

# REAL CONNECTION BETWEEN MATH AND MUSIC



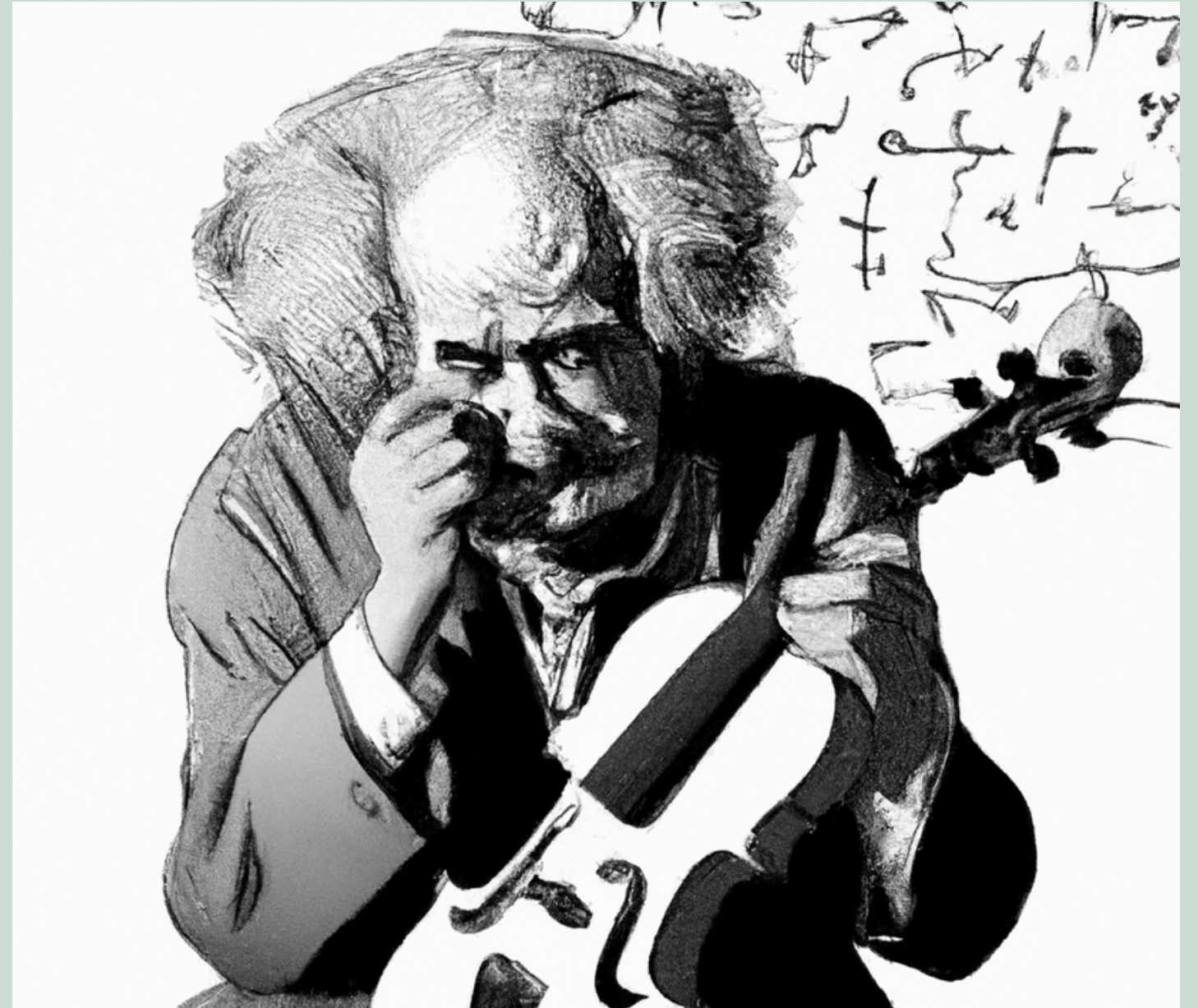
THE CONNECTION BETWEEN MUSIC AND  
MATHEMATICS IS SO STRONG THAT  
MUSICAL EXPERIENCES AND LEARNING  
ENHANCE MATHEMATICAL  
PERFORMANCE.  
(LUIZ, 2007)

[HTTPS://WWW.RESEARCHGATE.NET/PUBLICATION/266318346\\_The\\_Learning\\_of\\_Music\\_as\\_a\\_Means\\_to\\_Improve\\_Mathematical\\_Skills](https://www.researchgate.net/publication/266318346_The_Learning_of_Music_as_a_Means_to_Improve_Mathematical_Skills)

