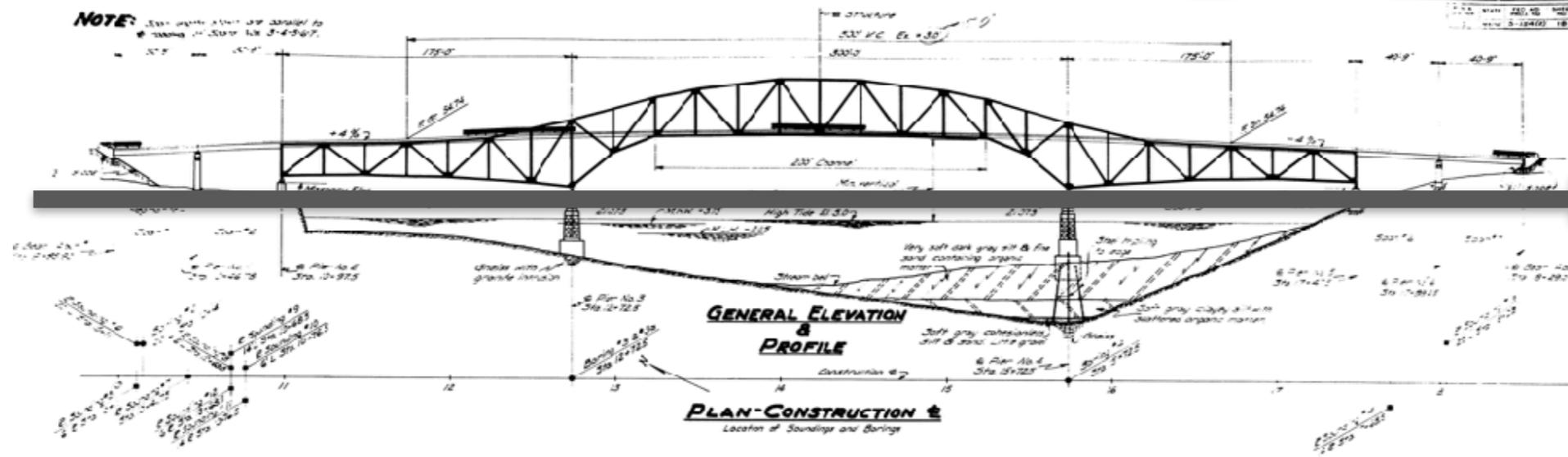


CS-411 : Digital Education & Learning Analytics

Chapter 4: Instructional Engineering



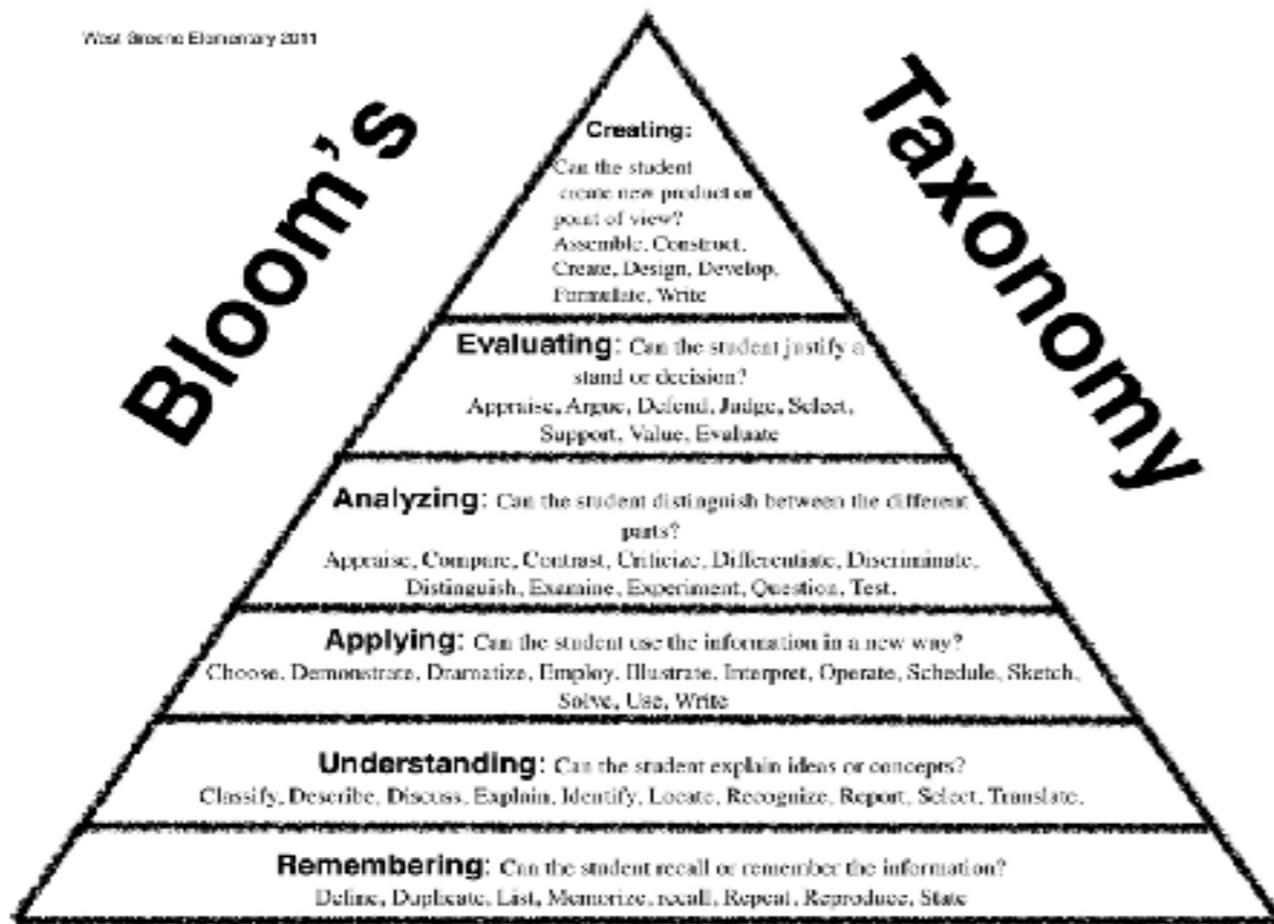
What should learners be able to do at the end ?

Pedagogical Objectives

Learning Goals

