RME

Realistic Maths Education

Draw It

Perhatikan gambar yang tersedia, selesaikan soal disamping menggunakan dua cara

RME is about contexts, not applications.

The RME curriculum is built around ***contexts*** that have the potential to elicit powerful yet flexible mathematical models. Contexts can be taken from the real world, from fiction, or from an area of mathematics with which students are already familiar. The important thing is that students are able to imagine and engage with these scenarios.

Commonly in mathematics classrooms, students are first shown a mathematical technique and then asked to *apply* this technique in various settings. Images in many textbooks do little to advance students' thinking. The image below, of a curved pitcher of orange squash, cannot help students model this recipe.

Perhatikan dua konteks berikut ini!

Sonja is making an orange drink.
She uses 4 parts water to 1 part orange squash.

a Write down the ratio of squash to water.

b She uses 200 ml of squash. How much water does she use?

c What *fraction* of the dilute drink is squash?

d If the jug contains 1500 ml of the dilute drink, how much of the squash has Sonja used?

The rounded pitcher and bottle may not help students make sense of ratio.

Making squash drinks

A22.

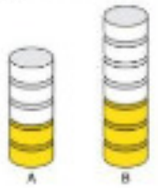
a) Which is your favourite of these 2 drinks?

b) Draw a straight glass and show how much of the squash and how much water you would pour in the glass to make your drink

Which drink tastes stronger?

A23.

Find two (or more) ways to tackle this problem



Cur[illegible]san

Setelah mencermati dua gambar pada slide [illegible]elumnya jelaskan apa perbedaan dari kedua konteks dalam gambar tersebut?

