

# *MUSICAL AWAKENINGS*<sup>®</sup>

presents

## MOZART

### PROGRAM

**Wolfgang Amadeus Mozart**      Variations on "Ah! Vous dirai-je, maman"

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### TEKS CORRELATIONS

#### **Social Studies Strand**

3.1 **History.** The student understands how individuals, events, and ideas have influenced the history of various communities.

2.2, 3.3 **History.** The student understands the concepts of time and chronology.

2.3 **History.** The student understands how various sources provide information about the past.

2.5, 3.5, 4.6 **Geography.** The student understands the concepts of location, distance, and direction on maps and globes.

3.14 **Culture.** The student understands the importance of writers and artists to the cultural heritage of communities.

2.15 **Culture.** The student understands the significance of works of art in the local community.

2.17, 3.16, 4.22 **Social Studies Skills.** The student applies critical thinking skills to organize and use information acquired.

2.18, 3.17, 4.23 **Social Studies Skills.** The student communicates effectively in written, oral, and visual forms.

#### **Language Arts Strand**

2.1, 3.1, 4.1 **Listening/Speaking/Purposes.** The student listens attentively and engages actively in various oral language experiences.

2.2, 3.2, 4.2 **Listening/Speaking/Culture.** The student listens and speaks to gain knowledge of his/her culture, the culture of others, and the common elements of cultures.

2.4, 3.4, 4.5 **Listening/Speaking/Communication.** The student communicates clearly by putting thoughts and feelings into spoken words.

2.5, 3.5, 4.6 **Reading/Word Identification.** The student uses a variety of word identification strategies.

2.7, 3.7, 4.8 **Reading/Variety of Texts.** The student reads widely for different purposes in varied sources.

2.8, 3.8, 4.9 **Reading/Vocabulary Development.** The student develops an extensive vocabulary.

2.9, 3.9, 4.10 **Reading/Comprehension.** The student uses a variety of strategies to comprehend selections read aloud and read independently.

2.10, 3.10, 4.11 **Reading/Literary Response.** The student responds to a variety of texts.

2.12, 3.12, 4.13 **Reading/Inquiry/Research.** The student generates questions and conducts research using information from various sources.

2.13, 3.13, 4.14 **Reading/Culture.** The student reads to increase knowledge of his/her culture, the culture of others, and the common elements of culture.

2.14, 3.14, 4.15 **Writing/Purposes.** The student writes for a variety of audiences and purposes and in various forms.

2.15, 3.15, 4.16 **Writing/Penmanship/Capitalization/Punctuation.** The student composes original texts using the conventions of written language, such as capitalization and penmanship, to communicate clearly.

2.16, 3.16, 4.17 **Writing/Spelling.** The student spells proficiently.

2.17, 3.17, 4.18 **Writing/Grammar/Usage.** The student composes meaningful texts applying knowledge of grammar and usage.

2.20, 3.20, 4.21 **Writing/Inquiry/Research.** The student uses writing as a tool for learning and research.

## **SUGGESTED LESSON PLANS**

**What is in a Name?©** pages 4-6

**Happy Birthday, Mozart!©** pages 7-11

**The Mozart Effect©** pages 12-39

Resource Information pages 19-39

**Composer Biography** pages 40-41



## Mozart **What is in a name?** Mozart

*“What’s in a name? That which we call a rose / By any other name would smell as sweet.”*

*“Sticks and stones may break my bones, but names will never hurt me.”*

*“A good name is better than riches.”*

There are lots of sayings about names, and most of them are at best only partially true. In this lesson, students investigate the meanings and origins of their own names in order to establish their own personal histories and to explore cultural significance of naming traditions.

After Internet research and interviews with family or community members, students write about their own names, using Mem Fox’s *Wilford Gordon McDonald Partridge* as a model.



**Subject Areas:** Language Arts, Social Studies

**Instructional Goals:**

- Students will understand the meanings of names.
- Students will observe how names have evolved over time.

**Materials needed:**

- Sentence strips
- *Wilford Gordon McDonald Partridge* by Mem Fox
- Paper
- Pencils
- Crayons, markers, or colored pencils

**Anticipatory Set:**

1. Ask the students to write their full names on sentence strips. Have students include all of their given names. Allow the students to discuss what the words in each list have in common.
2. Write Mozart's full name on the interactive white board, or on a sentence strip (or more) and show the class:  
Johannes Chrysostomus Wolfgangus Theophilus Amadeus Mozart.

**Activity:**

1. Read *Wilford Gordon McDonald Partridge* by Mem Fox to the students.
2. Ask the students to make connections with their names, the book, and Mozart's name.
3. Have students interview members of their family to find out additional details about their names. Students may ask questions about why they were named as they were, what other names were considered, and who ended up picking out their name.
4. In addition to the information that others tell students about their name, have students gather their own ideas about their name. Suggested questions include the following:
  - How do you feel about your name?
  - How do others respond to your name?
  - If you could pick out your own name, what would you select?
5. Students will write about their research findings and reflections.
6. Using the book, *Wilford Gordon McDonald Partridge* by Mem Fox, as a model, students will write and illustrate their own book interweaving their name research and Mozart's name. Students may incorporate the connections made with the literature and their own names.

**Teacher's Role:**

The teacher's role in this lesson is to facilitate understanding of the meaning behind given names, and to help students develop an organized method using thinking processes to research and reflect on their names and Mozart's name. The teacher will facilitate the application of the student's knowledge of each name's meanings and selection to the writing of their own book. Teachers will need to model the writing process for the students.

**Creative Question Suggestions:**

1. How might names relate to one another?
2. What attributes can be applied to a particular name?
3. What name choices do you think Mozart would have selected for himself?

**Evaluation:**

1. The students will be evaluated based on the depth of research and reflections on their own names.
2. The students will be evaluated on their authorship of the book of their names and Mozart's name.



## Happy Birthday, Mozart!

Celebrate Mozart's 253<sup>rd</sup> birthday! Students will share their families' traditions for celebrating birthdays.

**Subject Areas:** Social Studies, Language Arts, Music

### **Instructional Goals:**

- Students will explore the traditions across the globe that people use to celebrate birthdays.
- Students will apply traditions to celebrate the life of Mozart.
- Students will research historical significance of people who possess virtuosity.
- Students will use metacognition in determining salient information.

### **Materials needed:**

- Internet access
- Encyclopedias or other reference materials
- Notebook paper
- White card stock
- Markers, crayons, colored pencils

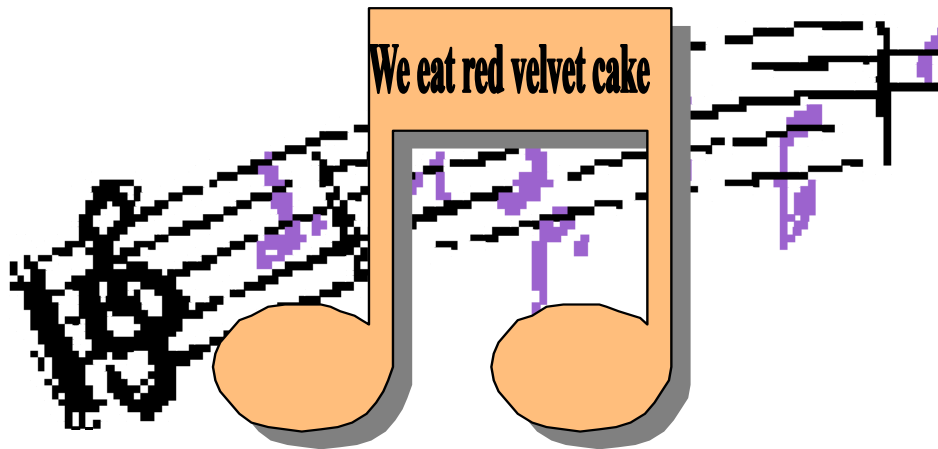
### **Anticipatory Set:**

1. The teacher will facilitate discussion of the meaning of creative genius.
2. The class will create a criteria chart for attributes that lead to creative genius.