This project Maths, Music and Creative Movement, Erasmus+ ID 2021-1-SE01-KA220-SCH-000032733 is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



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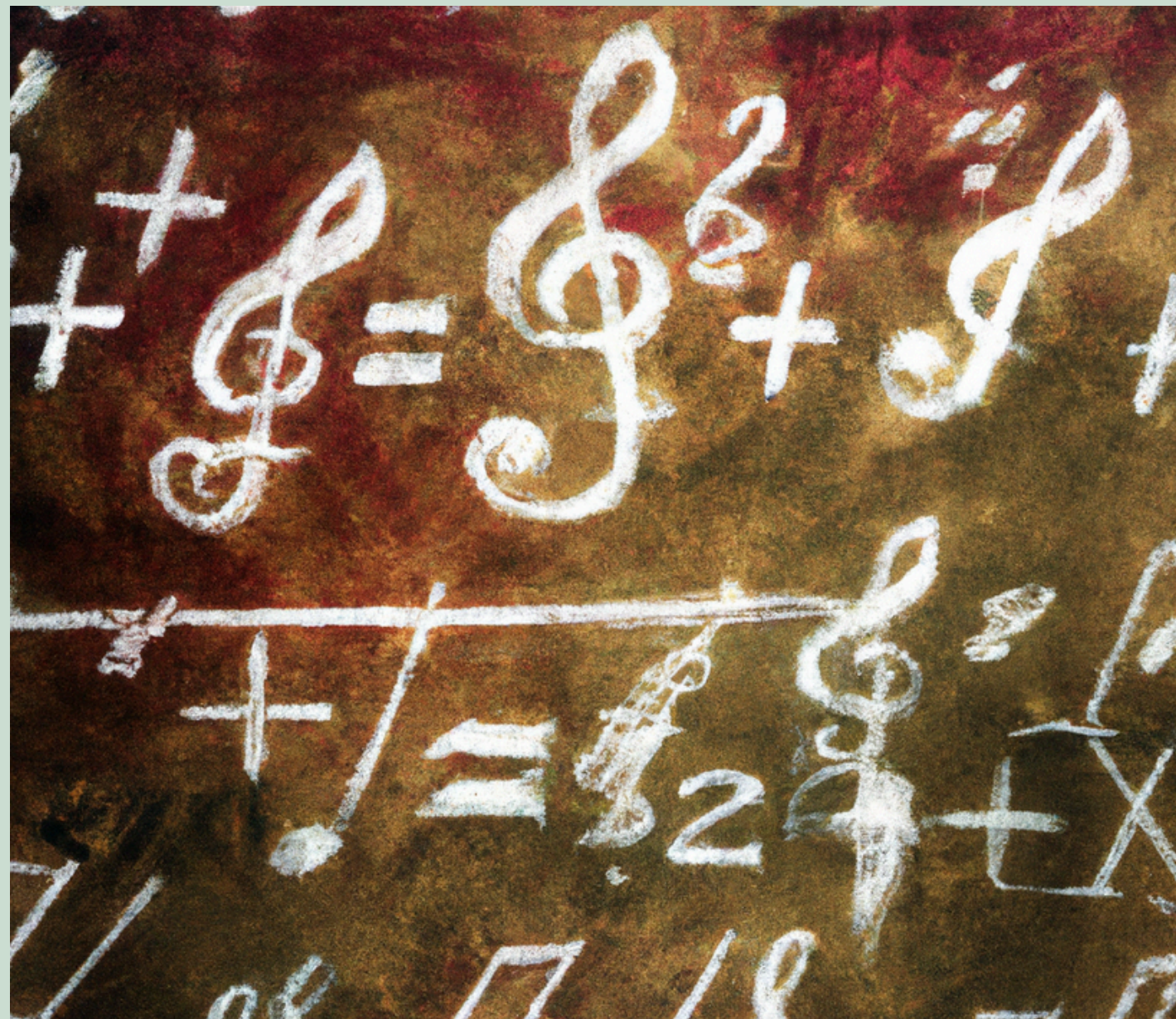


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MUSIC CAN BE USED TO INCREASE  
MATHEMATICAL KNOWLEDGE,  
ACADEMIC PERFORMANCE AND  
INTELLIGENCE IN GENERAL.  
(KELSTROM, 1998)

[HTTPS://DOI.ORG/10.1177/0192636598082597](https://doi.org/10.1177/0192636598082597)



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PRACTICALLY FROM BIRTH, BABIES  
START THINKING MATHEMATICALLY AND  
MUSICALLY. SUBITIZING IS INSTANTLY  
COUNTING WITHOUT COUNTING OUT  
EACH ITEM. INFANTS SUBITIZE AT  
THREE OR FOUR DAYS OLD.  
(DENISON, 2014)

