



# Building a Common European Numeracy Framework

ALM Virtual Seminar  
Erasmus+ International Multiplier Event

Numeracy is a human activity  
Numeracy is functional and highly practical

## CENF

Common European Numeracy Framework



UNIVERSITY of LIMERICK  
OILSCOIL LUIMNIGH

# Building a Common European Numeracy Framework

- 20 minutes: background info + sneak preview CENF website (under construction)
- 20 minutes: break-out, opportunity to comment in padlet
- 10 minutes: wrapping up, PDMs at website, and call for action
- x minutes: Q&A

Partners



Co-funded by the  
Erasmus+ Programme  
of the European Union



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# Common European Numeracy Framework

- Erasmus+ project running from December 2018 - November 2021
- Project is addressing serious challenges in a societal transformation
- Outputs are a reference **framework** including **rubrics** and a set of **professional development modules**

It is not “our” framework.  
It builds on the shoulders of giants: ALL,  
IALS, PIAAC, ACER, OECD, UNESCO, ...  
It will be developed further by many.



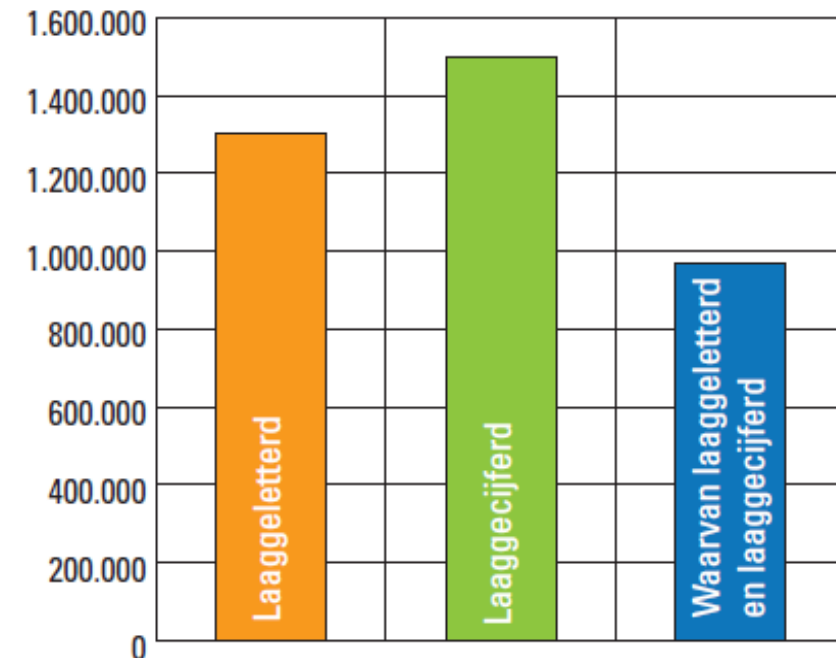
# Two serious challenges

Too many European citizens lack the necessary numeracy competencies to participate autonomously and effectively in our technologized and number-drenched society.....

- .... and consequently many citizens are overlooked for certain jobs and have problems in their daily life, dealing with the abundance of number-related issues (OECD, UNESCO, EU)
- Awareness of the importance of numeracy for personal empowerment and becoming a critical citizen.

- The amounts of citizen with low numeracy across Europe.

Absolute aantallen laaggeletterden en laaggecijferden



*Op basis van de beroepsbevolking in 2012: 10.992000 (CBS).  
Bron: Buisman e.a., 2013.*



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## Besmettingen



### Positieve testen

Aantal positief geteste mensen

**6.575** ↑ Waarde van 14 januari 2021



### Besmettelijke mensen

Aantal besmettelijke mensen

**140.833** ↓ Waarde van 31 december 2020



### Reproductiegetal

Meest recente reproductiegetal

**0,95** ↑ Waarde van 25 december 2020



### Sterfte

Gemeld aantal personen overleden aan COVID-19 per dag

**89** Waarde van 14 januari 2021

## Verdeling positief geteste mensen in Nederland

Deze kaarten laten zien van hoeveel mensen gisteren is gemeld dat ze positief getest zijn op COVID-19, per 100.000 inwoners.

