Measuring tool

Summary

Age category
6 - 8 years
Topic
Data & Statistics
Measurement
Numbers & operations
Total duration
300 minutes

Students design and build their own measuring tools to make a map for hidden treasure.

Problem(s) to be tackled

- Why we measure?
- How we measure?
- Why we use standard units (SI units)?
- What properties does a good measuring tool have?

Real context

Real-world motivation

Giraffe pirate has hidden big treasure somewhere on the skull island. After a long search, the mouse pirates find a map of the island and instructions on how to find the treasure. When the pirates arrive on the island, they start the treasure hunt. The instructions for finding the treasure are as follows: walk 250 steps in a straight line, turn right and walk 300 steps, turn left and walk 150 steps. Dig for 2 metres and you will be very rich! The mouse pirates did everything exactly as in the instructions but couldn't find the treasure. What did they do wrong?

Goals

Skills

- Student starts to learn how to perceive surroundings in a mathematical way
- Student practises social skills and teamwork
- Student learns about designing
- Student learns to use a ruler

Knowledge

- Student starts to conceptualise measuring and units
- Student learns about SI units (mm, cm, m)
- Concepts of length, height and width
- Student learns about material properties

Methodology

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Part	Description	Timing
1	**Introducing the problem with story**	10'
2	**Measuring outside** Students will be challenged to find a way to measure several different distances outside without any measuring tools. They will measure at least one long distance (sport track, street, etc.) and one shorter one (door, window, stone, etc.). Discussion about how they measured different distances.	35'
3	**Measuring with everyday objects** Measuring with different everyday objects. Students will use pens, rubbers, papers, rubber bands, paper clips, etc. to measure different lengths in their own class room. Measurements will be written in a shared table.	45'
4	**Discussion about different units of measure** Students reflect on two different measurements they have done and decide their own measuring unit that everybody will then use when they design their own measuring tool. As they use their own measuring unit, they should have same results in future measurements.	30'
5	**Own measuring tool** Students start to design their own measuring tools. The most important thing is that the measuring tool has same length as their own measuring unit. Students can also think of ways to measure long distances easily (folding ruler, string, etc.) and short distances (dividing the measuring tool into smaller fractions).	45'
6	**Building part** When plans for their measuring tools are ready, students start to build from materials found from school.	45'
7	**Time to measure** When tools are ready, students will receive some treasure that they will hide. They draw a map that explains where the treasure is. The map should explain where to start, what direction they should go in and how many length units. If the treasure hunters need to turn the map, this should also be stated.	45'
8	**Introducing standard units** Discussion about standard units (mm, cm, dm, m). Study of different measuring tools there are available in the school. Students can measure different objects with these tools.	45'

Organization

Materials

- Different kinds of everyday object for measurements
- Paper
- Colouring pencils

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- Cardboard
- Thick rubber bands
- Ice lolly sticks
- Pieces of wood
- Etc.

Grouping

- Groups consist of two to three students.

Coaching

Useful questions

2.

- What units did you use?
- What kind of results did you get?
- Did you have any problems with measurements?

3.

- Why did we get different results when we measured the same objects?
- Did some groups measure wrong?
- Can we tell who was wrong and who was right?
- What do we need to change to get the same results for every group?

4.

- What measuring units do you know already?
- Why is it important to use same units when we measure something?

5.

- What is a good size for a measuring tool to take exact measurements?
- What is a good material for a measuring tool?
- What is a good shape for a measuring tool?

8.

- What units do you use or know?
- Why do we need standardised units?

Adaptations (abilities of age group, within the group, etc.)

- Fast and enthusiastic children can take more measurements
- With SI-units, it is enough to teach only centimetres and metres for some students.

Assessment

Teacher's assessment:

Assessment takes place in a formative way, especially regarding:

- Working in a group

- Problem solving
- Making a plan
- Understanding units
- Understanding and using concepts of length, height and width

Students' assessment:

Assessment takes place after every lesson in formative way

- Did you use mathematics? When? Examples?
- How would you evaluate the group work?
- How did you help your group to work?

Tips & tricks

- When students are making their own treasure map, they need to measure it carefully. This can be practised in the class room
- It’s very important that students use the same unit when they design their measuring tool. Measuring tools don’t have to be same length but the lengths have to be each others' multiples.