

# *Tafelmusik*

Baroque Orchestra and Chamber Choir  
Jeanne Lamon, Music Director

## *The Galileo Project*

### *Teacher's Resource Guide*



*Alison Mackay & Suzanne Einstoss Rapoport*  
*with materials from Connexionarts and Julia Wedman*

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## *Welcome to Tafelmusik's The Galileo Project*

*Dear Teachers,*

*Welcome to Tafelmusik's 2009 Education Concert Programme. We are looking forward to seeing you and your students at "The Galileo Project". As specialists in period performance, we believe that the baroque music experience can be as fresh and exciting for your students today as it was for 17<sup>th</sup> and 18<sup>th</sup> century audiences.*

*The resources in this guide will help your students to engage with the music, and to extend and deepen their experience of the Tafelmusik Galileo Project concert. The activities outlined in this guide will introduce your students to the music, life and science of Galileo's time and explore the influence it has had on our current understanding of music and science today. We hope that you will take the time to explore the information, lessons and activities, and that you enjoy playing the accompanying compact disc for your students.*

A handwritten signature in black ink, reading "Jeanne Lamon". The signature is fluid and cursive, with the first name "Jeanne" and the last name "Lamon" clearly distinguishable.

*Jeanne Lamon, Music Director*

## Biographies



Music Director of Tafelmusik since 1981, violinist **Jeanne Lamon** has been praised by critics in Europe and North America for her strong musical leadership. In addition to performing with and directing Tafelmusik, Jeanne regularly guest directs symphony orchestras in North America and abroad. Upcoming and recent engagements include the Detroit Symphony, l'Orchestre Métropolitain (Montreal), Orchestra London, Les Violons du Roy, the Victoria Symphony and Symphony Nova Scotia. She has won numerous awards for her work with Tafelmusik, including the Prix Alliance from the Alliance Française, the 1997 M. Joan Chalmers Award for Artistic Direction, and the prestigious Molson Prize from the Canada Council for the Arts. In 2000, Jeanne Lamon was appointed a Member of the Order of Canada in recognition of her work with Tafelmusik. In 2003 she was named "Musician of the Year" by her

peers at the Toronto Musicians' Association, a prize previously awarded to Oscar Peterson and the Barenaked Ladies! Jeanne Lamon holds two honorary Doctorates, one from York University and one from Mount Saint Vincent University in Halifax. She is passionate about teaching young professionals, which she does at the University of Toronto and at the Glenn Gould Professional School of the Royal Conservatory of Music.



**Alison Mackay** has played violone and double bass with Tafelmusik since 1979. She is active in the planning of educational projects for the orchestra and her children's tale *Baroque Adventure: The Quest for Arundo Donax*, released on the Analekta label, was awarded the Juno Award for 2006 Children's Recording of the Year. In the spring of 2005 she was co-director (along with her husband, David Fallis), of the Metamorphosis Festival, a Toronto-wide festival of music, art, dance, film and theatre inspired by the stories from Ovid's *Metamorphoses*. Her concert on this theme featuring Tafelmusik with Canadian actor R.H. Thomson, has toured in Canada, the U.S. and Europe. Her multi-cultural creation "The Four Seasons, a Cycle of the Sun" has been made into a feature documentary by Toronto's Media Headquarters, and a concert version of this project toured in Asia last season. In spring 2008 she was active in organizing a special project for the orchestra called "Sacred

Spaces, Sacred Circles," a celebration of architecture and the arts in the varied worship spaces of many cultures in the city of Toronto. This season, Alison is the driving force in organizing the "Galileo Project," a celebration of baroque music and astronomy, to be performed in Toronto in January, and on tour in Banff and Ontario.



**John Abberger**, one of North America's leading performers on historical oboes, is principal oboist with Tafelmusik (Toronto) and the American Bach Soloists (San Francisco). He has performed extensively in North America, Europe and the Far East with these ensembles, and appears regularly with other prominent period-instrument ensembles. John serves on the faculty at the University of Toronto, and the University of Western Ontario, and has taught at the City College of New York. A native of Orlando, Florida, he received his training at the Juilliard School, and Louisiana State University. In addition, he holds a Performers Certificate in Early Music from New York University.



Oboist **Marco Cera** studied at the Padua Conservatory of Music (Italy) and at the Musikhochschule der Stadt Basel (Switzerland). In 1996 he was chosen as first oboe for the European Union Baroque Orchestra, with which he performed in Denmark, Portugal, Germany, United Kingdom and South Africa. He regularly collaborates as a soloist with the leading baroque orchestras in Italy and Europe. Marco moved from Italy to Toronto to play with Tafelmusik from 2000-2002, and rejoined the orchestra in January 2007.



A native of California, **Dominic Teresi** plays the dulcian (an early version of the bassoon) and Baroque, Classical and Modern bassoons. His playing has been described as "lively and graceful" (New York Times) and "dazzling" (Toronto Star), "reminding us of the expressive powers of the bassoon" (The Globe and Mail). Mr. Teresi has performed and recorded all over the world with Tafelmusik and many other ensembles. He studied at Yale and Indiana Universities, and has a medaille d'or from the Conservatoire National de Region in Bordeaux, France.



Violinist **Patricia Ahern** was educated at Northwestern University, Indiana University, and the Schola Cantorum in Basel, Switzerland. She taught baroque violin at the Freiburg Conservatory in Germany and has concertized in Europe, Australia and Chile. She has performed with Milwaukee Baroque, Ars Antiqua, Chicago Opera Theater, Kingsbury Ensemble, Newberry Consort, and at the Bloomington Early Music Festival. With Duo Marini she released the CD *La Desperata*, which was featured on NPR's Harmonia. Patricia joined Tafelmusik in 2002.



After studies at Cornell University and SUNY at Stony Brook, **Thomas Georgi** moved to Australia where he was a violinist in the Queensland Symphony Orchestra, and an active exponent of early music as a founding member of the Badinerie Players. Since joining the Tafelmusik Baroque Orchestra he has broadened his musical horizons to include the viola d'amore, performing solos on that instrument across North America, in Europe and in Japan.



**Geneviève Gilardeau**, a native of Québec, studied violin at the Université de Montréal, the Conservatoire du Québec, and the Glenn Gould School of the Royal Conservatory in Toronto. Geneviève became a core member of Tafelmusik in 1999 and has been featured as a soloist several times. In addition to the Aradia Baroque Ensemble, where she serves regularly as concertmistress, she also performs with the Toronto Consort and with Montreal-based ensembles, including Masques and Les voix humaines.



Born in Nanaimo, British Columbia, **Aisslinn Nosky** is known as a versatile musician who brings passion and fervour to every project she pursues. Before joining Tafelmusik, Aisslinn was Assistant Principal Second Violin of the Canadian Opera Company Orchestra (2003-2005) and appeared as Guest Concertmaster with Symphony Nova Scotia on several occasions. As a member of I FURIOSI Baroque Ensemble and the Kirby String Quartet, Aisslinn plays a wide range of eclectic repertoire and has helped to bring an enthusiastic new audience to baroque music.



Originally from Saskatoon, Saskatchewan, **Julia Wedman** has performed all over Canada, the US, Europe, Asia and New Zealand. As a student, she developed a passion for period performance, inspired by her work at Indiana University, the University of Western Ontario and the University of Toronto. Julie is a member of the innovative young Baroque ensemble I FURIOSI. In the summer season, Julie is one of the directors of the Kirby Quartet Summer Chamber Music Workshop in Langley, B.C., where she performs and teaches with the dynamic Kirby String Quartet, who like to play everything from Purcell to Dvorak to John Zorn.



**Christopher Verrette** has been a member of Tafelmusik since 1993 and is a frequent soloist and leader with the orchestra. He studied at Indiana University, is guest director with the Indianapolis Baroque Orchestra and is a founding member of the Chicago Baroque Ensemble and Ensemble Voltaire (Indianapolis). Mr. Verrette collaborates with ensembles around North America, performing music from seven centuries on not only the violin and viola, but also early instruments such as the rebec, vielle and viola d'amore.



Since the beginning of her professional career in Winnipeg, Manitoba, Canadian violinist **Cristina Zacharias** has traveled the world, played on more than 25 recordings, made TV and movie appearances, and performed in churches, bars, barns, palaces, schools, and concert halls. Her life-long interest in early music and period performance came to the forefront while she was completing a Master's degree in chamber music, and has been one of her passions ever since. Currently, Cristina lives in Toronto, and is a member of Tafelmusik Baroque Orchestra. She collaborates frequently with musicians and ensembles of all descriptions, in Canada, the US and Europe. Cristina has recorded for the BIS, Analekta, ATMA, NAXOS and CBC labels.



**Patrick Jordan** is a native of West Texas, where he studied with Susan Schoenfeld. His studies continued in Boston at the New England Conservatory and the Longy School. Patrick has been a member of the Handel & Haydn Society Orchestra, the violist of the Boston Quartet, violinist/violist/arranger in D.C. Hall's Band, violist of the period-instrument van Swieten Quartet and has been a member of the Boston Early Music Festival Orchestra since 1997, serving most recently as principal viola, and is the principal violist of the Carmel Bach Festival. Patrick is also violist and Artistic Administrator of the Gallery Players of Niagara and a member of the newly formed Eybler Quartet.



**Elly Winer**, a member of Tafelmusik since 1985, is proudly playing in his 24th season with the orchestra. With Tafelmusik he has performed solos and chamber music on both the viola and the viola d'amore. He has played, toured and recorded with many other early music ensembles, including the Toronto Consort, Theatre of Early Music, Carmel Bach Festival Orchestra, American Bach and Classical Soloists, Studio de Musique Ancienne de Montreal, and Apollo's Fire. Before joining Tafelmusik, Elly lived in Halifax, serving as principal violist with the Symphony Nova Scotia.



Dutch cellist **Christina Mahler** immigrated to Canada in 1981 to serve as principal cellist of the Tafelmusik Orchestra, a position she has held ever since. Reviews often praise her rich sound, energetic playing and insightful musicianship. She has played and recorded numerous concertos with Tafelmusik, including works by Boccherini, Haydn, Vivaldi, C.P.E. Bach and Leonardo Leo. Christina has been a member of the Ottawa-based string quartet, Quatuor Lumière, for the past four years. In addition to teaching at Tafelmusik's annual Baroque Summer Institute and the Advanced Certificate of Performance at the University of Toronto, Ms. Mahler enjoys giving masterclasses at various universities, as well as private lessons at home.



**Allen Whear** is a graduate of the New England Conservatory and the Juilliard School. The recipient of an ITT International Fellowship, he studied in the Netherlands, and holds a Doctorate from Rutgers University. Allen is Artistic Director of Baltimore's Pro Musica Rara, one of America's oldest period instrument ensembles. He is Principal Cellist and Recital Director for the Carmel Bach Festival in California and has performed as a soloist with the Philadelphia Classical Symphony, the Brandenburg Collegium and the Charleston Symphony. His recording credits include Sony, Virgin, Musical Heritage, Naxos and Deutsche Harmonia Mundi.



A native of southwestern Ontario, harpsichordist **Charlotte Nediger** joined the Tafelmusik Baroque Orchestra as principal keyboard player in 1980 at age 21 and has held that position ever since. She has an extensive background in research and musicology, and works behind the scenes at Tafelmusik as Assistant to the Music Director, Librarian and Programme Editor. She is also Artistic Coordinator of the Tafelmusik Baroque Summer Institute. As a performer Charlotte is one of few keyboard players to specialize in orchestral continuo playing. Charlotte holds bachelor and master degrees from the University of Western Ontario and a solo diploma from the Royal Conservatory of The Hague in the Netherlands.

## *About the Orchestra*

Led by Music Director Jeanne Lamon, **The Tafelmusik Baroque Orchestra** is one of the world's leading orchestras performing on period instruments. This means that all of their instruments were either made in Baroque times, or are reproductions of these old instruments. The members of the orchestra study how music was played in the seventeenth and eighteenth centuries, and many of them spend time researching and teaching the music as well as performing it.

