

MATHBEAT

Teacher Resource Guide



MathBeat - Empowering Math Students Through Music

for Grades 6-8

There are always a few students who feel they don't belong in math class - that they're just not the kind of student who can do math.

MathBeat shakes up the narrative by showing these students that math underpins music - something they relate to easily - so if they can understand music, they can also do math.

MathBeat focuses on aspects of music in common across cultures and musical genres, such as rhythm. Students are empowered to apply learning to whatever type of music interests them, making this a **culturally responsive** math program.

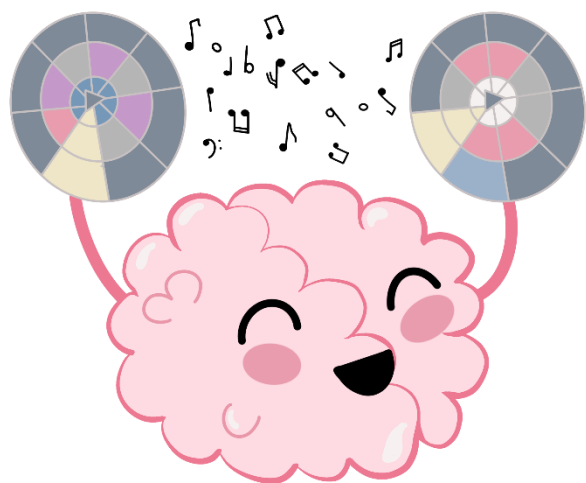
The program also offers students new opportunities and entry points to learning **proportional reasoning skills and concepts**, including fractions and percentages.

MathBeat was designed specifically for use by Grade 6-8 math and generalist teachers, with input from a math specialist. No prior musical knowledge is required.

Basic Information

MathBeat is a free online program intended for use in Grade 6-8 math classrooms consisting of 10 interactive math-music tutorials.

Each tutorial explores a musical element or process that is closely related to a mathematical process. For example, a rhythm pattern can be understood as a series of fractions of time



- MathBeat uses a clock face-like representation of music that makes it easy to transfer a musical idea students hear in their head to the app - this is very empowering for students
- Once transferred, the musical idea can be manipulated and measured, opening up opportunities for mathematics learning
- Tutorials also encourage students to place musical patterns on a number line, further reinforcing learning

Setting the class up for success

Each MathBeat activity takes 30-45 minutes. The 10 tutorials can be done one per week or completed in a more compressed period of time. MathBeat is most effective when students work in pairs or small groups; this also reduces the number of devices needed

The program is easy to deploy in the classroom:

- There are no student logins
- The tutorials are fully interactive
- Evaluation tools are included
- Musical concepts are explained in simple language
- A printable glossary of terms is provided

Impact

There are no algorithms that lead to students skipping vital steps: hence students ‘own’ every note or idea they create and demonstrate **pride of authorship**. This is one of the reasons why MathBeat produces breakthroughs in **engagement** for many students:

- All students benefit from reviewing core math skills and concepts in a new context, and from sharing musical expressions from different musical genres and cultures with one another
- Students who are clearly benefiting from the program can continue their explorations using a personal portfolio app that has the same toolkit as the tutorials, but allows students to save up to 8 sets of original musical patterns;
 - The personal portfolio URL is automatically generated the first time a student opens the app URL [[click here](#)] and saves work by pressing the Save Pattern button. Students need to **bookmark** this personal URL.
 - Student work is saved in groups of up to 8 patterns, called Sets. Students select the Set number, then Save Pattern. Clicking the Set number will load the work saved in that location
 - Students need to work from the same device each class, as work is saved to the device
 - There are no student logins, so privacy and safety are fully protected

Teacher Prep

MathBeat has been designed specifically **for mathematics and generalist teachers** – no prior musical training is needed:

- Concepts and tasks are explained in **simple, non-technical language** as much as possible.
- A printable glossary of the musical terms used in the program is provided
- Each online tutorial activity includes a Teacher Note that provides more context or suggestions for extensions

Evaluating Success with the MathBeat Program

MathBeat ends with a culminating project in which students are asked to create a short piece using all the tools they've explored in the program:

- Students are asked to write out all the math tools they use for the project, and to explain the musical choices they made, with reference to the math behind the music
- This allows teachers to evaluate for math understanding

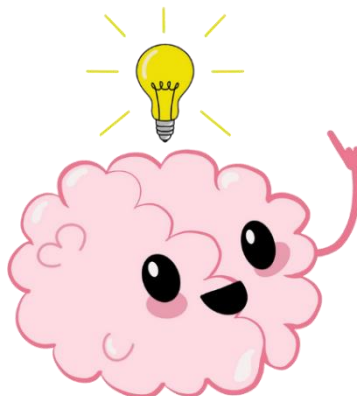
We recommend evaluating using these evaluation questions:

- Did students understand what was expected of them?
- Did they grasp new music-related vocabulary, putting it into terms they could understand?
- Did they grasp the main math-music connection - readily completing each task?
- Did they show their math work and thinking when completing their culminating project?
- Were they able to offer constructive feedback to their partner?

Conclusion

MathBeat is an ideal tool to help math teachers **boost participation** by students who do not feel a natural affinity with mathematics or question their math ability. It provides new entry points to proportional reasoning skills that are valuable for all students.

The program's unique design can also further your culturally responsive practice and foster feelings of belonging in all students.



Support

» You have a question that's not covered here or in the Teacher Notes?

Please email **shelley.macdonald@rcmusic.ca** or **shaun.elder@rcmusic.ca** and we'll respond within one school day

» Want help giving feedback on student projects?

We'd be delighted to help, either asynchronously or via a virtual classroom visit. Simply contact **shelley.macdonald@rcmusic.ca** or **shaun.elder@rcmusic.ca**

» If you'd be more comfortable getting a quick run through of the program, sign up for a free webinar.

Welcome to MathBeat!

