

# **Piano Adventure**

## **Teacher's Guidebook**

### **Introduction**

People take pleasure in making music together in social settings. Keyboard instruments have allowed people to do this for over 600 years. These instruments have evolved from the small, soft sound of the clavichord in the 1600s, to the harpsichord of the 1700s, where the strings were plucked by a quill. The music of Bach and Handel was played on the harpsichord by virtuosos who dazzled audiences as they shifted between multiple keyboards and used pedals that changed the stops and added layers of sound.

A new type of instrument was invented in the 1700s. It was called “Pianoforte” because the Italian word for soft is “piano” and for loud is “forte”. This innovative instrument had the ability to play both loud and soft sounds and allowed composers to create beautiful, expressive music. By the late 1700s, Mozart and others wrote music exclusively for the piano.

During the late 1700s, in Europe, music publishing was aimed at amateurs who played music for entertainment. Women were considered more refined and marriageable if they could play piano. People enjoyed music from popular operas and symphonies played on the piano in their home. It was socially acceptable for a man and women to spend time alone together if they were playing a piano duet! By the 19<sup>th</sup> century, the piano was the most popular instrument in Europe.

The dawn of the 20<sup>th</sup> century brought new inventions and ways to listen and share music, including the gramophone, the radio, and other recording and playback devices. This, and the invention of the electronic keyboard, reduced the sales of the traditional acoustic piano. While there are many versions of the piano and keyboard available to all different levels of musicians, the traditional, acoustic piano remains a popular and welcome fixture in homes, schools, and concert halls.

In modern times there are many versions of the piano. There are electronic keyboards with a vast array of sampled sounds that will play famous melodies at the push of a button. There are computer programs where students can watch scrolling colors and copy the notes to play a song. Synthesizers can add anything from a drumbeat to sound effects while the performer plays a simple melody. In light of these new technologies, many students do not understand the definition of “acoustic piano.” They may have walked through a hotel lobby and seen a grand piano playing by itself, but do they understand that an acoustic piano can work without electricity? The piano is used in a wide range of genres, from Jazz to popular to “Classical” the catch-all phrase for instrumental music written in a certain style. This program aims to acquaint students with the composers and music from different periods in history, explore the science of sound, and investigate the inner workings of the piano. Creative thinking and imagination will be encouraged as students discover the power of music to express emotion and ideas and the ability to tell a story without words.

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Additional Resources Available online:

The following electronic resources are provided to support the lessons:

Intro to Piano (PowerPoint)

Debussy Lesson ((PowerPoint)

The following electronic resource is intended to be played during the concert, following the script.

Concert PP

Checklist for Performance

- Suitable performance space for grand piano
- Microphone
- Equipment to project slideshow
- 30 minute set up time, 45 minute program time, 30 minute break down time
- Optional Program: After school student recital on Steinway Grand Piano

## **Program**

Hungarian Rhapsody #2

Franz Liszt

Twelve Variations on Ah, vous dirai-je Maman (Abridged)    Wolfgang Amadeus Mozart

Scenes from Childhood  
(From Foreign Lands and People, Catch Me, An Important Event, Dreaming)    Robert Schumann

Reflections in the Water

Claude Debussy

Modern Music (TBA)

Pirates of the Caribbean

Movie theme by Klaus Badelt



## **About the Composers**

### **Franz Liszt (1811 – 1886)**

Franz Liszt was a rock star of the 19<sup>th</sup> century. His piano recitals were flamboyant, exciting, and intense. When he performed he walked to the piano, carefully removed his white gloves, and let his fingers fly! Sometimes women fainted and grown men would cry. His technique was so dazzling that it was rumored that he had sold his soul to the devil.

Liszt's personality off stage was equally impressive. He did not bow down to royalty. He refused to play for monarchs who did not extend a personal invitation, and once threw away a present of jewels from the king of Prussia. When Nicholas I of Russia began talking during a performance, Liszt stopped playing, stood and sarcastically said "Music herself should be silent when Nicolas speaks."

