

# Summer School for **Mathematics Education** Monday 15 August – Thursday 25 August 2022



The Summer School is organized by the Freudenthal Institute of the Faculty of Science of Utrecht University.  
*Course number H16*

**Aim of the course:** Bringing participants up-to-date in design and research in the field of mathematics education. Topics will include: curriculum development, revealing and building on talents of students, classroom experiments, context and tools for modelling, assessment, and the use of technology for teaching and learning mathematics.

**Target audience:** Master's students and PhD students in mathematics education and the education and learning sciences with a strong interest in mathematics education, early childhood and kindergarten teachers, primary and secondary school teachers, teacher educators, curriculum and assessment developers, and researchers. Proficiency in English will be essential for a fruitful participation in the Summer School.

The following key-words/concepts will appear in several presentations/workshops

Assessment
Contexts
Design research
Embodied cognition
Informal-formal
Inquiry based learning
Mathematizing (horizontal-vertical)
Model of $\rightarrow$ model for (emergent modelling)
RME
Own productions
Problem solving
Progressive schematization

## Program

Lectures, workshops, reflections etc. are from Monday until Friday between 09:00 - 17:00. In general, each day provides a program from 9 am to 3 pm followed by group work from 3 pm until 5 pm. At the last day of the summer school groups present their results of the group work in a poster gallery.

During the weekend there are no classes, but activities organized by the central organization of the Summer School.

All classes are in the Buys Ballot building, Princetonplein 5, 3584CC Utrecht, except the opening, which will take place in the **Koningsbergerbuilding (Budapestlaan 4 a-b, 3584 CD Utrecht)** .

### **Monday 15 August – Opening day, introduction to RME and the content of the summer school (chair Michiel D.)**

Since the 1960s, the theory of Realistic Mathematics Education (RME) has been developed in the Netherlands, and at the Freudenthal Institute in particular. Since that time, RME has become widespread, but was also subject to criticism. You will be introduced to some key ideas in RME, such as mathematization, guided reinvention, didactical phenomenology, and the use of contexts.

<i>time</i>	<i>Location</i>	<i>activity</i>
<b>09:45-10:30 MN</b>	<b>Koningsbergerbuilding</b>	Intake in the Koningsbergerbuilding + coffee & tea
<b>10:30-10:45 MN</b>	<b>Koningsbergerbuilding</b>	Opening and welcome by Paul Drijvers, scientific director of the Freudenthal Institute
<b>10:45-11:00 MN</b>	<b>Koningsbergerbuilding</b>	Welcome by Michiel Doorman, director of the Summer school Mathematics Education
<b>11:00-12:00</b>	<b>Koningsbergerbuilding</b>	Opening activity and get to know each other by Michiel Doorman
<b>12:00-13:15</b>	<b>Koningsbergerbuilding</b>	Group photo and lunch in Botanic garden
<b>13:15-14:30</b>	<b>BBG 322</b>	Lecture "Realistic Mathematics Education (RME) - An introduction" by Paul Drijvers
<b>14:30-15:00</b>	<b>BBG 322</b>	Coffee break
<b>15:00-17:00</b>	<b>BBG 322</b>	Activity "Mathematics game for teams" by Joke Daemen and Michiel Doorman

<b>Tuesday 16 August – Modelling (chair Dede)</b>		
<i>time</i>	<i>location</i>	<i>activity</i>
09:00-12:00	BBG 322	Lecture / Working group "Open-ended modelling tasks in Dutch education" by Monica Wijers and Dédé de Haan
12:00-13:00		Lunch
13:00-14:00	BBG 322	Poster presentations "Open-ended modelling task" by participants
14:00-15:15	BBG 322	Lecture / working group "Inquiry and modeling in mathematics education" by Rogier Bos and Janka Medova (on experiences with students and teachers from Slovakia)
15:30-17:00	BBG 322	Introduction Mathcitymap activity by Janka Medova Afternoon Reflection and Working group by Dede and Michiel D. (collect who is going to present a poster tomorrow as brief presentation of your work)

<b>Wednesday 17 August – Utrecht tour: math city walk and Utrecht time machine (chair Anna)</b>		
<i>time</i>	<i>location</i>	<i>Activity</i>
09:00-12:00	Drift 21 - 003 In the city	Mathcitymap activity ( <i>entrance via Drift 27</i> ) With Janka Medova, Veronika Bockova, Mark Yannotta
12:00-13:30		Lunch
13:30-14:00	BBG 322	Introduction on RME learning trajectories by Michiel Doorman
14:00-15:30	BBG 322	Mark Yannotta (higher education trajectory - introduction) + explore textbooks on your working group topic (search for rme principles)
15:30-17:00	BBG 322	Afternoon Reflection and Working group (including a poster session for/by participants – bring your poster!) by Anna and Michiel D.

