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Music Education Posters

Edith L. Freedman

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ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of
The College of Fine and Applied Arts
in Candidacy for the Degree of

MASTER OF FINE ARTS

Music Education Posters

by

Edith Louise Freedman

May 20, 1981
APPROVALS

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Date: May 22, 1981

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Date: 6/10/81

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Date: 5/22/81
THESIS COMMITTEE

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Mr. Howard Pollack
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Introduction

In the fall of 1979, I began a design project that involved studying a viola from its various structural and functional aspects. During the course of the project, I came to realize how little I knew about the instrument historically, which meant in a sense that I was studying an object with little or no concern for its context. As the time for thesis proposals neared, I decided to confront this issue and expanded it to include all of the instruments of the symphony orchestra.

I spoke to several professionals in the music education field. They indicated that there was a need for some kind of educational tool that would introduce music students to orchestral instruments. I decided to design and produce a series of informational posters that would contain practical and anecdotal information about the instruments as well as photographs of the instruments. Posters utilizing photography and typography would serve the educational needs quite well, and also would allow me the opportunity to combine my design skills and my interest in photography.
Thesis Objectives

After discussion with my thesis committee, the following objectives for the thesis emerged:

1. To make the audience (students of beginning level music courses at the high school and college level) aware of the various types of instruments that make up the orchestra;

2. To give the audience some information about the history and/or function of each instrument in the orchestra;

3. To encourage the audience to learn more about orchestras, instruments, and orchestral music;

4. To produce a body of work that combines my interest in design and photography.

(See Appendix I for Data Sheet)
Research

The research for this project was done at the Sibley Library of the Eastman School of Music and at the Wallace Memorial Library at RIT. Editorial assistance and advice was given by Mr. Howard Pollack, who teaches introductory level music courses in the College of General Studies at RIT. The copy was written so as to give a general overview of the instruments, which included occasional historical references to various composers and pieces of music in addition to practical information about the functions of the instruments within the orchestra.

(See Appendix II for copy)
Design Process

As work on the thesis began, it became necessary to determine how to organize the series of posters. From my research I learned that the orchestra is traditionally divided into four main families: the Strings, the Brass, the Woodwinds, and the Percussion. Within the Woodwind and Percussion families there are various sub-families. It seemed appropriate to divide the orchestra into these four main families, and then to divide two of those families into their sub-groups in order to produce imagery for each poster that would reflect the general physical characteristics of all of the instruments in that group. For instance, although the Flutes and the Reeds are in the Woodwind family, they differ greatly in structure and function. The number of posters was set at nine: 1 General Introduction Poster, 1 Strings, 1 Brass, 3 Woodwinds, 2 Percussion, and 1 for the Harp and Piano (traditional orchestral instruments that do not belong in any of the four main families).

Since the posters were to be designed for use in introductory level college and high school music courses, a standard size of 14" x 17" for each poster was selected as a convenient size for classroom use. The organizational grid upon which the posters are based is derived from the treble and bass clef staffs of music notation. This grid was developed so as to have a consistent 3" headline area.
and a 14" x 14" square image area on each poster which served to unify the posters visually as a series (See Appendix III for the organizational Grid).

It soon became evident in the design process that visual priorities had to be set: what did the viewer see first? The photographic images were very rich visually and it seemed logical to give them primary importance both as attention grabbers and also as identification devices. The typographic information was also important. Often the photographic image had to be retouched or re-shot in order to give the typography the space and the attention that were required if the informational objectives of the thesis were to be realized.

The photographic images were chosen and manipulated to communicate the general characteristics of each group of instruments. In some cases, such as the Brass and the Flutes, a line screen was used to indicate the shiny metal surfaces of the instruments. On other posters, a mezzo-tint was used to suggest the vibration of the strings of the piano and the Harp, and high contrast imagery was chosen to relate to the audio dynamics of the Percussion instruments.

Color was used to give the posters more visual interest, and once again to unify them as a series. The color choices were based on the actual colors of the instruments, the types of sounds each family of instruments produced,
and the relationships between sub-groups of the same family. Tones of primary and secondary colors reflect the somewhat serious nature of traditional orchestral music.