### **Activity:**

1. The students will use the criteria listing attributes of people who demonstrate aspects of creative genius to note those attributes in the Mozart biography on a stop and jot format of note taking.

2. Ask the students to write down a family birthday celebration on a music note and post them on a musical score drawn on butcher paper or on chart paper.



3. Students will share family traditions and research birthday traditions around the world. The following websites have great information on the history of birthdays:  
[www.kidsparties.com/traditions.htm](http://www.kidsparties.com/traditions.htm)  
<http://www.birthdaycelebrations.net/traditions.htm>
4. Students may create birthday cards for Mozart from around the world.

### **Traditions from Around the World: How Happy Birthday is Said**

- Afrikaans - Veels geluk met jou verjaarsdag!
- Albanian - Urime ditelindjen!
- Alsatian - Gueter geburtsdaa!
- Amharic - Melkam lidet!
- Arabic - Eed melad said
- Armenian - Taredartzet shnorhavor! or Tsenund shnorhavor!
- Assyrian - Eida D'moladukh Hawee Brikha!
- Australia - Happy Birthday
- Austrian-Viennese - Ois guade winsch i dia zum Gbuadsdog!
- Aymara (Bolivia) - Suma Urupnaya Cchuru Uromankja!
- Basque - Zorionak!
- Belauan-Micronesian - Ungil el cherellem!
- Bengali (Bangladesh/India) - Shuvo Jonmodin!
- Bislama (Vanuatu) - Hapi betde! or Yumi selebretem de blong bon blong yu!
- Brazil - Feliz Aniversario, Feliz Feliz Aniversario
- Breton - Deiz-ha-bloaz laouen deoc'h!
- Bulgarian - Chestit Rojden Den!
- Cambodian - Som owie nek mein aryouk yrinyu!
- Canada - Happy Birthday
- Catalan - Per molts anys! or Bon aniversari!
- Chamorro - Biba Kumpianos!

- China - Sheng Ri Kuai Le or Saang yaht faai lokik
- Croatian - Sretan Rodendan!
- Czech - Vsechno nejlepsi k Tvym narozeninam!
- Danish - Tillykke med fodselsdagen!
- Dutch - Hartelijk gefeliciteerd met je verjaardag
- Ecuador - Feliz Dia del Santo
- Egypt - Kule Sana Winta Tayib (boy)  
Kule Sana Wintie Tayyiba (Girl)
- English - Happy Birthday!
- Esperanto - Felichan Naskightagon!
- Estonian - Palju onne sunnipaevaks!
- Euskera - Zorionak zure urtebetetze egunean!
- Faroes (Faroe island) - Tillukku vid fodingardegnum!
- Farsi - Tavalodet Mobarak!
- Finnish - Hyvaa syntymapaivaa!
- France - Joyeux Anniversaire!
- French-canadian - Bonne Fete!
- Frisian - Lokkiche jierdei!
- Gaelic - Co latha breith sona dhut!
- Galician (Spain) - Leticia no teu cumpreanos!
- Germany - Alles Gute zum Geburtstag or  
Herzlichen Glückwunsch zum Geburtstag
- Georgian - Gilotcav dabadebis dges!
- Ghana - Happy Birthday  
Medzi dzigbe njkeke nyuie no wo (ewe tribal language)
- Great Britain - Happy Birthday
- Greek - Eftixismena Genethlia! or Chronia Pola!
- Greenlandic - Inuununu pilluarit!
- Gronings (Netherlands) - Fielsteerd mit joen verjoardag!
- Gujarati (India) - Janma Divas Mubarak!
- Hawaiian - Hau oli la hanau!
- Hebrew - Yom Huledet Same'ach!
- Hiligaymon (Philippines) - Masadya gid nga adlaw sa imo pagkatawo!
- Hindi - Janam Din Ki Badhai
- Hungarian - Boldog szuletes napot
- Icelandic - Til hamingju med afmaelisdaginn!
- India - Sal Girah Mubarak
- Indonesian - Selamat Ulang Tahun!
- Irish - gaelic - La-briethe mhaith agat! or Briethla Shona Dhuit!
- Israel - Yom Holedet Sameach
- Italian - Buon compleanno! or Bun Cupleani!
- Japanese - Otanjyobi omedeto Gozaimasu!
- Javaans-Indonesia - Slamet Ulang Tuanmoe!
- Korean - Saeng il chuk ha ham ni da!
- Latin - Fortuna dies natalis!
- Latvian - Daudz laimes dzimsanas diena!

- Lithuanian - Sveikinu su gimtadieniu! or Geriausi linkejimai gimtadienio proga!
- Macedonian - Sreken roden den!
- Malaysian - Selamat Hari Jadi!
- Maltese - Nifrahlek ghal ghelug sninek!
- Maori - Kia Huritau ki A Koe
- Mexico - Feliz Cumpleanos
- Mongolian - Torson odriin mend hurgee!
- Native American - Haptee Hocuenera Hinigiren
- The Netherlands - Van Harte Gefeliciteerd or Hjertelig til lykke medfodselsdagen
- Nigeria - Eku ojobi
- Norway - Gratulere Med Daged
- Persian - Tavalodet Mobarak!
- Peru - Feliz Cumpleanos
- Polish - Wszystkiego Najlepszego! or Wszystkiego najlepszego z okazji urodzin!
- Portuguese (Brazil) - Parabens pelo seu aniversario!
- Portuguese - Felix Aniversario! or Parabens!
- Quebec - Bonne Fete <FRENCH)
- Romanian - La Multi Ani!
- Russia - s'dnom roshedenea or Sdnyom rozhdenya
- Samoan - Manuia lou aso fanau!
- Serbian - Srecan Rodjendan!
- Spanish - Feliz cumpleaños
- Sri Lankan - Suba Upan dinayak vewa!
- Sudan - Aid Milad Jamil
- Swedish - Grattis pa fodelsdagen!
- Taiwanese - San leaz quiet lo!
- Thai - Suk San Wan Keut
- Turkish - Dogum gunun kutlu olsun!
- Ukrainian - Mnohiya lita! or Z D dnem naradjennia!
- Venezuela - Hoy Es Tu Dia
- Vietnamese - Chuc Mung Sinh Nhat!
- Welsh - Penblwydd hapus
- Yiddish - A Freilekhn Gebortstog!

### **Teacher's Role:**

The teacher's role is to facilitate the discussion of traditions and how traditions may be manifested within specific cultures; and to facilitate the creation of a criteria sheet of creative genius attributes.

### **Creative Question Suggestions:**

1. Can you assess the value of being a creative genius?
2. How might you celebrate the birthday for someone observing their 253<sup>rd</sup> year?

3. How would your family's traditions for celebrating birthdays be received by Mozart?

**Evaluation:**

1. The students will be evaluated on their research notes on the birthday traditions across the globe.
2. The students will be evaluated on their birthday cards from across the world to Mozart.



## The Mozart Effect



Does music help you learn more easily? Can it help you to concentrate and focus better? Will it improve your memory? Can you get better test scores by listening to classical music just before taking an exam? Does music affect your health? Should parents expose their babies to classical music?

The students will find out the answers to these questions and more. Students will learn about research that some media have dubbed the *Mozart Effect* and the connection classical music can make with your brain. This is a controversial subject. Students will discover pros and cons about this.

