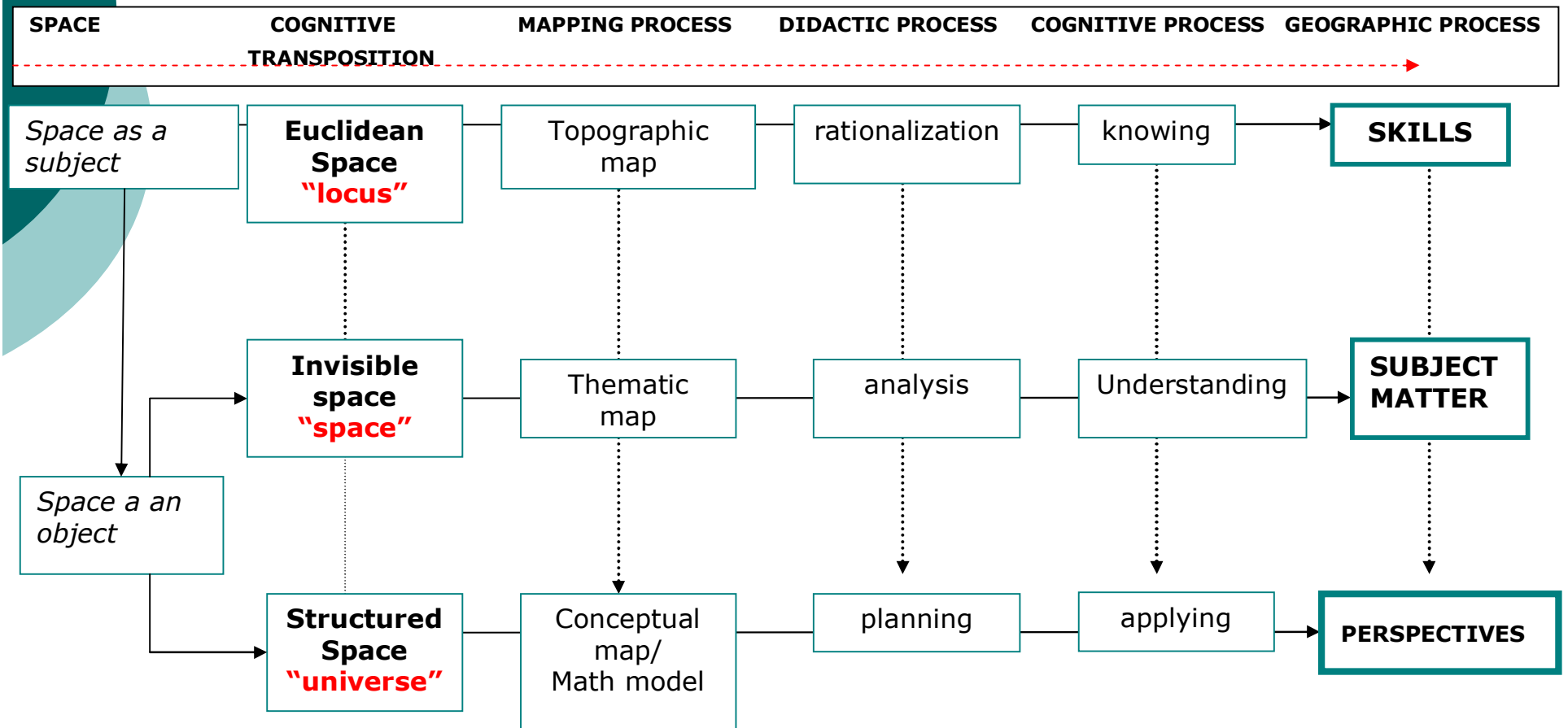


These in effect constitute the **cognitive tool** for the transmission of geographic thought.



There exists a need for a consecutive succession of **steps**.

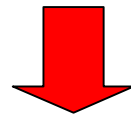
COMPREHENSION OF GEOGRAPHIC SPACE



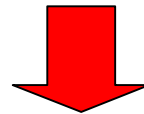


COMPREHENSION OF GEOGRAPHIC SPACE

In order for the map to become a tool in presenting geographic space there must be a passage from the **subjective space** to the **space –creation**.



