Situation: STREET MATH:

NAVIGATING NUMERACY IN TRAFFIC

Whether you're on foot, by bike, on the bus or in your own car, they're omnipresent on the roads: numbers, figures, shapes, and pictograms that you not only have to see, but also understand at lightning speed.

In this example, we focus on the symbolism at the side of the road, because understanding and correctly interpreting road signs and instructions is an essential skill in our everyday mobility.

Overview "STREET MATH"

How to understand the numbers and symbols on the roads

Context
Everyday life
Citizenship

Cognitive processes
Managing situations
Analysing situations
Problem solving

Target group (incl. necessary prior skills and competences)

Adults and young adults (no prior skills requested)

Content
Quantity and number
Dimension and shape

Dispositions
Self-confidence
Math difficulties
collaboration

Outcomes and results

Learners analyse and understand numeracy information in the streets.

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

Main information

Content	Perceiving numbers and data in one's surrounding (in the streets), with special focus on street signs
Target group	Adults and young adults willing to perceive their everyday life and surrounding with numeracy eyes
Learning intention	What is the intention of adults to face this problem? – Numeracy for personal and private purposes – Numeracy to understand society
Duration	Approx. 3 lessons
Material and resources	Camera or smartphone Computer, Internet Padlet or similar app Handout
Group size	Range from 7 to 15 learners
Problem statement	Adult learners encounter difficulties in effectively exploring and processing numerical information from road signs. This may stem from inadequate skills in handling numerical data or a lack of familiarity with the specific codes and symbols present on the signs. Addressing this issue requires a targeted intervention to enhance learners' competencies in dealing with numerical information and strengthen their ability to interpret relevant data for safe navigation in traffic.
Working questions	Do learners discover numerical information in everyday life? Can learners interpret the information they discover correctly? Are the learners able to order the numbers according to size? Do learners recognize geometric figures from street signs and form corresponding analogies?
Learning outcomes and results	The learners interpret numerical information in everyday life, as well as geometric figures on street signs. Learners develop awareness of numerical information in their personal environment and process it accordingly.

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

Working plan

Time (lessons)	Description of content/activities	Material	Methodical and didactic information[1]
30 min	**Activation: Walk of numbers** Take a walk with the learners with the task of photographing street signs or signs at the side of the road, especially those with numbers on them, using a smartphone or a camera.	Smartphone or camera	Putting the learners in a mathematical situation
30 min	**Activity 1: Collection of photos** The photos taken by the learners are collected collaboratively by the teacher or the learners themselves (depending on the digital skills of the learners), for example with Padlet or with a shared digital whiteboard. A dialog on the images shown is conducted: • What kind of photos are there? • What kind of numbers are there? • Do you understand the meaning of all these numbers? • Do you know other street signs with numbers on? • … It absolutely depends on the level of numeracy and the prior skills of the learners what further processing takes place with this data and information. Just to give an example: It can be a matter of	Computer and Internet App (Padlet e.g.) Collection of photos taken in the phase of activation (see appendix 1 for an example)	Collaborative learning Hands on learning Questioning Individualiza-tion (within the group of learners)

[1] for description and explanation of kinds of tasks, HITs and other background information please consult the teachers' guide

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

	arranging numbers in the 100 number range (house numbers, speed limits, etc.), or a closer examination of percentages of gradients or slopes.		
30 min	**Activity 2 (optional): Geometry of street signs** The street signs can also be organized by the learner in terms of their geometric shapes in a further exercise and the corresponding terms (rectangular, triangular, octagonal, round) can be introduced or repeated. At this point, the learning group can also hypothesize what effect the shape of a road sign can have on the meaning.	Handout or presentation with geometric shapes and their names (see appendix 2) Photos of street signs from above or from the Internet	Collaborative learning questioning
Indiv.	**Transfer** Learners are asked to bring at least 5 photos with numerical information from their personal everyday life by the next day of class. These will be processed according to the knowledge and interests of the learners as described above.	Smartphone	Hands on learning Questioning Collaborative learning

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

Suggestions for the teacher

The example presented here should be considered as exemplary and inspirational material presenting a guideline with a high range of possibilities of adapting those suggestions to a specific group of learners or an individual learner with his or her very personal requirements.