**Subject Areas:** Language Arts, Social Studies

### Instructional Goals:

- The students will demonstrate reading comprehension skills.
- The students will explore a topic using research skills.
- The students will communicate their findings.

### Materials Needed:

- Internet access
- Interactive presentation board/Promethean board
- Paper and pencil
- Resource articles

### Anticipatory Set:

1. The teacher will discuss classical music as a genre of musical expression.
2. The teacher will introduce graphic organizers.

### Activity:

1. The student will assume one of these three roles: parent, teacher, or doctor. They may work with a partner. Students will examine the research done by musicians and scientists to find out how classical music affects children and adults. Students will also include themselves in this research by actively listening to a variety of classical pieces to determine how they are affected.
2. If the student (and their partner) choose to take the role of a parent, the task is to find out if exposing children to classical music at a young age has any benefits.

What can the student find out about early music training and preschoolers?  
Should parents sing lullabies to their babies? Can music help your children do better in school? What type of research has become known as the *Mozart Effect*?

3. If students choose to take the teacher's role, the task is to find out if listening to classical music, taking general music classes, or learning an instrument, will help students do better in school. Will it help them prepare for a big test? What have researchers found out about children who take music lessons and who are exposed to the music of Mozart? What type of research has become known as the *Mozart Effect*?
4. If students take the role of a doctor, the task is to look into music as therapy. Can listening to classical music help cure patients? Should doctors offer music in the operating room? Can music soothe away pain? How does it affect the brain? What part of the brain processes music?
5. All students will need to see how classical music affects them. This part will take the teacher's help. The teacher will play classical music before tests and quizzes. Students will have a chance to listen to a variety of pieces from the Baroque, Classical, and Romantic eras during study times. Students will write their responses to the music and see if their focus, memory, and test scores improve.
6. Group work: After students have completed their research they will get together with their fellow researchers. Form a group of three (a doctor, a parent, and a teacher) or six (if students are working with partners—one pair each of doctors, parents, and teachers) and discuss your findings. What were the pros and cons you found in the research? Students will come to some agreement about the *Mozart Effect* and the power of music to heal the body and strengthen the mind. Then, together, create a graphic word web to show the group's findings.
7. Individually: The students will evaluate the music they listened to before exams and during study periods. Students will write a page about these musical experiences. Students should consider what they gained by listening to the musical pieces. Student reflections should include their favorite pieces and why they liked them, improvements they made academically or emotionally, and their least favorite pieces and why they disliked them or found them unhelpful.
8. Once students have decided a role to play, they will need to use the Internet links provided under resources for their particular character to get answers to the questions posed.
9. Students will organize the information learned by taking notes for the web concept graphic organizer.

## Resources:

*PRO: For Parents and Teachers:*

- **The Mozart Effect and Quotes** - An explanation of the research with interesting quotes.
- **Music Lessons Found To Spur Memory** - An article from the *San Diego Union Tribune* about how music lessons have been found to improve long-term verbal memory.
- **Music Tunes Mental Strings** – A Positive article from the *Boston Globe* about the many powerful effects of music.
- **Georgia Governor Zell & the Mozart Effect** - Article from the *Athens Daily News* (Athens, Georgia) explaining the Georgia Governor's new program to give classical music tapes or CDs to all new parents in his state.
- **Facing the Music: The Shaw Study - Piano lessons & preschool children** - Research by physics professor Gordon Shaw. The study involved seventy-eight three- and four-year-olds of normal intelligence from three preschools in Orange and Los Angeles Counties. Thirty-four children received private piano keyboard lessons, twenty children received similar private instruction on computers, ten children were given group singing lessons, and fourteen children in a control group received no special lessons. Find out what happened next!
- **Math, Academics, and Music Programs** - Does music instruction aid math skills? Does music instruction aid overall academic achievement? Does missing class for instrumental lessons hurt you academically? Studies that address these issues (from a book called *Spin-Offs, the Extra-Musical Advantages of a Musical Education*) are on this link.

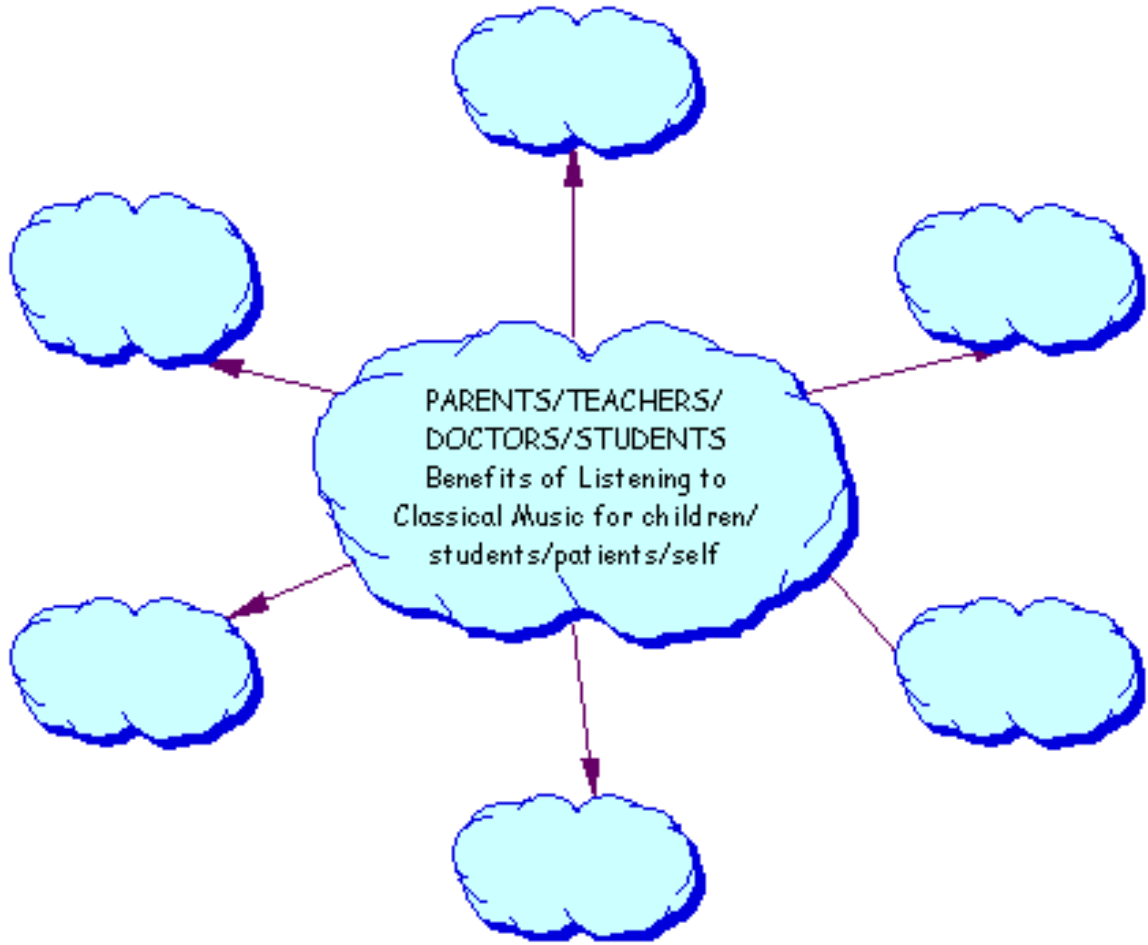
*PRO: For Doctors:* information from the book, *The Mozart Effect*

- **Sound Therapy, Music and Health**, pg. 1
- **Sound Therapy, Music and Health**, pg. 2
- **Music and Health, Traditional Musical Medicine**, pg. 3