The student has to change his **perception** into **reality**.



Students need to learn when seeing “**pictures**” from above to change them into **ground plans** and concrete **shapes** into geometric **forms**.



COMPREHENSION OF GEOGRAPHIC SPACE

Space as a subject:

The map functions as the intersect between the cognitive and the real space.

In this space:

The **topographic map**, acts as an instructive spatial tool.



Leads to the **rationalisation** of space,

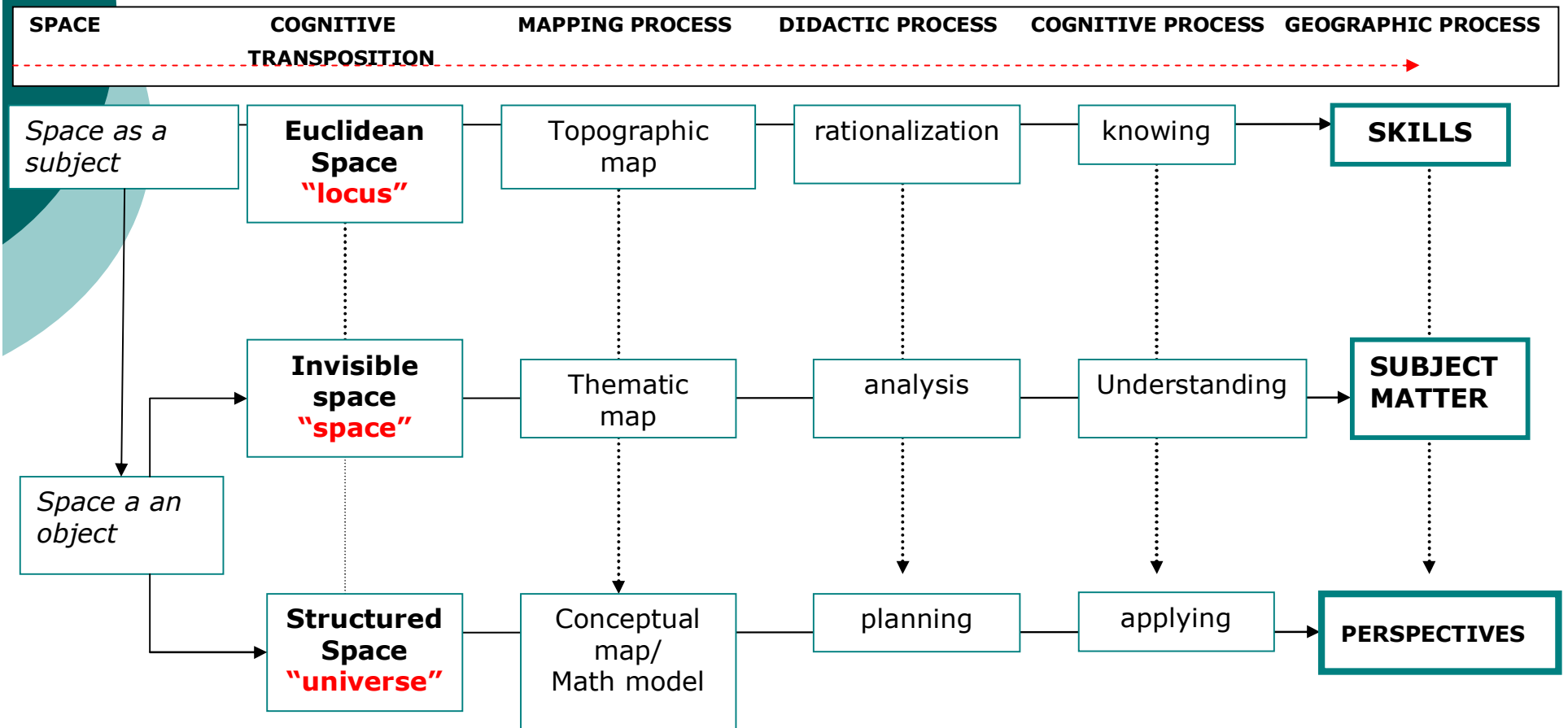


Which in turn promotes the students' ability of **knowing.**



Develops by induction the **skills** that the geographic thought requires.