The typography used on the posters had to function both as headline and as body copy in combination with the photographic imagery. A serif face, Times New Roman, was chosen for the headlines because of its classic style and legibility. The bold weight of Univers 65, a sans-serif face, allowed for good legibility especially over the complex textures of the photographic images. (See Appendix IV for Sketches, Appendix V for Contact Sheets and Appendix VI for Photographic Manipulations, Typeface Selections, and Color Choices)
Implementation

The production of the poster series involved several stages. After the initial selection and manipulation of the photographic imagery, 4" x 5" Kodalith negatives were shot of the images, and subsequently enlarged onto 16" x 20" photographic paper. These large prints were then incorporated into the final mechanicals. The copy was specified and set, and silhouettes of all of the instruments were produced.

The typography was arranged with the photo images on the mechanicals and small silhouettes of all of the instruments were added to the headline area. Large 16" x 20" Kodalith negatives were shot from these mechanicals, touched up, and contact printed onto 16" x 20" photo paper. Three of the images (Single Reed Woodwinds, Harp and Piano, and Brass) required double exposures in order to add the body copy over the image area.

The color bands across the top are strips of Pantone paper adhered to the poster surface, with INT transfer type applied to the strips.
(See Appendix VII for Stats of Final Posters)
Conclusion

The design and production of this series of informational posters put my design and photography skills to the test. Various technical design problems arose: for example, the placement of typography over highly textured photographic imagery. Initially, I had not realized that there would be legibility problems with this approach, and I found that I had to re-think some of my early design decisions in order to rectify the problems. The original typeface selections had to be discarded and the location and arrangement of the copy had to be adapted. There were difficulties with some of the photographic images as well, and in one case I had to reshoot a photograph to accommodate the typography.

As work on the thesis progressed, I decided that it was not necessary to screen print the posters as I had originally intended since I already had extensive experience with screen printing. I chose instead to produce them photographically, which afforded me a wider range of alternatives regarding image treatment. I was able to use images with finer detail and less contrast, which gave the photographic representations more legibility.

Although the posters will not be tested in a sample class until next fall at RIT, the feedback I've received from professionals in the music education field has been quite positive. The imagery is interesting visually and
the information on each poster gives the audience the small amount of knowledge necessary for a general introduction to the orchestra. The production of this thesis has brought my design and photography skills together, and I have learned much about the problems that can arise from the combination of typography and photography. I am proud of this accomplishment and I know that this experience will serve me well in the years to come.
Bibliography


APPENDIX I
DATA SHEET

Thesis Goal: A Series of informational/Educational Posters about Orchestral Instruments

Thesis Objectives: To make the audience aware of the various types of instruments that make up the orchestra

To give the audience some information about the history and/or function of each instrument in the orchestra

To encourage the audience to learn more about orchestras, instruments, and orchestral music

To produce a body of work that combines my interest in design and photography

Target Audience: Students of beginning music courses at the high school and college level

Other Audience: General Public

Processes and Strategies: Get input either by mail or phone survey from local music teachers that would give me ideas about what kinds of information to include on the posters

Research the basic history and the function of each instrument or instrument family; analyze and edit that data to communicate the most important information on the posters

Examine each instrument systematically to determine how the instruments relate to each other in terms of their forms and their families within the orchestra--this examination will be accomplished through the use of photography (see below)

Use this same type of examination into the systematic relationships of the instruments to find similar relationships in typography that can be applied to the posters to make concise statements about the instruments.

Photograph each instrument, both close-up and full-length. Analyze the graphic potential of each image and determine what type of photo-manipulation will be most effective for a concise statement

Silkscreen an edition of 10 portfolios of 8-12 posters

Keep a written record of the process, including research, sketches, and documenting the process of problem-solving
Time Schedule: Winter Quarter:

Dec 1-15 Preliminary Organization and Information Gathering
  meet with committee

Dec 15-Jan 12 Continued Research Sketches
Jan 12-Jan 26 Sketches
  meet with committee
Jan 26-Feb 9 Refine final sketches
  Select colors and papers
  (Meet with committee)
Feb 9-Feb 23 All preparatory and design work completed
Feb 23-Mar 1 Screen prep, begin printing

Spring Quarter:

Mar 16-23 (Meet with committee)
  Printing
Mar 23-Apr 6 Finish printing, put portfolio together for thesis show
Apr 6-20 Assemble all portfolios,
  Complete written report
  Final committee meeting
Copy: The Orchestra

The structure of the modern orchestra and the nature of orchestral music as we know it today are a development of the past two hundred years. During the 17th century, the foundation for the orchestra emerged: the Violin or String Family became the basic core of the orchestral ensemble. Over the next century, the roles of the Woodwinds and the Brass also stabilized. Composers such as Haydn and Mozart defined the individual roles of the instruments, the intensities and combinations of their sounds, and established the balance between the String and Wind Instruments. Occasionally new instruments such as the Tuba were invented to fill special needs; later the Tuba became a standard member of the orchestra. The Piano, a regular member of the orchestra up until the 18th century, became a solo instrument and is still used with the full orchestra only part of the time.