Per gemeente

Per veiligheidsregio

### Aantal per 100.000 inwoners



Waarde van donderdag 14 januari · Bron: [RIVM](#)

# Developing the CENF in Erasmus+

- Policy input
  - The **2019 European Numeracy Survey** across Europe (UL, Ireland)
  - Personal en professional networks around adult numeracy education
- Theoretical input
  - **Systematic Literature Review** on Numeracy (UB, Spain)
  - Existing supranational frameworks
    - PIAAC (1st and 2nd cycle), PISA, IALS, ALL
    - Principles and Standards (NCTM, USA)
    - ACARA, Australia
- Empirical Input
  - **Professional development modules and trials** (BFI, Austria)

IO2/4

IO1

IO5/6

IO3

**CENF**  
Common European Numeracy Framework

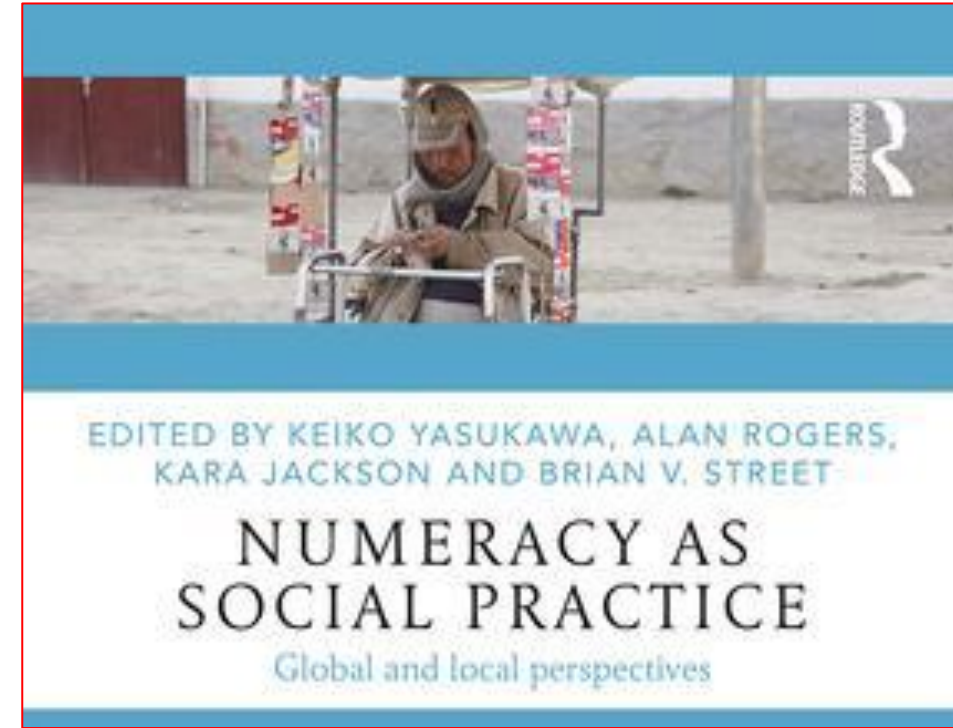


# Numeracy as social practice (NSP)

Conceptually inspired by:

- Situated cognition
- Cultural-historical activity theory (CHAT)
- Literacy as social practice (LSP)
- Ethnomathematics

“... **aggregate** of skills, knowledge, beliefs, dispositions, habits of mind, communication capabilities, and problem-solving skills that individuals need in order to **autonomously engage and effectively manage** numeracy situations that involve numbers, quantitative or quantifiable information, or visual or textual information that is based on mathematical ideas or has embedded mathematical elements”. (See Gall, 2000, p.6)

