Cooking for less than € 1

Does that pay off?

You spend a lot of money on groceries but still, you often don't know what to cook for your family without even higher costs. Then, you step over some recipes, e.g. from Swedish Nutritionist Hanna Olvenmark, that make sustainable eating possible – for less than one euro per portion! And the best: All these dishes shall be easily and quickly prepared!

Now you're curious: Is it really possible to cook those dishes for less than € 1? You want to and will try out!

Overview "Cooking for less than € 1 – does that pay off?"

How to find out if it is possible to cook those dishes for less than € 1?

Context
Everyday life
Finances

Cognitive processes
Analysing situations
Processing information
Problem solving

Target group (incl. necessary prior skills and competences)

Adults with an affinity for cooking

X2

Content
Quantity and number
pattern, relationship, and change
Multiplication and division
Equivalences
Decimal numbers

Dispositions
Self-confidence
(Experience and routine)
Affection
(Curiosity, Motivation)
Collaborations

Outcomes and results

Model (What needs to be done to answer the question?)
Design a scheme to calculate the cost per portion
An answer to the question posed

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Main information

Content	Natural numbers Number range up to 1000 Units of measurement, quantities (weight, money)
Target group	Adults with an affinity for cooking Learners ▪ recognise and understand simple, common quantitative representations and use the information to make decisions ▪ cope with one-step, simple operations such as counting, performing basic arithmetic operations to cope with everyday situations
Learning intention	Calculating for personal and private purposes
Duration	3 UE +
Material and resources	4 recipes (see appendix 1) Picture cards - ingredients (see appendix 2) Symbol cards (see appendix 3)
Group size	from 7 to 12 learners / small group work: 2 to 3 learners
Problem statement	The current inflation is forcing many people to be even more conscious with the money at their disposal and to calculate more tightly. Advice and savings tips are booming. Does it pay to check them out?
Working questions	How to link to learners' experiences and prior knowledge? How can learners be brought into a mathematical situation and identify (mathematical) problems in a situation? How can learners be supported in planning and carrying out a problem-solving process? How can adults learn to compare, check and, if necessary, adapt results and ways of solving problems?
Learning outcomes and results	Learners recognize mathematical information in a text. They represent a real everyday situation as a model. They represent a multi-step solution process step by step. They understand the concepts underlying basic arithmetic. They move in the number range up to 1000 and compare and order numbers (more, less - larger, smaller).

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Working plan

Time (lessons)	Description of content/activities	Material	Methodical and didactic information[1]
60`+	<u>1. Discover: Cognitive activation</u> Which of the dishes would you like to cook? Choose.	<u>Handouts</u> 4 cooking recipes picture cards (ingredients) – see appendix 1 and 2	investigate text, information and vocabulary
10 ' - 20' followed by presentation	<u>2. Devise: Modelling 1</u> The world of things Cooking for € 1,- per portion - Does that pay off? What do you think? How can you check this? Open situation - Investigation task Imagine the situation. What has to be done until you can start cooking? Present your considerations in a model. Numbers do not play a role here yet! Use the materials available. Presentation / discussion of the proposed solutions and the individual assumptions behind them. Feedback	Symbol cards – see appendix 3 Flemo materials	*hands on learning* *Working in small groups* *HITS* *Metacognitive strategies, Questioning, Collaborative learning*

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

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40′ followed by presentation, discussion	<u>3. Develop: Modelling 2</u> **Numerate challenge** **Open problem task** What is the question? What numbers do you find in the recipe? What do they mean in context? What calculations do you need to make? What other information do you need? Place the matching cards with the known numbers in the corresponding place in your initial model. Which numerical information is still missing for you and where? Mark these places. Which calculation would you do in which place. Put the appropriate cards (+, -, x, :) in the corresponding place. Where do you get intermediate results? Put in cards for meaningful intermediate results. **Presentation / discussion of the proposed solutions and the individual assumptions behind them. Feedback**	Symbol cards with numbers, units of measurement and symbols for arithmetic operations (from the recipe) – see appendix 3 flemo material (see appendix 4)	**investigate numbers, calculation paths, hands on learning,** ***Working in small groups*** **HITS** Questioning, Explicite teaching, Worked examples, Differentiated teaching
up to several hours	<u>4. Defend:</u> **The calculation demotask** Where does the calculation start? What are the steps for the calculation? What do you have to calculate at each step? Write down intermediate results on blank cards. What final result do you get? **Presentation / discussion of the proposed solutions and the individual assumptions behind them. Feedback**	Forms, calculator, picture cards, Cuisenaire rods (see appendix 5), Worksheets (see appendix 6)	**HITS:** Differentiated teaching, explicit teaching, instructional routines worked examples (I do, we do, you do)
	Transfer Questions arising from everyday life where numbers play a role Text information, where numbers are located		