Tafelmusik is the Baroque Orchestra-In-Residence at the University of Toronto Faculty of Music, and musicians from the orchestra also teach at the Royal Conservatory of Music. The orchestra regularly travels to other schools all over the world to give music workshops, and every year runs a summer music programme in Toronto called the Tafelmusik Baroque Summer Institute for students studying to become professional Baroque musicians and professional musicians wanting to learn more about playing Baroque music.

The **Tafelmusik Chamber Choir**, directed by Ivars Taurins joins the orchestra for many concerts, and also specializes in period performance.

In the last 25 years the Tafelmusik Baroque Orchestra has played in more than 280 cities and almost 30 countries around the world, including Canada, the U.S., Central America, South America, Asia, Europe and the Middle East.

The orchestra was founded in 1979 and the choir in 1981. Tafelmusik performs over 50 concerts a year in Toronto and tours extensively around the world. There are over 75 recordings, of which 9 have won Juno Awards for Best Classical Album.



## *Acknowledgements*

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## *The Galileo Project and the Science Curriculum*

A note from Dr. John Percy, Professor of Astronomy & Astrophysics at the University of Toronto

Fellow educators! Welcome to the intersection of Arts Avenue and Science Street! *The Galileo Project* links equally well with the music curriculum and the science curriculum – specifically with the grade six space/astronomy unit. Cross-curricular connections, as you know, are highly valued.

The overarching philosophy of the current Ontario science curriculum is STSE: *science, technology, society, environment* and Galileo's work serves to highlight these four areas. Galileo's scientific discoveries: the moons of Jupiter, the phases of Venus, the mountains on the moon, the stars of the Milky Way, and the behaviour of sunspots, proved that the sun was the centre of the solar system, not the earth. This revolutionized our understanding of the universe, and our place in it. The astronomical telescope that he developed and first used in 1609 has been the technology by which most of astronomers' observational knowledge of the universe has been obtained (though they now use the mirror telescope developed by Isaac Newton rather than the lens telescope developed by Galileo). Galileo's work certainly had a profound effect on society: philosophy and religion had to accept that the earth was no longer the centre of the universe; Galileo's contemporaries, including his church, had a hard time accepting this conclusion. Galileo's work has no particular connection with the "environment", but it does provide an opportunity for students to learn about light pollution and its effect on urban Canadians and their ability to view and enjoy the night sky.

Galileo's work is directly related to the core expectations of the grade six space/astronomy unit. The two "big ideas" are:

1. "Earth is a part of a large, inter-related system" (that includes our relationship to the sun and moon and to the Milky Way) and
2. "Technological and scientific advances that enable humans to study space affect our lives".

As mentioned, Galileo's telescope has become the key technology of modern astronomy, and he began the development (completed by Newton) of the laws of motion by which spacecraft explore the solar system. Two of the three overall expectations of the unit deal with the characteristics of solar system objects, the relationship between them, and the phenomena that result from their movement. At a deeper level, students should understand how, through the "scientific method", Galileo's observations proved the sun-centered model of the solar system, though this is not an explicit expectation of the science curriculum until grade nine. There, one of the "big ideas" is that "people use observational evidence of the properties of the solar system and the universe to develop theories that explain their formation and evolution".

There are several aspects of *The Galileo Project* education concert that are pedagogically exemplary: it presents a three-dimensional model of the solar system and its movement; students can learn about the processes of rotation (spin) and revolution (moving around an orbit) by engaging in them; they are exposed to the scales of space and time; they experience a historical perspective on scientific progress; and they see how astronomy has affected other societal pursuits such as the arts. And they experience science as being engaging and fun!

The universe, as we know it today, is grander than Galileo could possibly have imagined. There are tens of billions of galaxies, each with hundreds of billions of stars, many with planets, some undoubtedly like Earth. But lest you and your students feel humbled by this thought, here are some words by the French mathematician and scientist Henri Poincare: "Astronomy is useful because it shows how small our bodies, and how large our minds".

The year 2009 is being celebrated in more than 135 countries around the world as International Year of Astronomy – the 400th anniversary of Galileo's monumental achievements. The goal of IYA Canada is "to offer an engaging astronomy experience to every person in Canada, and to cultivate partnerships that sustain public interest in astronomy". We hope that, through *The Galileo Project*, that goal is being achieved for you and your students.

For more information about IYA in Canada, see:

<http://www.astronomy2009.ca>

And for a website specifically designed for Canadian students and teachers, go to:

<http://www.cascaeducation.ca>

As an astronomer with over 40 years of experience in supporting school science curriculum development and teacher education, I am sure you and your students will enjoy the creative, engaging fusion of arts, science, and culture found in *The Galileo Project*.

## **John R. Percy**

Professor Emeritus: Astronomy & Astrophysics

Professor Emeritus: Science Education University of Toronto

## *Using the Teacher's Resource Guide*

The lessons in the Lessons and Activities section provide a number of ways for students to explore the rich content in this resource and the concert programme. As you begin the unit:

- \* Start a *The Galileo Project* portfolio for each student to collect the student sheets, individual drawings, written responses, and research materials that will be generated during the unit
- \* Establish a *The Galileo Project Word Wall* and post interesting vocabulary as you come across it during the unit.
- \* Explore the CD by listening to a new selection each day, being sure to share any information from the liner notes with your students.
- \* Share the performer biographies with your students before they attend the concert, to help the students to develop a personal connection with the artists.
- \* Additionally, you may wish to work towards a Galileo Festival in your own school as a culmination for the unit. Plan to display the artwork and stories you will develop and arrange a star-gazing party in conjunction with the International Year of Astronomy.
- \* Customize this resource guide to best suit the needs of your students, using some or all of the suggested activities.

## *About the Recording*

In spring of 2007, Tafelmusik received an email from John Percy, Professor of Astronomy at the University of Toronto and a Tafelmusik subscriber. John proposed a concert in celebration of the 400<sup>th</sup> anniversary of Galileo's development and use of the astronomical telescope. Alison Mackay, who has played double bass with Tafelmusik since 1979 and who has created several education programmes in the past, immediately saw the fusion between baroque music and astronomy.

A recording of several of the selections that will be performed at the concert has been included as part of *The Galileo Project Resource Guide*. It provides an excellent and engaging introduction to baroque music for you and your students. All the music was recorded by Tafelmusik Baroque Orchestra.

You will find more information about the music in the following lessons and there is a short entry on each of the composers in the Composers of Galileo's Time section of this resource. Halley's Comet appeared in the night sky three times during the Baroque period and each of the recordings highlights the musical developments that took place during those years. We hope that you will explore the whole recording with your students and will reference these resources for years to come!

## *Tafelmusik's Educational Initiatives*

Tafelmusik launched its first educational programmes in 1995 with two open rehearsals and 150 free concert tickets for regular evening performances. Since that time, these initiatives have grown to include free afternoon concerts for student audiences, downloadable preparatory materials for teachers and parents, musician visits to schools throughout North America and a Juno-award-winning children's recording. Every year musicians are directly involved in the creation of new education concerts, in-depth workshops, Baroque Education Day, and a comprehensive Baroque music education website. We also offer special ticket prices to teachers wishing to introduce their classes to Tafelmusik concerts.

Tafelmusik also supports lifelong learning and offers several adult learning opportunities, including informal musician talkbacks following Wednesday night concerts, pre-concert lectures by knowledgeable experts in the community and free concerts in the community.

## *Educator Resource Materials*

Tafelmusik's vision is to be an international centre of musical excellence for generations to come. For additional resources and more information about Tafelmusik's educational initiatives, visit our website at [www.tafelmusik.org](http://www.tafelmusik.org). From our website you can access the Tafelmusik Baroque Learning Centre, and download additional Educator Resource materials. To accompany many of our education programmes, Tafelmusik musicians have created several **Study Guides** to help provide teachers, parents, students and music lovers with information on Baroque and classical composers, instruments, history, culture and music.

*Coming in February 2009!*



Tafelmusik's exciting new webgame based on the Juno-Award winning CD

## *What to Expect at the Concert*

In Toronto, Tafelmusik performs in the sanctuary of the historic Trinity-St. Paul's United Church. Your students will be interested in the striking architecture of the building, so do take time to provide some background if you are attending the concert at this venue.

The concert lasts 55 minutes. Please plan to arrive 15 minutes ahead of time.

Your students should use the washrooms before or after the concert as they should not leave the auditorium during the performance. Remind students that they must not bring anything to eat or drink into the performance hall.



### **Did you know...**

*Trinity-St. Paul's United Church* started its life in 1889 as the Trinity Methodist Church. It is a beautiful stone building, designed by Edmund Burke, who designed the Bloor St. Viaduct, the downtown Simpson's (now The Bay), and many other Toronto landmarks. Through the years many famous Canadians have been associated with the church, including Prime Minister Lester B. Pearson and soprano Lois Marshall. The extensive church buildings are now home to many organizations involved in neighbourhood outreach, social justice activities, educational forums, support services, and the performing arts. The organ was built in 1941 by renowned organ builders from Québec, Casavant Frères. (Visit their website at [www.casavant.ca](http://www.casavant.ca) to find out more about pipe organs.)

# *Concert Programme*

## THE GALILEO PROJECT: MUSIC OF THE SPHERES

Tafelmusik Baroque Orchestra  
Jeanne Lamon *Music Director*

Shaun Smyth *narrator*

Allegro, from Concerto grosso in D major, op. 3 no. 6*	George Frideric Handel
Overture from <i>Phaeton</i>	Jean-Baptiste Lully
Rondeau from <i>Abdelazer</i> *	Henry Purcell
Entrance of Mercury from <i>Platée</i>	Jean-Philippe Rameau
Ciaccona, after <i>Zefiro torna</i>	Claudio Monteverdi
Entrance of Jupiter from <i>Hippolyte et Aricie</i> *	J.-P. Rameau
Ciaccona	Tarquinio Merula
Ritornello, from <i>Orfeo</i>	C. Monteverdi
Music from <i>Phaeton</i> : Entrance of Saturn Dance for the Summer* Entrance of the Furies	J.-B. Lully
Moresca, from <i>Orfeo</i> *	C. Monteverdi

\* denotes pieces of music on the accompanying CD

## ***The Galileo Project: An Introduction***

*The Galileo Project: Music of the Spheres* is Tafelmusik's contribution to the International Year of Astronomy, marking 2009 as the 400<sup>th</sup> anniversary of Galileo's development and use of the astronomical telescope. Told through the eyes of Halley's Comet, the concert and this unit will explore the artistic, cultural and scientific changes that took place during the time in which Galileo lived and worked and the corresponding years Halley's Comet appeared in the night sky during the Baroque period.

### ***What is Baroque music?***

The word *baroque* likely comes from the ancient Portuguese noun "barroco", which means a misshapen pearl. It was originally used as an insult to describe art or music which was overly extravagant, even slightly bizarre, and over time became a word associated with music composed between 1600 and 1750 in Europe.

### ***What is a Baroque orchestra?***

In Renaissance instrumental ensemble music, each part was played by one musician. Baroque composers continued to compose solo and chamber music, but they also experimented with creating a fuller sound by putting several performers on one part to form an orchestra. The Tafelmusik Orchestra has adopted the configuration of one of Bach's orchestras, which had two oboes, bassoon, harpsichord and strings.

Baroque composers began to compose more extended instrumental pieces than before, and they created forms in which several movements could be grouped together. Sometimes these movements were in contrasting but related keys. Our modern system of major and minor keys is an invention of the Baroque period. Baroque composers were the first to think of their music as a series of chords built above a bass line, each having a relationship with the main note of the key.

### ***About the International Year of Astronomy***


In 2009, people around the world will celebrate the 400<sup>th</sup> anniversary of Galileo's development and the use of the astronomical telescope. The International Year of Astronomy 2009 (IYA2009) is a global celebration of astronomy and its contributions to society and culture, stimulating worldwide interest not only in astronomy, but in science in general, with a particular slant towards young people. IYA2009 is an activity for the citizens of Planet Earth. It aims to convey the excitement of personal discovery, the pleasure of sharing fundamental knowledge about the Universe and our place in it and the value of scientific culture. The Canadian International Year of Astronomy Coordinating Committee (IYACC) is a group of professional and amateur astronomers and others interested in astronomy, working together on Canada's celebration of International Year of Astronomy in 2009.