Learning Outcomes

What should learners be able to do at the end ?



Reproduction

Conceptualisation

Application

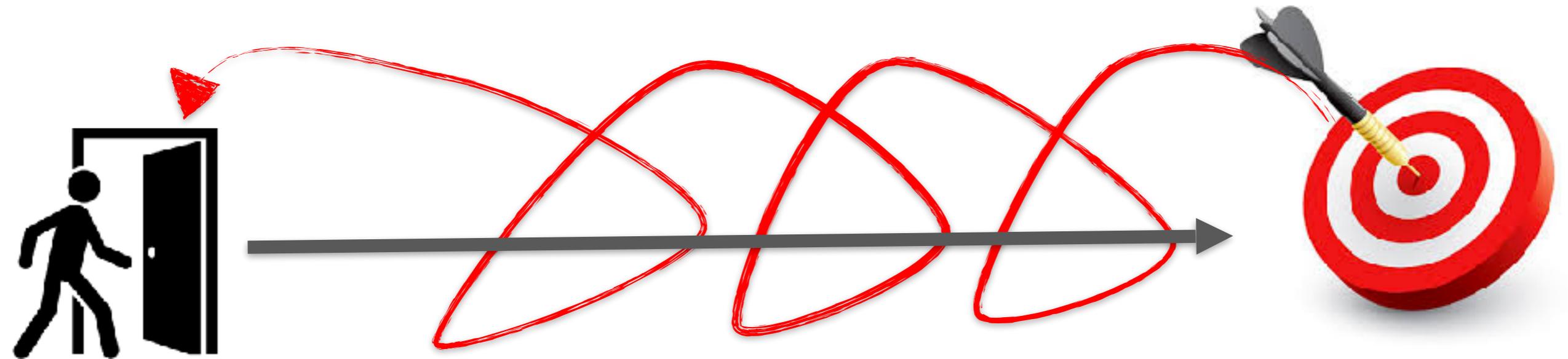
Exploration

Mobilisation

Problem solving

Pedagogical Objectives

Instructional design works backwards :