[HTTPS://ONWISCONSIN.UWALUMNI.COM/FEATURES/MUSICAL-NUMBERS/](https://onwisconsin.uwalumni.com/features/musical-numbers/)



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# CONCENTRATION AND CREATIVITY



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MAKING MUSIC IS A CREATIVE PROCESS  
THAT GIVES JOY IN THE MAKING,  
COMBINE MAKING MUSIC WITH SOLVING  
MATHEMATICAL PROBLEMS AND THIS  
CREATIVITY AND JOY WILL RUB OFF ON  
THE PROCESS OF LEARNING MATH.  
(HAMILTON, 2018)

[HTTPS://IEEEXPLORE.IEEE.ORG/DOCUMENT/8615262](https://ieeexplore.ieee.org/document/8615262)



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PHOTO: "BRAINS!" BY HEY PAUL STUDIOS IS LICENSED UNDER CC BY 2.0. CHANGES WHERE MADE

ART CAN AWAKEN ATTENTION IN THOSE THAT EXPERIENCE IT. MUSIC, RHYTHM AND CREATIVE MOVEMENT CAN HELP STUDENTS WITH THEIR CONCENTRATION ON CURRICULAR SUBJECTS.  
(MOERMAN, 2018)

[HTTP://SH.DIVA-PORTAL.ORG/SMASH/RECORD.JSF?PID=DIVA2%3A1244292&DSID=-1240](http://sh.diva-portal.org/smash/record.jsf?pid=diva2%3A1244292&dsid=-1240)



STUDIES HAVE BEEN CONDUCTED TO PROVE THAT INCREASED MUSICAL EDUCATION HAS POSITIVE EFFECTS ON SOCIAL BEHAVIOUR, SELF-PERCEPTION AND MOTIVATION.  
(MALL ET AL., 2016: 7)

[HTTP://MATHS.EMPORTFOLIO.EU/IMAGES/DELIVERABLES/TEACHER\\_HANDBOOK\\_ENGLISH\\_VERSION.PD](http://maths.emportfolio.eu/images/deliverables/teacher_handbook_english_version.pdf)

# PRESENT ABSTRACT IDEAS IN CONCRETE FORM



DANCE CAN GIVE A VISUAL  
REPRESENTATION OF MORE ABSTRACT  
SUBJECTS IN MATH THAT ARE DIFFICULT  
TO EXPLAIN IN PLAIN WORDS.  
(ROSENFELD, 2011)

[HTTPS://WWW.ACADEMIA.EDU/4787544/JUMP\\_PATTERNS\\_PERCUSSIVE\\_DANCE\\_AND\\_THE\\_PATH\\_TO\\_MATH](https://www.academia.edu/4787544/JUMP_PATTERNS_PERCUSSIVE_DANCE_AND_THE_PATH_TO_MATH)



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THE INTEGRATION OF THE ARTS INTO TEACHING  
GIVES STUDENTS MORE OPPORTUNITIES TO  
MAKE CONNECTIONS THAT LEAD TO DEEPER  
UNDERSTANDING.  
(MUNROE, 2015)

[HTTPS://DOI.ORG/10.1177/1048371315572878](https://doi.org/10.1177/1048371315572878)



DANCE IS NOT THE RESULT OF MIMETIC  
MOVEMENTS, BUT A COMBINATION OF  
PERCEPTION OF SPACE, TIME, SYMMETRICAL  
MOVEMENTS AND DIRECTIONS.  
(BELCASTRO & SCHAFFER, 2011)

[HTTPS://WWW.TANDFONLINE.COM/DOI/ABS/10.4169/194762111X12954578042939](https://www.tandfonline.com/doi/abs/10.4169/194762111X12954578042939)



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# PRESENT ABSTRACT IDEAS IN CONCRETE FORM



MUSIC IS ONE OF THE FIRST FORMS OF  
COMMUNICATION AND IS OFTEN THE  
FIRST CONTACT OF CHILDREN WITH  
MATHEMATICS.  
(GEIST & GEIST, 2008)



[HTTPS://WWW.PROQUEST.COM/DOCVIEW/197597007/FULLTEXTPDF/AD5A75E67FAE49AAPQ/1?ACCOUNTID=38978](https://www.proquest.com/docview/197597007/fulltextpdf/AD5A75E67FAE49AAPQ/1?accountid=38978)

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# VISUAL REPRESENTATION



WHEN USING THE SPACE OF THE CLASS  
ROOM AND THE NUMBERS WE HAVE  
AROUND US WE CAN GIVE THE  
CHILDREN A NEW LEVEL OF THE  
UNDERSTANDING OF MATHEMATICAL  
CONCEPTS  
(MOERMAN, 2016)