For more information please visit: <http://www.astronomy2009.ca/>

### ***Who was Galileo?***

Galileo Galilei was born on February 15, 1564 in Pisa, Italy and was the oldest of six children. His family moved to Florence while he was still a child. Galileo's father hoped that his son would study medicine and become a doctor, but instead Galileo chose to study mathematics. Galileo became a professor at the University of Padua in 1592 and during this time Galileo made significant discoveries in not only astronomy but physics as well. In the winter of 1610

with his telescope pointed skywards, Galileo discovered 4 moons orbiting Jupiter. Galileo went on to study the phases of Venus, the rings of Saturn, sunspots and was the first to describe the lunar mountains and craters on the surface of the Moon. In light of his discoveries, Galileo concluded that sun-centered model of the solar system, first proposed by Nicolaus Copernicus was indeed correct. Galileo's views were not widely accepted at the time and he faced great opposition from the Church, who viewed his beliefs to be in direct contrast to their teachings. In 1633 Galileo stood trial and was found guilty of heresy. Galileo was eventually forced to recant his belief about the movement of the planets and spent the last years of his life under house arrest. Galileo died on January 8, 1642 at the age of seventy-eight. While Galileo is best known as a physicist and astronomer, Galileo also had a strong musical roots; His father, Vincenzo Galilei, was a expert lute player (a stringed instrument similar to a modern-day banjo) and taught Galileo how to play the lute and organ. Galileo's younger brother, Michaelangelo, was also a notable lutenist and composer in the 17<sup>th</sup> century.

 **Did you know...**  
Galileo did not invent the telescope. Hans Lippershey, a spectacle-maker from Holland is credited with creating the first practical telescope in 1608. Based on only a description of Lippershey's invention, Galileo made his first telescope. In August 1609, Galileo demonstrated his telescope to lawmakers in Venice.

### *What are comets?*

Comets are icy objects which orbit the sun. Most of them are 1 to 10 kilometres in diameter and the largest is about 100 kilometres across.



### *Why do comets have tails?*

When a comet comes near to the sun, some of its ice evaporates and forms a gas. The sun's wind pushes the gas away, forming a tail which always points away from the sun. This acts like a hairdryer pushing long hair away from it!

### *What is Halley's Comet?*

Halley's Comet (officially designated 1P/Halley) is a famous comet that orbits the sun once every 75 or 76 years and thus appears in the night sky about once every lifetime. The first recorded sighting comes from China in 240 B.C. Its last appearance was in 1986 and its next one will be in 2061.

 **Did you know...**  
The word "comet" comes from an ancient Greek word, "Kometes" which means "wearing long hair".

### *How did Halley's Comet get its name?*



Halley's Comet is named after **Edmund Halley**, an English astronomer who lived from 1656 until 1742. Edmund Halley was the first astronomer to realize that the two famous comets that appeared in 1607 and 1682 had the same kind of orbit and were likely the same object. He predicted that the comet would return in the winter of 1758, and people all over Europe looked out for it then. When it appeared in the night sky on Christmas night of 1758, exactly on cue and years after Edmund Halley's death, it was named "Halley's Comet" in his honour.

## *Lessons and Activities*

The following arts-based lessons and activities will help you to introduce Baroque music and its connection to developments in astronomy in the 17<sup>th</sup> and 18<sup>th</sup> centuries.

Much of the music at the Tafelmusik concert you will be attending (including the music on the accompanying CD) was composed during the time of Halley's Comets three visits to earth during Baroque times.

The following lessons are designed to meet a wide range of curricular goals, as the following chart indicates. You are encouraged to customize these lessons by incorporating your own particular curriculum expectations. Use any or all of the materials provided depending on the particular needs of your classroom.

### *Curriculum Connections Matrix*

	Language Arts	Science and Math	Social Studies	Drama and Dance	Music
<i>The Life and Times of Galileo</i>	✓	✓	✓	✓	✓
<i>Listening and responding to the Music</i>	✓		✓	✓	✓
<i>Instruments of the Baroque Era</i>	✓		✓		✓
<i>Inspired by Live Performance</i>	✓		✓	✓	✓

\* Connections will vary, depending on the activities selected.

## A. *The Life and Times of Galileo*

### I. Composers of Galileo's Times

#### Lesson Focus

Halley's Comet appeared in the night sky three times during the baroque period of music, once at the beginning (1607), once in the middle (1682), and once at the end (1758). The concert the students will be attending focuses on these three dates to explore the developments in music during the baroque period. In this activity, students will explore the music and the composers of Galileo's time.

#### Materials

- \* *The Galileo Project* CD
- \* Student Worksheet: Composers of Galileo's Time
- \* Supplement File: Pictures of Monteverdi, Purcell, Lully, Handel and Rameau
- \* Student Worksheet: The Happenings at the Time of Halley
- \* Teacher Answer Sheet: The Happenings at the Time of Halley

#### Procedure

- \* Post pictures of each composer on your bulletin board (see Supplement File)
- \* Divide students into five groups (one for each of the composers) and hand out the Student Worksheet: Composers of Galileo's Time. Have each group of students focus on the information listed for one specific composer (Monteverdi, Lully, Purcell, Handel and Rameau)
- \* Have students read the information sheets and write down the facts that they find interesting about each composer on a stick-on note.
- \* Have each group of students present their research and post notes around the bulletin board pictures of each composer.
- \* Distribute Student Worksheet: The Happenings at the Time of Halley. Based on the information presented by each group, have the students complete the worksheet.
- \* Over the course of the unit, add more pictures related to The Galileo Project to your bulletin board, such as pictures of Galileo and images of his drawings and discoveries, additional examples of Baroque instruments, and pictures of planets, the solar system and comets. If possible, spend some class time exploring the additional resources located at the end of this guide.

### II. The Story of Phaeton

#### Lesson Focus

From the beginning of time, people have told stories in order to answer questions about how the world works. The Story of Phaeton was written by Ovid over 2000 years ago and is part of a collection of over 200 stories called *Metamorphosis*. This particular story gives a fantastical explanation of comets and their origins. This story served as inspiration to Baroque composer Jean-Baptiste Lully who wrote an opera titled *Phaeton* in 1682 - the same year Halley's Comet was visible from earth. Using the story of Phaeton as inspiration, students will create their own story or myth to explain why comets have tails.

## Materials

- \* Dance for the Summer, track #3, *The Galileo Project* CD
- \* Student Sheet: The Story of Phaeton
- \* Student Sheet: A Treacherous Tale of a Tail

## Procedure

- \* Distribute the Student Sheet: The Story of Phaeton and have the students read in small groups or as a class
- \* Play Track #3 from the CD - Dance for the Summer from *Phaeton* by Jean-Baptiste Lully and have students tap a steady beat as they are listening. Ask the students to describe what they are listening to - Is the tempo fast or slow? What instruments are you hearing? (Woodwinds, strings and harpsichord)
- \* Have the students create a simple dance: "Show me what you can create just by walking forwards, backwards or sideways, changing your direction every four beats."
- \* Explain to students that this was a story told thousands of years ago to explain the origins of comets. This ancient story served as inspiration to Baroque composer **Jean-Baptiste Lully** who wrote an opera titled *Phaeton* in 1682 - the same year Halley's Comet was visible from earth.
- \* Discuss with students any other myths that they may know and what they might be trying to explain
- \* Hand out copies of Student Sheet: A Treacherous Tale of a Tail and have students complete the worksheet. Time permitting, divide students into groups to share their stories.

## III. Galileo's Daughter

### Lesson Focus

Galileo was the father of three children - two girls and one boy. Of his three children, his eldest daughter Virginia was closest with Galileo. Born Virginia in 1600, she was thirteen when Galileo placed her in a convent near him in Florence, where she took the most appropriate name of Suor Maria Celeste. Maria Celeste and Galileo maintained contact throughout her life by writing letters. Although none of Galileo's letters survived, 120 of Maria Celeste's exist. These letters, written from 1623 to 1634, show the great love and respect she had for her father. Furthermore, contact with her father allowed her news of the outside world, as she herself was isolated within the convent. But the letters between Maria Celeste and Galileo served more than to maintain contact - she also had a genuine interest in her father's scientific work, sometimes even offering her own opinion on an issue. Additionally, the letters allowed a glimpse of Galileo's personal life as he and his daughter discussed various details regarding the running of the household, remedies for health and other family matters.

Using the letters Maria Celeste wrote to her father as inspiration, students will write a letter to Galileo and share their views on his discoveries and ask any questions they may have for him.

### Materials

- \* Student Sheet: Biography of Galileo
- \* Student Sheet: A Letter From A Daughter To A Father

## Procedure

- \* Begin the lesson by introducing Galileo and his work and his relation to the concert they will be attending
- \* If your students have computer or library access, they can research the life and work of Galileo using [www.wikipedia.com](http://www.wikipedia.com), or another appropriate websites. If students do not have computer access, this information is readily available in library encyclopedias. This research can be used in addition to the Student Sheet: Biography of Galileo
- \* Once students have researched Galileo, have them as a group list some the interesting things they learned about his work and his life.
- \* Have student read aloud a letter sent from Maria Celeste to Galileo in November 1623 (Student Sheet: A Letter From A Daughter To A Father)
- \* Ask each student to write a letter to Galileo asking him the questions they would have wanted to ask him if he was alive today. Students may choose to write about Galileo's discoveries, or give their own opinion on the disagreement between Galileo and his opponents and how they might feel if they had to recant something they believed in. They can include their own knowledge of the solar system today and how our understanding of outer space has changed in the last 400 years, or general questions about the life in the 17<sup>th</sup> century. Like the letters of his daughter Maria Celeste, the letters can be about all aspects of Galileo's life and times.
- \* In partners and using their letters as a guide, have one student role-play Galileo and the other student role-play a reporter interviewing Galileo and discuss how Galileo might have responded to their questions.

## *Connections to Ontario Curriculum*

The lessons in Section A: The Life and Times of Galileo support the delivery of the following expectations from *The Arts K-8: Music*.

### *Grade 4*

#### **Specific Expectations**

By the end of Grade 4, student will:

##### Knowledge of Elements

- identify the individual instruments of the woodwind, brass, string, and percussion families;
- identify tone colours (the specific sounds of individual instruments or voices) in familiar music;

##### Critical Thinking

- express their response to music from a variety of cultures and historical periods (e.g., "Frère Jacques", "Waltzing Matilda");
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., a word-processing program, storytelling, a collage);

### *Grade 5*

#### **Specific Expectations**

By the end of Grade 5, student will:

##### Knowledge of Elements

- recognize different kinds of tone colour in pieces of music (e.g., the sound of steel drums);
- recognize and classify various instruments (e.g., as woodwind, brass, stringed, or percussion instruments);

##### Critical Thinking

- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., computer graphics, charcoal drawings);

### *Grade 6*

#### **Specific Expectations**

By the end of Grade 6, student will:

##### Knowledge of Elements

- identify different kinds of tone colour in various performing ensembles (e.g., Inuit singing group, Mariachi band, string quartet);

### Critical Thinking

- describe, through listening, the main characteristics of pieces of music from the Baroque and Classical periods (e.g., Water Music by Handel, Clarinet Concerto in A, K.622, by Mozart);
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., painting, computer animation).

### *Grade 7*

#### **Specific Expectations**

By the end of Grade 7, student will:

#### Knowledge of Elements

- identify tone colours in various performing ensembles (e.g., brass trio, string quartet, marching band);

#### Critical Thinking

- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., a short essay, a dance drama);

### *Grade 8*

#### **Specific Expectations**

By the end of Grade 8, student will:

#### Critical Thinking

- describe some aspects of the historical context of music that they sing, play, or listen to (e.g., identify some major political events, social or philosophical movements, architectural or painting styles);
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., videotape, improvisation, watercolour paintings);

# The Composers of Galileo's Time

Halley's Comet appeared in the night sky three times during the baroque period of music, once at the beginning, once in the middle, and once at the end:

1607

Music: CD Track 1  
Moresca from *Orfeo* (1607)  
By Claudio Monteverdi



Claudio Monteverdi (1567 - 1643) was the most famous Italian composer of the early baroque period. He worked for many years in the northern Italian city of Venice, where Galileo first demonstrated his new telescope! Monteverdi composed works called "madrigals" to be sung at parties, music for church services, and musical plays called "operas" using stories from Greek mythology. His most famous opera, written in 1607, was called *Orfeo* and it told the story of a great singer whose music was so beautiful that he could enchant animals and trees. Orfeo went to the underworld to rescue his wife with the power of his art.