What are they able to do at the beginning

Pre-Requisites

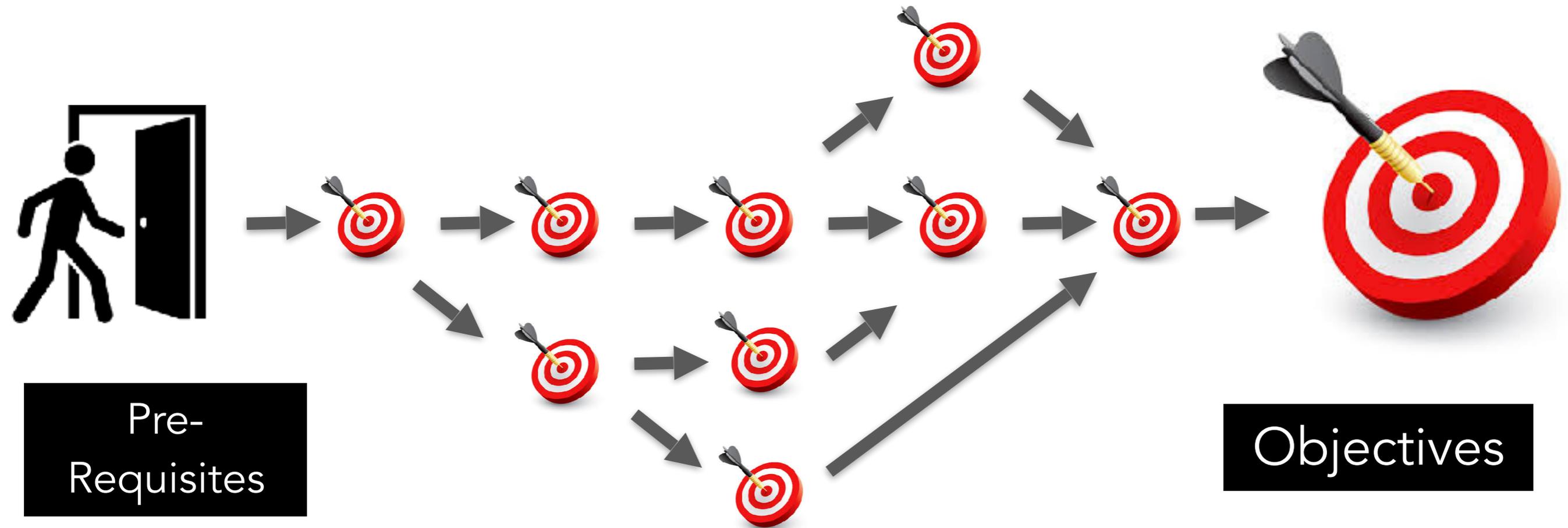
Pre-Representations

What should learners be able to do at the end ?

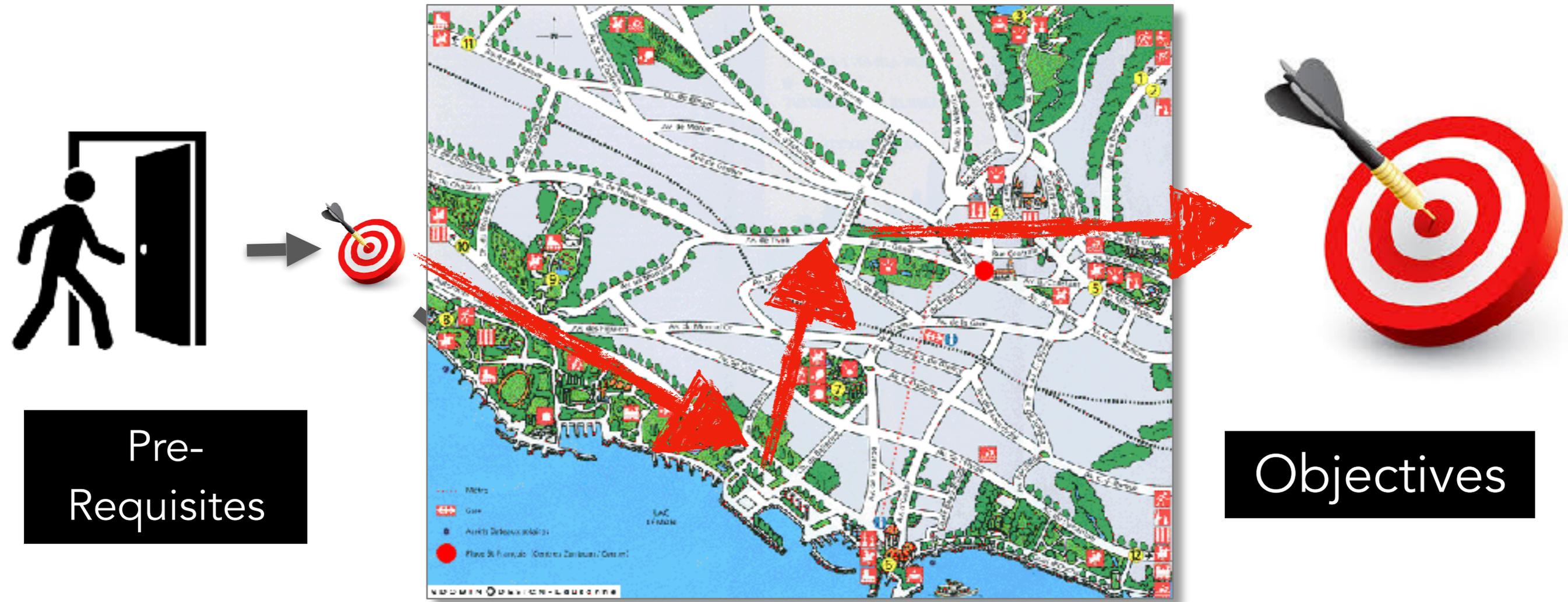
(which they could not do at the beginning)