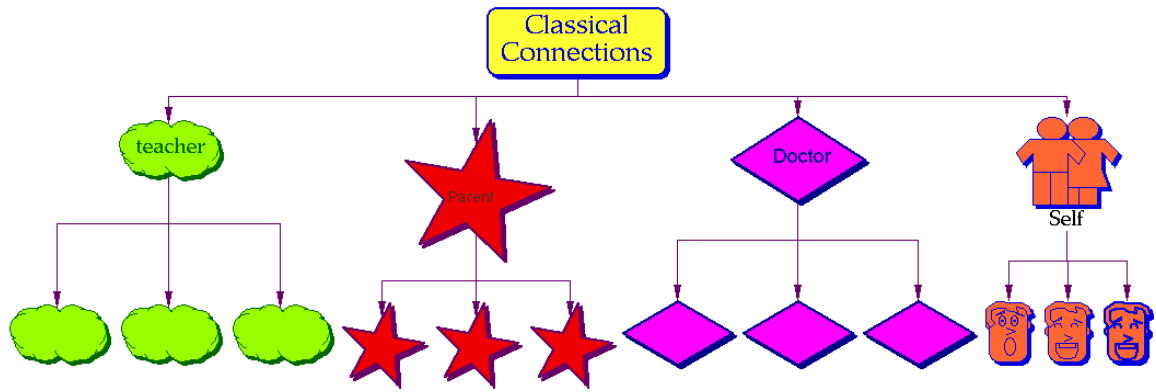
*CONS: For all researchers*

- **The Musical Brain** - A research neuroscientist, Dr. Chudler, explains the brain and some of the recent research about music and the brain. He is not convinced and believes further research is indicated.
- **Does Mozart Make You Smarter?** - This link questions the validity of the *Mozart Effect* experiment.

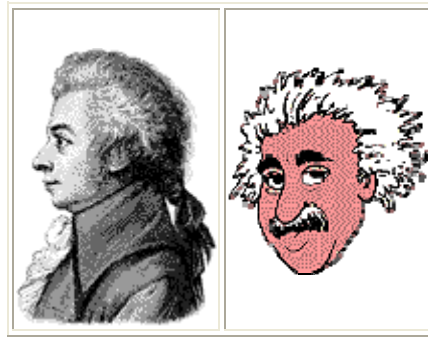
WEB CONCEPT GRAPHIC ORGANIZER:



Inspirations Student Web:



## What is The *Mozart Effect*?



Researchers across the nation have conducted studies to justify the importance of music in a child's life. Recent research suggests that listening to the music of Mozart increases *spatial* scores of high school and college students on IQ tests; this has been called The *Mozart Effect*. Spatial understanding is what you need to complete a puzzle. You need to be able to see how the pieces fit together. Well-developed *spatial intelligence* is the ability to see the visual world accurately, to form mental images of physical objects, and to recognize variations in objects. Spatial intelligence is crucial in activities like higher brain functions of mathematics, music, and chess. Researchers at the University of California at Irvine have found that simply listening to the classical music of Mozart can enhance spatial reasoning performance.

In other research, the College Board found that high school students who listened to classical music scored 51 points higher on verbal portions of the SAT and 39 points higher on the math portion of the SAT, than students who didn't listen to any music.

## **Some interesting quotes about the power of music.**

**“Research is showing that Music education increases ability in reading, thinking and learning.”**

**--*Working Mother*, May 1996**

**“Ten premature hospitalized infants who listened to lullabies on miniature Walkmans showed higher levels of oxygen in their blood and more normal heart and breathing rates than premature infants without headsets.”**

**--*Prevention Magazine*, July 1995**

**“Research found that inner city children’s reasoning skills that tested below the US average doubled after listening to music.”**

**--*Prevention Magazine*, February 1994**

**“Music therapy can enable children or adults with limited language skills to express emotions they otherwise could not, and helps build confidence by showing students they can succeed.”**

**--*Occupational Outlook Quarterly*, Winter, 1993**

**“Music and language are closely intertwined. Hence, music may be used to teach children language and language development.”**

**--*Childhood Education*, Winter 1994**

**“Music to me is representative of everything I like most in life. My musical experiences were just as important to me, in terms of my development, as my political experiences or academic life.”**

**--President Bill Clinton, 1994**

## Music lessons found to spur memory

REUTERS

November 12, 1998

LONDON -- Music lessons can improve long-term verbal memory, scientists said yesterday. Although musical training may not seem to be the most obvious way to improve one's memory, scientists in Hong Kong have shown musicians have an advantage over their non-trained counterparts.

Studying notes and scales seems to enlarge a region of the brain called the left planum temporale, which is involved in remembering words.

Agnes Chan of The Chinese University of Hong Kong tested the verbal memory of 60 female college students, half of whom had at least six years of music training before the age of 12.

They divided the students into two groups, read them 16-word lists three times and asked them to repeat what they could remember.

"We found that adults with music training learned significantly more words than those without any music training," Chan and her colleagues said in a letter to the science journal *Nature*.

They believe the music may be advantageous because it is easier to engage children in music lessons than other memory strategies. The research is consistent with previous studies linking music training with an enlarged cerebellum, which forms the bulk of the brain.

Scientists at Beth Israel Deaconess Medical Center in Boston found that the cerebellum of expert musicians was 5 percent larger than people who had not studied music.

Another American study also showed that piano lessons increased children's ability in learning mathematics and science.

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( <http://www.uniontrib.com/news/uniontrib/thu/index.html> )

# HOW MUSIC TUNES OUR MENTAL STRINGS

By JUDY FOREMAN

c.1997 The Boston Globe

Music fills the days at the John Eliot Elementary School in Needham, Mass. When recess is over a teacher may put something soothing on the classroom CD or tape player, perhaps a Baroque piece whose steady rhythm evokes the 60 beats a minute of a heart at peace.

When kids study the solar system and make splatter paintings of the heavens, they listen to "The Planets" by Gustav Holst. When they study the Colonial period, they write their own songs about the Boston Tea Party, says principal Miriam Kronish, who is also a musician.

And when they take the state MEAP exams in reading, science, social studies and math, these music-drenched kids soar like the voice of soprano Kiri Te Kanawa. The highest possible score on those tests is 1,600, on the latest tests, no child from the John Eliot scored less than 1,570.

This virtuoso performance fits with other data showing that older kids who've studied music-or the arts in general- score higher than average on both the verbal and math parts of the SATs, according to the CollegeBoard, sponsor of the tests.

## **Turn On Your Brain Power with Music!**

Is there really a connection between the magic of music and the way the brain develops? There appears to be, says a growing chorus of neuroscientists and psychologists.

Music, of course, should be enjoyed for its own sake, not for whatever it may do for brain cells. But there is compelling evidence that making and listening to music, starting as early as possible, may also build brain power.

In fact, some researchers now speculate that early exposure to music may help preserve some of the millions of brain cells a baby is born with that might be lost if they were not used.

"Music is as much a part of the human condition as language \_ we are born with the machinery to make and appreciate it," says Dr. Mark Tramo, a Harvard Medical School neuroscientist. "It's all there. All we have to do is turn it on."

## **We are Born to Hear and Love Music!**

By the time a baby is born, the cochlea, part of the inner ear, is already equipped with a rubber-band-like membrane that can vibrate in response to sound waves. Sound waves,

which consist of air molecules vibrating at different frequencies, are created all the time- whenever a car screeches, a steak sizzles or a violinist plays an "A." The "amazing" thing, says Tramo, is that specific sets of nerve cells respond to specific frequencies. For instance, some nerves respond to the middle A on the piano, which vibrates at 440 Hertz, or 440 cycles per second. Other nerves respond to middle C, about 262 Hertz.