Track 1 of the CD contains a lively dance called a "moresca" which ends the opera. It is played by the stringed family of instruments - violin, viola, cello and bass, along with harpsichord, and lute.

1682

Music: CD Track 2  
Rondeau from *Abdelazer*  
By Henry Purcell



Henry Purcell (1659 - 1695) was a great genius of English baroque music. When he was a boy he sang in the royal choir of King Charles II in London. Purcell began composing at a very early age and he was appointed organist of Westminster Abbey when he was 20. When he died at the tragically young age of 36, he was buried at the foot of the organ. His "Rondeau" was music written for a spoken play by a famous female writer and spy, Mrs. Aphra Behn. A rondeau is a piece with a repeated refrain at the beginning, middle and end, with two sections of contrasting music between.

Music: CD Track 3  
Summer from *Phaeton*  
By Jean-Baptiste Lully



Jean-Baptiste Lully (1632 - 1687) was the court composer to King Louis XIV of France. He was originally from Italy and moved to France when he was 14. Like Monteverdi, Lully was a famous opera

1758

Music: CD Track 4  
Allegro from *Concerto grosso in D major*  
By George Frideric Handel



George Frideric Handel (1685 - 1759) died just a year after the famous reappearance of Halley's Comet in 1758. Handel was born in Germany, the son of a barber-surgeon (those went together in those days!) who wanted him to become a lawyer. But Handel became a famous keyboard player and opera composer. In 1714 he moved to London and became the most celebrated composer of the late baroque period in England.

The lively music on track 4 begins our concert with a revolving theme that appears in each instrumental voice in turn - it reminded us of orbiting planets spinning in their orbit around the sun!

Music: CD Track 5  
The Entrance of Jupiter from *Hippolyte et Aricie*  
By Jean-Philippe Rameau



Jean-Philippe Rameau (1683-1764) was the greatest French composer of late

## 1682 continued...



composer who took his stories from Greek mythology. *Phaeton* tells the story of the sun god Apollo and his son Phaeton who insisted on driving his father's chariot of the sun with disastrous results. We will be telling the story of Phaeton at our concert.



The opera contains instrumental music for the Four Seasons. "Summer" is a lively dance with the string family, and the two new additions to the orchestra in the late 1600s - oboes and bassoon.



## 1758 continued...

baroque music. Best known for his operas, his first staged work didn't appear until he was 50 years old! Like Jean-Baptiste Lully, he worked for the King of France (now Louis XV) and used stories from ancient Greek myths for the plots of his operas.

Rameau was famous for his use of unusual colours in the sound of wind instruments - he often had the oboes and bassoon play very high to make a dramatic and intense sound. The short little piece "Jupiter" was played by the orchestra in the opera to accompany the entrance onto the stage of the king of the gods, Jupiter, who was the personification of the planet Jupiter. You can imagine a kingly figure making a procession to the regal, measured rhythm of this music.

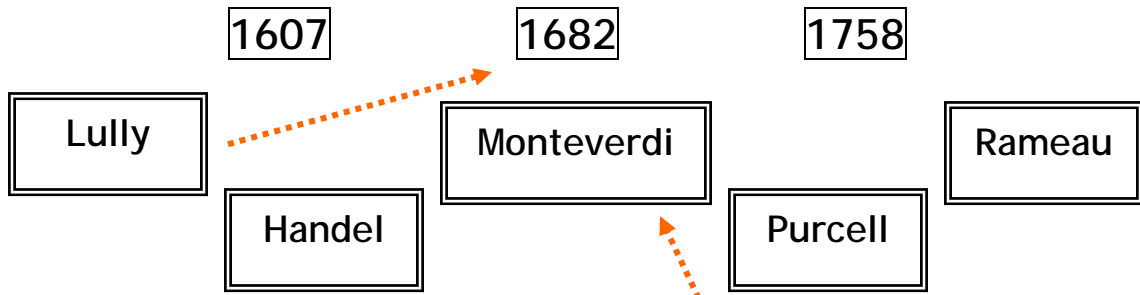


### Did you know...

Tafelmusik has been in SPACE! Canadian astronaut and former member of the Tafelmusik Chamber Choir Julie Payette brought Tafelmusik's "Messiah Choruses" CD to space on a shuttle mission to the International Space Station in 1989.

## The Happenings at the Time of Halley

Halley's Comet appeared in the night sky three times during the baroque period of music, once at the beginning, once in the middle, and once at the end. Draw a line matching each composer with the year they wrote music inspired by Halley's Comet and another line matching each fact listed below to the right composer.



- He composed an opera about Phaeton, a story from Greek mythology that tells the story of how comets came to be.

- He died a year after the famous reappearance of Halley's Comet in 1758.

- He was famous for the unusual sounds the wind instruments made in his pieces.

- His "moresca", which ends an opera, is played by the string family of instruments.

- He worked in Venice where Galileo first demonstrated the telescope!

- His most famous opera written in 1607, tells the story of a great singer whose music was so beautiful that he could enchant animals and trees.

- He wrote a piece of music called "Jupiter"

- His work "Summer" features two new additions to the orchestra in the late 1600s - oboes and bassoons.

- He was the most celebrated composer of the late baroque period in England.

- When he died at the young age of 36, he was buried at the foot of his organ.

- His music was written for a spoken play by a female spy.



## Student Sheet:

# The Story of Phaeton | Metamorphosis Book I - Ovid



Young Phaeton was a handsome and confident boy who, though brought up alone by his mother Clymene, was secure in the knowledge that his father was none other than Apollo, the sun-god himself. One day, however, a school chum teased him saying, "You are a fool to believe that nonsense about your father being a god. You're so conceited about someone who is not your father at all!"

Back at home, Phaeton's shame poured out. "And to make it worse, mother, I stood there saying nothing at all!" He cried, "Give me proof that what you say is true, that my father is actually Apollo." Clymene pointed to the brilliant sun above them. "I swear that you are the child of the sun which you behold." She turned to her son. "But you may gather proof for yourself, Phaeton. Go to your father's palace in the east and ask him."

So Phaeton set out, travelling ever eastward across Africa and India until he came to the glittering palace from which the sun-god begins his daily journey across the sky. Entering his father's presence, the boy was dazzled. There was the god dressed in purple, seated on a throne of flashing emeralds. Round about him were the hours, days, years and generations in their appointed rows. The boy stood trembling at the strangeness of it all till the sun-god addressed him.

"Why have you come, my son."

"Give me proof," the boy replied, "that I am indeed your son."

Then the god came down off his throne, and embraced Phaeton. "You are right to claim me as your father. To clear away all doubts, ask me any favour you could ask, and I will grant it you."

Scarcely had Apollo spoken than the boy asked to be allowed to drive his father's chariot, to have one day in charge of the winged horses and carriage of the sun. Apollo drew back, and his bright head shook with regret. "You do not know what you are asking, my son. Even Jupiter cannot control those creatures. I will not go back on my promise, but you can change what you ask. The journey across the sky is wildly difficult, the horses uncontrollable, the path full of dangers, the heights dizzying. Ask for some other favour, I beg you!"

But Phaeton, ignored his father, so eager was he to get into the driver's seat. Still Apollo protested, but time ran out. Rosy dawn was showing in the east as the winged horses were led from their stables; they snorted and pawed the ground impatiently.

But in a moment Phaeton would regret his choice. The horses sensed that something was wrong with the chariot: their burden was too light, and like an unsteady ship that has no cargo, the chariot shot into the air as if it were empty. Phaeton looked about him, but earth was by now far away, and in a panic he dropped the reins. At this the horses began to careen about the sky, leaving their normal path. The chariot veered about frantically, and Phaeton, distracted with terror, saw the giant creatures of the skies - the Bull, the Crab, the Lion, the Scorpion - menacing from every side. The sun-chariot went now too high, starting fires in the heavens, now too low, creating firestorms on earth. Mountaintops melted, rivers and lakes dissolved in horrible hisses of steam; even Neptune, the god of the sea, shrank as far underground as he could creep.

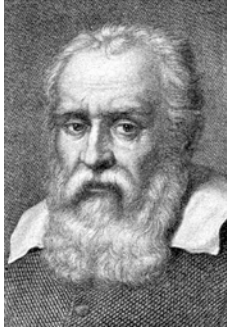
Finally Earth herself raised her voice and cried to Jupiter that if he wished to destroy her, he should do it now with his thunderbolts rather than with this tortured, scorching heat. Was he so angry with her, she who sustained all earthly creatures, that he should devise so horrible an annihilation?

Jupiter heard her cry, and seized a thunderbolt, launching it at the famous chariot. Across the heavens flew pieces of the smashed axle, shreds of harnesses, bits of the shattered wheels. The horses broke free and escaped from their severed reins, but Apollo's son, with flames searing from his glowing locks, hurtled down through the air, leaving a long trail behind him, like a star which flashes in the heavens and in a moment is consumed. He plunged into the river Eridanus (the Po) and the gods turned him into a swan.



## Student Sheet:

# A Brief Biography of Galileo Galilei



Galileo Galilei was born on February 15, 1564 in Pisa, Italy and was the oldest of six children. His family moved to Florence while he was still a child. Galileo's father hoped that his son would study medicine and become a doctor, but instead Galileo chose to study mathematics. Galileo became a professor at the University of Padua in 1592 and during this time Galileo made significant discoveries in not only astronomy but physics as well. In the winter of 1610 with his telescope pointed skywards, Galileo discovered 4 moons orbiting Jupiter. Galileo went on to study the phases of Venus, the rings of Saturn, sunspots and was the first to describe the lunar mountains and craters on the surface of the Moon. In light of his discoveries, Galileo concluded that sun-centered model of the solar system, first proposed by Nicolaus Copernicus was indeed correct. Galileo's views were not widely accepted at the time and he faced great opposition from the Church, who viewed his beliefs to be in direct contrast to their teachings. In 1633 Galileo stood trial and was found guilty of heresy. Galileo was eventually forced to recant his belief about the movement of the planets and spent the last years of his life under house arrest. Galileo died on January 8, 1642 at the age of seventy-eight. While Galileo is best known as a physicist and astronomer, Galileo also had a strong musical roots; His father, Vincenzo Galilei, was a expert lute player (a stringed instrument similar to a modern-day banjo) and taught Galileo how to play the lute and organ. Galileo's younger brother, Michaelangelo, was also a notable lutenist and composer in the 17<sup>th</sup> century.

### A Few of Galileo's Discoveries

- 1597 - Galileo invents a military compass to help with accuracy in shooting a cannon
- 1602 - Galileo experiments with a pendulum and works on theories of motion (how things move)
- 1606 - Galileo invents the thermoscope (an early version of the thermometer)
- 1609 - Galileo uses a telescope to look at the night sky
  - Galileo makes several observations and drawings of the moon
- 1610 - Galileo discovers four moons orbiting Jupiter
  - Galileo discovers that Venus passes through phases just like the moon
  - Galileo discovers the rings around Saturn
- 1612 - Galileo begins his work on sunspots
- 1616 - Galileo develops a theory on tides which he argues proves the earth moves



### Did you know...

Galileo did not invent the telescope. Hans Lippershey, a spectacle-maker from Holland is credited with creating the first practical telescope in 1608. Based on only a description of Lippershey's invention, Galileo made his first telescope. In August 1609, Galileo demonstrated his telescope to lawmakers in Venice.