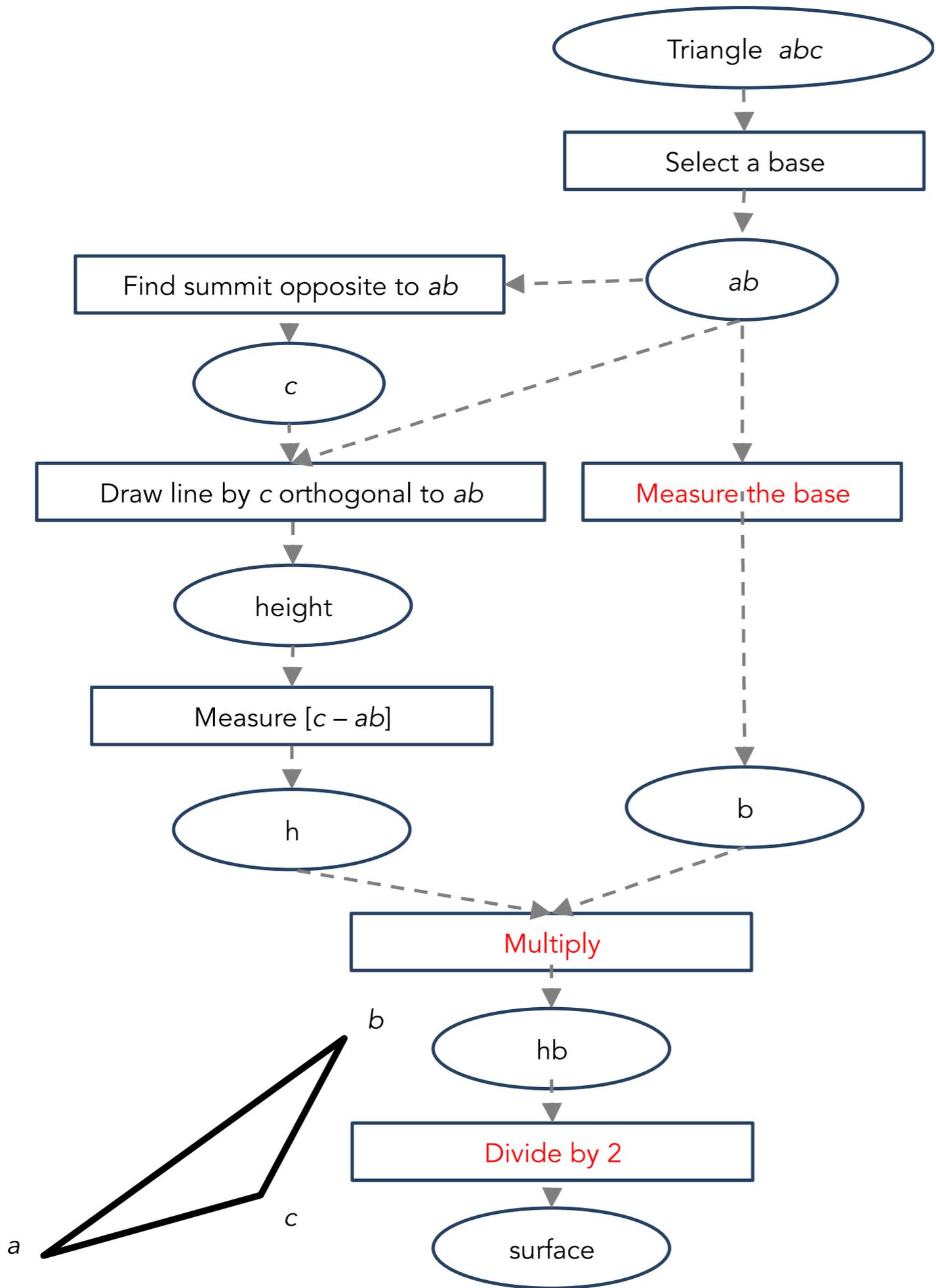
Objectives

Mastery learning



A map helps to draw (learning) paths ?

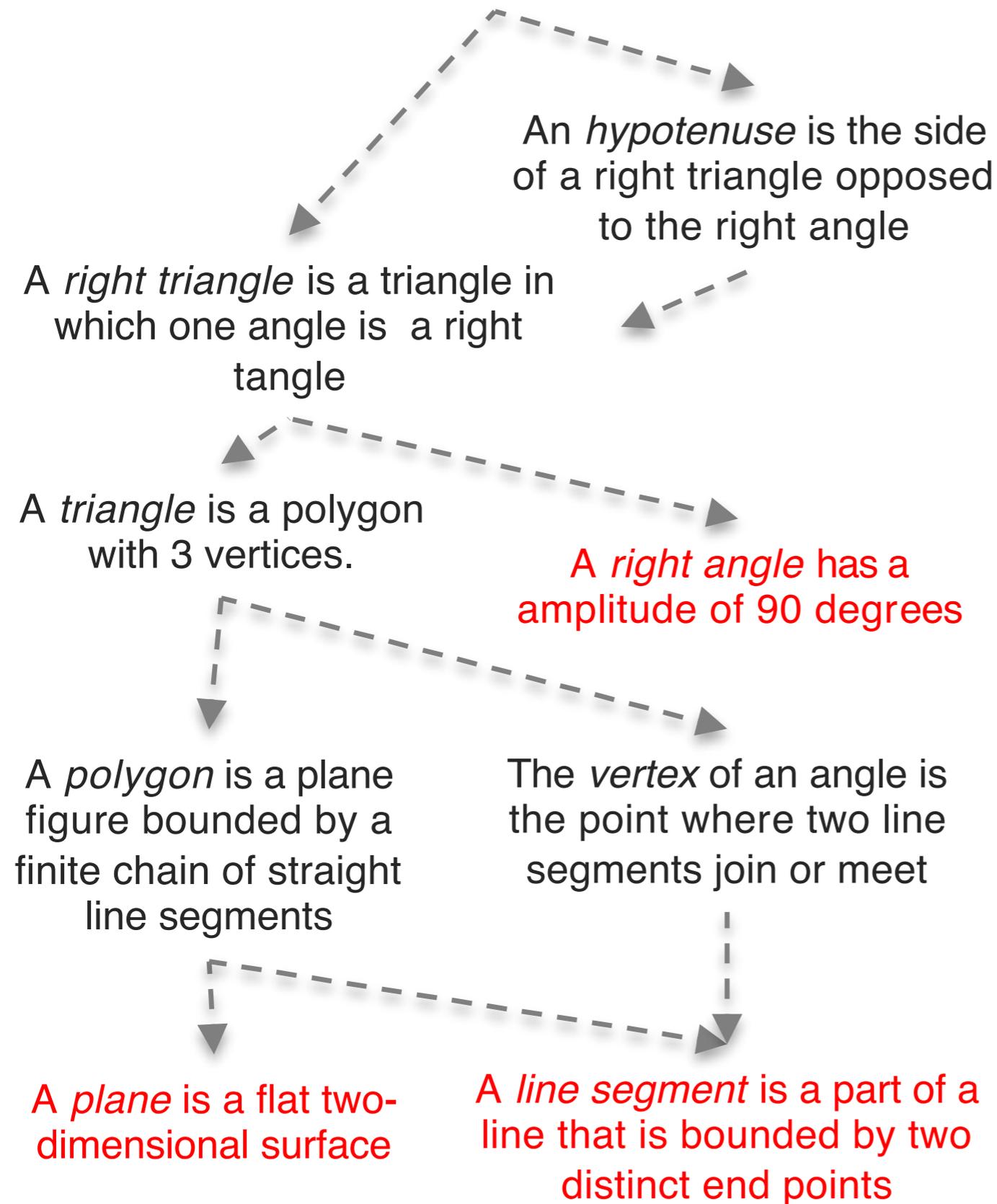




Content Analysis

(mathetic analysis)

In a right triangle, the square of the hypotenuse is the sum of square of the two other sides.