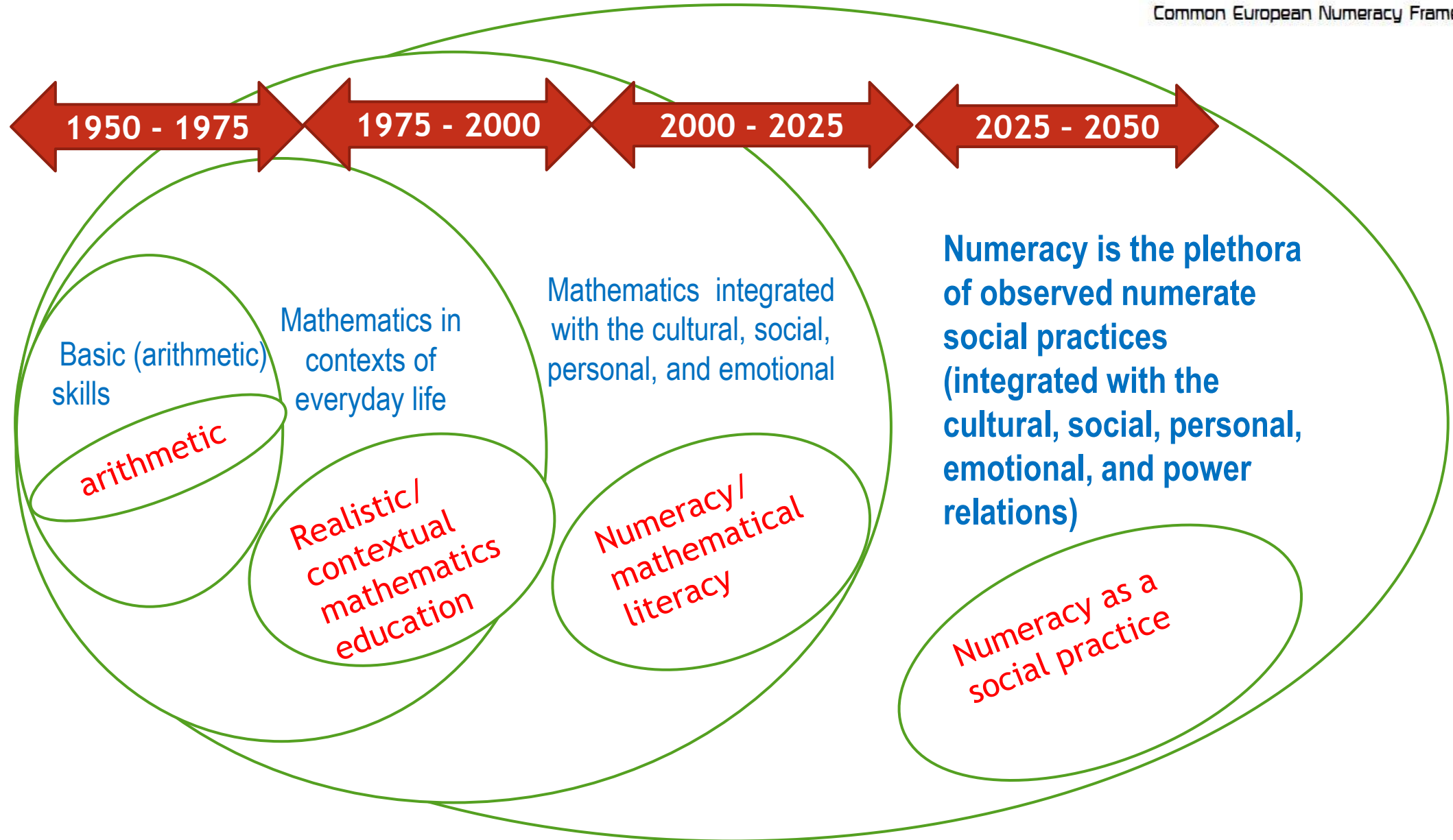


(See Yasukawa et al., 2018)

“A **social practice view of numeracy** not only takes into account the different contexts in which numeracy is practised, such as school, college, work and home, but also how people’s life and histories, goals, values and attitudes will influence the way they carry out numeracy”.