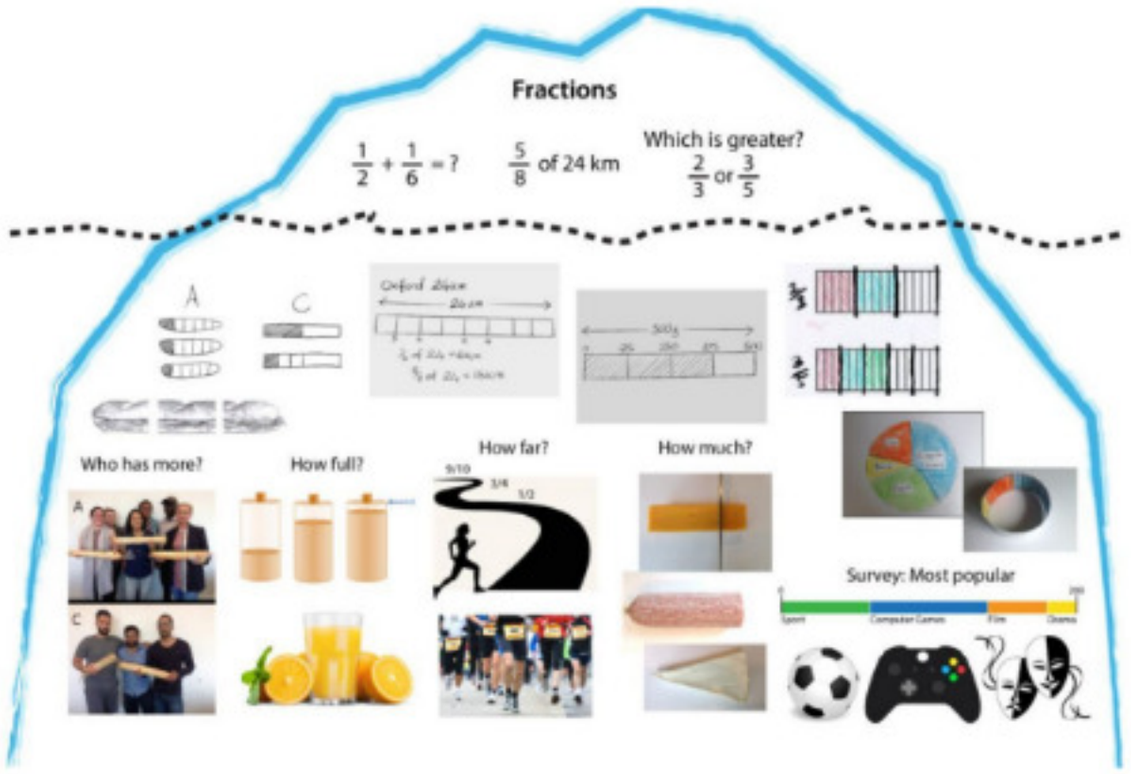
Collaborate Board

Curah Gagasan

RME is about formalising, rather than formulas

Experience shows that when students stay connected with the underlying context of a particular problem type, they are able to make sense of what they are doing, without memorising rules and procedures which have no meaning for them. Even when students move into more abstract maths—dealing with ratios, gradients or circumferences—they are able to go back to contexts that help them unpick and explain formulae.
One way of visualising the RME learning experience is through an 'iceberg' metaphor. While formal mathematics is visible above the water, much more lies beneath.

RME is about formalising, rather than formulas



The iceberg beside shows the multiple contexts that underpin an understanding of fractions in our Fair Sharing (N1) module. Without a grounding in meaningful contexts from which students can generate a number of connected representations, the formal notation of fractions could not stay afloat. In this iceberg, the subway sandwich context leads first to a representation, which is very close to the sandwich shape. This is rapidly mathematised to a bar shape. The bar appears again as a representation of distance on the stylised fun run track, and again in answer to the question 'how much?'. Finally, we see the bar appearing as a representation of survey results, in a context which has come a long way from the subway sandwich.
When students work from meaningful

RME is a process, an ethos, and an ethics

Training in the use of RME materials helps teachers to develop a new classroom culture that features active mathematising. But, this revolution in thinking doesn't happen overnight. Many times both pupils and instructors must work hard to develop a discussion-based classroom that can carefully evaluate new contexts and novel student strategies. Key features of an RME classroom include:

extended discussion of multiple contexts
development of students' representations of contexts
focus on multiple strategies for solving problems
sharing, explaining and discussing strategies

Achieving these aims requires a great deal of practice and encouragement. Everyone must deepen their listening and questioning skills. And teachers must learn to facilitate "thinking time" and inter-student discussions.

Over the long term, RME classrooms come to exhibit a class-wide commitment to learning from each other. These shifts make space for more students to contribute ideas and engage confidently in democratic, mathematical debate. They also profoundly change commonplace assumptions about what it is to do mathematics. Aligned with the

Slideshow

Meaningful Learning with Realistic Mathematics Education (RME)

SEAMEO REGIONAL CENTRE FOR QITEP IN MATHEMATICS

What to Discuss:

- What is RME?
- Philosophy of RME
- RME and Conventional Learning
- Principles of RME
- Characteristics of RME
- Horizontal and Vertical Mathematization
- Example

Realistic Mathematics Education (RME)

- "RME is a theory of teaching and learning of mathematics which put emphasize on student exploration – whether alone or in a group – to real-world problem as a starting point in their journey to develop their mathematical understanding" (Hadi, 2013)
- RME focuses on mathematics itself, how students learn mathematics, and how mathematics should be taught (Van den Heuvel-Panhuizen,1996)
- RME promotes historical simulation that allow students to begin at the basic, simulate the discovery of the mathematics concepts and appreciate the complexity of mathematics.
- In Dutch, the word "zich realiseren" means to imagine, and so the term 'realistic' refers to situations which can be imagined (Panhuizen, 2001).

Philosophy of RME:

Mathematics is a human activity

http://bisnis2014.96.lt/bisnis/kegiatan-jual-beli/

http://webblogkkn.unsyiah.ac.id

(Van den Heuvel-Panhuizen,1996)

Philosophy of RME:

Mathematics must be connected to reality

http://srirejeki345.wordpress.com

https://ummysalmah.wordpress.com

(Van den Heuvel-Panhuizen,1996)

RME and Conventional Learning

- RME is started with contextual problems, while conventional learning is started with formal mathematics., followed by examples.
- RME uses context as source and learning objectives, while conventional learning uses context in applying formal mathematics.
- RME demands students' contributions and interactivity.
- The context in RME is used as vehicle to connect several mathematics strands in order to develop students' mathematical understanding

(Hadi, 2013)

Principles of RME

Guided Reinvention Principle through progressive mathematizations

Didactical Phenomenology

Self-developed models

(Zulkardi, 2009)

Guided Reinvention

"Mathematics lesson should give students the 'guided' opportunity to 're-invent' mathematics by doing it"

(Freudenthal, 1968)

- The process where students can experience a similar process compared to the process of inventing mathematics.
- Students are given opportunity to build their mathematical knowledge in the learning process.
- Students will be guided by instructional materials and teacher will be facilitator.