"The miracle is that the physics of the sound vibration and the physiology of the ear and brain match so well. We're born ready to hear-and love-music," he says.

### **An Experiment with Music and Babies**

Babies as young as four months old appear already capable of understanding musical structure, according to a series of ingenious experiments by psychologist Carol Krumhansl of Cornell University and others.

In a typical experiment, the baby is placed in a dark room. When a light goes on, the baby turns her head toward it. As soon as she does, music comes on and stays on until she turns her head away.

Babies quickly learn, says Krumhansl, that the music plays only when they are looking at the light. Once the infants make the connection, the researchers play minuets by Mozart. Sometimes, they are played just as Mozart wrote them. Other times, they are played with long pauses between notes, a disruption that "sounds terrible" to adults, Krumhansl laughs.

The babies think so, too. When Mozart is played right, babies look at the light for long periods. When the musical structure is broken up, they look away. Stanford researchers have documented the same effect with Bartok and Bach.

"Babies are born with a sense of music," Krumhansl says, adding that studies suggest that even young babies know a cadence - a set of chord patterns that often signals the end of a piece - when they hear one. And they prefer consonant music, with its pleasant-sounding chords, to dissonance, which often sounds harsh or out of tune.

### **Early Music Training Helps Test Scores**

Furthermore, it is becoming clear that specific types of music training can enhance certain intellectual skills, say Frances H. Rauscher, a psychologist at the University of Wisconsin, and Gordon Shaw, a physicist at the University of California at Irvine.

In their latest study, published in February, Rauscher, Shaw and their team took 78 three- and four-year-olds from working-class families and divided them into four groups. One group had six months of private piano lessons; another got computer lessons, a third, singing lessons and the fourth, no training. Unlike the kids who learned piano, Rauscher notes, those given singing lessons were taught little about musical concepts.

By the end of the study, the piano students scored 34 percent higher than the others on a test of spatial-temporal reasoning (putting a puzzle together) to gauge their ability to process information in sequence and space.

“It's a very definite, causal thing,” says Shaw. “You use large parts of the brain when you're doing anything at a high level, like processing music.”

### **The "Mozart Effect" in College Students**

Rauscher and Shaw also documented the “Mozart effect” in college students. Several years ago, they found that just listening to the complexities of Mozart's piano sonatas increased scores on temporal-spatial reasoning tests, while listening to relaxation tapes or music by Philip Glass, which is more hypnotic, did not.

But in the college-age kids, the “Mozart effect” lasted only about 15 minutes, notes Rauscher, while the brain-boosting effect of piano lessons for little kids seems to last at least a week.

### **A "Critical Period" to learn Music: Before the age of 7**

There is also growing evidence of a “critical period”- roughly the first seven years of life-during which music training is most likely to help brain development, says Dr. Gottfried Schlaug, a neurologist at Beth Israel Deaconess Medical Center in Boston.

In one study of right-handed musicians, Schlaug used modern imaging techniques like MRI to examine the corpus callosum, the structure that links the two halves of the brain. To play an instrument that involves both hands, such as the piano, a person must transfer information quickly from one side of the brain to the other.

Schlaug found that in musicians who started playing before age 7, the corpus callosum is bigger than in those who started after age 7.

In another study of pianists, Schlaug found that the motor cortex -the part of the brain that controls movement, including movement of fingers -was more symmetrical in those who started playing before age 7 than in those who started later.

All the musicians were right-handed, which means that researchers expected the left side of the motor cortex to be well-developed because the right side of the body is controlled by the left half of the brain, and vice versa.

Surprisingly, among musicians the right side of the motor cortex was equally strong, especially among those who started early. Most likely, this is because, as kids, these musicians used the fingers on their left hands so much.

A German study of right-handed musicians who play string instruments-and use the fingers on their left hands to press on the strings-bolsters this idea. In the right motor cortex, the spaces between areas that control the thumb and pinky were wider apart than normal, especially among those who started playing early.

Perfect or absolute pitch -the ability to identify one tone without reference to others - may also be honed early. Chances are, Schlaug says, that ``if you don't get exposed to music before age 7, you don't have it."

### **So what can you do to keep kids' music neurons humming?**

``It's use it or lose it," says Tramo. ``If you want to maximize your children's intellect, give them music lessons."

That philosophy underlies Harvard's Project Zero program, led by neuropsychologist Howard Gardner, who has long believed that music is one of the basic forms of intelligence.

### **Keep Music in Your Schools**

You can also fight for arts programs in schools and communities. Budget cutters often see the arts as frills, says Jim Simpson, executive director at the South Shore Conservatory, which teaches 2,000 kids a year in Hingham and Duxbury, Mass. But the arts ``are not an adjunct," he says. ``They are an important intellectual development area."

The bottom line, says Schlaug, is that ``any kind of music, either listening or practicing, is able to shape the structure and function of the brain. So anything you can do to enhance a child's attraction to music will help."

## Will Georgians embrace Governor's musical idea?

Associated Press

ATLANTA -- Georgians more accustomed to home-grown music -- such as the B52s' "Love Shack" or Alan Jackson's "Games Rednecks Play" -- got a jarring message from the governor this week: Try Beethoven.

Gov. Zell Miller -- the guy who writes lyrics for country music songs and pals around with stars from the Grand Ol' Opry -- has embraced the Mozart Effect, the theory that classical music at the earliest age makes children smarter and more analytical as they grow.

In his budget address this week, he asked the legislature for \$105,000 to pay for a classical music tape or CD to be sent home from the hospital with every newborn.

That's assuming that their parents, many of whom wouldn't know a harpsichord from a harmonica, would even listen to -- much less enjoy -- a soaring passage from a Mozart sonata.

Miller, besides being a devotee of country and western, likes classical, rock and roll, and blues. He even wrote about the state's diverse group of musicians in his book, "They Heard Georgia Singing."

Music experts say it's the harmony and rhythms of 18th century music that build brain power. Longer pieces increase attention span at an early age.

"I heard about it on the radio, and I thought to myself, 'I want one of those.' 'Ode to Joy' is one of my favorites," said Jennifer Dickie of Atlanta, who is seven months' pregnant with her first child.

"But then I started thinking, would I play the CD to make my baby smarter or would I play it because I like it and I would like to hear it in the house?"

"I guess it doesn't matter because I probably would do anything to soothe my child."

Should Miller's idea warrant a bravo from lawmakers, even musical parents have their own ideas about the tape. Just which composers, which pieces and which orchestras? The notable New York Philharmonic or the local Atlanta Symphony Orchestra?

"His idea is good, but I'd like to hear more about what orchestras he wants to put on there," said Barbara Wager, a mother of two who teaches flute, clarinet and saxophone at the Georgia Academy of Music in Atlanta.

From the womb, both of her daughters, 1-year-old Cille and 1-month-old Lena, heard lots of instruments and musical styles, from Bach's flute sonatas to Bobby McFerrin's peppy "Don't Worry, Be Happy."

Just accept it, says piano teacher Laura Gordy of Athens. Introduction to any music at an early age helps to improve performance in school and to make children become more patient and coordinated.

At the very least, it would put music in homes where classical is the great unknown.

"There are a lot of homes where they would not have any classical music at all ... a lot of their parents would have not grown up with it," Gordy said.

Said Robert Freeman, president of the New England Conservatory of Music in Boston:

"We have given some Americans the idea that this is elitist, that you have to go to the right colleges, wear the right clothes ... to understand it. That's not true.

"Lots of young Americans don't get exposed to music when they're young. That's great shame," Freeman said.