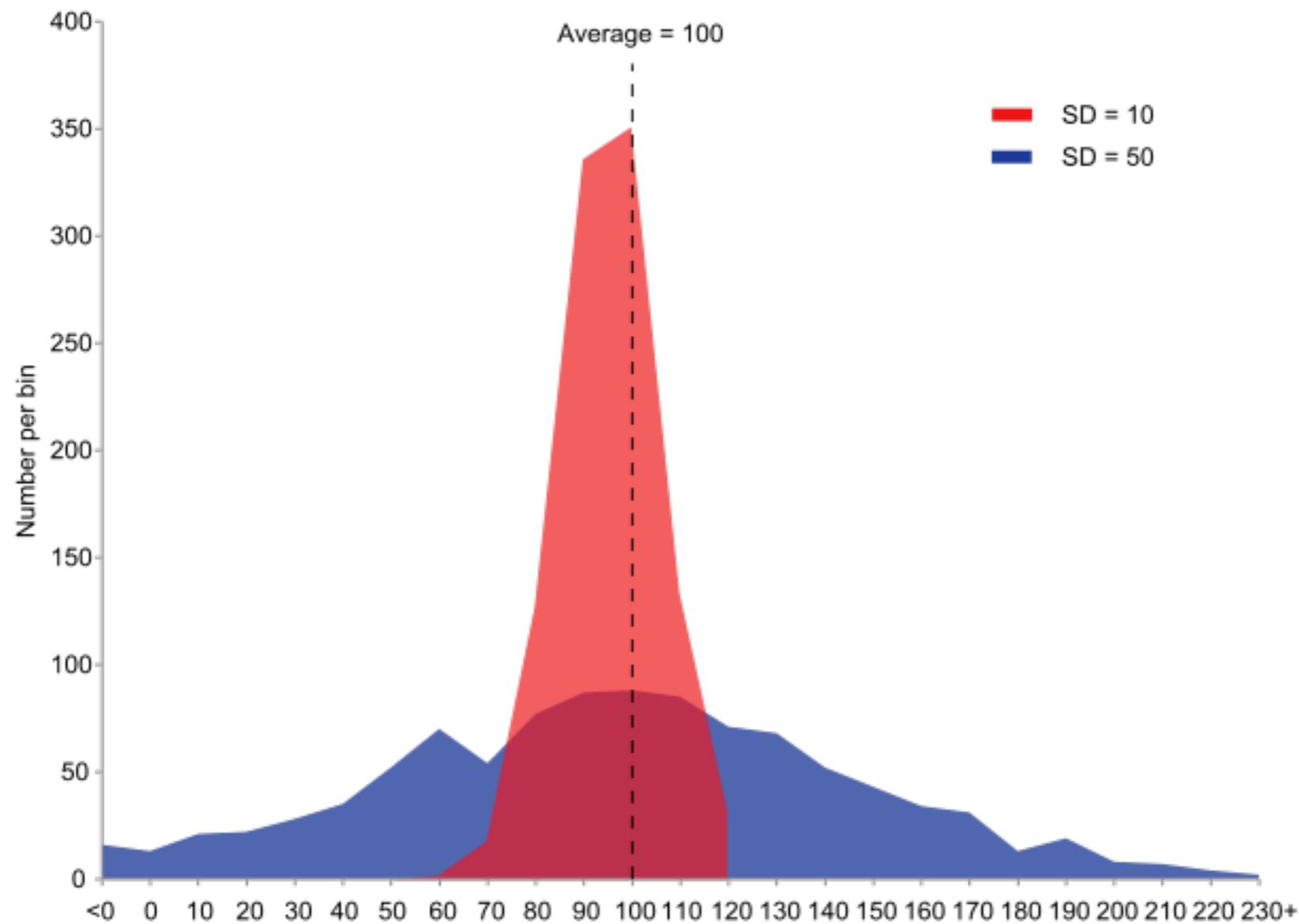


Content Analysis

(semantic analysis)