Student Sheet:

## A Letter From A Daughter to A Father

*Most Illustrious Lord Father,*

*I cannot rest any longer without news, both for the infinite love I bear you, and also for fear lest the sudden cold, which in general disagrees so much with you, should have caused a return of your usual pains and other complaints. I therefore send the man who takes this letter purposely to hear how you are, and also when you expect to set out on your journey. I have been extremely busy at the dinner-napkins. They are nearly finished, but now I come to putting on the fringe, I find that of the sort of which I send you a sample, a piece is wanting for two dinner-napkins: that will be four braccia. I would be glad if you could let me have it immediately, so that I may send you the napkins before you go; as it was for this that I have been making such haste to get them finished.*

*As I have no cell of my own to sleep in, Sister Diamanta kindly allows me to share hers, depriving herself of the company of her own sister for my sake. But the room is so bitterly cold that with my head so infected, I do not know how I shall remain well, unless you can help me by lending me a set of those white bed-hangings which you will not want now. I would be glad to know if you can do me this service.*

*Moreover, I beg you to be so kind as to send me that book of yours which has just been published, so that I may read it, for I have a great desire to see it.*

*These few cakes I send are some I made a few days ago, intending to give them to you when you came to bid us adieu. As your departure is not so near as we feared, I send them lest*

*they should get dry. Sister Arcangela is still under medical treatment, and is much tried by the remedies. I am not well myself, but being so accustomed to ill health, I do not make much of it, seeing, too, that it is the Lord's will to send me continually some such little trial as this. I thank Him for everything, and pray that He will give you the highest and best felicity. And finally, with all my heart, I greet you in the name of me and Sister Arcangela.*

*From San Matteo, the 21st of November 1623*

*Your most affectionate daughter,*

*Sister Maria Celeste Galilei \**

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\*Sources: The Private Life of Galileo. Compiled principally from his Correspondence and that of his Eldest Daughter, Sister Maria Celeste, Nun in the Franciscan Convent of S. Matthew in Arcetri (London: MacMilland, 1870), published anonymously, but written by Mary Allan-Olney. This book is riddled with errors in names, dates, etc., but contains many extracts of letters translated into English.

## B. Listening and Responding to the Music

### I. Listening and Responding to a Moresca

#### Lesson Focus

Students discover the musical form with Monteverdi's "Moresca" from *Orfeo* and create a dance using this knowledge.

#### Materials

- \* Track #1, *The Galileo Project* CD

#### Procedure

- \* Play the Moresca and ask students what activity this music was intended for.
- \* Listen to the students' responses; hopefully someone suggests that it is music for dancing.
- \* Share the following:  
*A moresca is a type of dance. It was usually performed by dancers in Moorish costume and wearing small bells attached to their legs. The tradition carries on to this day and in you will sometimes see Morris Dancers out in the parks around Toronto. They dress in white, wear hats with flowers attached, and sometimes dance with long handkerchiefs in their hands. Traditionally only men did Morris dances, but now many women do as well.*
- \* Listen again and add movements to help students hear the A and B sections. A = pat 8 beats, B= clap 8 beats (this continues to the end of the piece).
- \* In groups of six, have students create a dance in 8 beat phrases.
  - o Begin by selecting a form (circle, lines, etc.)
  - o Create a movement for the A section and then an opposite movement for the B section.
  - o Join two groups of six together and have each group teach the other their movements.
  - o The dance has a total of 12 phrases so students can combine the created movements in a number of ways (perhaps first ABAB = Group One movements, second ABAB = Group Two movement; last ABAB = Group One and Two movements combined).
- \* Ask students to describe how the music ends. What movement does it suggest? (a bow).
- \* Perform again and be sure to add a bow at the end. Enjoy!



#### Teacher Tip:

If you have any classroom instruments have a couple of students play a soft beat on a drum for the A section, and on jingle bells for the B section

## II. How Do I Feel About Baroque Music

### Lesson Focus

Students will be introduced to the elements of Baroque music through the selected work of Monteverdi, Lully, Purcell, Handel and Rameau.

### Materials

- \* *The Galileo Project* CD (Tracks 1 - 5)
- \* Student Sheet: How Do I Feel About Music?
- \* Teacher Supplement: How Do I Feel About Music?
- \* Supplement File: Information Cards: How Do I Feel About Music?  
(available at [www.tafelmusik.org/education/teacherstudy.htm](http://www.tafelmusik.org/education/teacherstudy.htm))

### Procedure

- \* Handout the Student Sheet: How Do I Feel About Music? The students can either work individually or in small groups. Each group or student will receive all five Information Card: How Do I Feel About Music?
- \* The student and/or groups will review the information on the cards. After discussing the meaning of each word (either as a class or within their groups), students will then fill in all of the categories on Student Sheet: How Do I Feel About Music? as you play each of the selections on *The Galileo Project* CD. Encourage the students to be creative in their descriptions in all categories.
- \* As a class, review your descriptions and discuss any differences or similarities.

## *Connections to Ontario Curriculum*

The lessons in Section B: Listening and Responding to the Music support the delivery of the following expectations from *The Arts K-8: Music*.

### *Grade 4*

#### **Specific Expectations**

By the end of Grade 4, student will:

##### Knowledge of Elements

- identify the form ABABAB
- identify the individual instruments of the woodwind, brass, string, and percussion families;
- identify tone colours (the specific sounds of individual instruments or voices) in familiar music.

##### Creative Work

- perform simple rhythmic patterns.

##### Critical Thinking

- express their response to music from a variety of cultures and historical periods communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media;
- explain, using appropriate musical terminology, their preference for specific songs or pieces of music;
- describe how a composer can manipulate the elements of music to create a specific mood;
- explain the effects of different musical choices.

### *Grade 5*

#### **Specific Expectations**

By the end of Grade 5, student will:

##### Knowledge of Elements

- identify the form of ...music that they sing, play, or hear;
- recognize different kinds of tone colour in pieces of music (e.g., the sound of steel drums);
- recognize and classify various instruments (e.g., as woodwind, brass, stringed, or percussion instruments).

##### Critical Thinking

- describe how various elements of music are combined to create different moods (e.g., compare tempo and melody...);
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media.

## *Grade 6*

### **Specific Expectations**

By the end of Grade 6, student will:

#### Knowledge of Elements

- identify simple structural patterns in music that they sing, play, or hear;
- identify the type of texture in music from a variety of cultures and historical periods;
- identify different kinds of tone colour in various performing ensembles.

#### Critical Thinking

- describe how the various elements of music are used to create mood;
- describe, through listening, the main characteristics of pieces of music from the Baroque and Classical periods (e.g., Water Music by Handel);
- describe briefly the construction and use of an instrument;
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media.

## *Grade 7*

### **Specific Expectations**

By the end of Grade 7, student will:

#### Knowledge of Elements

- identify simple ...triple metre
- demonstrate understanding of the markings and Italian terms for dynamics, tempo, articulation, and phrasing in the music they sing and play;
- identify the type of texture in music appropriate for the grade;
- recognize binary form (AB) and ternary form (ABA) in music they perform and hear;
- identify tone colours in various performing ensembles;

#### Critical Thinking

- describe how changes in texture alter the mood in a piece of music;
- describe the history, construction, and use of an instrument (e.g., historical or period instrument);
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., a short essay, a dance drama).

## *Grade 8*

### **Specific Expectations**

By the end of Grade 8, student will:

#### Knowledge of Elements

- demonstrate understanding of the markings and Italian terms for dynamics, tempo, articulation, and phrasing in the music they play or sing;
- identify the type of texture in music appropriate for the grade;
- recognize ...form ...in music they perform and hear.

### Critical Thinking

- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media.

## How Do I Feel About Music?

<b>Musical Selection</b>  <i>What am I listening to?</i>	<b>1. Tempo</b>  <i>How fast is it?</i>	<b>2. Dynamics</b>  <i>How loud is it?</i>	<b>3. Affect or Composer's intent</b>  <i>What emotion or character is it?</i>	<b>4. Texture</b>  <i>Who is playing?</i>	<b>5. Emotional Response</b>  <i>How does it make me feel?</i>
<i>Moresca from L'Orfeo</i>					
<i>Rondeau from Abdelazer</i>					
<i>Dance for the Summer</i>					
<i>Allegro, from Concerto grosso in D major</i>					
<i>Entrance of Jupiter from Hippolyte et Aricie</i>					

## Teacher Supplement: **How Do I Feel About Music?**

### **Tempo:**

The Italian word for "time", *tempo* is the word for musical speed or pacing. If one were to walk along to the beat of the music, a normal walking speed would be a medium tempo. If you feel like you might need to break into a run, that would be a fast tempo, and if you find yourself dragging your feet, that is definitely a slow tempo! You may be familiar with other Italian words that musicians use to describe tempo like Allegro (fast and happy), Adagio (slow and at ease), Presto (very fast), Andante (walking tempo), and Grave (very slow). Baroque composers sometimes use these terms as well, but more often they give no tempo marking at all, or they give the names of a dance. Since dancing was so popular in those days, everyone knew that a Minuet was a graceful, medium tempo dance, but a Sarabande was much slower and Bourrées and Giges were quick and lively.

### **Dynamics:**

This is the word that musicians use for the intensity of volume with which notes and sounds are expressed. A loud dynamic (musicians use the Italian words *forte*, pronounced fore-tay) would be like speaking in an outdoor voice. Very loud (*fortissimo*) would be shouting. If someone else would need to listen very carefully in order to hear you, you would be speaking softly (*piano*). Very soft (*pianissimo*) would be like whispering. A normal speaking voice would be medium loud (*mezzo forte*, pronounced met-zo fore-tay) or medium soft (*mezzo piano*).

### **Affect (pronounced Ah-fect):**

In Baroque music, this is the word for the emotion or character of a piece of music. Music can describe many feelings such as sadness, anger, hate, joy, love and jealousy. Composers use all of their musical skills to describe their own emotions, or those of others. They can try to write joyful, festive sounding music, or fearful, sneaky sounding music. Be creative in your descriptions of the composer's intentions! If a piece sounds sad, try to think of a more descriptive word - is it sad and tired? Sad and lonely? Sad and miserable? Sad and weepy? Sad and fed-up? How sad is it? Is it mournful? Tragic? Tortured? Gloomy?

### **Texture:**

The texture of music refers to who is playing and how many people are playing at the same time. A thin texture might be two oboes playing together. A thick texture would be a whole orchestra with many violins, violas, cellos, double bass, harpsichord, oboes and bassoons all playing together, with many of them playing different parts. Try to describe how many people are playing and what instruments they are playing.

### **Emotional Response:**

This category is your own personal response to the music. There is no right or wrong answer here, and music can make you feel different things on different days. Your own personal response may mirror your answer in the Affect category, but it doesn't have to. If a composer writes a piece that is lighthearted and joyful, it may lift your spirits too! However, music affects us in different ways at different times. One day a piece that is noisy and fast and joyful might make you feel energized, but on another day you might be in a quiet and thoughtful mood, so it may make you feel annoyed and jittery. How does this piece of music make you feel right now?

## C. *The Instruments of the Baroque Era*

### I. What Are Baroque Instruments and How Do They Sound?

#### Lesson Focus

During the time of Galileo and the visits of Halley's Comet during the 17<sup>th</sup> and 18<sup>th</sup> centuries, there were several developments in the construction of musical instruments. In 1531, just before Galileo was born, the lute and the viola were being made in the north of Italy, where Galileo was from. By 1607, when Halley's Comet returned to earth, the viola had created a "family" of string instruments including the violin, the violoncello and the double bass violin. The harpsichord had also been created at this time. By the time Halley's Comet returned in 1682, the oboe and bassoon had been created.

Focusing on the instruments that will be played by the musicians during *The Galileo Project* concert, students will learn about instruments of a baroque orchestra.