COMPREHENSION OF GEOGRAPHIC SPACE





COMPREHENSION OF GEOGRAPHIC SPACE

Space as an object:

- Functions as **object of knowledge**.
- There are **two** cartographic **representations** that create the background for geographic thought.
 - The passage from the cognitive and Euclidean space to the **“invisible” space**.
 - The passage from the cognitive and “invisible” space to the **“structured” space**.



COMPREHENSION OF GEOGRAPHIC SPACE

The **first** cartographic representation is related to the passage from the cognitive and Euclidean space to the “**invisible**” space. **In this space:**

The **thematic map** acts as an instructive spatial tool.



Activates the didactic process of **analysis** of the characteristics of space and their relationships.

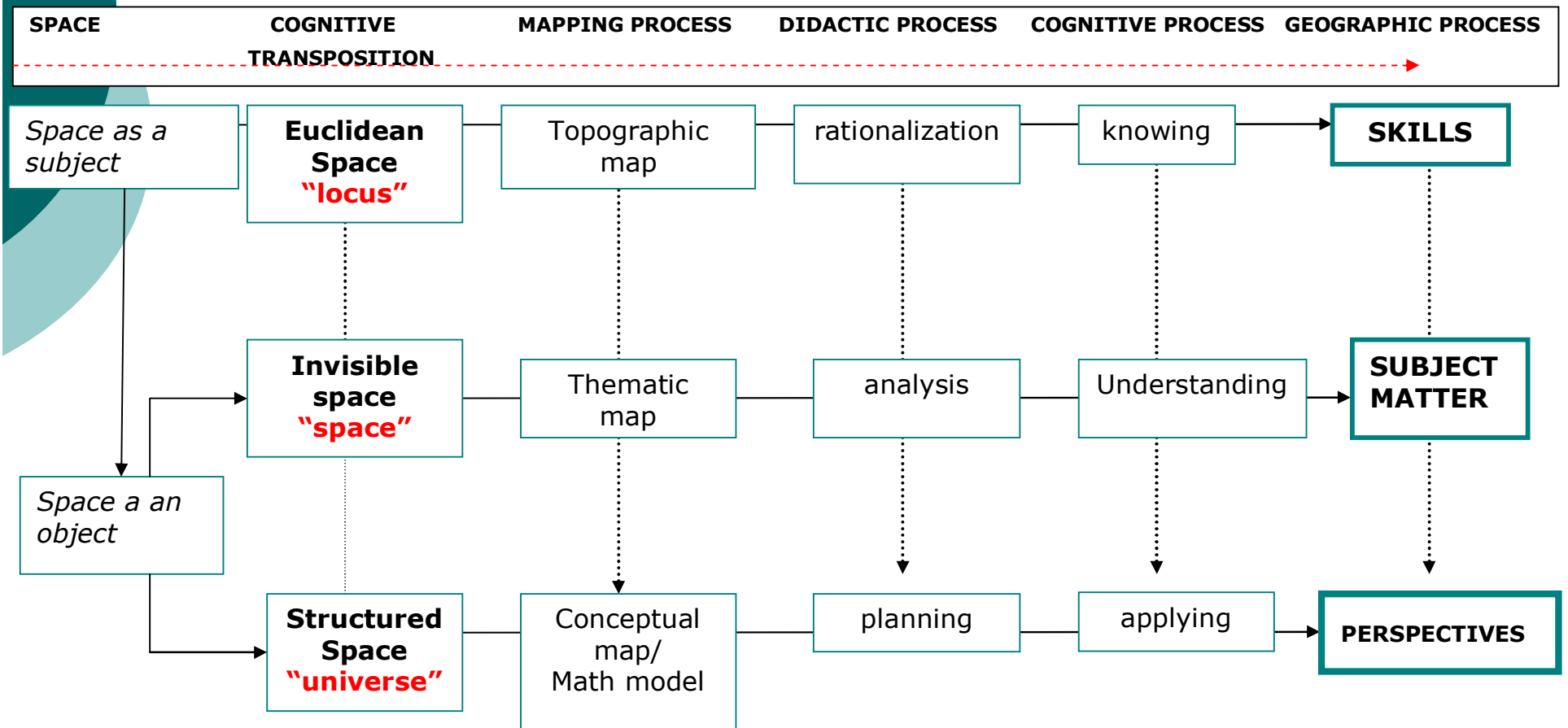


Which in turn promotes students participation in the process of **understanding**.



