

UEB Math/Science and UEB With Nemeth: A Guidance Document for IEP Teams

Background

In November 2012, the United States members of the Braille Authority of North America (BANA) voted to adopt Unified English Braille Code (UEB) to replace English Braille American Edition (EBAE). Implementation of this international code began in January 2016. UEB is a complete code that can be used to transcribe any content, including technical materials such as math and science. At the same time, the United States voted to maintain its separate mathematics code, Nemeth Code, in addition to adopting UEB.

As a result, for individuals in the United States who read, write, and calculate using braille, there are currently two approved codes – Unified English Braille (UEB) and the Nemeth Code – that are both capable of representing technical (i.e., mathematical and scientific) information. To avoid confusion, these two codes are referred to as UEB Math/Science and UEB with Nemeth (Braille Authority of North America, 2020). BANA has stated that the decision which code individuals use “should be made based on braille readers’ individual needs” (2015). Therefore, Individualized Education Program (IEP) teams, which include students’ families, have options to discuss when making decisions about appropriate instruction in braille for technical materials.

UEB and Nemeth are different codes, but they are simply different ways of representing the same things. Children will learn to read, write, and do math and science no matter which code is chosen, and children have the option to learn both codes, if that would be useful. The purpose of this document is to provide IEP teams, which include the student’s family/guardian, with information and guiding questions to help them make this decision.

Because we know that students’ needs change over time, IEP decisions are conversations that continue throughout the school years. IEP decisions should be revisited by the team periodically and should be based on student needs and goals. This document is intended to facilitate the conversation about math instruction; additional resources will be provided at the end for those who would like to learn more.

The purpose of this document is to provide IEP teams with information and guiding questions to help them make decisions about which code a student should use, based on individual needs.

Characteristics of Each Code

Children in the United States who use braille learn UEB for their core content classes, such as language arts and social studies. Math and science textbooks, worksheets, and assessments can also be transcribed into UEB Math/Science. Students may also learn UEB with Nemeth. Both braille systems are equally equipped with the symbols needed to transcribe all levels of technical material. There are differences between the two codes, however:

UEB Math/Science: The Unified English Braille Code can be used to transcribe both literary and technical materials. Numbers in UEB are in the upper part of the cell and the symbols and rules are consistent within UEB no matter what the context. For example, the degree sign that a student may see in a weather report will be the same degree sign that the student would use in geometry class. When using UEB for math and science material, there is no need to switch into a different code or use different numbers or symbols. Because there is only one set of symbols, some math expressions are less compact than Nemeth code to distinguish letters from numbers.

UEB with Nemeth: The Nemeth Code was designed specifically for mathematics and science transcriptions. It has been used in the United States for technical transcriptions since the 1950s, although, like any braille code, it has had several revisions over time. Nemeth Code symbols are now embedded within UEB text, so that students will also see UEB symbols and contractions in their textbooks; that's why the code is now referred to as "UEB with Nemeth." Nemeth uses a separate set of symbols for mathematical expressions from those used in UEB. Nemeth Code also uses "dropped numbers;" that is, the numerals are in the lower part of the braille cell. The use of dropped numbers distinguishes numerals from letters, which are in the upper part of the cell. In short, Nemeth numbers, symbols, and rules are different from those of UEB.

Typically, students learn one code or the other for technical materials; that is, students may use UEB for all content including math and science, or they may use UEB for literary transcriptions, then switch to UEB with Nemeth for mathematics and science. Both codes can be used with braille technology. There is no evidence that one code is superior to the other. They are simply different. It is important to note that the team can decide that instruction in both codes may be appropriate for the student.

Considerations for IEP Teams

The following guiding questions are intended to assist an IEP team in determining which braille code to use for mathematics and science materials for an individual student. As stated earlier, decisions can be revisited at any point in a student's education and changes can be made to the student's IEP document.

There are additional considerations and questions that could be discussed, but the following questions are a starting point for IEP teams. Additional resources are listed at the end of this document.

Answering “Yes” to this set of questions may point to UEB Math/Science as the more appropriate code for the student:

- Would the student benefit from a consistent way to represent mathematics and scientific information across all subjects?
- Would the student benefit from using a single set of symbols for all content?
- Would the student benefit from reading math expressions that are less dense?
- Has the student previously used vision to access math and science in print, and thus would they benefit from a braille code that more closely follows print?
- Might the student’s future career involve collaborating with others in different English-speaking countries?

Answering “Yes” to this set of questions may point to UEB with Nemeth as the more appropriate code for the student:

- Would the student be able to use two different braille codes during the school day with no difficulty?
- Would the student benefit from learning separate braille dot configurations having different meanings depending on the context?
- Would the student benefit from reading more compact braille mathematical expressions?
- Could the student benefit from access to a range of existing math materials previously transcribed in Nemeth Code?

Additional Resources

For more in-depth information about the adoption of UEB in the United States and other topics related to the use of UEB and Nemeth Codes, scan the following QR code or visit: <https://www.pattan.net/BrailleUEB>.



References

Braille Authority of North America. (2015). BANA takes action at fall meeting in Crystal Lake, IL. <http://www.brailleauthority.org/pressreleases/pr-2015-11-18.html>

Braille Authority of North America. (2020). Terminology: UEB math/science and UEB with Nemeth. <https://www.brailleauthority.org/unified-english-braille-codebooks>

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