[HTTP://ARCHIVE.BRIDGESMATHART.ORG/2016/BRIDGES2016-269.HTML](http://archive.bridgesmathart.org/2016/bridges2016-269.html)



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MUSIC GIVES A RANGE OF WAYS TO  
UNDERSTAND MATHEMATICS AS  
PATTERN BUILDING, COMPARING AND  
ORDERING, DESCRIBING WHAT ONE  
HEARS AND SEES AND SOLVE  
PROBLEMS, MAKE MUSIC!  
(JOHNSON & EDELSON, 2003)

[HTTPS://WWW.PROQUEST.COM/DOCVIEW/214139035](https://www.proquest.com/docview/214139035)



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PHOTO: "REFLECTING LINES" BY SCOTT ROBINSON, CHANGES MADE.

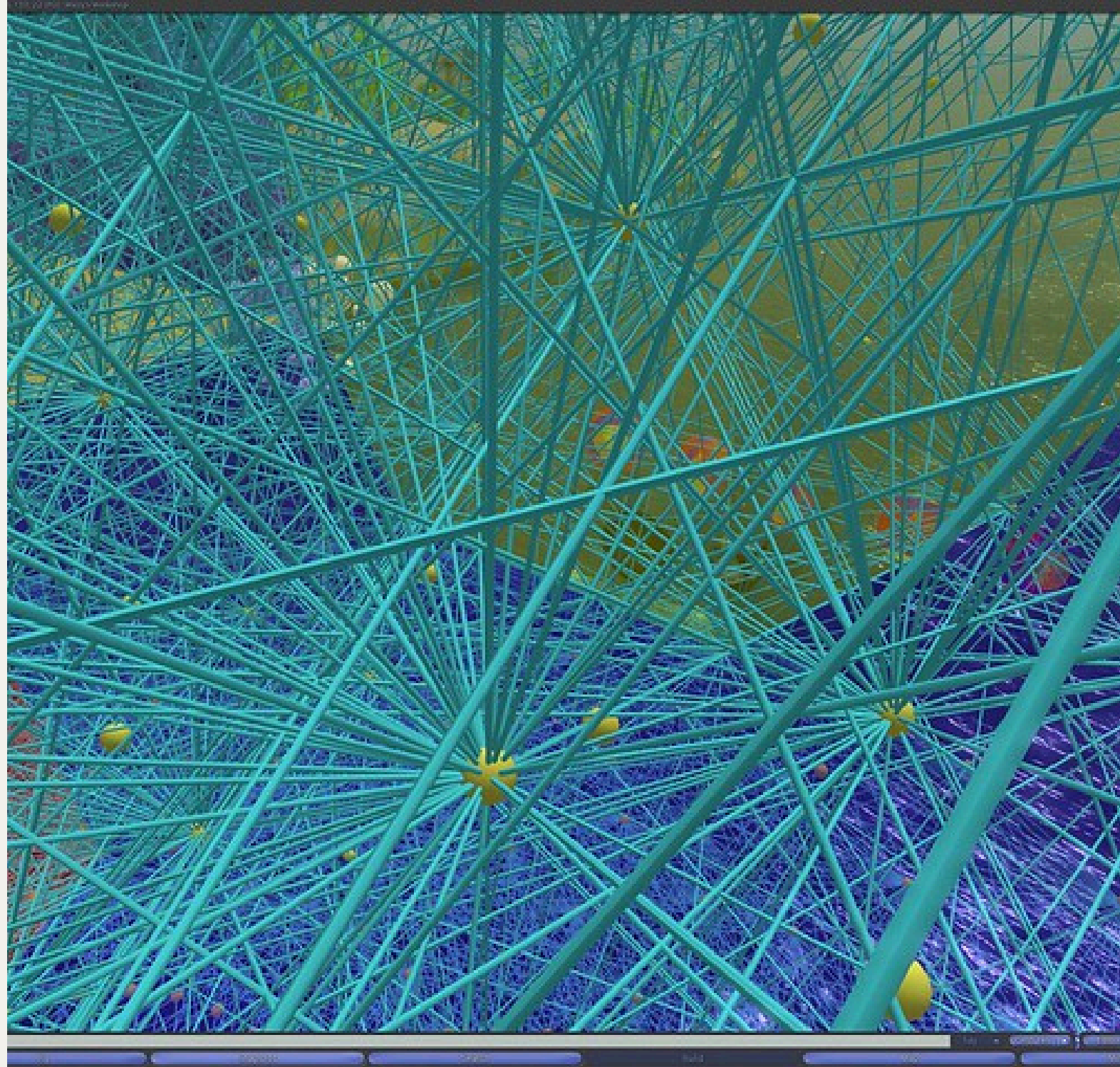


DANCE AND CREATIVE MOVEMENT CAN  
GIVE A VISUAL REPRESENTATION OF  
ANGLES, GEOMETRIC FORMS AND  
SPATIAL PERCEPTION.  
(ROSENFELD, 2011)