(See Oughton, 2013)

# Numeracy conceptual development





$1 \frac{3}{4} \times 7 \frac{1}{5} =$



 [Alle](#)

 [Shopping](#)

 [Afbeeldingen](#)

 [Nieuws](#)

 [Video's](#)

 [Meer](#)

[Instellingen](#)

[Tools](#)


Ongeveer 1.460.000.000 resultaten (0,87 seconden)



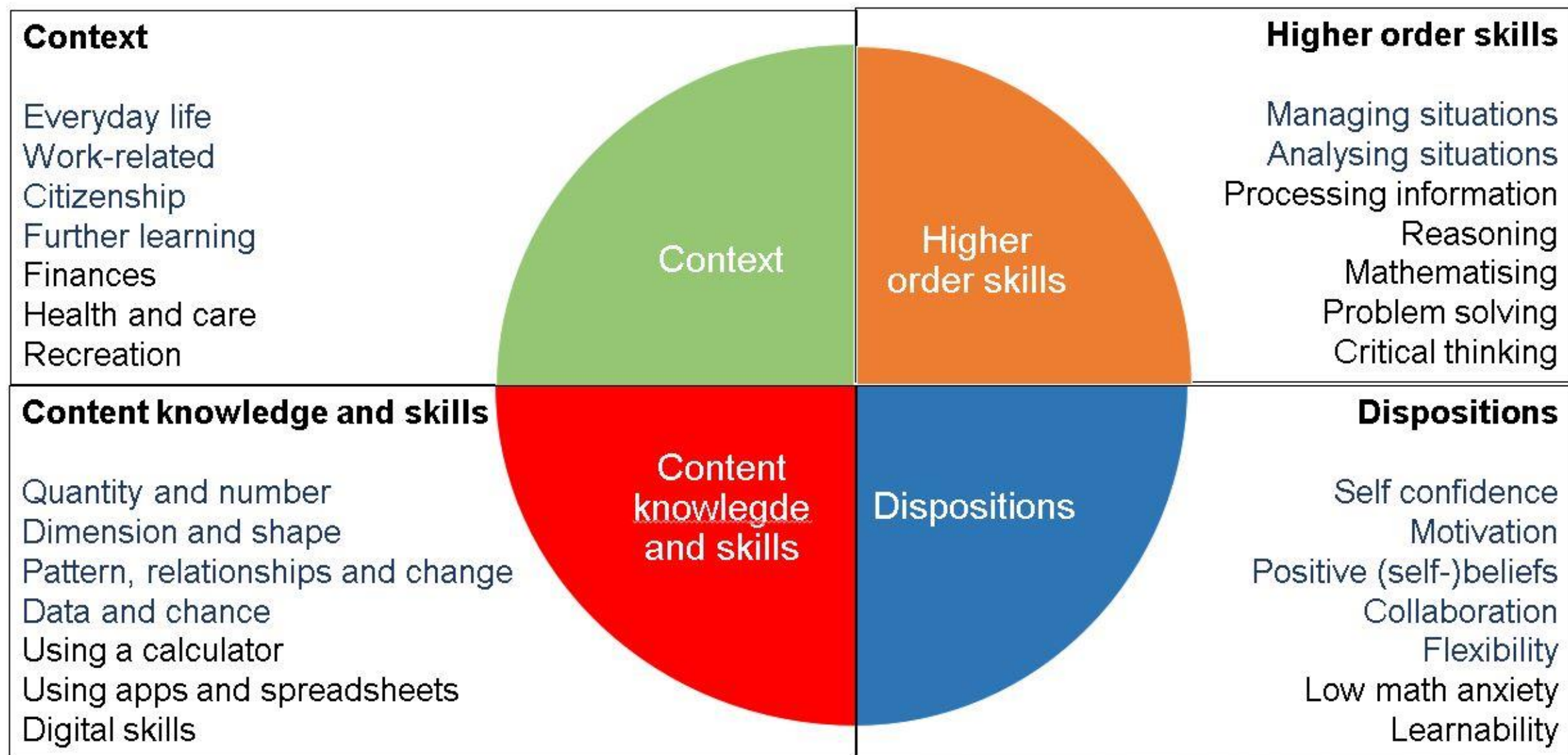
$(1 \frac{3}{4}) \times (7 \frac{1}{5}) =$

12.6

# Implications for a framework

- Many aspects , multifaceted, multidimensional
  - Implies using cognitive and psychological **aspects**
  - Implies individuals have specific multidimensional profiles
  - implies describing behaviour in a “valued system”
- **Levels** 
  - to define progress as a result of educational interventions
  - to categorise job requirements
  - to categorise assessment items
  - to connect to (psychological) scales
  - ....