#### Materials

- \* *The Galileo Project* CD
- \* Student Sheet: Who Am I and What Am I Made Of?
- \* Teacher Answer Sheet: Who Am I and What Am I Made Of?
- \* Supplement File: Colour photos of Baroque instruments
- \* *Baroque Adventure: The Quest for the Arundo Donax* online webgame (available at [www.tafelmusik.org/education/index.htm](http://www.tafelmusik.org/education/index.htm))

#### Procedure

- \* Discuss the Baroque instruments that the students will see when they come to the Tafelmusik concert (see the Teacher's Guide to Baroque Instruments available online at [www.tafelmusik.org/education/teacherstudy.htm](http://www.tafelmusik.org/education/teacherstudy.htm))
- \* Hand out Student Sheet: Who am I and What am I made of? Talk about the two types of instruments in a Baroque orchestra: Winds (instruments that you blow into like oboes and bassoons) and Strings (instruments with strings that are bowed or plucked like violins, violas, cellos, double basses, lutes and harpsichords). Note: percussion instruments are only used on special occasions, such as the timpani in Handel's famous oratorio, *The Messiah*. Be sure to discuss how size relates to sound (the bigger the instrument, the lower the sound), as well as the differences in sound. Your students may be familiar with many of the instruments on the student sheet, but others may be new.
- \* Have the students label each instrument in the blank space next to the corresponding picture. (see Teacher Answer Sheet: Who am I and What am I made of?) There are certainly other Baroque instruments that occasionally play in Baroque orchestras, like percussion instruments, flutes or recorders. Have your students write the names of other instruments they know at the bottom of the page. (see the bottom of the teacher answer sheet for a list of these instruments)
- \* Help your students connect the visual images of the instruments with the sounds they make. Play some short excerpts to demonstrate the sound of different instruments. Give examples for each instrument from *The Galileo Project* CD or baroque pieces they are familiar with. Encourage them to use verbal descriptions of the sounds, such as "*The oboe sounds \_\_\_\_, a violin sounds \_\_\_\_*"

Examples of the instruments and the sounds they make can also be found online as part of the *Baroque Adventure: The Quest for the Arundo Donax* online webgame at [www.tafelmusik.org/education/index.htm](http://www.tafelmusik.org/education/index.htm)

## II. What Materials Are Used to Make Baroque Instruments?

### Lesson focus

Baroque instruments are made from many different interesting and often surprising materials, including exotic and common materials, plants, animals and minerals.

### Materials

- \* *The Galileo Project* CD
- \* Student Sheet: What Am I Made Of?
- \* Student Sheet: Why Am I Musical?
- \* Teacher Answer Sheet: Why Am I Musical?
- \* Student Sheet: Who Am I and What Am I Made Of?
- \* Teacher Answer Sheet: Who Am I and What Am I Made Of?
- \* Supplement File: Information Cards: Why Am I Musical?
- \* Supplement File: Colour photos of baroque instruments  
(both available at [www.tafelmusik.org/education/teacherstudy.htm](http://www.tafelmusik.org/education/teacherstudy.htm))

### Procedure

- \* Divide the class into “home” groups of five students. Number off the home groups to form “expert” groups for the following materials:
  1. Expert Group 1 - Maple
  2. Expert Group 2 - Brass
  3. Expert Group 3 - Sheep gut (Sheep)
  4. Expert Group 4 - Ivory (Elephants)
  5. Expert Group 5 - Ebony
- \* Each member of the expert group researches their material using the internet, library or Supplement File: Information Cards: Why Am I Musical? Once the research is complete, the expert groups disband and everyone returns to their home group to share their findings - this way each home group should have one expert for each of the five materials.
- \* Home groups complete the Student Sheet: Why Am I Musical? Students try to figure out which materials the Baroque instruments might be made from. Experts within each home group will help make identifications. For example, the ebony expert in the group may have noticed that it is a black wood, and s/he might notice that all of the stringed instruments have black fingerboards. Discuss the student predictions as a class and have students fill in the materials space on Student Sheet: Who Am I and What Am I Made Of? (see Teacher Answer Sheet: Who Am I and What Am I Made Of?)

## III. Listening and Responding to Baroque Instruments

### Lesson Focus

Students will learn to identify the different sounds of each baroque instrument.

## Materials

- \* *The Galileo Project* CD
- \* Student Sheet: Guess The Instrument Challenge
- \* *Baroque Adventure: The Quest for the Arundo Donax* online webgame (available at [www.tafelmusik.org/education/index.htm](http://www.tafelmusik.org/education/index.htm))

## Procedure

- \* Play the Guess the Instrument Challenge game. This game can be played individually or in groups. Hand out Student Sheet: Guess the Instrument Challenge.
- \* Play musical selections from *The Galileo Project* CD and have the individual students or teams guess the instruments playing AND the materials used to make them. A correct answer for each instrument gets a point. A correct answer for each material used to make the instrument gets another point.
- \* If you have access to the internet, students can guess play Guess the Instrument Challenge game with instruments from the orchestra game that is part of the *Baroque Adventure: The Quest for the Arundo Donax* online webgame at [www.tafelmusik.org/education/index.htm](http://www.tafelmusik.org/education/index.htm)

## IV. Creating New Instruments

### Lesson Focus

Many Baroque instruments were made from materials that were easily found in everyday 17<sup>th</sup> and 18<sup>th</sup> century life. We encourage you to create music in your classrooms using materials easily found in everyday 21<sup>st</sup> century life. Instruments can be made from very simple and surprising materials, such as a home-made double reed instrument made from a straw and a styrofoam cup!

## Materials

- \* Student Sheet: Building Your Own Double Reed Instrument
- \* Straws and styrofoam cups (1 per student)

## Procedure

- \* Create and decorate new instruments with your students using everyday objects (see Teacher Guide: Homemade Instruments)
- \* Have a "rehearsal" with your new instruments. Look again at Student Sheet: How Do I Feel About Music? Practice playing your instruments using elements of music found on the sheet.
- \* Try playing different tempos
  - o slow, medium, fast
  - o slow getting faster (accelerando)
  - o fast getting slower (ritardando)
- \* Try playing different dynamics
  - o piano, forte, crescendo (getting louder) and decrescendo (getting softer)
- \* Try out some different affects
  - o how can you play your new instrument in a joyful, tired, or angry way
- \* Try focusing on texture
  - o have one person play alone, or small groups.

- \* Encourage the students to choose musical elements to rehearse. Try combining elements such as a fast tempo, with a soft dynamic and a sneaky character! Start with one person, and then add more and more people until everyone is playing.
- \* Compose a new piece of music. Choose a simple Baroque form like AABB, or ABA. Use ideas from your rehearsal to create the structure.
- \* In Baroque music, there is often one **affect** (feeling or emotion) for each piece, or section of a piece. Choose an affect or create a simple narrative for each section and then add all of the other musical elements. For example:
  - o The A section might be a HAPPY beautiful morning. The instruments might represent animals coming out to play. You may start with one or two "animals" (instruments), and gradually add to the texture until everyone is playing at a medium tempo in a medium dynamic, in a contented or playful affect.
  - o The B section might be a SCARY storm in which all of the animals scamper away and there is terrible thunder and lightning. Everyone might play loudly, quickly and aggressively for a short time, and then quickly decrescendo to silence.
  - o You can continue to alternate between the A and B section.
  - o Encourage the students to choose their own ideas and musical elements to represent those ideas.
- \* Give your new composition a title and don't forget to perform your new piece of music!

## *Connections to Ontario Curriculum*

The lessons in Section C: The Baroque Instruments of Galileo's Time support the delivery of the following expectations from *The Arts K-8: Music*.

### *Grade 4*

#### **Specific Expectations**

By the end of Grade 4, student will:

##### Knowledge of Elements

- identify the individual instruments of the woodwind, brass, string, and percussion families;
- identify tone colours (the specific sounds of individual instruments or voices) in familiar music;

##### Creative Work

- ...perform simple rhythmic patterns in 4/4 time;
- sing or play expressively, giving particular attention to using suitable dynamics and tempi;
- create musical compositions that show appropriate use of some of the elements of music (e.g., tempo, dynamics, pitch, beat, rhythm, tone colour), and perform them.

### *Grade 5*

#### **Specific Expectations**

By the end of Grade 5, student will:

##### Knowledge of Elements

- recognize different kinds of tone colour in pieces of music (e.g., the sound of steel drums);
- recognize and classify various instruments (e.g., as woodwind, brass, stringed, or percussion instruments);

##### Creative Work

- sing or play expressively, showing awareness of different tone colours;
- create musical compositions that show appropriate use of various elements of music (e.g., tempo, dynamics, melody, form, tone colour), and perform them;

### *Grade 6*

#### **Specific Expectations**

By the end of Grade 6, student will:

##### Knowledge of Elements

- identify simple structural patterns in music that they sing, play, or hear (e.g., the pattern AABA in a simple four-lined folk song);
- identify different kinds of tone colour in various performing ensembles (e.g., Inuit singing group, Mariachi band, string quartet).

### Creative Work

- sing or play expressively, giving particular attention to using suitable dynamics, tempi, and phrasing;
- create musical compositions that show appropriate use of various elements of music (e.g., tempo, dynamics, melody, rhythm, form, texture, tone colour), and perform them;

### *Grade 7*

#### **Specific Expectations**

By the end of Grade 7, student will:

#### Knowledge of Elements

- identify the type of texture in music appropriate for the grade;
- recognize binary form (AB) and ternary form (ABA) in music they perform and hear;
- identify tone colours in various performing ensembles (e.g., brass trio, string quartet, marching band);

#### Creative Work

- create and perform musical compositions that make use of elements of music studied in pieces learned in this grade;

#### Critical Thinking

- describe the history, construction, and use of an instrument (e.g., historical or period instrument such as the sackbut, or the instrument they play in class).

### *Grade 8*

#### **Specific Expectations**

By the end of Grade 8, student will:





#### Knowledge of Elements





- demonstrate understanding of the markings and Italian terms for dynamics, tempo, articulation, and phrasing in the music they play or sing;
- identify the type of texture in music appropriate for the grade;
- recognize... form in music they perform and hear.

#### Creative Work





- create musical compositions that make use of elements of music studied in this grade, ...and perform them.





## Who Am I and What Am I Made Of?

	<p>Name: _____</p> <p>I am the most famous stringed instrument. I am the smallest and have the highest voice. My players hold me under their chins, and modern versions of me even have a chinrest! I have been known to play all kinds of music from Baroque to Country and Western to Rock and Roll.</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am a little bigger than my famous string cousin. I have a slightly lower, warmer and mellower voice. I play the middle part in an orchestra - neither the highest nor the lowest, but many say the most heartfelt.</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am held upright, between the legs. I have a low, deep voice and am a very important member of the continuo "team". The continuo players play almost continuously in Baroque music and we all play the same part - the bass line!</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am the largest stringed instrument - I am so big that my players have to stand up to hold me! I play the lowest notes in the orchestra and am also a member of the continuo "team".</p> <p>Materials: _____</p>

	<p>Name: _____</p> <p>I am a keyboard instrument kind of like a piano, but I have many long strings that are plucked. I am a member of the continuo "team" too, but my players are required to improvise chords while reading the bass line along with the rest of the team.</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am a beautiful wind instrument that uses a double reed to make a sound. My players hold me out in front of them in full view! Sometimes Baroque composers have me play together with the violins, but on special occasions, my sound soars above the orchestra.</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am a double reed wind instrument, but I make a much lower sound and my players hold me on the side because I am so big. I am the wind family's contribution to the continuo "team". You can hear me the most clearly when other wind instruments are playing because I am usually the lowest sound you will hear.</p> <p>Materials: _____</p>
	<p>Name: _____</p> <p>I am a plucked string instrument with a round back, a cousin to the guitar. I have many pairs of strings stretched across a pear-shaped soundboard with a beautiful rosette in the middle. I like to play alone but am also used for accompanying and am a member of the continuo section in a Baroque orchestra.</p> <p>Materials: _____</p>

## Who Am I and What Am I Made Of?

	<p>Name: <b>Violin</b></p> <p>I am the most famous stringed instrument. I am the smallest and have the highest voice. My players hold me under their chins, and modern versions of me even have a chinrest! I have been known to play all kinds of music from Baroque to Country and Western to Rock and Roll.</p> <p>Materials: <b>Spruce (front), Maple (back sides and scroll), Ebony (finger board, tuning pegs and tailpiece), Ivory (button on bottom sometimes, and also frog of bows), sheep gut (strings), bows made of snakewood and horsehair</b></p>
	<p>Name: <b>Viola</b></p> <p>I am a little bigger than my famous string cousin. I have a slightly lower, warmer and mellower voice. I play the middle part in an orchestra - neither the highest nor the lowest, but many say the most heartfelt.</p> <p>Materials: <b>Same as violin</b></p>
	<p>Name: <b>Cello</b></p> <p>I am held upright, between the legs. I have a low, deep voice and am a very important member of the continuo "team". The continuo players play almost continuously in Baroque music and we all play the same part - the bass line!</p> <p>Materials: <b>Same as violin</b></p>
	<p>Name: <b>Double Bass</b></p> <p>I am the largest stringed instrument - I am so big that my players have to stand up to hold me! I play the lowest notes in the orchestra and am also a member of the continuo "team".</p> <p>Materials: <b>Same as violin</b></p>