Didactical Phenomenology

- Situations should be selected in such a way that they can be organized by the mathematical objects which the students are supposed to construct (Gravemeijer & Terwel, 2000)

Self-developed Model

- Model means situational model and mathematical model which are developed by students themselves
- Modeli is used to bridge the gap between formal and informal mathematics.
- At the beginning, the model is a model of a situation that is familiar to students. By a process of generalizing and formalizing, the model eventually becomes an entity on its own. It then becomes possible to use this entity as a model for mathematical reasoning.

(Zulkardi, 2009)

RME Characteristics

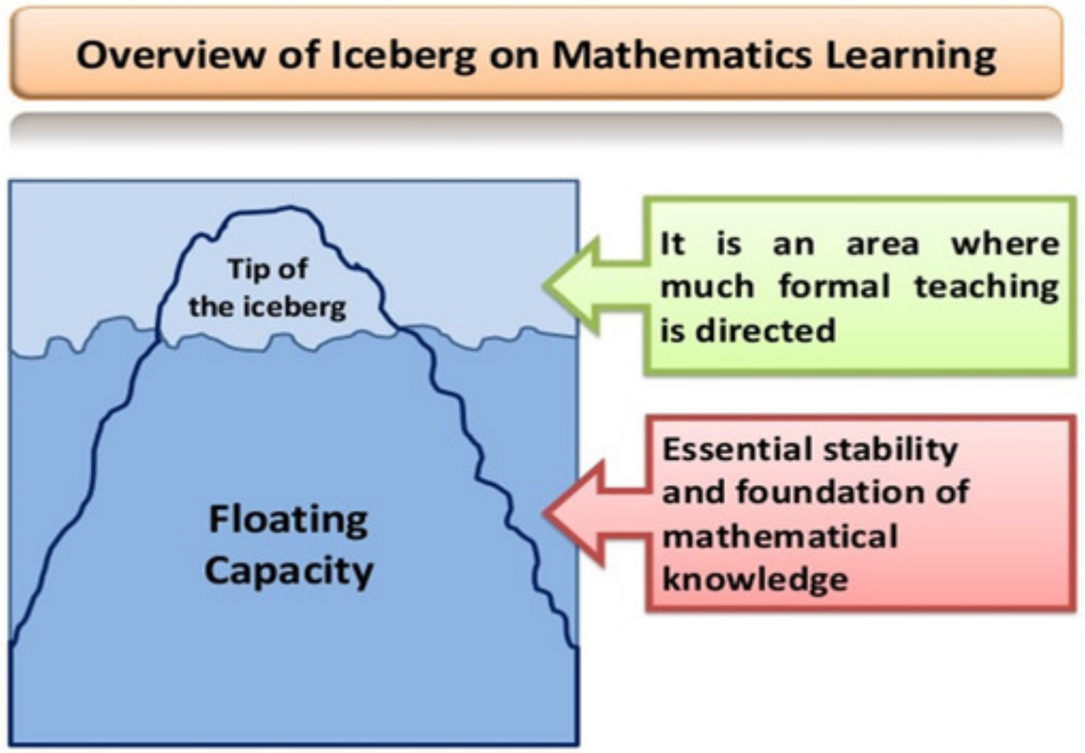
- The use of context
- The use of Models
- Student contribution
- Interactivity
- Intertwinement

(Treffers, 1987)