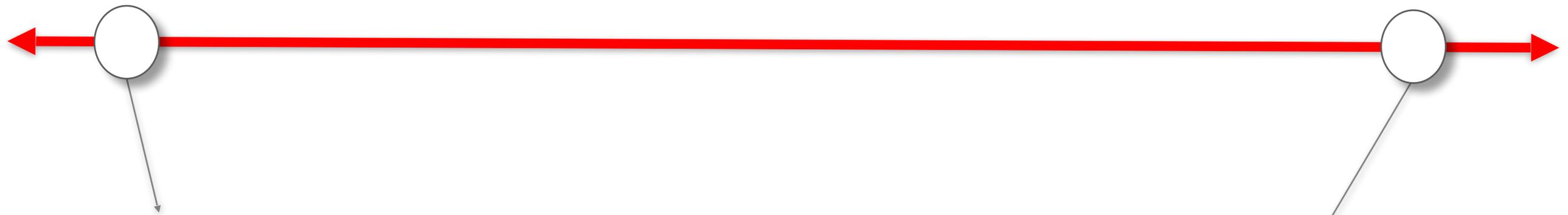
Exercise:

Do the content analysis of 'standard deviation'

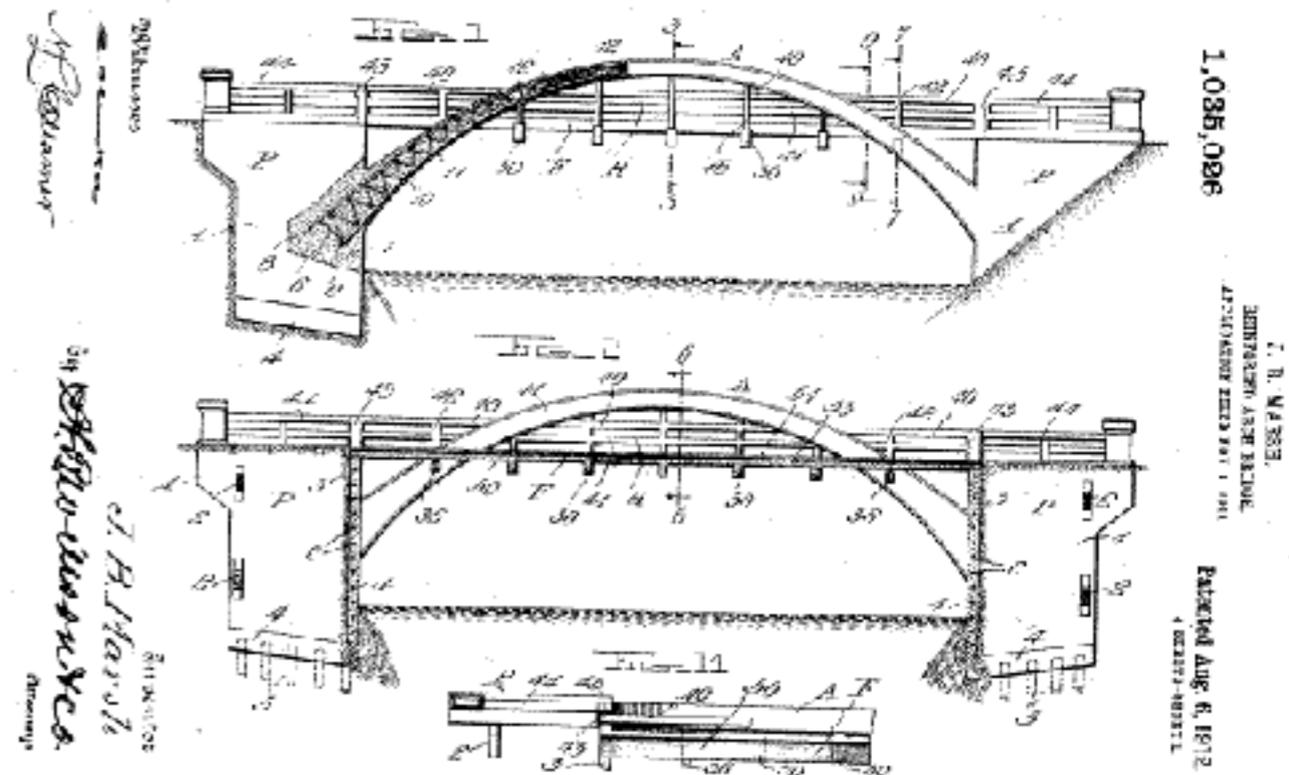


Instructional Engineering

Where is instructional design on this continuum ?