	<p><b>Name: Harpsichord</b></p> <p>I am a keyboard instrument kind of like a piano, but I have many long strings that are plucked. I am a member of the continuo "team" too, but my players are required to improvise chords while reading the bass line along with the rest of the team.</p> <p><b>Materials: Many different woods including Spruce and Maple (frame and sound board, keys), Ebony (keys), Brass and Iron (for strings), Quills from Crow or Seagulls (used to pluck strings)</b></p>
	<p><b>Name: Oboe</b></p> <p>I am a beautiful wind instrument that uses a double reed to make a sound. My players hold me out in front of them in full view! Sometimes Baroque composers have me play together with the violins, but on special occasions, my sound soars above the orchestra.</p> <p><b>Materials: Boxwood (body), ivory (decorates joints), bamboo (Arundo Donax) for reed, beeswax and thread (fastener for reeds)</b></p>
	<p><b>Name: Bassoon</b></p> <p>I am a double reed wind instrument, but I make a much lower sound and my players hold me on the side because I am so big. I am the wind family's contribution to the continuo "team". You can hear me the most clearly when other wind instruments are playing because I am usually the lowest sound you will hear.</p> <p><b>Materials: Maple (body), brass (keys and tube to mouthpiece), bamboo (reed), beeswax and thread (fastener for reeds)</b></p>
	<p><b>Name: Lute</b></p> <p>I am a plucked string instrument with a round back, a cousin to the guitar. I have many pairs of strings stretched across a pear-shaped soundboard with a beautiful rosette in the middle. I like to play alone but am also used for accompanying and am a member of the continuo section in a Baroque orchestra.</p> <p><b>Materials: Spruce (soundboard), maple (ribs), ebony (fingerboard/pegbox), boxwood (pegs).</b></p>

Can you think of any other instruments you might hear playing in a Baroque orchestra on special occasions?

Recorder, flute, piccolo, oboe d'amore, trumpet, sackbut (an early trombone), percussion instruments like timpani and tambourines, organ, lute, theorbo (a large lute), Baroque guitar (used in some Italian and Spanish music), viola da gamba (held between the legs like a cello but tuned and fretted like a guitar). Instruments that they would definitely NOT hear might be clarinet (only starting being used in orchestras around 1750 at the earliest - Tafelmusik uses clarinets for music of the Classical era, like Mozart's opera *The Magic Flute*). They would not hear pianos, saxophones, tubas, any metal percussion instruments like cymbals or xylophone, or electric instruments like electric guitar and electric bass.



**Teacher Tip:**

Visit the online Baroque Learning Centre at [www.tafelmusik.org](http://www.tafelmusik.org) for additional information about baroque composers and baroque instruments.

## What Am I Made Of?

Connect the instrument on the left with its matching list of materials.



- \* Many different types of wood
- \* Brass
- \* Iron
- \* Quills from crow feathers



- \* Maple
- \* Brass
- \* Bamboo (Arundo Donax)
- \* Beeswax



- \* Spruce
- \* Maple
- \* Sheep gut
- \* Ebony



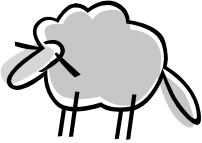


## Why Am I Musical?

### Materials used to make Baroque instruments

1. What am I? \_\_\_\_\_
2. Am I a plant, animal or mineral? \_\_\_\_\_
3. Am I found in Canada? (if not, where?) \_\_\_\_\_
4. What do I look like? Describe at least 2 characteristics of my appearance and properties such as colour, size, texture, etc. \_\_\_\_\_  
\_\_\_\_\_
5. What am I used for? Name at least 3 uses, including a musical use if you can find one! \_\_\_\_\_  
\_\_\_\_\_
6. Guess which Baroque instrument(s) are made from me! \_\_\_\_\_  
\_\_\_\_\_
7. Draw a picture of me in my original form (for brass, draw a picture of something I am used for):

Teacher Answer Sheet

## Why Am I Musical?

1.	Maple	Brass	Sheep Gut	Ivory	Ebony
2.	Plant	Mineral	Animal	Animal	Plant
3.	Canada	Canada	Canada	Africa	India & Sri Lanka
4.	<ul style="list-style-type: none"> <li>• Medium brown wood</li> <li>• "tone wood"</li> <li>• Good for carrying sound</li> <li>• Decorative "flamed maple" grain</li> </ul>	<ul style="list-style-type: none"> <li>• Gold appearance</li> <li>• Turning slightly reddish</li> <li>• Germicidal</li> <li>• Non-magnetic</li> </ul>	<ul style="list-style-type: none"> <li>• Tough cords that last a long time</li> </ul>	<ul style="list-style-type: none"> <li>• Hard</li> <li>• White</li> <li>• Opaque</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy</li> <li>• Black</li> <li>• Fine-grained wood</li> </ul>
5.	<ul style="list-style-type: none"> <li>• Maple syrup</li> <li>• Musical instruments</li> <li>• Bowling pins</li> <li>• Butcher's blocks</li> <li>• Baseball bats</li> </ul>	<ul style="list-style-type: none"> <li>• Musical instruments</li> <li>• Locks</li> <li>• Screws</li> <li>• Gears</li> <li>• Ammunition</li> <li>• Plumbing &amp; electrical</li> <li>• Doorknobs</li> </ul>	<ul style="list-style-type: none"> <li>• Strings for musical instruments</li> <li>• Hanging clocks</li> <li>• Bow-strings</li> <li>• Surgery</li> <li>• Tennis racquets</li> </ul>	<ul style="list-style-type: none"> <li>• Decorative pieces on musical instruments</li> <li>• Billiard balls</li> <li>• Buttons</li> </ul>	<ul style="list-style-type: none"> <li>• Furniture</li> <li>• Musical instruments</li> <li>• Chess pieces</li> </ul>
6.	<ul style="list-style-type: none"> <li>• All string instruments, including harpsichord</li> <li>• Bassoon</li> </ul>	<ul style="list-style-type: none"> <li>• Horn</li> <li>• Bassoon keys</li> <li>• Harpsichord strings</li> </ul>	<ul style="list-style-type: none"> <li>• All strings <u>except</u> harpsichord</li> </ul>	<ul style="list-style-type: none"> <li>• Ornaments on oboe</li> <li>• Frogs and tips of bows of string instruments</li> </ul>	<ul style="list-style-type: none"> <li>• Fingerboards</li> <li>• Tuning pegs</li> <li>• Tailpiece for strings (<u>except</u> harpsichord)</li> <li>• Harpsichord keys only*</li> </ul>
7.					

\* Tafelmusik's harpsichord is black, but it is not ebony. It is made of various other types of wood (like maple) that have been painted black.

## Guess the Instrument Challenge!

This game can be played by individual students or in groups.

1 point for each correct instrument, 1 point for each material that's used to make the instrument, and a bonus point for stating if the material is endangered! Record your total number of points at the bottom. If you scored higher under "Instruments Playing", you're Musical! If you scored higher under "Materials", you're Environmental! Are you both? How many Musicians and Environmentalists are in your classroom?

Musical Selection	Instruments playing	Materials	Bonus
<b>Totals</b>	<i>Musical</i>	<i>Environmental</i>	

## Building Your Own Double Reed Instrument

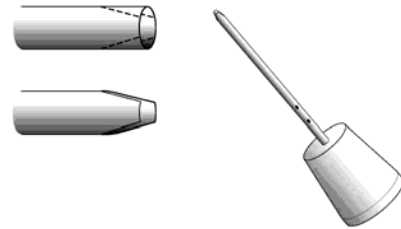
A reed is a thin strip of material which vibrates to produce a sound on a musical instrument. The reeds of baroque woodwind instruments, such as the oboe and the bassoon, are made from the stem or cane of a plant called *Arundo donax*. A double reed instrument has *two* pieces of cane vibrating against each other.

### Materials

- \* Drinking straw
- \* Styrofoam cup
- \* Masking tape
- \* Scissors

### Directions:

1. Pinch one end of the straw to flatten it.
2. Hold the pinched end and cut a small piece off each corner.
3. Take the other end of the straw and cut a small hole one inch from the bottom. The easiest way to do this is to pinch the area where you want the hole before cutting.
4. Cut a second hole an inch above the first hole.
5. Punch a hole in the bottom of the styrofoam cup. It should be no bigger than the circumference of your straw.
6. Push the bottom of the straw into the hole about 1/4".
7. Tape the straw to the styrofoam with a small piece of masking tape.



### Playing Your Double Reed Instrument:

- \* Put the top of the straw between your lips. Press lips together and smile slightly. Don't pinch the straw completely shut - your lips must be tight but still leave a small bit of space to allow air through.
- \* Take a breath and blow. It may take several tries before you get a sound.
- \* To change the pitch, place a finger over the first hole and a second finger over the second hole. Is the sound higher or lower? How many different sounds can you make?



### Did you know?

It is because of its double reed that the oboe is such a difficult instrument to play - without regular practice, the mouth can become very tired and loose and one finds difficulty in playing even a single note for more than 30 seconds

## Teacher Guide

# Building Your Own Homemade Instruments

### Kazoo

#### Materials needed:

- \* Comb
- \* Waxed Paper

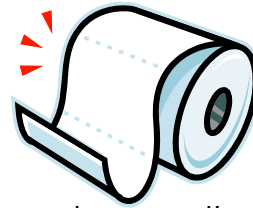
#### Directions:

1. Fold a small piece of the waxed paper in half over the comb with the teeth of the comb in the fold.
2. Play by placing your mouth over the toothed edge and humming. Move the comb from side to side.

OR

#### Materials Needed:

- \* Empty Paper Towel Roll
- \* Waxed Paper
- \* Rubber Band
- \* Something sharp to poke holes in the paper like a pin or a sharp pencil
- \* Crayons or Markers



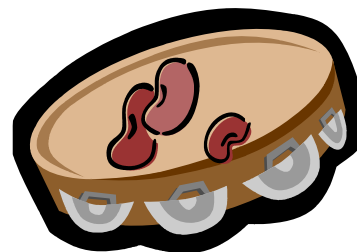
#### Directions:

1. Place a piece of waxed paper over one end of the roll and secure it with a rubber band.
2. Poke 2 or 3 small holes into the waxed paper allowing sound to be produced.
3. Decorate the outside of the kazoo with crayons or markers.

### Tambourine

#### Materials needed:

- \* 2 Paper Plates
- \* Stapler
- \* Rice or Dried Beans
- \* Crayons or Markers



#### Directions:

1. Place rice or dried beans between the plates.
2. Staple the paper plates together.
3. Shake to produce a sound.
4. Decorate with crayons or makers. (*This can also be done before the plates are stapled together*)

### Rain Stick

The rain stick is an unusual instrument that was created by native peoples in the rain forest. They took a hollowed out branch from a tree, covered both ends and used it to carry their

seeds and precious items from one place to another as they traveled. Inside the branch were thorns or sticks that would "catch" the seeds as they fell, creating a noise that sounded like the slow drizzle of rain.

**Materials needed:**

- \* A long tube (a mailing tube from the post office, cardboard tubes from gift wrap, paper towels, or even toilet paper for a tiny one!)
- \* Aluminum foil, felt, fabric or strong paper to seal ends of tube
- \* Strong tape like masking tape or duct tape
- \* Materials for decorating like crayons, markers, pictures from magazines, glitter, glue, yarn, feathers, string, fabric, etc.
- \* Toothpicks
- \* Filler materials like birdseed, macaroni, beads, lentils, unpopped popcorn, buttons, or just about anything else that is small (Try a variety of things for the best effect)

**Directions:**

1. Seal one end of the tube with foil or other material. Use strong tape like masking tape or duct tape.
2. Decorate your stick. Use whatever you like and can find around your classroom.
3. Create the rain stick effect. To create this effect, push tooth picks through the mailing tube. Of course, this part of the project is best with bigger kids or with grown-ups around. For smaller children, focus on the decoration and performance because you'll probably want to omit this step.
4. Fill your rain stick with your "filler materials". You can use a whole bunch of things here! When doing this project with a group of children, set up a "filler buffet" and have the children go down the line while they fill their rain sticks.
5. Seal the other end of the rain stick now.
6. Play your rain stick! Turn your rain stick from side to side and upside-down. Do this at different speeds to listen to the rain!