[HTTPS://WWW.ACADEMIA.EDU/4787544/JUMP\\_PATTERNS\\_PERCUSSIVE\\_DANCE\\_AND\\_TH  
E\\_PATH\\_TO\\_MATH](https://www.academia.edu/4787544/JUMP_PATTERNS_PERCUSSIVE_DANCE_AND_THE_PATH_TO_MATH)



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# TEAM BUILDING/CLASS MANAGEMENT/INSPIRATION



PHOTO: "ANIMAL FARM" BY ONLY\_ALIVE IS LICENSED UNDER CC BY-NC-ND 2.0.



THE USE OF BODY PERCUSSION AND  
EURYTHMIC GAMES HELPS TO IMPROVE THE  
INTEGRATION LEVEL OF ALL STUDENTS IN THE  
WHOLE CLASS.  
(LUNDBERG, 2014)

[HTTPS://LUP.LUB.LU.SE/LUUR/DOWNLOAD?FUNC=DOWNLOADFILE&RECORDID=4986216&FILEID=4986219](https://lup.lub.lu.se/luur/download?func=downloadfile&recordid=4986216&fileid=4986219)



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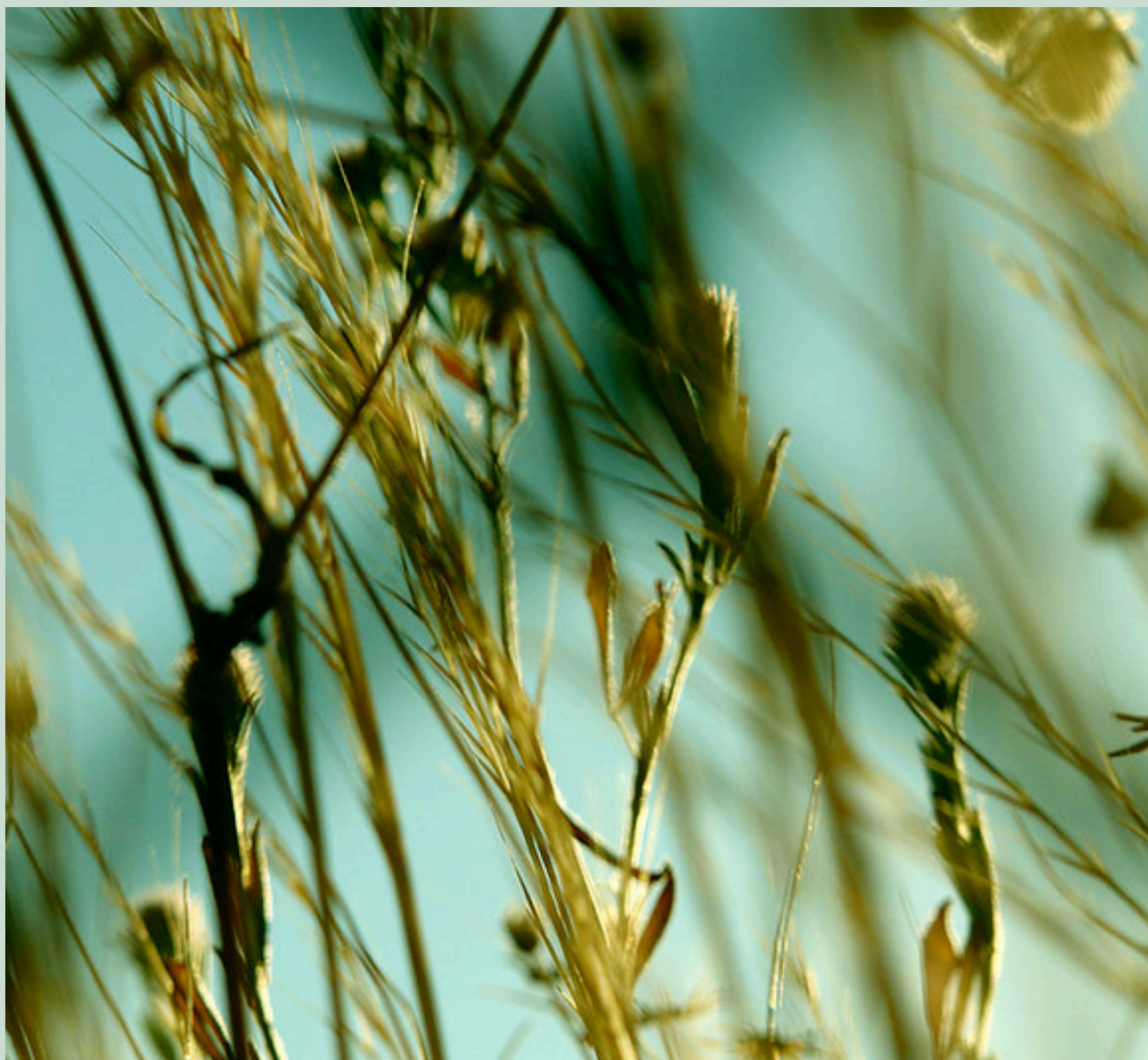