In spite of this rock star image, Liszt was an incredibly devoted musician. He was born in the village of Doborján, Hungary. This was the romantic era, a European artistic and musical movement that emphasized nature, expression of intense feelings, and new genres for the orchestra and piano music. Liszt wrote over 700 pieces of music, tutored other young talents, and was an accomplished conductor who traveled and performed all over Europe. It was said he travelled 4,000 miles a year by train, which was very difficult and unusual in his time. He often donated the money he earned from his concerts to charity. In 1842, when there was a devastating fire in Hamburg, Germany he donated money to help the homeless rebuild their lives.

### **Wolfgang Amadeus Mozart (1756 – 1791)**

Mozart was born in Salzburg, Austria . His father was a professional musician who was determined that Mozart would also be a musician. From a young age he showed great talent. At the age of three, instead of banging aimlessly on the keyboard he explored different combinations of notes and their sounds for hours at a time. He effortlessly learned many instruments, including violin, keyboard (in his childhood the harpsichord was the most popular keyboard instrument), organ and trumpet. He wrote his first songs at the age of five, and at age six, he embarked on a grand tour of Europe with his father and his sister, Nannerl, who was also an accomplished musician.

Mozart was a precocious child with a rampant sense of humor. After a playing a concert for the Empress Maria Theresa of the Hapsburg dynasty, he climbed in her lap and asked if he could marry her daughter. (Her daughter was Marie Antoinette, who later became the infamous queen of France.) Because of his musical genius and ostentatious personality, he was able to impress and charm royalty as he travelled and performed. His audiences included the King of France at Versailles and King George II in London.

He also spent time in Italy. As a fourteen year old, Mozart composed and directed his first full scale opera in Milan.

In addition to writing music, he was legendary as a performer. Competitions were as popular in 18<sup>th</sup> century Europe as they are today. While we have *America's Got Talent*, in 1781 Emperor Joseph II arranged a piano competition between Mozart and Roberto Clementi, another popular pianist and composer, who happened to be an archrival of Mozart. Pianists would often improvise music at concerts, much like Jazz musicians in the 20<sup>th</sup> century. Sometimes they would create their own music on the spot. Other times they were asked to create music around a theme, or musical idea. Unfortunately, we don't have a video of the competition between Mozart and Clementi. The history books give different accounts of who won the competition, although there are stories that the Emperor bet the Grand Duchess that Mozart would win, and that he won his bet.

Who could learn their ABCs without singing the familiar ABC song? While we know the tune as the *ABC Song* or *Twinkle Twinkle Little Star*, Mozart knew it as *Ah, vous dirai-je Maman*, which was a popular French folk song in the 18<sup>th</sup> century. He used this melody to write *Twelve Variations on Ah, vous dirai-je Maman*. The program will include the familiar melody and four of these variations.

### **Robert Schumann (1810 – 1856)**

Schumann's life is the source of many movies and extraordinary stories. Born in Zwickau, Germany, he was a brilliant yet tortured artist who struggled with mental illness throughout his life. As a young man he showed great musical talent, but his family encouraged him to study law. After one year of study he wrote to his mother: "My whole life has been a struggle between Poetry and Prose, or call it Music and Law." He then began studying piano with Friederich Wieck, the father of Clara Wieck, his future wife. Clara Schumann was also an accomplished pianist and composer. She was a devoted wife to Schumann during his health battles and the mother of eight children. She was a much sought after concert pianist, and this was the sole support of her family after Schumann's death.

Robert Schumann got musical ideas from books, stories, and sometimes even letters from his own name. The piece on the program is called *Scenes from Childhood*. This collection of pieces was an ode to childhood, with titles such as "A Curious Story", "Blind Man's Bluff", "Pleading Child" and "Knight of the Hobby Horse". *Träumerei* (Dreaming) has been recorded by many artists for piano and other instruments, including Vladimir Horowitz and Joshua Bell.

This type of music is called "Program Music", a type of art music that became popular in the 1800s during the Romantic Period. In Program Music, composers used music to create a story without words.