In concrete terms, the example STREET MATH could be adapted these ways:

- Duration: If there is not enough time or opportunity for the activating walk, pictures can be collected from the Internet or from the learners' wealth of experience instead. However, it should be noted that this phase of recognizing numeracy in everyday life is very valuable for learners.
- Individualization: If a group represents different subgroups of numeracy competences, it can be fruitful to form two or more groups with different tasks, e.g. one group in charge of numbers and another group in charge of the geometric shape of street signs. As a result, the learners become experts in their respective tasks and share their results with their colleagues in a short summary presentation.
- Level of difficulty: Like described above, the level of difficulty can be adjusted to the group or subgroups of learners by proposing different tasks for processing the photos taken, e.g. arranging numbers in the 100 number range (house numbers, speed limits, etc.), or either a closer examination of percentages of gradients or slopes.

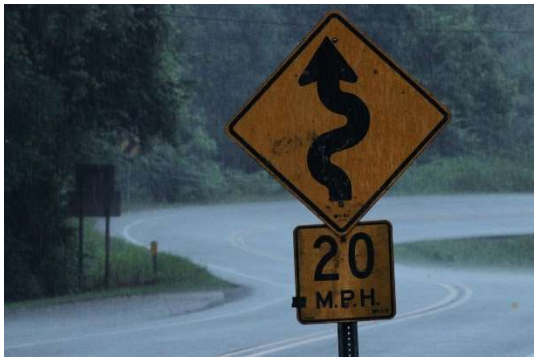
Our educational activities aim at numeracy skills being not only memorized, but first of all being practiced and functionally used by the learners in daily life or/and vocational situations. It is therefore recommended to implement the idea of HITS[2] (higher impacts of teaching skills) as far and often as possible: ...

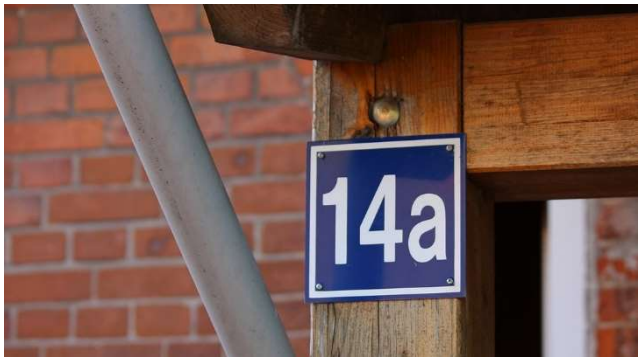
- ... work with concrete and authentic material that learners will recognize from everyday life situations. If we train learners' eyes with simple exercises such as the activation walk to be aware of numbers in our everyday lives, we help them to understand the importance of numeracy in all our lives.
- ... ask the learners questions and let them raise questions themselves. It can be crucial to discuss numeracy themes, contexts and numbers.
- ... think of possible ways of transfer: encourage learners to be aware of numbers in their everyday lives and to engage with them: on the bus, when shopping, at the hairdresser, etc.

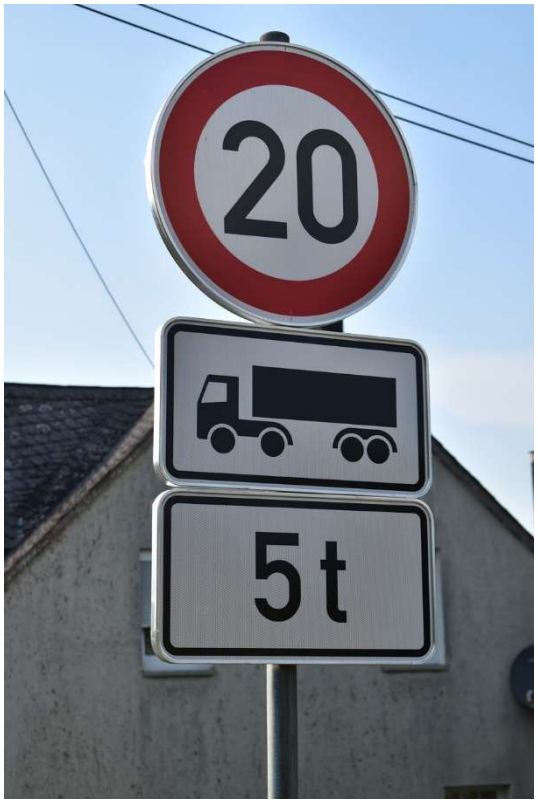
[2] For general information and explanation on HITS please see (link)

