

1. Name of the task:
Origami instructions in words
2. Why did you choose this task?
It can be a challenge to clearly state what you mean. Students often think that what they write is what they mean. This task meddles with these assumptions.
3. Subjects covered from STEAM areas:
Natural language, mathematics, creating, paper folding, domain-specific language, cooperation.
4. Target group (age range and size of the group):
The participants of this study were 150 11-13 years old pupils in 5 different groups at one upper secondary school, "Het Rhedens Rozendaal".
5. Duration of the activity:
Two one-hour lessons
6. Keywords:
Paper folding, origami, manual, instruction, writing, reading
7. Key sentence describing the context of the activity, followed by a short description (200 words):
In these two lessons, pupils will convert visual origami instructions into textual instruction. The created textual instructions are then tested by fellow students.

The pupils will experience what it is like to write instructions and see the effect of their instructions. In addition, they will also experience what it is like to receive and have to carry out potentially confusing instructions. They also will experience the added value of visual support for a written text.

8. Description of the activity environment, including the list of materials and tools needed:

The first lesson starts with a short movie, about a father who irritates his children by taking their written instruction 'How to spread a peanut butter and jelly sandwich' extremely literally. Then the pupils start by folding a simple instruction read by the teacher. Thereafter the pupils work in pairs on the assignment. Each pair receives a (different) visual instruction. In total there are six different models available. They are going to write a verbal instruction (manual) based on this visual instruction. The manual mustn't state what will be folded.

In the second lesson, the manuals will be distributed among the (same) different groups. The manuals are marked so that the pupils do not get their manual. In front of the classroom different copies of all manuals can be found. When the group finished folding the first manual, they put down their result in front of the classroom. Thereafter they choose another manual and start folding again.

When the folding time is up, the folding results are returned to the groups that wrote the instruction. They review the results: 'What is going well, what could be improved'. This will be followed by a class discussion about the difficulty of the assignment and what is needed to be able to give good instruction.

Materials

- video <https://www.youtube.com/watch?v=Ct-IOOUqmyY>
- several folding sheets
- paper or computer to write down the instruction
- a simple visual instruction for the teacher to read
- five different visual instructions for the writing assignment

Examples and working sheets of visual folding instructions can be found on www.origamivoorkinderen.nl (Dutch).

9. Step-by-step, detailed description of the activity, including teaching and learning strategies:

Stage of the lesson 1	Description	Learning strategy
Introduction (If time) 6 min	Showing the movie 'How to spread a peanut butter and jelly sandwich'	The movies show what happens when someone takes an instruction literally.
Experiencing a spoken instruction 10 min	Teacher reads instruction, pupils are folding	Experience how difficult it is to fold a spoken instruction
Working in pairs writing an instruction 30-45 min	Writing an instruction from a visual instruction	Learning to write an instruction in understandable language. In addition, they learn to check their own steps by consulting, folding, and reflecting their manual with each other.

Stage of lesson 2	Description	Learning strategy
Introduction 3 min	Explaining the goals of this lesson.	
Folding a manual 5 min	The teacher hands out the manuals to the different groups.	Experiencing to follow the written instructions
Folding more manuals 15 min	The folding result will be presented in the class and the groups start to fold another (chosen by themselves) manual	
Feedback, discussing results 10 min	The groups start to evaluate the results of their own writing instruction	Based on the results, analyse which instructions could be followed correctly and where improvements are needed. Discovering that some instructions need visual support
Class discussion 10 min	Discussing the assignment and collecting tips and recommendations. In addition, the interdisciplinary aspect of the assignment will be discussed	Students learn that it is not self-evident that what they write down is what they mean. And that they will also encounter this in other subjects and assignments.

10. Learning objectives/competencies:

The purpose of this lesson series is to show pupils that it requires effort and care to make clear instructions. When pupils write an instruction or answer a question, there are often ambiguities and/or imperfections. The assumption 'It is obvious that' is quickly made.

One goal is for pupils to experience that assumptions are often made and that this does not have to be clear to everyone (looking from a different perspective). They also practice the precise formulation of an instruction (algorithm).

Folding an instruction written by fellow pupils allows students to experience what happens, and what it does to you if a message is not clear. It is also a goal that students learn the added value of supporting visual instruction with written text.

11. Evaluation/Assessment guidelines:

During the two lessons, there is regular evaluation and the pupils experience what the learning goals are. No grades will be given

12. Lessons learned:

It is important to keep the pace (and spirit) in class. Each group works differently. Some groups find it more difficult than other groups to write an instruction, but also to fold it. Folding is a skill that students have to possess to a greater or lesser extent. This affects their enjoyment and success in this assignment. As a bouncer, the lesson can be ended with a competition to see who can fold the furthest flying plane.

13. Additional information/Links:

14. Contact person:

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