In the 19th century, many changes and improvements were made in the physical construction of the Woodwinds and the Brass Instruments. A fingering system for the Reeds and the Flutes was developed by Theobald Boehm; the system made the instruments more flexible musically and easier to play. Valves were incorporated into the Trumpet and the French Horn, and the specifications for these instruments were standardized. With a few minor adjustments and refinements, the Woodwinds and the Brass remain basically unchanged today.

Although the changes in construction made the instruments easier to play and established standards of sound and pitch, they also changed the nature of orchestral music. Pieces of music that had been written for the orchestral instruments that existed before this time became difficult or impossible to play in their original form as the instruments and the musicians who played them faded from the scene. Today there is a resurgence of interest in those instruments and those compositions written for them are regaining some of their original sound.

As composers explored the possibilities of the redesigned instruments, their ideas about the size and the sounds of the orchestra changed. Throughout the 19th century, the small orchestra of Mozart's time expanded to the size of today's orchestra. Some composers expanded it even further, and at the turn of the century Mahler and Bruckner were writing compositions for enormous orchestras of up to 150 performers. A standard core orchestra did emerge, however, and this is the basic orchestra that we know today, consisting of about 100 performers. This core group includes four major families of instruments: the Strings, the Woodwinds, the Brass, and the Percussion Families. A Harp and a Piano are often included as well, and
composers add and subtract instruments to this standard core to create different types of sounds.

Towards the beginning of the 20th century, the interest in the new sounds created by orchestral instruments led to new approaches to the orchestration of music. There was a new awareness of the idea that the orchestra was an instrument itself, capable of rendering many different interpretations of one piece of music. It was at this time that the conductor's role became more established as the leader of the orchestra and a performer in his/her own right.

The orchestra is still changing. Rather than re-interpret classical pieces, modern composers are searching for new ways to use the orchestra. Although few changes are being made in the construction of the traditional instruments, they are being used to make new sounds. Technology is playing a part in this evolution: electronic and other types of new instruments and sounds are occasionally incorporated into contemporary orchestral music. New groupings of the traditional orchestral instruments are being used as well. In the concert halls, conductors are making their mark on both the more established classical compositions and the newer experimental pieces by applying their own interpretations of the sounds.
The Strings

The String Family is the foundation of the symphonic orchestra. This position of prominence dates from the 17th century: the Strings emerged during the 16th century and as composers of the period recognized the orchestral capabilities of the family, its leadership role grew. The reason for this role has less to do with the tonal quality of the String Instruments than with their extraordinary flexibility. String instruments have the power of modifying their quality and loudness in the course of a single note.

The Violin is the best example of this flexibility: it can sustain a tone almost indefinitely; it can be played in many different styles, ranging from a smooth legato to a delicate staccato.

The Viola, Cello, and Bass do not have the great range of the Violin, but they are capable of producing a wide choice of tonal qualities, depending on the various methods of bowing or phrasing.

The Brass

The French Horn and the Trumpet as we know them today date from the second half of the 19th century. Changes made in the basic structure of the instruments at that time made them easier to play: before the late 1800's, neither had valves to change its pitch. The pitch was varied by changing the embouchure of the lips and by inserting a hand into the bell of the instrument. Beethoven and Brahms both wrote for this type of hand horn. The addition of valves gave the instruments greater agility but somehow lessened the brilliance of their tone.

Trombones are made in various sizes, of which the most commonly used is the tenor trombone in Bb. Because of the way in which the trombone is played, with one metal tube sliding back and forth inside another, this instrument is also called the Slide Trombone. Its tone is deep, rich, and full.