## **Claude Debussy (1862 – 1918)**

Debussy was born to a poor family in Saint-Germain-en-Laye, France. As he developed and trained as a musician there were many new ideas in the cultural life of France and Europe that influenced his music. The artist Claude Monet created a new style of painting that emphasized color and light rather than a carefully staged setting painted with strong lines and photographic details. He often painted outdoors and aimed to capture a fleeting moment in a scene. In 1872 his painting *Impression – Sunrise* gave a name to this new movement: Impressionism.

Poets, writers and musicians were all influenced by this break with tradition and emphasis on new ideas. Debussy's music didn't use long established concepts of music theory. His harmonies didn't follow traditional rules. Instead he focused on timbre (tone color) and layers of sound created by the use of the pedals, glissandos, tremolos and arpeggios. His melodies did not have a clear beginning and end, and his rhythms didn't always follow a rigid pattern. He was influenced by Asian music after hearing a Javanese Gamelon orchestra at the Paris Exposition Universelle of 1889. Many of his pieces use pentatonic and whole tone scales.

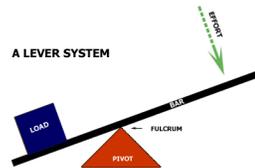
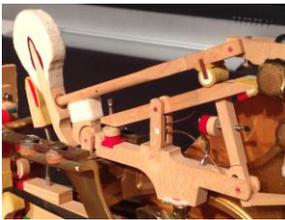
These innovative ideas were not immediately popular. Camille Saint-Saens, a well known French composer, said his of one of Debussy's pieces: "it contains not the slightest musical idea in the real sense of the word." An art critic complained that Monet's work looked "unfinished" and reminded him of a sketch for wallpaper. However, the concepts and ideas were influential. Debussy created a new genre of music and is considered by many to be a founder of 20<sup>th</sup> century music.

Like the artists of the time, Debussy often used nature as a theme for his work, such as in *Reflets dans l'eau* ("Reflections in the Water"). In this piece there are creative tone colors influenced by the motion of water and light reflecting off the water. The beauty of water in nature was an theme for many of Debussy's pieces.

## Isn't it Grand?

Ready, set, action! Inside the piano is a very important group of parts called the "action". The action is made of wood and does not require electricity to work. The thousands of pieces in the action work together to make sound. The pianist can dampen(stop) the sound and control the sound in ways that makes beautiful music.

A piano key is a lever that sits on top of a fulcrum (pivot). At the other end of the lever is the action mechanism. When a piano key is pressed down, the piano action makes the hammer strike the strings and the strings vibrate. The vibration is transferred to the soundboard through the bridge, much like the guitar or violin. The vibration is amplified by the soundboard so it can be heard. There is a damper on top of the strings that is lifted to allow the strings to vibrate.



A piano has over 200 strings. The strings are stretched very tightly. The wooden sound board would collapse from the tension if it didn't have support. There is a heavy cast iron plate that supports the system. This metal piece has holes called rosettes, which allow the sound to come through.

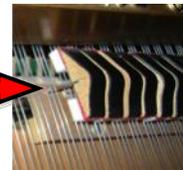
The grand piano gets its shape from the length of the strings. The low strings are much longer than the high strings, which is why the left side is long and the right side curves in.