# What matters to improve numerate behaviour

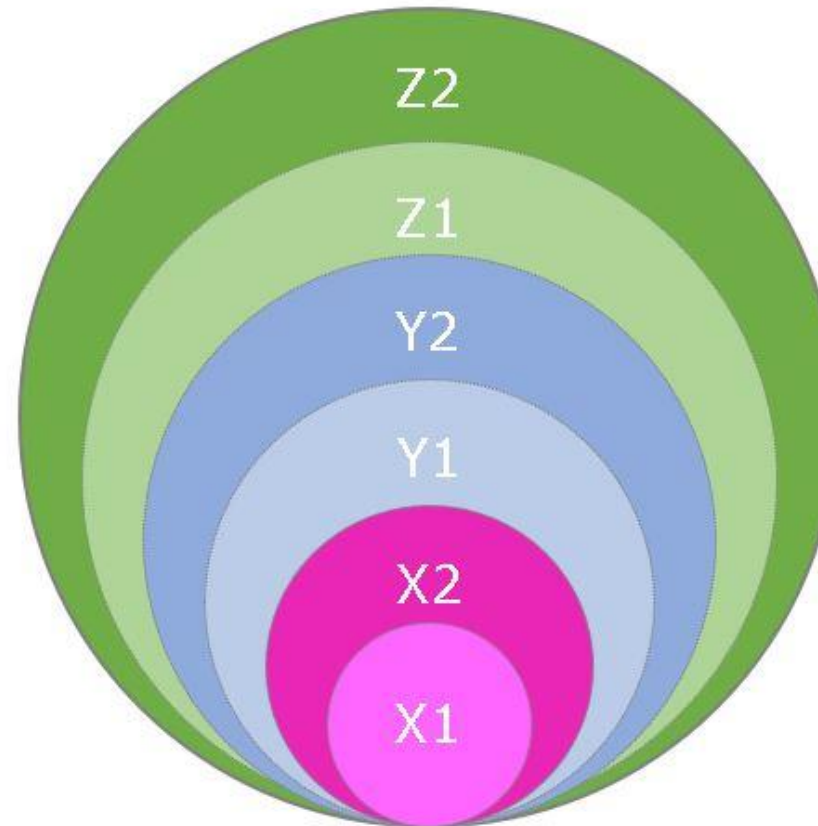


# Overall levels (= categories $\neq$ thresholds)

**Z**  
Specialized  
societal and  
work situations

**Y**  
Societal and  
regular work  
situations

**X**  
Daily-life  
situations



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- [Link to the website](#)



Common European Numeracy Framework

## Common European Numeracy Framework

Numeracy into the 21st century

CENF

Aspects

Rubrics ▾

Survey

Lit. review

PDM ▾

Pilots PD

About

# CENF

## This is an Erasmus+ project

In the Erasmus+ project Common European Numeracy Framework the aim is to design a comprehensive numeracy framework to identify key factors in improving the quality of numerate behaviour of individuals. HU University of Applied Sciences Utrecht, The Netherlands, is in charge of the project and works closely together with project partners BFI-OÖ, Linz, Austria, University of Barcelona, Spain, and University of Limerick, Ireland. The complete framework will be published in autumn 2021.



+ Introduction

+ Rationale

+ Project outputs



With the support of the  
Erasmus+ programme  
of the European Union

Search ...