For more information on homemade instruments there are many helpful websites on the internet, including:

<http://songsforteaching.com/articles/makingmusicalinstrumentsathome.htm>

## D. *Inspired by Live Performance*

### Lesson Focus:

To articulate a verbal, literary, or artistic response to attending a live performance of Tafelmusik.

### Materials

- \* *The Galileo Project* CD

### Procedure

Soon after attending the live concert by Tafelmusik at Trinity-St. Paul's church, invite the students to have a group discussion about what they saw and heard. You may want to ask the following questions:

- \* How was attending a live performance different than listening to the CD?
- \* Was the performance what you were expecting? How was it different? Did it sound different?
- \* Was it easier or more difficult to pick out the different instruments that were playing?
- \* What was your favourite instrument?
- \* If you played a Baroque instrument, what would it be? Why?
- \* What was your favourite part of the concert? Why? What was your least favourite part of the concert? Why?
- \* What was your favourite piece? Why?
- \* Invite the students to choose a literary or artistic response to the concert and their experiences with Baroque music. Play a favourite track from *The Galileo Project* CD for some inspiration.
- \* The following are some suggested activities:
  - o Compose a poem or a short story about your experiences with Tafelmusik. The subject might be Baroque music, the life and times of Galileo, an emotional response to music or a particular instrument, or how science and music are connected.
  - o Write a review of the concert. A review should include where and when the performance took place, by whom, who was in attendance, and what music was performed. Add some background information on Galileo and the composers, as well as positive and negative aspects of the concert and the concert experience.
  - o Choose a partner and write a TV or radio interview about your experiences. One person is the interviewer and asks questions about Baroque music and the Tafelmusik concert. The other person answers the questions. Perform your interview for the class. Be sure to prepare both the questions and the answers!

- Write and perform a dramatic monologue from the point of view of an audience member at a Tafelmusik concert. Did you enjoy the concert? How do you feel about Baroque music?
- Create a poster advertising *The Galileo Project*. Make a poster that Tafelmusik might use today, or one that would invite people to see an opera by Purcell, Monteverdi, Lully, Handel or Rameau.

## *Connections to Ontario Curriculum*

The lessons in Section D: Inspired by Live Performance support the delivery of the following expectations from *The Arts K-8: Music*.

### *Grade 4*

#### **Specific Expectations**

By the end of Grade 4, student will:

#### Critical Thinking

- express their response to music from a variety of cultures and historical periods;
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., a word-processing program, storytelling, a collage);

### *Grade 5*

#### **Specific Expectations**

By the end of Grade 5, student will:

#### Critical Thinking

- describe how various elements of music are combined to create different moods;
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., computer graphics, charcoal drawings);

### *Grade 6*

#### **Specific Expectations**

By the end of Grade 6, student will:

#### Critical Thinking

- describe how the various elements of music are used to create mood in ...music in different styles;
- describe, through listening, the main characteristics of pieces of music from the Baroque and Classical periods (e.g., Water Music by Handel);
- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., painting, computer animation).

### *Grade 7*

#### **Specific Expectations**

By the end of Grade 7, student will:

#### Critical Thinking

- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., a short essay, a dance drama);
- describe their response to a musical performance in their community.

## *Grade 8*

### **Specific Expectations**

By the end of Grade 8, student will:

#### Critical Thinking

- communicate their thoughts and feelings about the music they hear, using language and a variety of art forms and media (e.g., videotape, improvisation, watercolour paintings);
- describe their response to a musical performance in their community.

## *Additional Resources*

### *Websites*

Tafelmusik Educational Programmes: [www.tafelmusik.org/education/index.htm](http://www.tafelmusik.org/education/index.htm)

Tafelmusik Resource Guides: [www.tafelmusik.org/education/teacherstudy.htm](http://www.tafelmusik.org/education/teacherstudy.htm)

Tafelmusik Online Baroque Learning Centre:  
[www.tafelmusik.org/flash/learningcentre/index.html](http://www.tafelmusik.org/flash/learningcentre/index.html)

International Year of Astronomy - Canadian Site: [www.astronomy2009.ca](http://www.astronomy2009.ca)

Canadian Astronomy Education: [www.cascaeducation.ca](http://www.cascaeducation.ca)

Telescopes from the Ground Up:  
<http://amazing-space.stsci.edu/resources/explorations/groundup/>

The Galileo Project - a research project by Rice University: <http://galileo.rice.edu/>

### *Books*

*Galileo for Kids* by Richard Panchyk, Chicago: Chicago Review Press, 2005, ISBN 1-55652-566-4

*Heavens Above: The Story of Galileo Galilei* by Kenneth Ireland, East Sussex: Macdonald Young Books, 1997, ISBN 0-7500-2302-3

*Galileo's Daughter* by Dava Sobel, New York: Penguin Group, 1999, ISBN 0-8027-1343-2

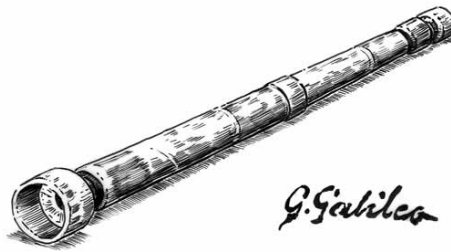
*Comets and Asteroids* by Ian Graham, North Mankato: Smart Apple Media, 2008.  
ISBN 1-5992-0074-0

### *Recordings*

*Baroque Adventure: The Quest for the Arundo Donax*, Tafelmusik Baroque Orchestra & Jeanne Lamon, Music Director, Analekta, 2005.

*A Baroque Feast*, John Abberger, oboe; Maxine Eilander, harp; Geneviève Gilardeau, violin; Jeanne Lamon, violin; Christina Mahler, cello; Allen Whear, cello, Analekta, 2002.

# Galileo's Telescope



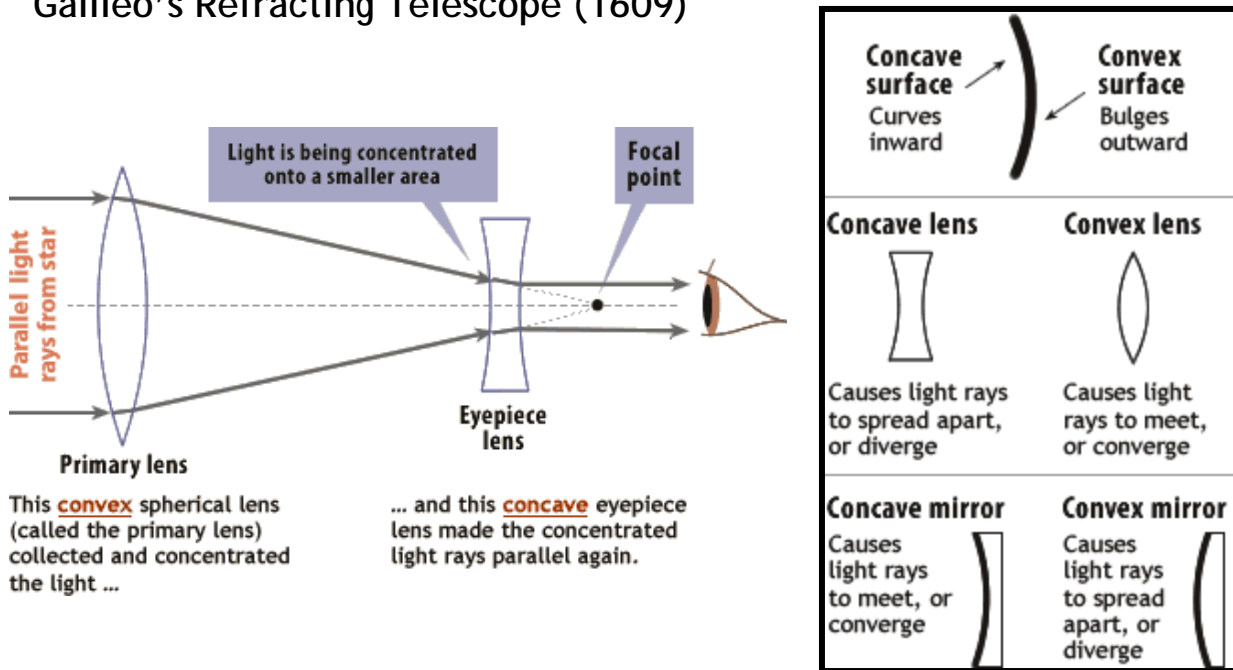
Galileo wasn't the first to build the device that would become known as the telescope, but he seems to have been the first to use it to study the night sky.

Galileo's telescope was a simple instrument compared with the ones we use today. It was a tube with two lenses – the convex primary lens that curved outward and the concave eyepiece lens that curved inward.

The first telescope used the same principles that all telescopes would rely upon. The combination of the two lenses gathered more light than the human eye could collect on its own, focused it, and formed an image. Because the image was formed by the bending of light, or refraction, these telescopes came to be known as refracting telescopes or, simply, refractors.

Galileo's best telescope magnified objects about 30 times. Galileo mounted his telescope to minimize the shaking that results from holding the telescope.

## Galileo's Refracting Telescope (1609)



Galileo's refractor used two lenses to concentrate the light from celestial objects, delivering more light to the human eye than it can gather on its own. The light was refracted through a spherical lens, forming an image.

The spherical shape of Galileo's primary lens made the images blurry. The lens also split light into colors, creating a fringe of color around bright objects. But it was good enough for Galileo to explore the night sky.

For more information on Galileo's refractor and the history of telescopes visit: <http://amazing-space.stsci.edu/resources/explorations/groundup/>

# *How to Build Your Own Refracting Telescope*

A telescope is an instrument that makes a far away object look closer. To do this, a telescope has a device that collects light from a distant object (a lens or a mirror) and brings that light (image) to a focus where a second device (an eyepiece lens) magnifies the image and brings it to your eye.

## Materials

- 2 lenses - a large convex lens and a small concave lens (Hint: convex lenses are thicker in the center than the edge; concave lenses are thinner in the centre)
- 1 cardboard tubes (i.e. paper towel roll or gift wrapping roll - it helps if it is long!)
- Duct tape or glue gun
- Scissors
- Tape measure
- Sheet of printed paper

## Procedure

- ① Get the two lenses and a sheet of printed paper
- ② Hold the convex lens (the bigger one) between you and the paper. The image of the print will look blurry.
- ③ Place the second lens (the smaller concave one) between your eye and the first magnifying glass.
- ④ Move the second lens forward or backward until the print comes into sharp focus. You will notice that the print appears larger and upside down.
- ⑤ Have a friend measure the distance between the two lenses and write down the distance.
- ⑥ Cut a slot in the cardboard tube near the front opening about an inch (2.5 cm) away. Do not cut all the way through the tube. The slot should be able to hold the large convex lens.
- ⑦ Cut a second slot in the tube the same distance from the first slot as your friend wrote down. This is where the second lens will go.
- ⑧ Place the two lenses in their slots (big one at front, little one at back) and tape them in with the duct tape.
- ⑨ Leave about 0.5 - 1 inch (1 - 2 cm) of tube behind the small magnifying glass and cut off any excess tube remaining.
- ⑩ Check to see that it works by looking at the printed page. You may have to play slightly to get the exact distances between the two glasses right so that the image comes to a focus.

**Note:** Lenses are pretty powerful things - **DO NOT** look at the sun through these lenses!

Visit [www.atronomy2009.org](http://www.atronomy2009.org) to find out more information on how to access the official GalileoScope, a simple easy-to-assemble, easy-to-use telescope made available by the International Year of Astronomy.

*Notes:*