damper pedal



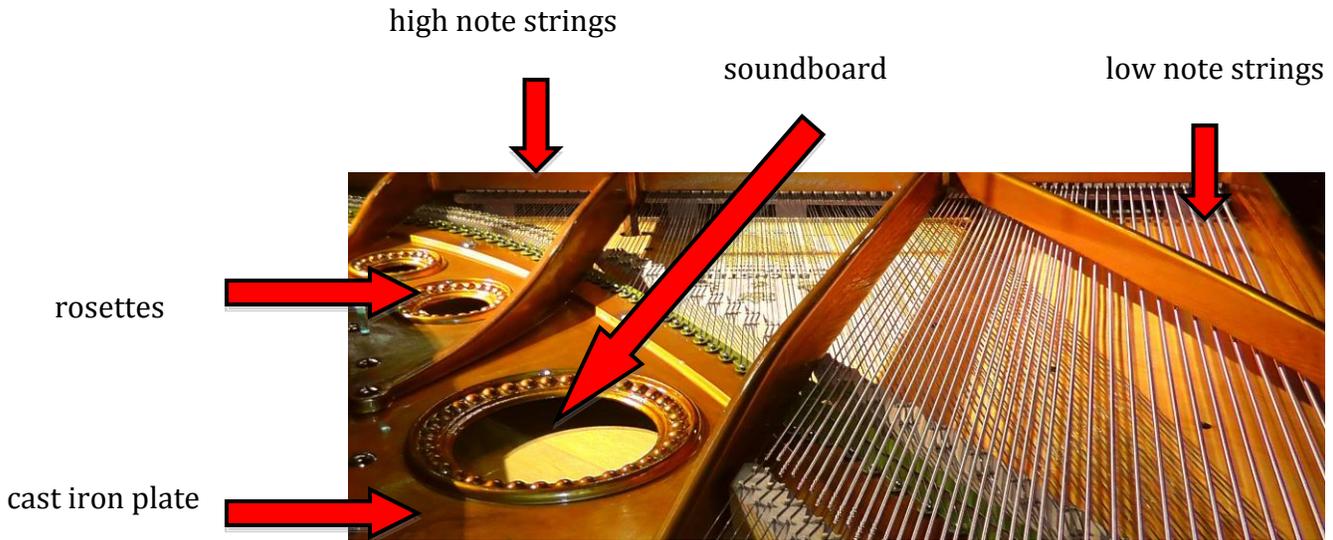
The brass things near the floor are called pedals. Pianos can have two or three pedals. The one that is used most often is the one on the right, called the damper pedal. When a pianist presses the damper pedal it lifts the small felt squares off the strings (called dampers) which allows the strings to continue to vibrate even after the pianist lifts their finger off the key. This can make it sound like a pianist has more than ten fingers.

dampers



The pedal on the left is called the soft pedal. When you look inside a grand piano you will see the strings grouped together in twos or threes. This is because each note has two or three strings that work together to make the sound.

The exception to this is the low notes, which have one, thick string. When the soft pedal is depressed the piano action shifts, so the hammer is only hitting one string, thus making the sound softer. The official name for the soft pedal is “una corda” or one string.



## Lesson Plans

### Intro to the Piano: How it works/Intro to Mozart

#### Learning Goals:

Student will understand how a piano produces sound.

Student will examine and describe music of Mozart.

#### Music Standards (NGSSS):

MU.3.H.1.2 Identify significant information about specified composers and one or more of their musical works.

MU.4.H.2.2 Identify ways in which individuals of varying ages and cultures experience music.

MU.5.H.2.1 Examine the contributions of musicians and composers for a specific historical period.

MU.5.H.1.2 Compare and describe the compositional characteristics used by two or more composers whose works are studied in class.

#### Science Standards

SC.3.P.10.1: Identify some basic forms of energy such as light, heat, sound, electrical, and mechanical.

SC.4.P.10.3 Investigate and explain that sound is produced by vibrating objects and that pitch depends on how fast or slow the object vibrates.

SC.5.P.10.1: Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.

SC.5.P.13.1: Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects.

**Materials:** rubber band, piano with cover removed, Intro to Piano PowerPoint

**Vocabulary:** vibration, sound wave, lever, pivot (fulcrum), amplify, soundboard, dynamics, composer, prodigy, melody, tempo, dynamics, timbre

**Introduction:** Discuss prior knowledge about how sound is made. Include discussion of vibration, sound waves, amplification, high and low sounds.

#### Classify the piano

- The piano is a percussion instrument because the sound is produced by hitting or striking.

#### Watch piano being played without the cover

- Play a simple piano piece. Students listen and observe hammers striking strings, action moving, dampers lifting to allow strings to vibrate.
- Demonstrate concept of string vibrating by stretching a rubber band vertically and asking a student to pluck it.
- can you see the vibration?
- can you hear the sound?
- Discuss how the soundboard amplifies the sound, the same way a guitar or violin is surrounded by wood to amplify the sound.
- Ask students to point to the strings they predict make a low sound.
  - How did you know they were the low strings? (bigger, thicker)
  - Discuss how low strings vibrate slower, therefore create lower pitch
- Invite students to stand next to piano in small groups to observe:

- Vibrations. Let a student lightly touch the low strings to feel the vibrations.
- Notice the sound stops when you press the string with a finger. Point out the dampers (they are behind the hammers) and discuss that they do the same thing – stop the sound when they press against the string because the string can no longer vibrate.
- Simple machine in action: watch the lever connected to a key move when a key is depressed.
- Demonstrate damper pedal lifting all of the dampers. Play several chords and lift hands to show the sound will continue. Tell students to observe what happens when you release the damper pedal with your foot. (The sound stops when dampers press against strings.)
- Demonstrate soft pedal (left pedal). In some pianos you can see the hammers move closer to the strings when the soft pedal is depressed.
- Middle pedal. (The students always ask!) It is different in every piano, and is rarely used. Some pianos don't have a middle pedal. In most pianos, the middle pedal lifts the dampers off the low strings only.

### **Wolfgang Amadeus Mozart**

- Biographical information on Mozart (See Teacher Guidebook p. 4)
- Listen to part of *Twelve Variations on Ah, vous dirai-je Maman* – or other short Mozart piano piece. Analyze musical elements:
- Melody: Mozart was known for crafting beautiful melodies.
  - Compare and contrast with Debussy *Reflets dans l'eau* ("Reflections in the Water"). In Debussy do you notice a melody? (No, it is focused more on timbre or tone color.)
- Discuss: tempo and dynamics.
- Movement: Stand on your own space and glue feet to the ground. Move to show how each variation changes tempo, dynamics and style.

### **Extension**

- Create own variations on *Ah, vous dirai-je Maman* melody using xylophone playing rhythm of Twinkle, Twinkle melody

### **Assessment**

Students will analyze musical elements in *Twelve Variations on Ah, vous dirai-je Maman* using Musical Detectives Worksheet\*.

Scale:

4 = Gave exemplary Answers to describe all musical elements

3 = Gave thoughtful answers and correct observations

2 = Gave answers that were mostly accurate

1 = Did not correctly describe timbre or other musical elements

### **5<sup>th</sup> Grade Extension**

Students will compare and contrast *Twelve Variations on Ah, vous dirai-je Maman* and *Reflets dans l'eau* ("Reflections in the Water" using Musical Detectives Same-Different Worksheet\*

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\* see appendix

## **Lesson on timbre and music of Claude Debussy**

### **Learning Goals:**

Student will demonstrate understanding of the term “timbre”.

Student will analyze musical elements in Claude Debussy’s compositions.

### **Music Standards (NGSSS):**

MU.3.H.1.3 Identify timbre(s) in music from a variety of cultures.

MU.3.O.1.1 Identify, using correct music vocabulary, the musical elements in a piece of music.

MU.4.O.1.1 Compare musical elements in different types of music, using correct music vocabulary, as a foundation for understanding the structural conventions of specific styles.

MU.4.H.1.2 Describe the influence of selected composers on the musical works and practices or traditions of their time.

MU.5.O.1.1 Analyze, using correct music vocabulary, the use of musical elements in various styles of music as a foundation for understanding the creative process.

MU.5.H.2.1 Examine the contributions of musicians and composers for a specific historical period.

**Materials:** Orff instruments set up in pentatonic scale of your choice. PowerPoint and/or audio of selected music.

**Vocabulary:** timbre, pentatonic, melody, harmony, pitch

### **Introduction**

- Define Timbre (tone color).
- Read words from timbre word bank\* to get ideas on ways to describe tone color.
- Select group of students to improvise on glockenspiels. Ask for words to describe the timbre.
- Select group of students to improvise on xylophones, then metallophones. Describe timbre. Compare with glockenspiels.
- Continue refining descriptive words for timbre while listening to other instrument combinations or recordings.
- Contrast timbre with other musical elements.
  - Play a melody on barred instrument or piano. What is the dominant element? Melody or timbre? (other option: use opening phrase of Mozart Sonata)
  - Improvise on Bass Xylophone or low pitches on piano. If we say it is “low” are we describing timbre or pitch?