Under construction

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### Project Partners

HU University of Applied Sciences  
Utrecht, The Netherlands

BFI-OÖ, Linz, Austria

University of Barcelona, Spain

University of Limerick, Ireland

Sneak preview

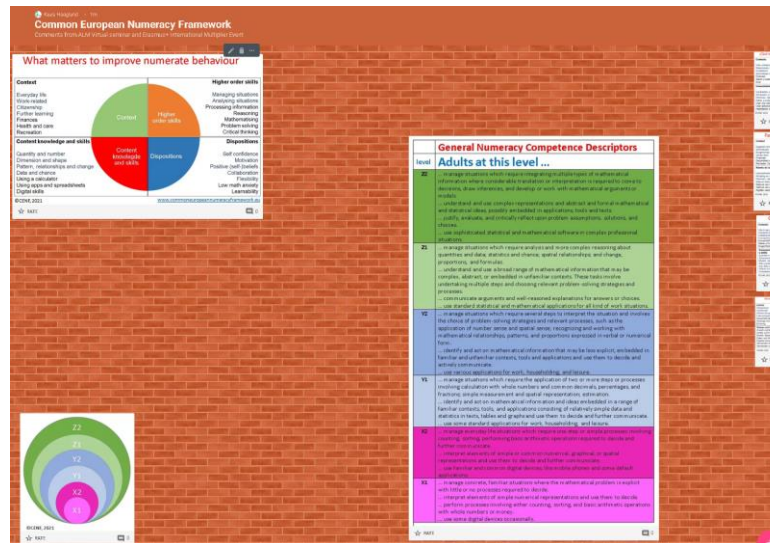
Heavily under construction

Delivery date October 2021

# Break out rooms

20 minutes

- Discussion points:
  - Which Higher Order Skills are most relevant for numerate behaviour?
  - Which Dispositions are most relevant to numerate behaviour?
  - Any other suggestion or remark are very welcome
- Padlet to give comments: [https://padlet.com/kees\\_hoogland/e246lwzm3w652l6c](https://padlet.com/kees_hoogland/e246lwzm3w652l6c)
- Just click on the wall and start writing (optional, please, add your name)
- Alternative: Put suggestions and remarks in the chat after return to plenary



# Common European Numeracy Framework

It is:

- Aspects which matter for numerate behaviour
- Rubrics with descriptions of numerate behaviour
- Suggested measuring tools, when available
- Input for professionals development courses