<b>Thursday 18 August – Learning trajectories &amp; guided reinvention (chair Michiel)</b>		
<i>time</i>	<i>location</i>	<i>activity</i>
09:00-12:00	BBG 322	Mark Yannotta continues with learning trajectory in higher education <i>Break from 10:30-11:00</i>
11:00-12:00	BBG 3.19	Mara Otten on algebra in primary education
12:00-13:00		Lunch
13:00-15:00	BBG 322	Martin Kindt on RME Algebra in secondary education
15:00-17:00	BBG 322	Afternoon Working group by Anna and Michiel D.

## Friday 19 August – Assessment and diversity (chair Anna)

<i>time</i>	<i>location</i>	<i>activity</i>
09:00-09:15	BBG 322	Assessment and diversity: Introduction – Anna Shvarts
09:15-10:15	BBG 322	Mathematics for the blind – Annemiek van Leendert
10:15-10:30		break
10:30-12:30	BBG 322	Assessment items in digital environments for doing mathematics – Peter Boon
12:30-13:30		Lunch
13:30-14:45	BBG 322	Assessment, what and how by Mieke Abels
14:45-15:00		break
15:00-16:00	BBG 322	Mathematics for life – Willem Uittenbogaard
16:00-17:00	BBG 322	Afternoon reflection by Anna and Michiel D.

La Vuelta in Utrecht: <https://www.lavueltaholanda.com/en/>

## Monday 22 August – Innovative learning environments (chair Anna)

<i>time</i>	<i>location</i>	<i>Activity</i>
09:00-10:15	BBG 322	Workshop "Computational Thinking and AR" by Sylvia van Borkulo
10:15-10:30		break
10:30-12:00	BBG 322	Working group Imaginary by Joke Daemen
12:00-13:00		Lunch
13:00-14:30	BBG 322	Working group "Embodied design for mathematics" by Anna Shvarts
14:30-15:00		Refreshments, networking break
15:00 -17:00	BBG 322	Afternoon reflection and work on final group designs by Anna and Michiel D.

## Tuesday 23 August – Inquiry-based learning, SSIs and intercultural learning (chair Michiel)



Inquiry-based learning (IBL) aims to develop and foster inquiring minds and attitudes that are vital for students being able to face and manage uncertain futures. Fundamentally, IBL is based on students adopting an active, questioning approach. Of course you need 'basic skills' in the area of mathematics and science, but it is important that students also learn to use those basic skills in new situations. You will practice with one example from IBL in order to get an idea what this means for both students and teachers. Relations and differences between IBL and RME will be discussed. In addition you will focus on the potential of IBL to take the opportunity of diverse and multi-cultural classrooms with a specific focus on the important role of language in the teaching and learning of mathematics. This day in particular is inspired by our work performed in the context of [ICSE](#).

<i>time</i>	<i>location</i>	<i>activity</i>
09:00-11:00	BBG 322	Workshop IBL and intercultural learning – Vincent Jonker and Monica Wijers
11:00-11:15		Break
11:15-12:00	BBG 322	IBL lecture – Michiel Doorman
12:00-13:30		Lunch
13:30-15:00	BBG 322	Workshop SSIs – Vincent Jonker and Monica Wijers
15:00-15:30	BBG 322	Break
15:30-17:00	BBG 322	Afternoon Working group by Michiel D.

## Wednesday 24 August – Primary and adult education (chair Michiel V.?)

<i>time</i>	<i>location</i>	<i>activity</i>
09:00-10:30	BBG 322	Mathematics education at Dutch primary schools: a journey from answer-getting to problem-solving - Marjolein Kool
10:30-11:00		Break
11:00-12:30	BBG 322	Mathematics in play – Ronald Keijzer
12:30-13:30		Lunch
13:30-15:00	BBG 322	Numeracy is the new buzz word. What is meant by it? by Kees Hoogland
15:00-17:00	BBG 322	Afternoon Working group by Michiel V./Michiel D.

## Thursday 25 August - Closing day – and presentations by participants (chair Michiel/Anna)

<i>time</i>	<i>location</i>	<i>activity</i>
09:00		Participants return housing keys
09:00-10:00	BBG 322	Final preparations for presentation
10:00-10:30		Refreshments and networking break
10:30-12:00	BBG 322	Lecture Mathematics on the guitar by Rogier Bos
12:00-12:30	BBG 322	Preparing poster gallery + take home message
12:30-15:00	BBG 315-317	Gallery walk, and snacks and lunch

**Note:**

When you leave your room, please hand in your keys on Friday before 11:00 AM at the Freudenthal Institute. If you want to drop off your luggage for the day, bring it to the Freudenthal Institute; you can store it there at a safe place.