<https://www.pinterest.ch/explore/fashion-design-classes/>



https://en.wikipedia.org/wiki/File:Marsh_Reinforced_Arch.png

(3) Build the map (content analysis)



(2) Define pre-requisites

(1) Specify Objectives

PROJECT

Instructional design

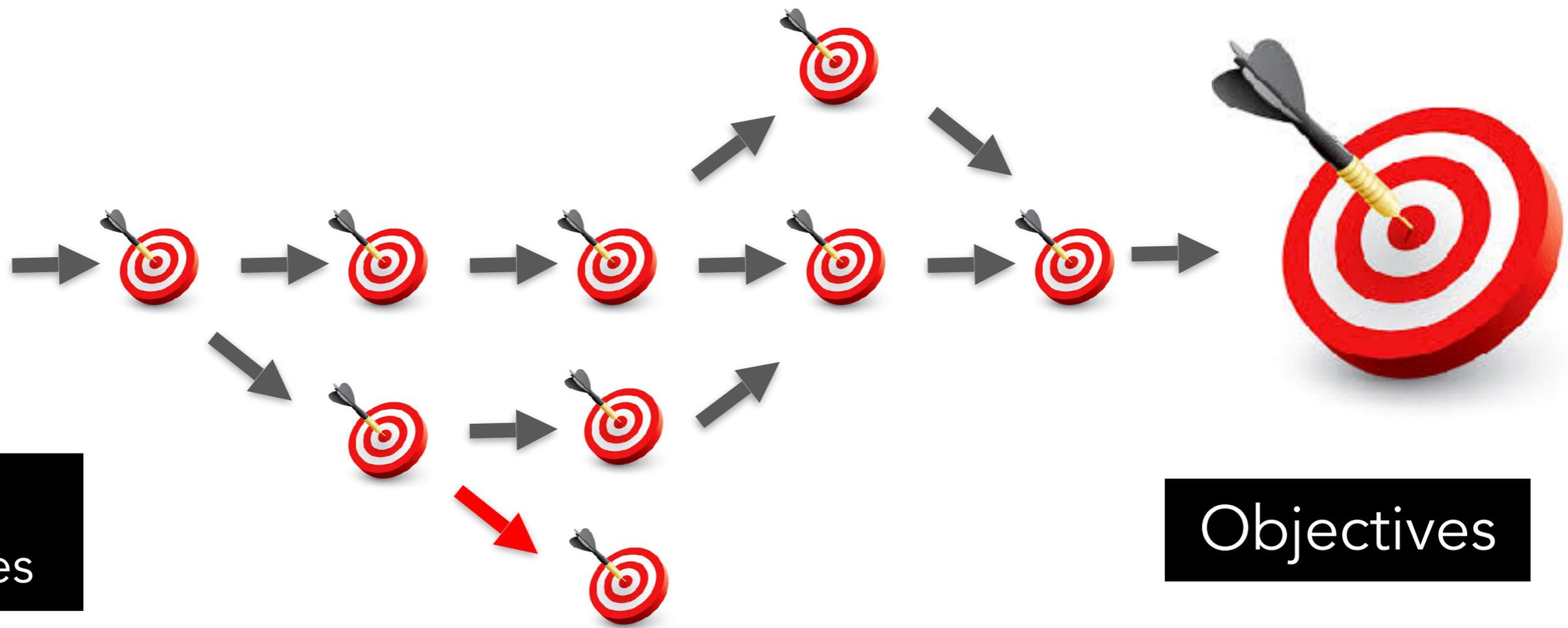
(1) Start from :

- Who are the learners (target audience) ?
- What should they be able to do at the end of the course ?
- How will you know they are able ? (*write the exam before the course*)
- Which kind of skill is that ? (\rightarrow *taxonomy of cognitive activities*)

(2) Then analyse contents:

- Decompose, disentangle, ...
- THINK² : think what students need to think to acquire the concept
- What are the pre-requisites ? Are they reasonable for this audience ?

(3) Chose the activities, sequence them as a scenario (NEXT PHASE)



- Pre-prerequisite
- Advance Organiser
- Shift representations
- Intrinsic/Extrinsic Representations
- Induction/Deduction
- Proceduralisation/Elicitation
- Transfer