## **Math, Academics, and Music Programs**

These studies (and many more) are found in the book *Spin-Offs, The Extra-Musical Advantages of a Musical Education*, United Musical Instruments USA, Inc., 1995. pp. 18-24. These studies show that students who participate in music ensembles and appreciation are the students with the highest I.Q.'s, math scores, and grade point averages. Music programs attract students that schools traditionally regard as their best students. The data here provides strong support for the existence of school music programs throughout a child's academic life.

**Does Music Instruction Aid Mathematical Skills?** Studies convincingly demonstrate the relationship between math and music. Four studies are cited in *Spin-Offs*.

It was found that high school students who participate in music appreciation or music performance classes receive Scholastic Aptitude Test (SAT) scores higher than the national average of students who take no music course work. Students who took music appreciation or participated in musical performance had math scores which were consistently 14 to 23 points above the national average and 19 to 37 points above students with no arts experience of any kind.

It was also found that the more arts studies, the higher the scores. Students who participated in music or other arts courses for four or more years in high school scored on average 18 points better on the math section of the SAT than did students with less than one year and approximately 14 points better than students with only one year of high school music participation.

One study also found support for a relationship between math achievement and participation in instrumental music instruction. They found that students who participated in instrumental music instruction in high school took on the average 2.9 more advanced math courses than did students who did not participate. This shows that music instruction is attractive to students who excel in mathematics.

Another study found that the better a person can read music, the higher the math achievement scores will be. The reverse is also true- the higher one's math achievement, the better one will be able to read music! It seems clear that students who do well in math, also do well in music.

### **Does Music Instruction Aid Academic Achievement?**

A study which shows a correlation between music study and overall achievement was conducted by Wood in the late 1980's. He studied approximately 7500 students at a medium sized university. He looked at their scores on reading tests, their high school rank and grade point average, and their American College Test (ACT) scores. He then compared student's scores from different majors. He found that music majors and music

education majors scores were higher than those who were majoring in biology, history, mathematics, and English.

In a 1972 study 50 students, ages 6-8 years old, were divided into two groups. These students were all slow learners with I.Q.'s between 80-95. One group received music instruction and learned about melody, rhythms, and meter. The other group did not receive any music instruction. At the end of the study it was found that the students who received music instruction had higher reading scores on the Metropolitan Readiness Test and the Botel Test of Reading Achievement than students who did not get any music.

Students in the music group were better at recognizing letters and were better at discriminating between pairs of letters that are similar. From these findings the researcher concludes that music instruction can improve the ability of the slow learner in the recognition of letters of the alphabet and reading skills.

In another study, the researcher found that teaching students to play string instruments in third grade increased their reading achievement. The experiment used 110 third graders equally divided by I.Q., sex, reading achievement, and spelling achievement. Group 1 received 25 weeks of instrumental (string) instruction during the school day. Group 2 did not receive any music training. At the end of the study it was found that the instrumental groups' reading gain was 1.9 months higher than group 2. When just the low readers in each group were compared, it was found that those who had taken string instruments were 3.5 months ahead of the same students in group 2. This study shows that learning to play an instrument in the early years of learning to read language will help the language ability of the students. Problem readers in the class will benefit more from music instruction than the average readers!

Many more studies show a relationship between music study and language ability and learning a foreign language.

### **Does Missing Class for Instrumental Lessons Hurt Academic Achievement?**

Some teachers worry that when students leave their classroom to go to instrumental lessons they are missing out academically. Studies show that this is NOT the case!

In 1985 Kvet found NO academic achievement difference between students who were excused from class for instrumental studies and those who were not. His study was conducted with over 2000 sixth grade students in 26 schools in 4 school districts. He found no significant difference in reading, language and math achievement between students who were excused for instrumental lessons and those who were not. This was true among schools of different sizes, setting, socioeconomic level, and racial composition.

A 1963 study also found that students who were excused from class to study musical instruments did not suffer academically when compared to non-instrumental students. A

researcher divided fifth grade students from four schools in control and experimental groups. The experimental group was given instrumental instruction during the school day. The control group received no instrumental training. Then four sections of the Stanford Achievement test were given to both groups. The researcher found no difference between the two groups in the arithmetic and computation sections of the test. Nor did he find a difference in the word and paragraph meaning sections of the reading test. He concluded that using classroom time for instrumental music instruction did not decrease the reading or math achievement of fifth grade students.

In a final study sixth grade students who left class "once or twice a week" for instrumental instruction were compared with those of similar sex, IQ, and age and found **NO DIFFERENCE** between the two groups on the Iowa Tests of Basic Skills. He concluded that missing class to study instrumental music is not detrimental to the academic achievement of sixth graders.

# Sound Therapy: Music and Health

## Page 1

In his book, *The Mozart Effect* (which I will refer to as *ME*), Don Campbell writes of music's many therapeutic uses. Mr. Campbell's book is in no way connected to the research done by Prof. Shaw and his colleagues. Many claims made by Mr. Campbell are not scientifically substantiated.

*Music masks unpleasant sounds and feelings:* Mr. Campbell sites the experience of using music to calm a patient who is undergoing a dentist's drill. Often, dentists will offer headphones to their patients, knowing that the effects of music can mask the harsh sounds of the drill and calm the patient. (*ME* p.65) Patients undergoing surgery often request calming music to be played in the operating room, although in 1997, when President Bill Clinton was having tendon repair, he requested his favorite country-western music because it lifted his spirits. (*ME* p.130)

*Music can slow down & equalize brain waves:* Our brain waves vibrate at different speeds during different activities. The slower the brain waves, the more relaxed and peaceful we feel.

*Beta waves* vibrate from 14-20 hertz. *Beta waves* occur when we have strong negative emotions, or when we focus on daily activities.

*Alpha waves* cycle from 8 to 13 hertz during which we can have heightened awareness and calm.

*Theta waves* cycle from 4-7 hertz and occur during periods of creativity, meditation, and sleep.

*Delta waves* range from .5-3 hertz. Our brain produces this speed wave when we are in a deep sleep or meditation.

It has been found that music of about 60 beats per minute (certain Baroque and New Age music) can change brain waves from the beta to the alpha range, enhancing alertness and well being. Droning drumming has been found to shift a person into the theta range. It has been found that playing music at home, in the office, or in school can help to focus a person. If you are daydreaming or unfocused, a little Mozart or Baroque background music for ten to fifteen minutes can help to make you more aware and increase your mental organization. (*ME* p.65-66)

*Music affects breathing:* By slowing the tempo (speed) of the music you are listening to, you can contribute to your own calmness. Music with longer, slower sounds can deepen and slow the breath, allowing your mind to calm. Gregorian Chant and New Age music can also have this affect. (*ME* p.66-67)

*Music affects heartbeat, pulse, and blood pressure:* Our heart responds to music. Our heart rate can speed up or slow down to match the music we hear. The faster the music, the faster the heart will beat! Like slower breathing, lower heartbeat creates less stress and helps the body heal itself. Conversely, a study done with university students found

that, after exposure to loud rock music by the Rolling Stones, the Beatles, Jimi Hendrix, and other similar bands, students had increased heart rate, breathed faster, and were less sensitive to skin stimuli. In another study, it was found that excessive noise may raise blood pressure by as much as 10 percent. But it can be lowered by listening to music that averages between 44 & 55 hertz. (ME p. 67-68)

*Music reduces muscle tension and improves body movement and coordination:* When you do exercises in an aerobics class, chances are you are moving to music. Researchers have found that exercisers match their movements to the rhythm and tempo of the music they hear played. They found that those who listened to music while they exercised improved their attitude as well as their strength. Music therapy for children with severe physical and mental abilities was found to reduce muscle tension and relax the children. Where people have lost movement due to serious illness or accident, music is often used to aid in the recovery. (ME p. 69)

# Sound Therapy Music and Health

## Page 2

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Here are some of the ways in which Campbell claims that doctors and patients can use music to heal.