SOME TEACHERS TEND TO FOCUS ON THE ABILITY TO UNDERSTAND MATHEMATICAL CONCEPTS AND NEGLECT NEGATIVE MATHEMATICS DISPOSITIONS. INCORPORATING ART INTO THE MATHEMATICS CLASSROOM ARE SHOWN TO IMPROVE MATHEMATICAL DISPOSITION AND ALSO PERFORMANCE IN MATH. (AN ET AL., 2014)

[HTTPS://WWW.CIMT.ORG.UK/JOURNAL/AN.PDF](https://www.cimt.org.uk/journal/an.pdf)



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THE DISCIPLINE, CONCENTRATION AND  
CLOSENESS IN DANCE CAN HELP STRENGTHEN  
STUDENTS' SENSE OF EMPATHY, CO-  
OPERATIONAL SKILLS AND RESPECT FOR ONE  
SELF AND OTHERS.  
(ROBINSON & ARONICA, 2018)

[HTTPS://IDEAS.TED.COM/WHY-DANCE-IS-JUST-AS-IMPORTANT-AS-MATH-IN-SCHOOL/?](https://ideas.ted.com/why-dance-is-just-as-important-as-math-in-school/)  
[UTM\\_SOURCE=FACEBOOK.COM&UTM\\_MEDIUM=SOCIAL&UTM\\_CAMPAIGN=SOCIAL&UTM\\_CONTENT=2022-2-22](https://ideas.ted.com/why-dance-is-just-as-important-as-math-in-school/?utm_source=facebook.com&utm_medium=social&utm_campaign=social&utm_content=2022-2-22)



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"WOMAN AT PIANO AND CHILDREN WITH MUSICAL INSTRUMENTS. THE UNIVERSITY OF IOWA, FEBRUARY 22, 1938" BY THE UNIVERSITY OF IOWA LIBRARIES IS LICENSED UNDER CC BY-NC 2.0.



ART-THEMED MATHEMATICS EDUCATION  
ACTIVITIES HAVE BEEN PROVEN TO INCREASE  
TEACHERS' INNOVATIVE CAPABILITIES AND  
STRENGTHEN THEIR PEDAGOGICAL SELF-  
ESTEEM.

(AN ET AL., 2019)

[HTTPS://DOI.ORG/10.1080/15290824.2018.1472380](https://doi.org/10.1080/15290824.2018.1472380)



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"MUSICAL MOVEMENT (STAGE SIX)" BY CLAIR GRAUBNER IS LICENSED UNDER CC BY-NC 2.0.



IN INTEGRATED CLASSROOMS, WHERE MUSIC AND MOVEMENTS ARE USED COMBINED WITH MATHEMATICAL PROBLEM-SOLVING, GROUP DYNAMICS ARE BOOSTED AND CHILDREN BECOME MORE ACTIVE IN THEIR LEARNING PROCESS, MAKING THEM REACH CURRICULUM GOALS MORE EASILY.  
(MOERMAN, 2016)

[HTTP://ARCHIVE.BRIDGESMATHART.ORG/2016/BRIDGES2016-269.HTML](http://archive.bridgesmathart.org/2016/bridges2016-269.html)



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# OVERCOME LANGUAGE OBSTACLES/UNIVERSAL COMMUNICATION



PHOTO: "THANK YOU NOTE FOR EVERY LANGUAGE" BY WOODLEYWONDERWORKSIS LICENSED UNDER CC BY 2.0.



PHOTO: "COMMUNICATION" BY FLAVIJUS IS LICENSED UNDER CC BY-NC-ND 2.0.