This representation develops by succession the subject matter that composes the base for geographic thought.

COMPREHENSION OF GEOGRAPHIC SPACE





COMPREHENSION OF GEOGRAPHIC SPACE

The **second** cartographic representation is related to the passage from the cognitive and “invisible” space to the “**structured**” space. **In this space:**

The conceptual map and mathematic models act as **instructive** spatial tools.



Those activate the didactic process of **planning**,

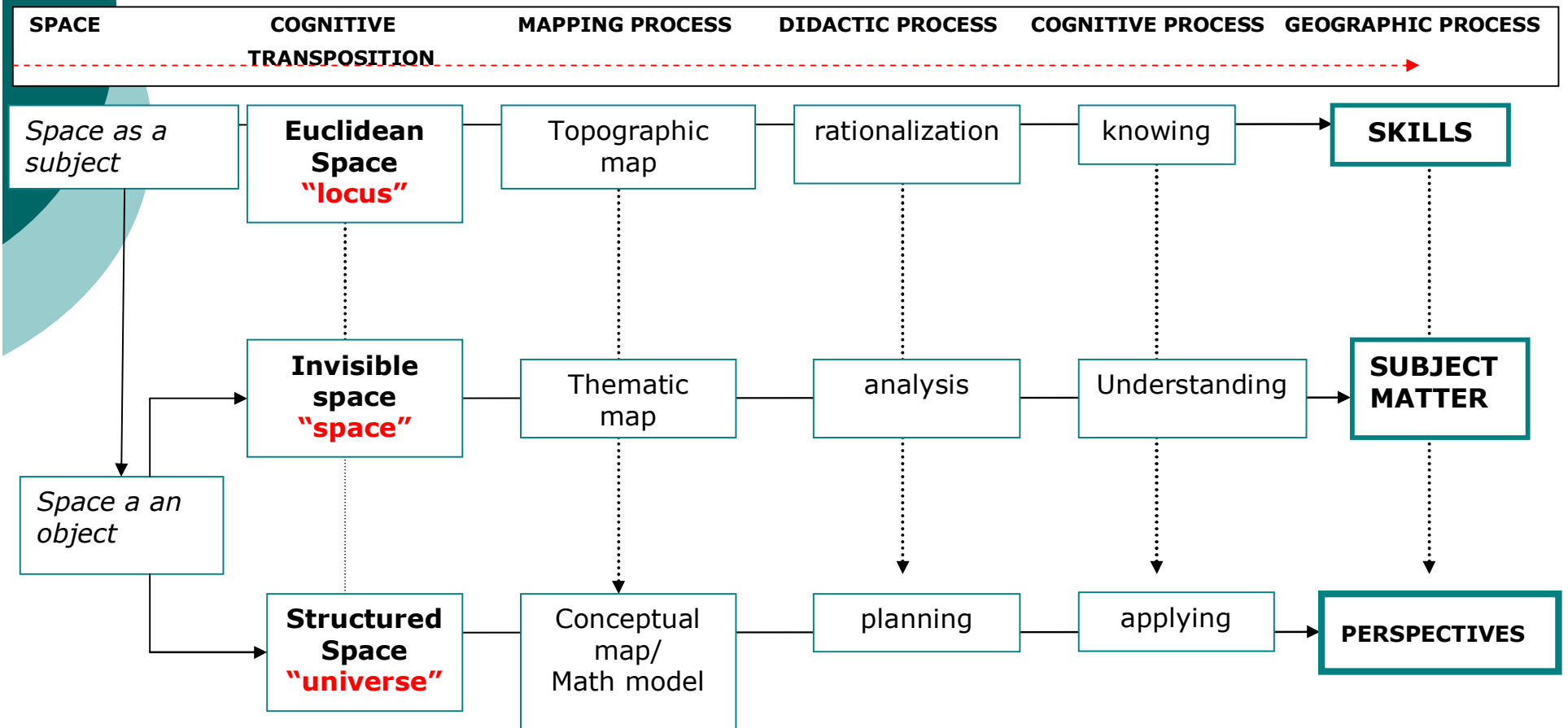


Which in turn promote the cognitive process of **application** in space.