*Music can increase endorphin levels:* Endorphins are natural chemicals in our brains. Endorphins can give us a natural 'high' or good feeling. Endorphins can help reduce pain. Biologists have discovered that the emotional richness of music can give people a sense of euphoria, or 'a high'. **"The healing chemicals created by the joy and emotional richness in music (movie soundtracks, religious music, marching bands, and drumming ensembles) enable the body to create its own anesthetic and enhance the immune function."** (*ME* p. 71) One music study found that half of the expectant mothers who listened to music during childbirth did not require anesthesia. It is believed that the music stimulated endorphin levels and provided a distraction from pain and anxiety. (*ME* p. 71)

*Hospitals and clinics around the world use music therapy, and not only on their patients!*  
Here are some examples: (from *ME* p. 132-133)

- In a 1995 study it was found that surgeons, who listened to the music of their choice while operating, were found to have lower blood pressure and a slower heart rate and could perform mental tasks more quickly and accurately.
- A professor of music and psychiatry, Dr. Paul Robertson of Kingston Univ. in Ontario, Canada, shares studies that show that patients who are exposed to 15 minutes of soothing music require only half the recommended doses of sedatives and anesthetic drugs for painful operations.
- Harp music has been prescribed instead of tranquilizers and painkillers for cancer patients at the University of Massachusetts Medical Center.
- The use of chants, tones, and music has been used to aid a variety of clients and Alzheimer patients at the University of Louisville School of Medicine. This Medical center sponsors an Arts in Medicine program which coordinates with the Department of Psychiatry and Behavior Sciences.
- Deaf and hearing-impaired children are "learning to hear" at a Multi-sensory Sound Lab developed at the University of Oklahoma Dept. of Communication Sciences and Disorders. A floor containing an audio system amplifies sound and as children sit on it, it transforms into vibrations that can be felt through their bodies. There are also light shows, and other displays that are sensitive to the music, making this an intense experience that has often helped these children with the development of speech, control of their voice, and an ability to hear.

# Music and Health

## Traditional Musical Medicine

### Page 3

In his book, *The Mozart Effect*, (referred to here as *ME*) Don Campbell writes of music's many therapeutic uses. Mr. Campbell's book is in no way connected to the research done by Prof. Shaw and his colleagues. Many claims made by Mr. Campbell are not scientifically substantiated.

Campbell states that in ancient healing systems music was used as a spiritual bridge. Drums, rattles, and other primitive instruments were used to bring people together in celebration. Harvest times, changes of season, births, deaths, and initiation rites were some of the occasions. Music was used to call upon the spirits, for prayer, and for exorcism. Here are some of the ways music is being used around the world and in traditional cultures.

Navajo Indian "singings" weave together sand painting and chanting as healing therapy. (*ME* p.135)

Chinese traditional music therapy is being used today in China. Music is played on traditional instruments to aid patients with modern disorders. (*ME* p.138-139)

In Japan, Western classical and romantic music is sometimes prescribed for various ailments. For instance, for headaches and migraines Mendelssohn's *Spring Song*, Dvorak's *Humoresque* and George Gershwin's *An American In Paris* are suggested. (*ME* p.138-139)

At hospitals and universities throughout India traditional Indian music is used as a therapeutic tool. In Madras, India the Raga Research Center experiments with different *ragas* for use in music therapy. (A *Raga* is a traditional Indian composition, usually religious.) They have found two particular ones they believe to be beneficial in treating hypertension and mental illness. (*ME* p.140-141)

In Africa music is used in celebration and religion. For African-Americans, the spiritual becomes the musical vehicle for affirmation. Black folk songs, work songs, and hymns contain African traditions such as call & response and field hollers. Traditional African callers and story tellers are today's modern rappers. African American spirituals were used to heal the soul and to communicate messages during slave days when Southern plantation owners prohibited traditional drumming and other forms of music. (*ME* p.143-144)

Australian Aboriginals have communicated cultural values and stories through music for over 40,000 years. "Songlines," or story songs, help them to pass on oral traditions about their beginnings, their land and families. *Corroborees* (musical ceremonies) are still held for special events, such as boy and girl initiations or special manhood rites. The

*didgeridoo*, a traditional instrument is generally made of eucalyptus wood. It is a tree trunk naturally hollowed out by termites, through which Aboriginal men blow. The haunting, earthy tones of this droning instrument are meant to raise the listeners spiritually and can help in healing.

# The Musical Brain

Classical - Pop - Rap - New Age - Folk - Blues - Rock - Country - Jazz

You might like all of these types of music, you might like a few of these, or you might not like any of them at all. Your brain somehow makes sense of music and allows you to make the decisions about your musical taste.

At its most basic level, music is just sound. Sound produced by vibration. These vibrations can be caused by voices, musical instruments or by objects hitting each other. Sounds are carried to the ear by changes in air pressure. Music itself has several important characteristics such as rhythm, pitch, tempo, and melody.

## Musical instruments create sound by vibrating in different ways



**Reed Instruments** - the reed is vibrated and a player's lips are used to create changes in air pressure.



**Brass Instruments** - a player's lips are vibrated as he or she puffs on the instrument.



**String Instruments** - strings on the instrument are vibrated by plucking or bowing.



**Percussion Instruments** - objects are vibrated by banging them together.



**The ear converts sound waves** into movement by vibrating specific parts of the middle and inner ear. This movement is then converted into electrical signals that travel in the eighth cranial nerve to the brain. The figure on the right shows the location of the

eighth cranial nerve (vestibulocochlear nerve). From the ear, auditory information travels first to the brain stem, then to the thalamus, and then to the auditory cortex in the temporal lobe on both sides of the brain.



## **The Lobes for Music**

Damage to the temporal lobe of the brain may cause a person to have problems with singing a song, playing an instrument, or keeping rhythm. Sometimes this damage causes problems related to recognizing music, but no problem with hearing speech and other sounds. This type of condition is called amusia. People with amusia have trouble recognizing melodies.

Some research has suggested that music is processed by the right cerebral hemisphere. Other research has shown that the left hemisphere is also important. Listening to music and appreciating music is a complex process that involves memory, learning, and emotions. It is likely that there are multiple areas of the brain that are important for the musical experience.

## **Music and the EEG**

There have not been many experiments that have looked to see how the brain processes music. Measurements of brain activity using the electroencephalogram (EEG) have shown that both the right and left hemispheres are responsive to music.

Other researchers have recorded neuronal activity from the temporal lobe of patients undergoing brain surgery for epilepsy. During this study, awake patients heard either a song by Mozart, a folk song, or the theme from Miami Vice. These different kinds of music had different effects on the neurons in the temporal lobe. The Mozart song and folk song reduced the activity in 48% of the neurons while the theme from Miami Vice reduced the activity in only 26% of the neurons. Also the Miami Vice music increased the activity in 74% of the neurons while Mozart and folk music increase the activity in only about 20% of the neurons. Some of the neurons had action potentials that kept time with the rhythm of the music. Although these results do show that the temporal lobe is probably involved with some aspect of music, it is unclear exactly how this area of the brain is used in the appreciation of music.

## **Music and Memory and Intelligence**

Several years ago, an experiment was done which seemed to show that listening to classical music could improve memory! This effect has come to be known as "The Mozart Effect" because the musical selection that seemed to improve memory was a song by Wolfgang Amadeus Mozart. Many people read about this experiment in popular magazines and newspapers and thought that listening to classical music would be a good way to improve memory and increase intelligence. Let's look a bit closer at the original experiment and other experiments.