STUDENTS LEARN TO COMMUNICATE ABOUT DANCE  
THROUGH MATH AND MATH THROUGH DANCE.  
(ROSENFELD, 2011)

[HTTPS://WWW.ACADEMIA.EDU/4787544/JUMP\\_PATTERNS\\_PERCUSSIVE\\_DANCE\\_AND\\_THE\\_PATH\\_TO\\_MATH](https://www.academia.edu/4787544/JUMP_PATTERNS_PERCUSSIVE_DANCE_AND_THE_PATH_TO_MATH)

DANCE IS SPEECHLESS BUT CAN GIVE AN EXTRA  
DIMENSION TO THE COMMUNICATION WITHIN A  
CLASSROOM. IN A MULTI-LINGUISTIC CLASS THIS CAN  
HELP EASE THE LANGUAGE-OBSTACLES.  
(MOERMAN, 2016)

[HTTP://ARCHIVE.BRIDGESMATHART.ORG/2016/BRIDGES2016-269.HTML](http://archive.bridgesmathart.org/2016/bridges2016-269.html)

## OVER-BRIDGE ANXIETY/ MATH-PHOBIA



TO WORK WITH DANCE AND MOVEMENTS IN THE MATH CLASS ROOM CAN SOMETIMES MAKE THE KIDS FORGET THAT THEY ARE LEARNING MATH, AND HENCE THEIR PHOBIA OF MATH DISAPPEARS. THE SAME CAN BE TRUE FOR KIDS WITH A PERSONALITY THAT LIKES MATH MORE THAN DANCING AND MOVING, THE MATH MAKES IT EASIER FOR THEM TO JOIN IN ON THE DANCING.

(ROSENFELD, 2011)

[HTTPS://WWW.ACADEMIA.EDU/4787544/JUMP\\_PATTERNS\\_PERCUSSIVE\\_DANCE\\_AND\\_THE\\_PATH\\_TO\\_MATH](https://www.academia.edu/4787544/JUMP_PATTERNS_PERCUSSIVE_DANCE_AND_THE_PATH_TO_MATH)



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DANCE-THEMED MATHEMATICS EDUCATION  
HELPED "IMPROVING STUDENTS'  
DISPOSITIONS TOWARD MATHEMATICS AND  
CREATING AN ENJOYABLE LEARNING  
ENVIRONMENT FOR REDUCING  
MATHEMATICS ANXIETY".  
(AN ET AL., 2017)

[HTTPS://DOI.ORG/10.1080/15290824.2017.1299153](https://doi.org/10.1080/15290824.2017.1299153)



MUSIC, RHYTHM AND DANCE CAN HELP  
CHILDREN FORGET ABOUT THEIR SOCIAL  
ANXIETY AND ALSO THEIR FEAR OF NOT  
UNDERSTANDING THE MATH THAT THEY  
FEEL THEY ARE SUPPOSED TO  
UNDERSTAND IN THE CLASS ROOM.  
(MOERMAN, 2016)

[HTTP://ARCHIVE.BRIDGESMATHART.ORG/2016/BRIDGES2016-269.HTML](http://archive.bridgesmathart.org/2016/bridges2016-269.html)



"EXCELLENCE IN MUSIC AND MOVEMENT" BY  
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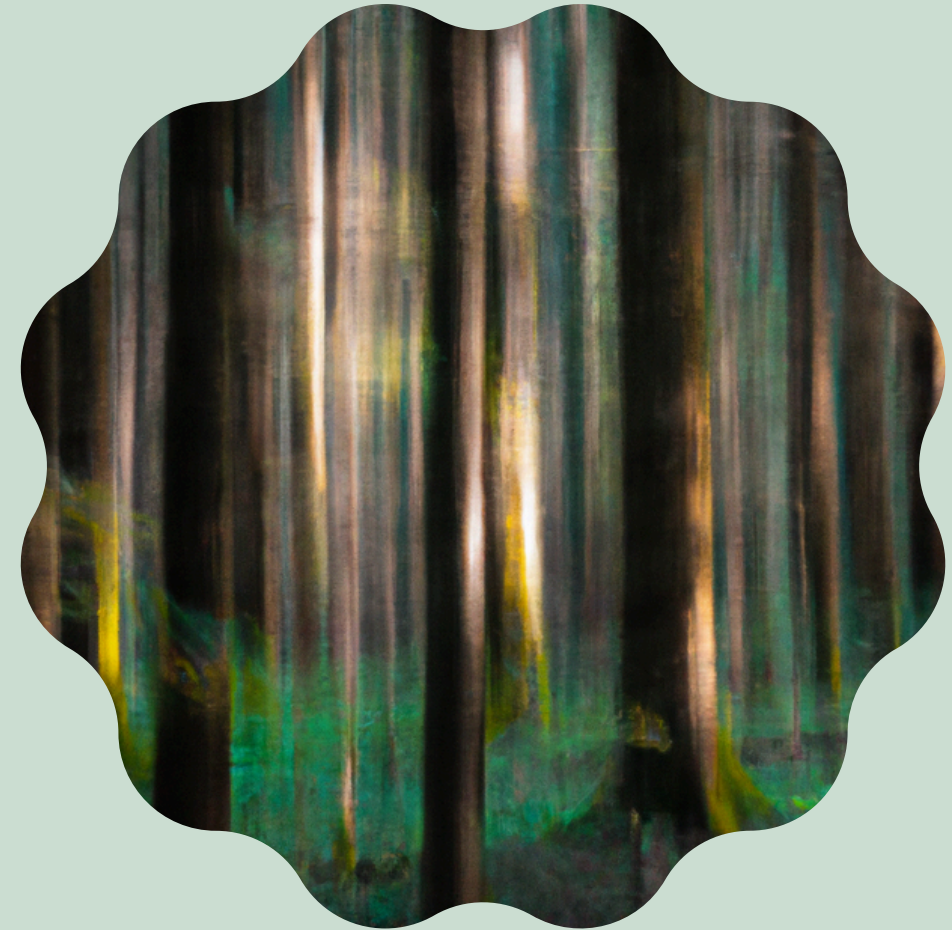