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Suggestions for the teacher

This task focuses on modelling as a general competence of mathematical work. It is about establishing a relationship between everyday situations and mathematics. When adults stumble upon mathematical problems in everyday life, they usually want to investigate and cope with a concrete life situation or task. They are first faced with the task of forming an image, of constructing a thought model. Concepts such as Realistic Maths, Investigation Maths, Inquiry Maths Pedagogy are particularly dedicated to this aspect.

The challenge for learners is certainly to gain a routine in translating an everyday problem into the language of mathematics and to process and solve it by mathematical means. Some will progress faster; some will need more time. Therefore, it is advisable to use such tasks from time to time.

HITS worth of special consideration for this type of task

Structuring lessons

As this task is initially an open investigation task, which should make visible which (numerical) facts can be found in an everyday problem, the sequence of 4 phases has proven itself: Discover - Devise - Develop - Defend and should also be used for similar tasks. So, routines in dealing with tasks - guided by a question, with ambiguities that have to be negotiated, mathematical reasoning required to address the problem and justify a proposed solution (in our opinion, the DNA of numeracy and solving numerical problems in daily life) - are established.

While in phase 2 (Devise) the task should be worked on as independently as possible by the learners in small groups, in phase 3 (Develop) and phase 4 (Defend) the use of elements of explicit teaching (instructions, Mathematical talks, valid fluency, implementation of arithmetic techniques through worked tasks and exercise tasks) proves to be useful and recommendable. (Teachers have mostly sufficient materials and experience in this regard).

Phase 4 (Defend - The Calculation) can be carried out separately as one or more lessons, in which increased use is made of structural elements such as explicit teaching, instructional routines, …

It is important to keep in mind the various possibilities of representation (pictures, real objects, ...). It is equally important to use the different types of tasks in a varied way.

Metacognitive strategies

The learners should gain control over their learning, improve their learning skills, reduce anxiety and control their own motivation to learn. Therefore, it is recommended to conclude each phase with a presentation / discussion of the proposed solutions and the individual assumptions behind them and to give feedback as a teacher.

Questioning

This teaching strategy is a powerful tool in the classroom and extremely valuable for teachers. Here below there are specific suggestions for questions to ask about this example.

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Questioning
Questions teachers might ask with this example - some proposals.

How to link to learners' experiences and prior knowledge?

- What situation do you find yourself in?
- What is it about?
- What questions arise?
- What do you already know about using recipes?
- Do you use recipes?
- How do you verify information?

How can they put learners in a mathematical situation?

- What information can you find in the recipe?
- Which ones help you to answer the question? (Can I really prepare this dish for € 1,- per portion?).
- Which ones do you still need? How do you arrive at these?
- Which assumptions do you make? What steps do you take?

How can adults learn to identify (numerical) problems in a situation?

- What numbers do you find in the question?
- What numbers do you find in the cooking recipe?
- What do they mean in context?
- What calculations do you have to make?

How can adults learn to plan and carry out a problem-solving process? How can they be supported in this?

- How many people should be cooked for?
- What ingredients are needed?
- What quantities are needed?
- What are the relationships? What happens if you want to cook one more portion?
- What quantities should be bought?
- Where should you buy?
- How much does the total purchase cost?
- How many portions are needed?
- How much does a portion cost?
- What invoices do you have to make?

How can adults learn to compare, check and, if necessary, adapt results and solution paths?

- How can you present your solutions with the materials available?
- How can you explain your solution to others?
- What results have you reached?
- Are you satisfied with your results?
- Where could you improve your solution?
- Which solution seems best to you?