This representation reflects the geographic perspectives that constitute a collective (geographers’) point of view.

COMPREHENSION OF GEOGRAPHIC SPACE





SPACE AS A SUBJECT

Conceptual transformation: **Euclidean**

- The passage from **subjective space** to “real” or **Euclidean space** is achieved through instructive processes that concern the geometric expression of space.
- The **knowledge** of the map’s semiology, of its syntax and its scale:
 - Is changing students’ **overall view**.
 - Helps in the **transformation** of the forms of space.
 - Helps students in “**seeing**” the geographic space.
- The **Euclidean space** provides all the essential tools for:
 - The cognitive **transformation**.
 - The **teaching** of Geography with the help of **cartographic representation**.

SPACE AS A SUBJECT

Cartographic Proc.: Topographic Map

Recording of space
Absolute location



Scale in absolute
terms



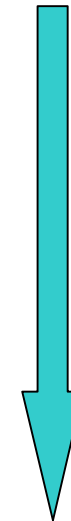
Space recognition
Forms and shapes



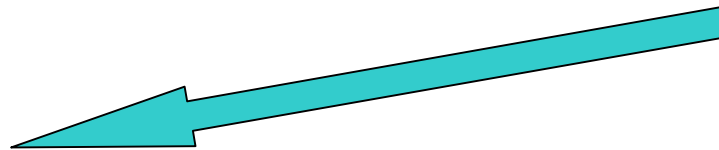
Complex information



Relative location



Scale of
relationships



Relations



Beginning of
Geographic
Thought





SPACE AS A SUBJECT

Didactic Process: Rationalisation

- Geography students should be in a position to:
 - Recognize **locations**.
 - Identify in a “vertical” reading the **forms** of geographic space.
 - Record as forms or shapes the geographic **entities**.
- These together with the notion of scale:
 - Contribute to the didactic growth of students.
 - Constitute the base of **rationalisation** of space.

The didactic processes provided by the topographic maps act as tools of rationalisation of space.



SPACE AS A SUBJECT

Cognitive Process: **Knowing**

- Perception of space by using cognitive “**abstractions**” helps its comprehension.
- The use of **mathematics**, using proportions and geometry, to record space:
 - Helps students to see and conceive **distributions** in space.
 - Shapes the “words” that help them understand the geographic **language**.
 - Leads them into comprehending the expressions of **geographic thought**.



SPACE AS A SUBJECT

Geographic Process: **Skills**

- The Euclidean **recording of space** helps students:
 - To observe and recognize the **dynamics** and the **complexity** of space.
 - To conceive, through “seeing”, that there exist many **parameters** behind spatial phenomena.

Many spatial decisions and processes lead to the teaching of geographic skills.



SPACE AS AN OBJECT

Conceptual Transformation: “Invisible”

- **Optical** variables as tool of research and consideration help in:
 - Comprehending such principles as “**similarity**”, “**diversity**”, “**hierarchy**” and “**quantity**”,
 - Revealing the “**invisible**” space of geometry or spatial organisation.
- This leads into projecting relationships in space as a **unified** geographic framework.

The introduction to the graphic principles, to the rules and to the syntax of mapping initiate cognitive processes that help Geographic thinking.



SPACE AS AN OBJECT

Cartographic Process: Thematic Map

- A thematic map using an **optical** “dialect”:
 - Transforms into shapes and **colours** the **forms** of geographic space.
 - Expresses spatial phenomena using **principles** of geographic thought.

The composition of a thematic map is an essential tool in providing students with dexterities to treat and generalize spatial elements.

- As a result of this **transposition** students:
 - Comprehend the **internal relationships** of these elements.
 - Discover **phenomena** in space.
 - Become observers of their development.