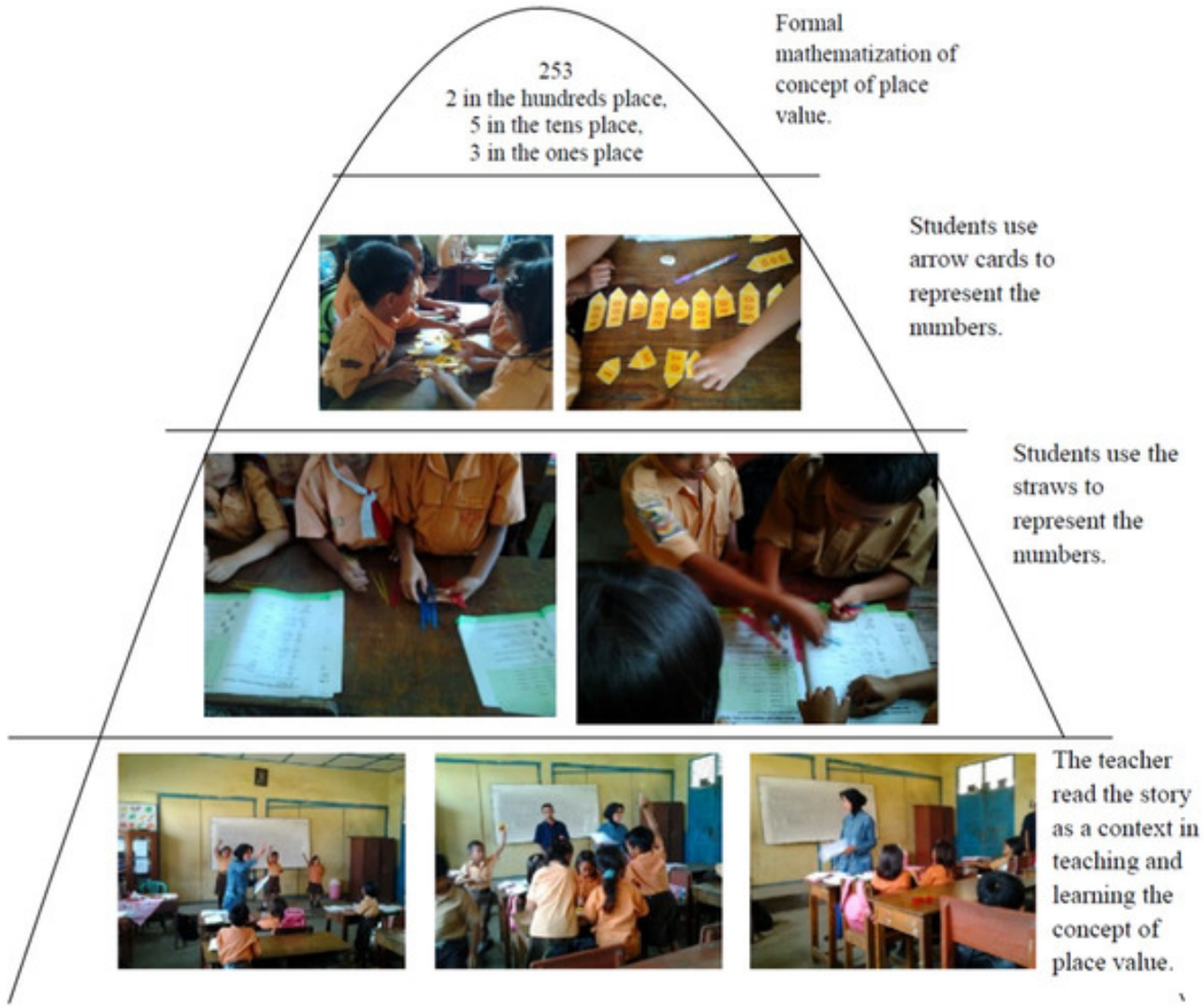
Horizontal and Vertical Mathematization

Horizontal Mathematization	Vertical Mathematization
Mathematical tools are provided to guide students organizing and solving problem in real situation	Reorganization process within the mathematical system itself
Bridges the real world and world of symbols	Bridges within the world of symbols

Iceberg


Overview of Iceberg on Mathematics Learning
Tip of the iceberg
Floating Capacity
It is an area where much formal teaching is directed
Essential stability and foundation of mathematical knowledge

ICEBERG


253
2 in the hundreds place,
5 in the tens place,
3 in the ones place
Formal mathematization of concept of place value.
Students use arrow cards to represent the numbers.
Students use the straws to represent the numbers.
The teacher read the story as a context in teaching and learning the concept of place value.

RME in Classroom

Here is an example of RME implementation in Place Value topic. The teacher gave activity to count some various groups of objects in their classroom. The students were asking to count the objects and make sign of the number of objects which they counted.

Let’s watch the video how RME use in classroom.

Conclusion:

- RME emphasizes on student exploration to real-world problem as a starting point in their journey to develop their mathematical understanding
- RME can make mathematics learning more meaningful as it involves contextual problems in delivering mathematical concepts.
- The principles and characteristics of RME

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