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Appendix 1

Cooking recipes to choose from

(Sources: ideas from www.koch-mit.de/kueche/1-euro-rezepte/ and https://omas-1-euro-rezepte.net, pictures from www.pixabay.com, https://realandvibrant.com/coconut-chickpea-curry/ [14.06.2023])

Potato salad with lentils and parsley

Ingredients for 4 people

- 1 kilo potatoes
- 250 g beluga lentils
- 100 g fresh parsley
- juice of 2 limes
- 1 teaspoon ground cumin
- 1 tablespoon olive oil
- 2 tomatoes
- 100 g feta cheese

Mushroom risotto from rice pudding

Ingredients for 4 people

- 300 g champignons
- oil
- 1 vegetable stock cube
- 1 onion
- 1 clove garlic
- 360 g rice pudding
- 100 ml white wine
- 50-100 g cheese
- salt, pepper

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Spaghetti aglio olio

Ingredients for 4 people

- 500 g spaghetti
- 5 cloves of garlic
- 1-2 mild chili peppers
- 5 tablespoons of olive oil
- salt

Fruity coconut milk curry with chickpeas

Ingredients for 8 people

- 2 onions
- 2 cloves garlic
- oil
- 2 tbsp yellow curry powder
- 400 g chopped tomatoes
- 1 cube vegetable soup
- 60 g peanut puree
- 600 g cooked chickpeas
- 125 g mango
- 3 sliced bananas
- salt, pepper
- coriander leaves to garnish
- 5 tablespoons of olive oil

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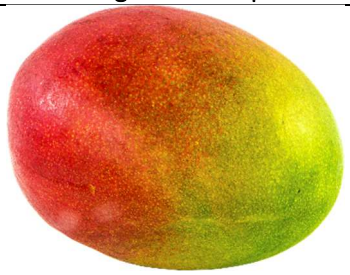
Appendix 2

Handout: Symbol cards – ingredients for "fruity coconut milk curry with chickpeas

(**Sources:** pictures from www.pixabay.com)

Ingredients: "Fruity coconut milk curry with chickpeas"

onions	garlic	oil
yellow curry powder	coconut milk	tomatoes
vegetable soup	peanut puree	chickpeas
 mango	bananas	salt, pepper
coriander leaves		

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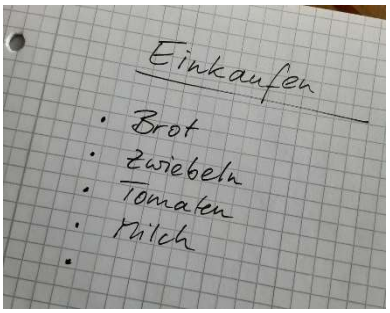
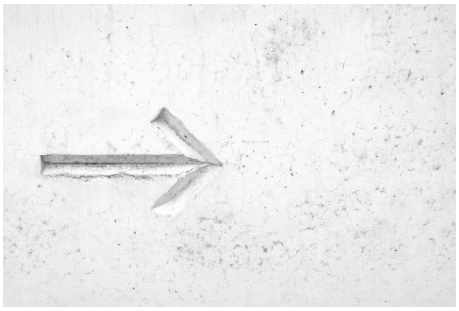
Appendix 3

Symbol cards (modelling material) – some suggestions

(**Sources:** pictures from www.pixabay.com)

	
	+ - * /

Appendix 4

Flemo material (learning means creating one's own image)

(Sources: https://slideplayer.org/slide/14469770/ [14.06.2023])

Appendix 5

A mix of techniques and tools is needed to solve everyday mathematical problems. Cuisenaire rods as an alternative approach in the development of basic arithmetic operations.

- solving addition problems with Cuisenaire rods: www.youtube.com/watch?v=OmkaHt6FiVA [13.06.2023]
- cuisenaire rods subtraction: www.youtube.com/watch?v=5VhBXlmluGc [13.06.2023]
- cuisenaire rods multiplication: www.youtube.com/watch?v=xTL-HlZXA00 [13.06.2023]
- cuisenaire rods division: www.youtube.com/watch?v=T02qefkUDjA [13.06.2023]

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Appendix 6

Worksheet (phase 4 – defend): formular for price comparison

	best price	for which quantity	where (in which supermarket, ...)	how much do I need?
onions				
garlic				
oil				
curry powder				
coconut milk				
tomatoes				
vegetable soup				
peanut purree				
chickpeas				
mango				
bananas				
salt				
pepper				
coriander leaves				
rice				

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