The Tubas are among the most important brass instruments in the modern orchestra, where, in addition to other functions, they often provide a weighty bass for the Trombone family. The Tuba was invented in the middle of the 19th century in Germany. Wagner brought it to prominence later in the century in Ring of Nibelungen.
The Flute, like the Harp, has been known since earliest times. Originally made of wood, modern Flutes are made of silver or metal with silver plate. They are played transversely—the instrument is held perpendicular to the body of the player, and the player blows across, not into, the mouthpiece to produce sound.

The Flute was redesigned in the 19th century by Theobald Boehm. He calculated the ideal number positions and sizes for the fingerholes and then devised keys to enable the fingers to manage them. This made the Flute louder, more even in tone, and easier to play.

The Piccolo is a smaller version of the Flute, pitched one octave higher. It sounds the highest notes in the orchestra and is used chiefly to add brightness to certain passages of music.

The Single-Reeded Woodwinds are played with a single cane reed lying on the nearly flat surface of the mouthpiece. The reed vibrates and causes the instrument to produce a particularly resonating sound.

There are two different Clarinets in use in the orchestra, pitched to A and Bb. The Clarinet is the most prominent single reed Woodwind. The standard Clarinet has the greatest range of the Woodwinds and can produce low mellow tones, clear and sweet middle tones, and sharp, shrill high notes. The shape of the Clarinet distinguishes it from the Oboe: it has a cylindrical tube unlike the conical tube of the Oboe. This difference in shape is responsible for the more hollow tone of the Clarinet.

The Bass Clarinet is identical to the standard Clarinet as to holes, keys, and fingering, but differs in length, and thus, in pitch. The Bass Clarinet is an octave lower and has a rich melancholy sound.

A pair of Clarinets became standard in the orchestra from 1780. Wolfgang Mozart was the first major composer to explore the possibilities of the instrument in the symphony orchestra.

The Woodwinds provide some of the orchestra's strongest colorings and are divided into three groups: the Flutes, the Single-Reed Woodwinds, and the Double-Reed Woodwinds.
Copy: The Double Reed Woodwinds

A Double Reed Woodwind uses a pair of cane reeds in the mouthpiece to produce an unusual plaintive sound. The Oboe was the first treble Woodwind to become standard in the orchestra. There are different types of Oboes played in the modern orchestra, of German and French origin. Due to the slightly different construction of the instruments from the two traditions, each type produces a different tone. Beethoven had a great fondness for the Oboe; his music includes many Oboe solos.

A close relative of the Oboe is the English Horn. It is neither English, nor a horn at all, but rather a larger low-pitched Oboe. The richness and expressiveness of its oboe-like tone are enhanced by the lower pitch.

The Bassoon first appeared in the 16th century. The tone of the Bassoon is considerably smoother than that of the Oboe, especially in the lower registers. Its role in the orchestra is to reinforce the bass, to fill up the harmony in the middle, to double a melody played by some other instrument, and/or to play the melody alone.

The Double Bassoon is about six feet tall, twice the size of the standard Bassoon, and its pitch is one octave lower. It is used mainly to provide deep tones and to provide a solid foundation for the Woodwinds.

Copy: The Harp and Piano

The Harp is one of the most ancient instruments; pictures of it can be seen on ancient Greek vases and it is mentioned in the Bible. Unlike the Piano, in which the strings are hammered to produce sound, the strings of the Harp are plucked with the fingers. The modern "double action" Pedal Harp was perfected early in the 19th century. It has pedals for raising the lowest pitch of any string or strings by either one-half or one whole tone. The modern Harp has 47 strings and 7 pedals. Though it is technically a String instrument, its unique construction and the fact that it is plucked rather than bowed places the Harp in a unique category within the orchestra.

The Piano (or Pianoforte) (from Italian: soft-loud) acquired its name from its ability to pass through gradations from soft to loud and back again by touch alone. In the 19th century, a desire for ever greater volumes of sound invited a response from many orchestral instrument makers. In the case of the Piano, the strings were made thicker, and the sound of the Piano, though amplified, lost some of its color and brilliance. These losses are reduced somewhat by the use of foot pedals, which either soften and mute the tones (the soft pedal) or cause them to be rich, full, and colorful (the loud or sustaining pedal).
Copy: The Percussion

There are two groups of Percussion instruments: those with metal or wood surfaces which are struck with a mallet to produce sound; and those with stretched membranes which are played by striking the membrane with a drumstick or mallet or the palm of one's hand.

The Xylophone is in the first group of Percussion instruments. It is made of bars of hardwood, arranged much like a piano keyboard. The bars vary in size and length and thus are pitched in different notes. The tone that is produced by striking the wooden bars with a mallet is clear and brilliant.