All elements of geographic thought.



SPACE AS AN OBJECT

Didactic Process: **Analysis**

- The process of **analysis** is expressed by at least three questions:
 - “Why is there?”
 - “How did it get there?”
 - “What is its significance?”
- In **teaching Geography** the focus is on students to be able to:
 - Attribute **meaning** to what they observe.
 - **Explain** it.
- That involves the teaching of the analytical **concepts** and **principles** which provide them with:
 - The ability to **comprehend**.
 - To see **connections**.
 - To explain **patterns** and **processes** in space.
- These abilities provided through the creation of **thematic maps**, help to:
 - Comprehend **relations**.
 - See **connections** between different entities in space.



SPACE AS AN OBJECT

Cognitive Process: **Understanding**

- The systemic tools that are available to students with the use of thematic maps are helping them in:
 - Drawing **inferences**.
 - **Analysing** relationships, changes, patterns and processes taking place in space.

Which reflect the cognitive process of understanding.

- The use of thematic maps help student to participate in the:
 - Didactic processes of analysis and
 - Cognitive process of understanding.

Which provide the tools for the subject matter of geography to be taught.



SPACE AS AN OBJECT

Geographic Process: **Subject Matter**

- The **subject matter** of geography is divided, into the following six essential **basic elements**:
 - The world in spatial terms.
 - Places and regions.
 - Physical systems.
 - Human systems.
 - Environment and society.

All of which can be taught with the help of thematic maps.

- Geography's goal is to determine the **relationships** between people, places and environment,
- Which requires **understanding** and **comprehending** geographic space.

Teaching the subject matter of Geography can rely on the use of thematic maps.



“STRUCTURED” SPACE

Conceptual Transformation: “Structured”

- The passage from the space –object to the “structured” space refers to a cognitive transformation where a map:
 - Constitute a spatial model.
 - Represent a tool of contemplation and analysis.

This help to describe relations, and overlays end even lead into restructuring space itself.

- The definition of space in terms of points, lines and polygons:
 - is not simply a recording of places or their characteristics,
 - but promotes a cognitive model of space that describes such principles as convergence and divergence.

This promotes Geographic thought, necessary in teaching and learning Geography.



“STRUCTURED” SPACE

Cartographic Process: Conceptual Map

Symbolic maps or mathematical models provide space:

A tool of contemplation and research,

Contributes to problem solving,

That involves the utilization of geographic thought.

The objective of this mapping approach is to promote knowledge itself.

There is no interest to attain new cartographic knowledge.

Rather to comprehend and apply existing one.

These help students to develop an organised and critical geographic perspective,

That promotes solution of problems, a basic element of geographic thought.



“STRUCTURED” SPACE

Didactic Process: Planning

Planning is the process involving the integration of spatially referenced data in a problem solving environment.

Maps or models constitute tools for facilitating geographic knowledge.



They formulate hypothesis and confirm the dynamic nature of space.



They allow students to devise graphic subterfuge to apply geographic prospects.



In examining the relationships of people, places and environment



Thus developing intellectual dexterities.



That allows them to move from absolute to relative and structured space.



Consequently conceptual maps shape and strengthen geographic thought.



“STRUCTURED” SPACE

Cognitive Process: **Applying**

- The cognitive process of **Applying** involves:
 - Forming **problem-solving** models.
 - Formulating **solutions** to problems.
 - Applying **geographic knowledge** in a practical manner to real life situations that exist around us.
- Geography students have to comprehend the **contents** of space, which can efficiently be provided by the appropriate use of **conceptual maps**.
- Conceptual maps or mathematical models are important tools in **spatial planning**, for they facilitate the development of geographic thought.



“STRUCTURED” SPACE

Geographic Process: Perspectives

- A geographic perspective is a **collective** (Geographer’s) point of view:
 - Interpreting the **significance** of space.
 - Interpreting the **meaning** of patterns processes and relationships.
 - Involving people, places and the environment.
- A geographic perspective is simply **a lens** through which geographers look at the world and can be used to **resolve** geographic problems.
- The **representation** of human experience that brings people places and the environment under the lens of cartography provides the means to **apply** the geographic perspectives.