Appendix

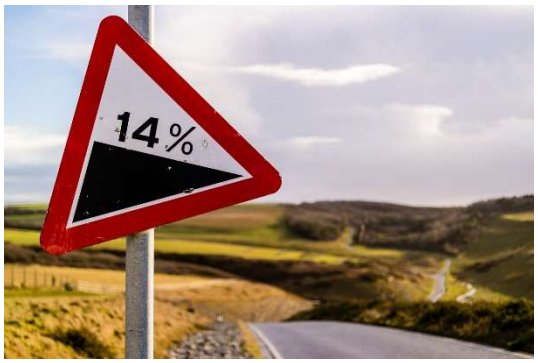
Appendix 1: Possible photos taken during the "walk of numbers"

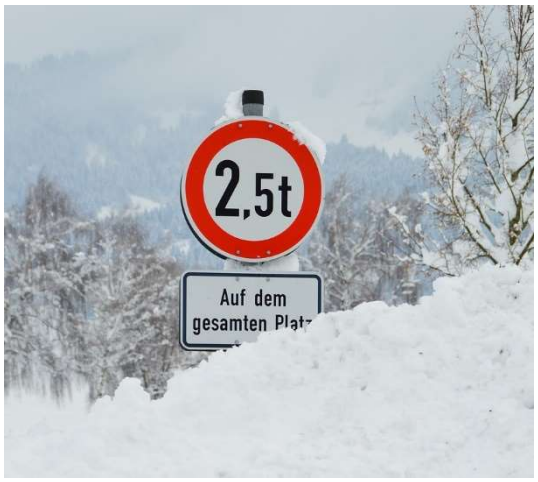


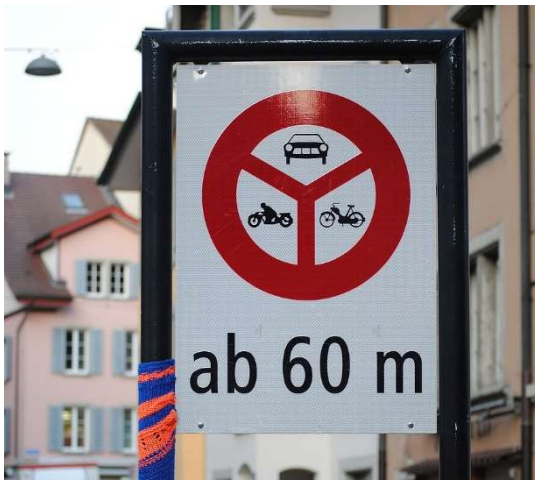


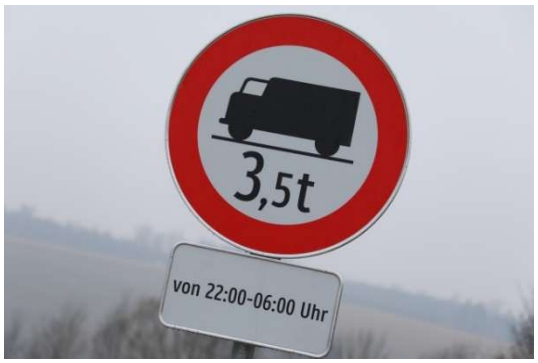


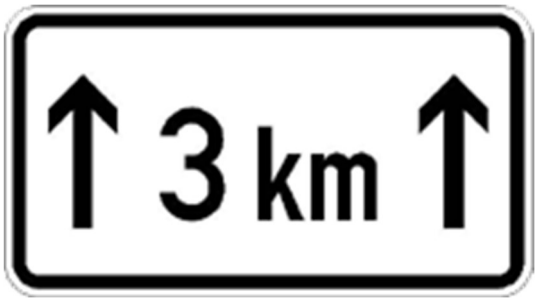
Co-funded by the
Erasmus+ Programme
of the European Union











Source: www.pixabay.com [20.11.2023]

Appendix 2: Geometry of street signs

Geometry of street signs

What shape are the signs on our roads?

Try to match the photographed examples and comment on the characteristics of the individual shapes.

Do the colors of the signs have a general meaning?

Formulate hypotheses.

Source of pictures: www.pixabay.com [21.11.2023]

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