The Glockenspiel (or Orchestra Bells) looks like a small Xylophone except that the bars are made of steel instead of wood. In the orchestra the clear sweet tones of the Glockenspiel are used to create special ethereal effects. Wagner, Tchaikowsky, and Debussy often used the Glockenspiel in their orchestral pieces.

The Tam-Tam (or Gong) is of Chinese origin, and can range in size from two to six feet in diameter. Its sound is brassy and low. The Tam-Tam is generally used for solemn or mysterious effects.

The Cymbals are metal discs that can be suspended or hand held. If suspended, they are played with a mallet or wire brushes to produce a wide variety of sounds ranging from staccato accent notes to soft hushed tones. When the Cymbals are hand held and brought together with great force, the sound produced is quite loud, and is used in orchestral music to emphasize crescendos and add fullness to the overall sound of the orchestra.

There are several minor Percussion instruments in this group as well: the Triangle, Castanets, Finger Cymbals, the Chimes, and the Celesta among others. These instruments are generally used to create special moods and effects.

Copy: The Percussion

The Timpani (or Kettledrums) have been called the most important Percussion instruments in the orchestra. Timpani are huge brass or copper kettles with calfskin stretched tightly over the top. The pitch of the drum can be raised or lowered by a pedal system which tightens and loosens the tension of the drum head.

Drums of other types have been known from earliest times. Sometime after the Crusades, the Sanre Drum and the Bass Drum became permanent members of the percussion family. These drums are very similar in shape, but their size and their sound are very different. The Snare Drum is made of wood
and has "snares"—taut spun strings fitted beneath the stretched skin—which made a bright crisp sound. The Bass Drum comes in several sizes and is used for special effects and to increase the volume of sound in the orchestra.

The Tambourine is also a member of this group of Percussion instruments. It is a small, circular wooden frame with a stretched membrane across one side and loose metal discs that are fitted into holes in the frame itself. The metal discs make the sound for which the Tambourine is best known, a metal rattling sound that is often heard in Gypsy dance music.
APPENDIX III
## ORGANIZATIONAL GRID

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APPENDIX IV
Strings

Violin

Viola

Cello

Bass
The Orchestra
A Short History

The Layout
Woodwinds

Single Reed:

Clarinet

Bass Clarinet
Percussion

Triangle

Cymbals

Gong
Percussion

- Snare Drum
- Tambourine
- Bass Drum
- Kettle Drum
APPENDIX VI
TYPEFACE SELECTIONS

Headlines: Times New Roman

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Body copy: Univers 65

ABCDEFGHIJKLMNOPQRSTUVWXYZ
qrstuvwxyz&abcdefg hijklmnopqrstuvwxyz123 4567890!?$.,;()’”
APPENDIX VII
The Orchestra

The structure of the modern orchestra and the nature of orchestral music as we know it today are a development of the past two hundred years. During the 17th century, the foundation for the orchestra emerged: the Violin or String Family became the basic core of the orchestral ensemble. Over the next century, the roles of the Woodwinds and the Brass Instruments also stabilized. Composers such as Haydn and Mozart defined the individual roles of the instruments, the intensities and combinations of their sounds, and established the balance between the String and Wind Instruments. Occasionally new instruments such as the Tuba were invented to fill special needs; later the Tuba became a standard member of the orchestra. The Piano, a regular member of the orchestra up until the 18th century, became a solo instrument and is still used with the full orchestra only part of the time.

In the 19th century, many changes and improvements were made in the physical construction of the Woodwinds and the Brass Instruments. A fingering system for the Reeds and the Flutes was developed by Theobald Boehm. The system made the instruments more flexible musically and easier to play. Valves were incorporated into the Trumpet and the French Horn, and the specifications for these instruments were standardized. With a few minor adjustments and refinements, the Woodwinds and the Brass remain basically unchanged today.

Although the changes in construction made the instruments easier to play and established standards of sound and pitch, they also changed the nature of orchestral music. Pieces of music that had been written for the orchestral instruments that existed before this time became difficult or impossible to perform in their original form as the instruments and the musicians who played them faded from the scene. Today there is a resurgence of interest in those instruments and those compositions written for them are regaining some of their original sound.