### **Introduce Claude Debussy**

Debussy was a visionary composer who created music in a different way. While Classical composers crafted beautiful melodies, and Romantic composers created rich harmonies, Debussy focused on creating beautiful layers sound. He was not immediately popular, but he was determined, and his music became a guiding influence of 20<sup>th</sup> century music. (Further information on p. 6 of Teacher’s Guide.)

### **Listen to Reflections on the Water (PowerPoint Slide 2).**

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\* see appendix

- Imagine your favorite day on the water. It could be at the beach with the sun dancing on the waves, or in a boat on the river with the setting sun shimmering on the water. Use your imagination to create a picture while listening. (Teacher can dim the lights and instruct them to close eyes if desired.)
- Ask students to describe what they heard. Encourage use of musical terms as well as vivid pictures from their imagination.

**Claude Monet – Impressionism movement in art (PowerPoint Slide 3).**

Claude Monet was a visionary in the art world. His paintings emphasized light and color rather than line and setting. (See Teacher’s Guide p. 6 for more information.)

- Draw comparisons from Debussy’s music to Impressionism

**Harmony in Debussy’s music (PowerPoint Slide 4).**

It is said Debussy influenced the new sound of the music in the 20<sup>th</sup> century. One way he did this is by using new harmonies. Instead of the major scale (DEMONSTRATE) and minor scale (DEMONSTRATE) he used pentatonic and whole tone scales (DEMONSTRATE).

- Listen to Mozart Variation #VII to demonstrate Major Scale.
- Listen to Mozart Variation #VIII to demonstrate Minor Scale.
- Listen to recording of Gamelon Music to demonstrate the pentatonic scale and influence on Debussy.

**Assessment**

Complete Musical Detectives Worksheet-What Did You Hear\* to analyze musical elements heard in Reflections on the Water

Scale:

4 = Gave exemplary Answers to describe all musical elements

3 = Gave thoughtful answers and correct observations

2 = Gave answers that were mostly accurate

1 = Did not correctly describe timbre or other musical elements

**Learning Extension (5<sup>th</sup> Grade)**

MU.5.H.1.2 Compare and describe the compositional characteristics used by two or more composers whose works are studied in class.

Compare and Contrast Classical Music and Music of Debussy.

Listen to Mozart *Variations* and Debussy *Reflections on the Water*.

- Analyze each piece using vocabulary for harmony, melody, timbre.

**Assessment**

Complete Musical Detectives Worksheet-Compare and Contrast\* to compare and contrast Mozart and Debussy.

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\* See appendix

## **Imagination and Inspiration in Music**

### **Lesson on Robert Schumann and Program Music**

#### **Learning Goals:**

Student will demonstrate understanding of listening strategies for Romantic Music.

#### **Music Standards (NGSSS):**

MU.3.C.1.2 Respond to a musical work in a variety of ways and compare individual interpretations.

MU.3.H.1.2 Identify significant information about specified composers and one or more of their musical works.

MU.4.C.1.1 Develop effective listening strategies and describe how they can support appreciation of musical works.

MU.4.H.1.2 Describe the influence of selected composers on the musical works and practices or traditions of their time.

MU.5.C.1.1 Discuss and apply listening strategies to support appreciation of musical works.

MU.5.H.2.1 Examine the contributions of musicians and composers for a specific historical period.

**Materials:** audio of Scenes from Childhood selections

**Vocabulary:** composer, melody, harmony, timbre, tempo, dynamics, legato, staccato, Romantic Period, Program Music

#### **Introduction**

- Sing contrasting folk songs from student repertoire that tell a story or express an emotion. Examples include Rocky Mountain to demonstrate sorrow at missing someone, or Cindy, Cindy to demonstrate humor and silly stories.
- Discuss the story or mood of the song. How did you know?
- Sometimes composers can tell a story or create a mood without words. This is called Program Music.
- Biographical information about Schumann (Teacher's Guidebook p. 5)

#### **Journal activity**

Listen to one or two selections from *Scenes from Childhood*. (without knowing the title). As music is playing, students write their impressions. They can predict the title or story of the piece, observe musical elements, or create a story of their own. After each piece is played, invite students to share their observations and thoughts. At this time the teacher can reveal the title of the piece. Compare and contrast with journal entries. Questions to consider:

- What makes music sound a certain way?
- Why does the music make you feel that way?
- How does the way a composer uses tempo and dynamics create a mood?