**Aim:**

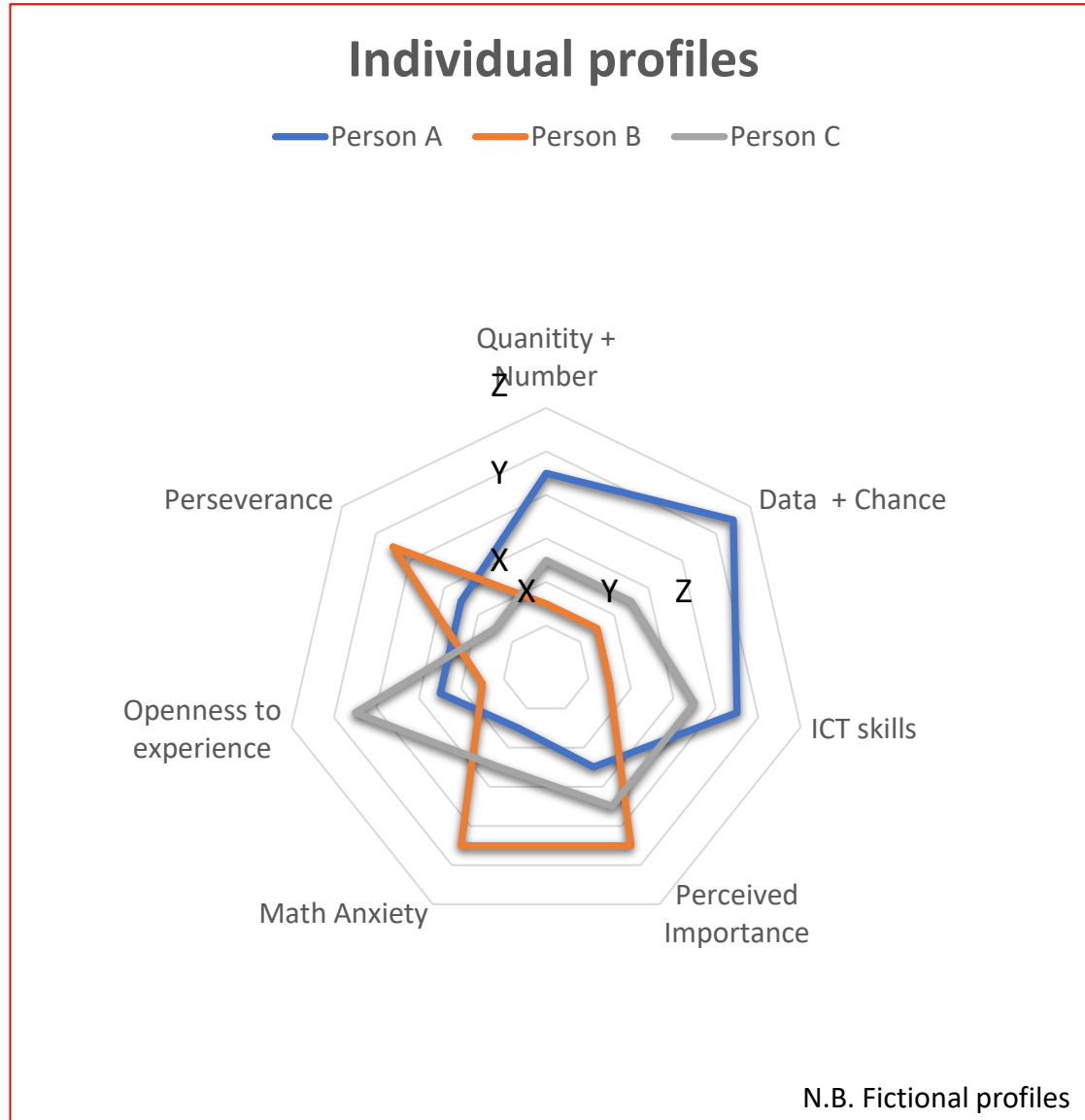
**CENF as a reference framework**

It is not:

- A curriculum
- A programme
- A course



# Individual multidimensional profiles



## Content

- Quantity + Number
- Space + Shape
- Relationship + Change
- Data + Chance

## Other Skills

- ICT skills

## Attitude

- Enjoyment
- Perceived importance
- Intrinsic value
- Usefulness
- Confidence in learning
- Math Anxiety

## Personality

- Openness to experience
- Conscientiousness
- Perseverance

For each aspect sources are mentioned for “measuring” tools: tests, observations, portfolio proofs, self-evaluations, ....



# Professional development modules

+ Challenges of the 21st century

+ Aspects of Numeracy

+ Prior knowledge (Teachers and Participants)

+ Modeling problems in everyday life

+ Analysing situations

+ Managing situations

+ Reasoning

+ Problem Solving

+ Further Learning

+ Motivation and affection

+ Math anxiety

+ Vulnerable groups

Set up:

- Introduction
- Relation to CENF
- Key issues
- Suggestion for PDM meetings
- Self study
- Resources
- Literature / References

# Call for action

- A. to work on **awareness** of the important role **numeracy** plays for the inclusion and wellbeing of European citizens by outreach activities using the CENF.
- B. to **enhance the quality and quantity of adult numeracy education** (in formal and informal settings) by using and piloting the CENF and the accompanying professional development modules.
- C. to further **validate** and **enhance** the Common European Numeracy Framework (CENF).

# End of presentation

For information, collaboration, and  
comments, please contact Kees Hoogland  
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<https://www.gecijferdheid.nl/kees-hoogland-appointed-professor-of-mathematical-and-analytical-competences-of-professionals/?lang=en>

- Programme manager of Erasmus+ project: Common European Numeracy Framework
- Member of the OECD - Numeracy Expert Group - PIAAC 2nd cycle
- Trustee of Adults Learning Mathematics – A research Forum
- Fellow of the International Society for Design and Development in Education
- Chair of the Thematic Working Group - Adult Mathematics Education - at CERME 12 (Bolzano, Italy, 2-6 February 2022)

Just published:

- ALM: key-note <https://www.gecijferdheid.nl/adult-numeracy-practices-imperative-implications-for-education/>
- Springer: National Reflections on the Netherlands Didactics of Mathematics: <https://link.springer.com/book/10.1007/978-3-030-33824-4>
- ZDM: "Computer-based assessment of mathematics into the twenty-first century: pressures and tensions" <https://rdcu.be/Oz4e>