# Notes from startup meeting of Nordic Braille STEM group

Present: Tim, Karin Jönsson (enhanced 8-dot braille for Swedish), Anders Eklund (SPSM, adapting STEM materials for school children), Alfred Halldórsson (HBS, full text books incl. STEM), Mika Minkkinen (Valteri, assistant teacher), Gaute Rönningen (NB, MathML guidelines), Charlotte Magnusson (Certec, tactile display), Sami Määttä (Celia, study materials, MathCAT project), Dan Albrechtsen (Nota, braille printing), Marjo Kauttonen (Celia, coordinator), Oddvar Öyan (Statped, braille mathematics adviser), Asdis Tordardottir (Icelandic braille authority), Essi Aura (Celia), Susanna Ruohonen (Celia, material designer), Jonas Manley (Nota, head of IT), Rolf Arne Mellem (Media LT company, tester),

## Purpose and organisation of this group

* This group was formed during the annual meeting of the Nordic Braille Authorities in Reykjavik in October 2023. The purpose is to be a working group where we can collaborate on STEM-related projects. I (Tim) am also thinking that the group collectively has a lot of expertise, and could work as a reference group that STEM-related Braille projects can consult as needed.
* Organisation: should we have regular meetings? If so, how often? Or should we call the group together on an as-needed basis? Does anyone here have will and time to take lead? Otherwise I have an ok from my boss to be responsible for calling meetings together and taking notes.

Sami: if and when this group is functional, how could it be used for the MathCAT project? Also are there ways to proceed after the MathCAT project? How to work on writing math in braille notation. E.g. an editor. Does anything like this already exist?

Anders: Agreed, we have discussed the writing issue at SPSM for a long time. Everyone should be able to read what is written in braille. Conversion needed. MTM and SPSM will probably do a study on the current situation, this group would be good as reference group. Maybe also meet twice a year to keep each other updated. We need to gather our resources because we are so few with the expertise at each organisation.

Gaute: Yes, we need to put our heads together. Our only braille expert was busy, that’s why I’m here.

Jonas: Right now we are mostly observing because we’re not participating in the MathCAT project.

Anders: While we’re working on MathCAT we’re discovering a lot of things we need to do afterwards. E.g. if MathML is becoming more accessible for our user groups we have the issue of MathML quality. It ties into Gaute’s project on MathML guidelines which will probably be needed by commercial producers. Even if the technology for reading MathML is good it will not help if the MathML has bad quality. Only guidelines for mathematics in braille in Swedish are for 6 dot, we need to think of the digital standard.

Charlotte: How specific is the group to this MathCAT project? Been looking at the dot pad, the Monarch. Typically you use a lot of graphics in maths. Practical suggestion: a mailing list.

Sami: Is this mainly going to be a technical group or also about the standard work? Can we also have the pedagogical point of view? Also how can we help other actors in the field, e.g. producers of standard exams. Ways of making the digital exams accessible.

Karin: There are many different things we have to make work for braille users. E.g. a reader for epub books that works with braille.

Anders: We should have a mailing list and a scheduled meeting every half a year, and additional meetings as needed. The mailing list could be for sharing ideas and resources. (Like from Charlotte)

Gaute: When it comes to MathML guidelines we could use a lot of feedback from braille users. In the past we haven’t had much feedback.

Oddvar: About the epub reader: some years ago we found the qread (link added by Tim: <https://q-continuum.net/qread/>) which was adapted to screen readers. Not sure about it now. In Norway we have a 6 dot standard for math, in 8 dot we’re using a (non-official) standard based on the 6 dot standard, created 20 years ago. We need to develop it and integrate it with MathML so braille users can communicate.

Jonas: Denmark currently has no braille standard for advanced math.

Dan: At the moment our main way to present math is through LaTeX.

Ásdís: We use asciimath in Iceland. Very few users.

Sami: In Finland we have a 6 dot standard for math in braille, digital we do a modified (unofficial) 8 dot standard.

Tim: should we work towards a common Nordic standard for math in 8 dot braille?

Karin: We will make sure to make a Swedish standard so the whole country works the same, it would be great with a common Nordic standard.

Jonas: would be good to have but ultimately up to the authority to decide.

Dan: I see a future in digital braille but not in printed.

Karin: Relevant question, should we even have 8 dots? Today it’s easy for the individual to decide between 6 dot on paper or 8 dot digitally. Ridiculous how many signs are different between the 6 and 8 dot.

## Ideas for projects to co-operate on

* **The MathCAT translation project** (“STEM content in the Nordic languages”). Update: Swedish, Finnish and Norwegian TTS translations are almost done. We’re doing quality assessment now with a mathematician and users and hope to be done by early February. We estimate 300 working hours for the Swedish translations, which the Norwegians used and were done in a few days.   
  We are kicking off the Braille translations with a meeting with Neil Soiffer (creator of MathCAT) on February 1st and then a physical work meeting in Stockholm 5-6th February where we will also compare the Swedish, Norwegian and Finnish braille standards for math. It looks like he has already done part of the work for us. How could this group contribute? Does anyone want to join either of the meetings?   
  Invite Oddvar.
* **Development of the Swedish standard for 8-dot braille**, including mathematics. Do we want to work towards a common Nordic standard? How can we be involved in the work?
* **Pilot study/tech overview** of the current possibilities for accessing STEM content in braille. What solutions exist, how compatible are they with one another, what is missing and what should be the next step in our contribution? If MTM (et al.) launches such a study, could this group be a reference group? Thumbs up from Karin and Gaute. Sami thinks it’s a good way of reaching also the pedagogical side. Could help with survey. Things to include: epub reader that works with braille, graphics.

## The DAISY STEM meeting today

* I am attending a meeting tonight about “Math writing solutions for the visually impaired”. Any questions or input I should take with me?

Sami: share the mailing list after the meeting.

## DEIMS conference in Tokyo in February

* I am attending the “Digitization and E-Inclusion in Mathematics and Science” conference in Tokyo 15-17th February. Anybody else here going? Any questions I should take with me or people I should connect with?

Sami: there are going to be recordings from the event which are free, so you can access it from home.

Oddvar: Also please email the link.

Tim: <https://workshop.sciaccess.net/deims2024/>

## Other

* Sami: Bureaucracy. How officially are we attending this meeting? Should the authorities recommend members for the working group? I don’t think we can make decisions but maybe we can make recommendations.   
  Karin: Every authority has to know that we are talking about it and that we are working on it, but decisions will have to be taken by the authorities.   
  Tim: Share meeting notes with Nordic authorities?  
  Dan: Agreed. I will report to the Danish authority.   
  Ásdís: No objections.  
  Tim: take this to next authority meeting, ask how official member recommendation should be.
* Next meeting: 24th May.

## Summary

This group will be valuable for containing not only technical but also pedagogical expertise and the user perspective. We see several possibilities for collaboration, e.g.

* Be a reference group for e.g. the MathCAT project and a tech overview.
* A mailing list where we can share ideas and questions.
* Discussing if/how we should move towards a common Nordic standard for math in 8 dot braille.

Everyone will take the question of how to appoint members to this group to their respective braille authority at their next meeting. This group cannot make decisions but can be consulted by the authorities to make recommendations.

We will have regular meetings twice a year to share updates. Additionally the group will be called together as-needed for specific purposes, e.g. as a reference group in projects.

Tim will be responsible for calling the meetings together, and will share notes on the mailing list and to the Nordic authorities.