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MUSIC, WROTE THE GREAT 17TH-CENTURY  
GERMAN MATHEMATICIAN GOTTFRIED  
LEIBNIZ, "IS THE SENSATION OF COUNTING  
WITHOUT BEING AWARE YOU WERE  
COUNTING."  
(DU SAUTOY, 2011)

[HTTPS://WWW.THEGUARDIAN.COM/MUSIC/2011/JUN/27/MUSIC-MATHEMATICS-FIBONACCI](https://www.theguardian.com/music/2011/jun/27/music-mathematics-fibonacci)



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# MEMORISATION



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IT IS SHOWN THAT STUDENTS REMEMBER MORE THOROUGHLY WHAT THEY LEARN IF THEY GESTURE WHILE THEY ARE LEARNING. (COOK ET AL., 2008)

[HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/ABS/PII/S001002770700114X? CASA\\_TOKEN=AY335ioLfc4AAAAA:CALSDiDX\\_1Ri8HGd8NBjHQDB3UGTh0KQxxK8SDuGYG3-QF8P\\_2ky\\_YTvLMbBRD5SFsMPyUIPS4PV](https://www.sciencedirect.com/science/article/abs/pii/S001002770700114X?casa_token=AY335ioLfc4AAAAA:CALSDiDX_1Ri8HGd8NBjHQDB3UGTh0KQxxK8SDuGYG3-QF8P_2ky_YTvLMbBRD5SFsMPyUIPS4PV)

# MOTIVATING, ENGAGING AND REWARDING



'MUSIC CAN ACTIVATE THE SAME REWARD CENTER IN YOUR BRAIN AS THE OTHER THINGS YOU ENJOY. REWARDING YOURSELF WITH YOUR FAVOURITE MUSIC CAN IMPROVE THE MOTIVATION YOU NEED TO LEARN NEW INFORMATION'.  
(GOLD ET AL., 2019)

[HTTPS://DOI.ORG/10.1073/PNAS.1809855116](https://doi.org/10.1073/pnas.1809855116)



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INTEGRATING MUSIC ACTIVITIES INTO  
LEARNING ROUTINES ENABLES  
CHILDREN TO DEVELOP LEARNING  
EXPERIENCES IN A PLAYFUL AND  
ENGAGING WAY.  
(VAIOULI & FRIESEN, 2016)

[HTTPS://DOI.ORG/10.1080/00094056.2016.1150745](https://doi.org/10.1080/00094056.2016.1150745)



"DIA DE LOS MUERTOS ART BY CHILDREN" BY JUST SOME DUST IS LICENSED UNDER CC BY 2.0.



MUSIC CREATION IS THE ONLY ONE  
THAT ACTIVATES MOST PARTS OF THE  
BRAIN AS OPPOSED TO ANY OTHER  
ACTIVITY.

(SCRIPP & GILBERT, 2016)

[HTTPS://DOI.ORG/10.1080/10632913.2016.1211923](https://doi.org/10.1080/10632913.2016.1211923)



PHOTO: "DESERT HEIGHTS" BY SCOTT ROBINSON. CHANGES MADE. [HTTPS://CREATIVECOMMONS.ORG/LICENSES/BY/2.0/](https://creativecommons.org/licenses/by/2.0/)



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