The original experiment was published in the journal *Nature* by scientists at the University of California at Irvine in 1993. These scientists had college students listen for 10 minutes to either:

1. Mozart's sonata for two pianos in D major
2. a relaxation tape
3. silence

Immediately after listening to these selections, students took a spatial reasoning test (from the Stanford-Binet intelligence scale). The results showed that the students' scores improved after listening to the Mozart tape. Unfortunately, the researchers found that the effects of the music lasted only 10 to 15 minutes. Nevertheless, these researchers believed that memory was improved because music and spatial abilities shared the same pathways in the brain. Therefore, they thought, the music "warms up" (these are my words) the brain for the spatial reasoning test.




Other laboratories have tried to use the music of Mozart to improve memory, but have failed. For example, one group of scientists used a test where students had to listen to a list of numbers, and then repeat them backwards (this is called a backwards digit span test). Listening to Mozart before this test had no effect on the students. Apparently the Mozart Effect depends on what kind of test is used. Other researchers have said that the original work on the Mozart Effect was flawed because:

1. only a few students were tested
2. it was possible that listening to Mozart really did not improve memory. Rather, it was possible that the relaxation test and silence IMPAIRED memory.

In another attempt to demonstrate the Mozart Effect, researchers at Appalachian State University went to great lengths to follow the exact procedures of previous studies. In the July 10, 1999 issue of *Psychological Science* (vol. 10, pages 366-369), Dr. Kenneth Steele and coworkers reported that they were unable to show that listening to the music of Mozart had any effect on spatial-reasoning performance. They conclude by stating:

"...there is little evidence to support basing intellectual intervention on the existence of the Mozart effect."

The researchers who were successful at finding the Mozart Effect have also looked at the effects of music lessons on spatial reasoning. They gave preschool children (ages 3-4 yr. old) training for 8 months. Children were divided into 4 groups:

Experimental Groups			
Group 1	Group 2	Group 3	Group 4
Keyboard lessons 	Singing lessons 	Computer lessons 	No Lessons

After 8 months of this treatment, the children were tested on their ability to put puzzles together (spatial-temporal reasoning) and to recognize shapes (spatial-recognition reasoning). The results were fascinating. They found that only those children who received the keyboard lessons had improvement in the spatial-temporal test. Even when the children were tested one day after their last keyboard lesson, they still showed this improvement. So, the effects of the keyboard lesson lasted at least one day. Test scores on the spatial-recognition test did not improve in any of the groups, even the keyboard group.

Some researchers have even tried to see if the Mozart Effect exists in monkeys. In these studies, monkeys listened to Mozart piano music for 15 minutes before they had to do a memory test. The researchers found that listening to Mozart music did not improve the monkeys' performance compared to when the monkeys listened to rhythms or white noise. They also found that listening to Mozart during the test impaired memory and while white noise during the test improved memory slightly.

Politicians have even jumped on the Mozart Effect bandwagon. On June 22, 1998, the governor of the state of Georgia (Zell Miller) started distributing free CDs with classical music to the parents of every newborn baby in his state. I have a feeling that the governor has not read all the literature on the subject. The only study that has shown the Mozart Effect was done with college students. There have been no studies that have looked at the effects of music on the intelligence of babies. Some people say that that Governor Miller's plan is good, others think the money could be better spent on other projects.

So, if people want to improve their intelligence should they run out and buy some classical music? Should children start piano lessons when they are young? You are sure to get some beautiful music, but there is no conclusive evidence that it will improve your intelligence. Also, there is no evidence that music enhances memory permanently. More research and testing needs to be done to see if and how music and memory interact.

# **Does Classical Music Make Kids Smarter?**

**by Martha Brockenbrough**

Raise your hand if you've heard that listening to Mozart can make kids smarter.

Okay, you can put your hand down now. You look a little silly waving it in the air like that. And while we're on the topic of silly things, let's talk about that "Mozart effect."

Much ado has been made about the magic of the boy-genius musician, so it's understandable that so many of us believe his brilliance can somehow buff our children's brains, centuries after his death.

Books have been written in support of this idea. A popular line of Baby Mozart videos for infants is now on many a baby-registry list. And former Georgia governor Zell Miller even set aside tax dollars so that parents of every baby born in his state would get a CD of brain-boosting classical music.

The problem is, there is no Mozart effect.

Since it was first publicized over a decade ago, scientists have deflated claims that classical music boosts brainpower.

Despite that, belief in the Mozart effect is stronger than ever--or so concluded a pair of professors at Stanford University's Graduate School of Business.

So what happened? And does music make kids smarter at all? Is it worth buying those Baby Mozart videos, just in case?

Here's where the Mozart madness began. In 1993, the journal *Nature* published an article by scientists at the University of California-Irvine. In their experiment, students listened to a Mozart sonata, a relaxation tape, or nothing at all for ten minutes, and then took a spatial reasoning test.

The students who listened to Mozart scored highest, an effect that lasted for 10 or 15 minutes. The researchers concluded that Mozart's music had helped. (Some later pointed out the possibility that Mozart's effect was neutral, but relaxation tapes and silence hurt the students' performance.)

From this study arose the Myth of Mozart. And it grew from there. Even though the original test had nothing to do with babies or small children, the idea stuck in the craw of our collective consciousness.

The Stanford researchers noted the media latched on to that particular *Nature* report more than any others published around the same time. And as it swirled around the media, people started talking about the effect on babies' intelligence, even though no research made these links.

And even after a 1999 review showed that 12 subsequent studies had failed to verify the famous 1993 one, people still believed in the magic of Mozart.

It's understandable. We all want our kids to be smart--and if something as easy as popping in a CD makes a difference, well, super!

What's more, classical music isn't as palatable to many people of parenting age as, say, the Red Hot Chili Peppers or Cake. Like spinach, it has to be good for you, right? What's more, old people listen to it!

The moral of this story: Kids should listen to classical music if they like it. But it won't make them smarter. Unless ...

That's right. There's a catch. In a University of Toronto at Mississauga study, music has been shown to increase IQ points in six-year-olds who took weekly singing or piano lessons. If your kids learn to sing or play an instrument, they just might become smarter.

So you don't have to turn your back on Mozart, after all. Kids just have to work hard to learn to play or sing his music for it to actually boost their little brains.

## **THE STORY OF WOLFGANG AMADEUS MOZART (1756-1791)**



**Wolfgang Amadeus Mozart was born in Salzburg, Austria, in 1756. He was four-years-old when he began studying music with his father, and received instructions for both the piano and violin. He developed very rapidly and was already composing at the age of six. Mozart's older sister, Maria Anna, was also a musician, and they often enjoyed playing together. He wrote a number of duets and duos to play with her.**

**Mozart was six when his father took him to Vienna, where he played for the Austrian emperor and was introduced to the public as a child prodigy. He played for the rich, for royalty, and for the public. He dazzled court patrons with his ability to improvise in many styles and sight-read as well as any adult. The next year Wolfgang's father took his family to Paris, where Mozart's first compositions were published. As a teenager he mastered the piano and completed his first opera, *La finta semplice* (The Simple Pretense). Mozart traveled a great deal and by the time he was twenty-five, he had visited most of the great European cities. In 1782, he married Constanze Weber. He and Constanze had two children.**

**Mozart was a prolific composer, and wrote over 600 pieces of music. He wrote in almost every major genre, including symphony, opera, solo concerto, chamber music, and the keyboard sonata. While none of these genres were new, the piano concerto was almost single handedly developed and popularized by Mozart. Among his most famous works**

are *Eine kleine Nachtmusik* (A Little Night Music, 1787) and the operas *Don Giovanni* (1787) and *Die Zauberflöte* (The Magic Flute, 1791). Mozart also wrote a great deal of religious music, and he composed many dances, serenades, and other forms of light entertainment. He is considered one of the best, if not the best, classical composer.