For the last piece play *Dreaming (Träumerei)*. Tell the students the title. Ask them to write in their journal as the music plays. When the piece is finished, complete one of these sentences using knowledge of music vocabulary and explaining your opinion:

- I liked *Dreaming* because . . . .
- I did not like *Dreaming* because . . .

## **Other Benchmarks covered with *Piano Adventure Program***

### **Language Arts**

LAFS.3.L.2.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.

LAFS.3.SL.1.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

LAFS.3.SL.1.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

LAFS.3.4.5 W.1.1 Write opinion pieces on topics or texts, supporting a point of view with reasons.

LAFS.4.L.2.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.

LAFS.5.L.2.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.

LAFS.5.SL.1.3 Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

### **Theater**

TH.3.S.1.1 Demonstrate effective audience etiquette and constructive criticism for a live performance.

TH.4.S.1.1 Exhibit proper audience etiquette, give constructive criticism, and defend personal responses.

TH.5.H.1.2 Participate in a performance to explore and celebrate a variety of human experiences.

### **Social Studies**

SSS.5.G.1.1

Interpret current and historical information using a variety of geographic tools.

## **Bibliography and Resources**

Grout, Donald Jay. *A History of Western Music*. New York: WW Norton & Company, Inc., 1960.

Scholl, Sharon et. al, *Music and the Culture of Man*. New York: Holt, Rinehart and Winston, Inc. , 1970.

Schonberg, Harold C. *The Great Pianists from Mozart to the Present*. New York: Simon and Schuster, 1963.

Vernon, Roland. *Introducing Mozart*. Silver Burdett Press, 1996.

<http://www.biography.com/people/franz-liszt-9383467>

<http://www.liszt.org><http://www.npr.org/templates/story/story.php?storyId=127444692>

[http://web.fscj.edu/Joy.Kairies/tutorials\\_2012/chapter32\\_tut/Impressionism/impressionism.html](http://web.fscj.edu/Joy.Kairies/tutorials_2012/chapter32_tut/Impressionism/impressionism.html)

<http://castle.eiu.edu/modernity/eskilson.html>

## **Images**

The following images are from the Europeana Collection. They are public domain.

Liszt Franz en concert à Vienne, Assis

Franz Liszt / lithogr. par Léon Noël, d'après le tableau d'Ary Scheffe

Mozart as a child

The Mozart Family

Mozart kisses the Queen: Mozart chez Madame de Pompadour / tableau de M. V. de Paredes ; gravure de M. Baude

Robert and Clara Schumann

## **Resources for Students**

### **Books**

Introducing Mozart. Roland Vernon. Silver Burdett Press, 1996.

Mozart. Catherine Brighton. Reed Business Information, Inc., 1990.

The Piano and Other Keyboard Instruments. Rita Storey. Smart Apple Media, 2010.

Music (Eyewitness Books). Neil Ardley. Dorling Kindersley, 1989. (pp. 44 – 48)

### **Computer resources**

Website that explains the piano action; includes detailed pictures of a grand piano and the piano action.

<http://www.explainthatstuff.com/piano.html>

This website focuses on simple machines, and includes animated pictures of levers.

<http://www.enchantedlearning.com/physics/machines/Levers.shtml>

Explanation of how the piano works in kid friendly language.

[http://www.ducksters.com/musicforkids/how\\_the\\_piano\\_works.php](http://www.ducksters.com/musicforkids/how_the_piano_works.php)

Virtual animation of what happens when a finger presses a piano key.

<http://www.rennerusa.com/piano-action-guide/grand-piano-virtual-action-model/>

This YouTube video shows a Steinway piano being made over the course of 12 months. The black and white video is not narrated, but it is fascinating to watch the detail that goes into making a grand piano.

<https://www.youtube.com/watch?v=HttInAXsvtw>

## **Appendix**

The following documents are included as separate PDF file:

**Musical Detective Worksheet**

**Musical Detective Worksheet: compare and contrast**

**Timbre Word Bank**