As composers explored the possibilities of the redesigned instruments, their ideas about the size and the sounds of the orchestra changed. Throughout the 19th century, the small orchestra of Mozart's time expanded to the size of today's orchestra. Some composers expanded it even further, and at the turn of the century Mahler and Bruckner were writing compositions for enormous orchestras of up to 150 performers. A standard core orchestra did emerge, however, and this is the basic orchestra that we know today, consisting of about 100 performers. This core group includes four major families of instruments: the Strings, the Woodwinds, the Brass, and the Percussion Families. A Harp and a Piano are often included as well, and composers add and subtract instruments to this standard core to create different types of sounds.

Towards the beginning of the 20th century, the interest in the new sounds created by the orchestral instruments led to new approaches to the orchestration of music. There was a new awareness of the idea that the orchestra was an instrument itself, capable of rendering many different interpretations of one piece of music. It was at this time that the conductor's role became more established as the leader of the orchestra and a performer in his own right.

The orchestra is still changing. Rather than re-interpret classical pieces, modern composers are searching for new ways to use the orchestra. Although few changes are being made in the construction of the traditional instruments, they are being used to make new sounds. Technology is playing a part in this evolution: electronic and other types of new instruments and sounds are occasionally incorporated into contemporary orchestral music. New groupings of the traditional orchestral instruments are being used as well. In the concert halls, conductors are making their mark on both the more established classical compositions and the newer experimental pieces by applying their own interpretations of the sounds.
The String Family is the foundation of the symphonic orchestra. This position of prominence dates from the 17th century: the Strings emerged during the 16th century and, as composers of the period recognized the orchestral capabilities of the family, its leadership role grew. The reason for this role has less to do with the tonal quality of the String instruments than with their extraordinary flexibility. String instruments have the power of modifying their quality and loudness in the course of a single note.

The Violin is the best example of this flexibility: it can sustain a tone almost indefinitely; it can be played in many different styles, ranging from a smooth legato to a delicate staccato. The Viola, Cello, and Bass do not have the great range of the violin, but they are capable of producing a wide choice of tonal qualities, depending on the various methods of bowing or phrasing.

The instruments of the String family are very similar in shape, but vary widely in size. The size of each instrument is not standard but varies depending on the instrument-maker and the period in which it was built.
The French Horn and the Trumpet as we know them today date from the second half of the 19th century. Changes made in the basic structure of the instruments at that time made them easier to play. Before the late 1800s, neither had valves to change its pitch. The pitch was varied by changing the embouchure of the lips and by inserting a hand into the bell of the instrument. Beethoven and Brahms both wrote for this type of hand bell. The addition of valves gave the instruments greater agility but somewhat lessened the brilliance of their tone.

Trombones are made in various sizes, of which the most commonly used is the tenor trombone in Bb. Because of the way in which the trombone is played, with one metal tube sliding back and forth inside another, this instrument is also called the slide trombone. Its tone is deep, rich, and full.

The Tubas are among the most important brass instruments in the modern orchestra, where, in addition to other functions, they often provide a weighty bass for the Trombone family. The Tuba was invented in the middle of the 19th century in Germany. Wagner brought it to prominence later in the opera Ring of Nibelungen.
The Woodwinds provide some of the orchestra's strongest colorings and are divided into three groups: the Flutes, the Single-Reed Woodwinds, and the Double Reed Woodwinds.

The Flute, like the Harp, has been known since earliest times. Originally made of wood, modern Flutes are made of silver or metal with silver plate. They are played transversely—the instrument is held perpendicular to the body of the player, and the player blows across, not into, the mouthpiece to produce sound.

The Flute was redesigned in the 19th century by Theobald Boehm. He calculated the ideal number positions and sizes for the finger-holes and then devised keys to enable the fingers to manage them. This made the Flute louder, more even in tone, and easier to play.

The Piccolo is a smaller version of the Flute, pitched one octave higher. It sounds the highest notes in the orchestra and is used chiefly to add brightness to certain passages of music.
A Double-Reed Woodwind uses a pair of cane reeds in the mouthpiece to produce an unusual plaintive sound. The Oboe was the first treble Woodwind to become standard in the orchestra. There are different types of Oboes played in the modern orchestra, of German and French origin. Due to the slightly different construction of the instruments from the two traditions, each type produces a different tone. Beethoven had a great fondness for the Oboe; his music includes many Oboe solos.

A close relative of the Oboe is the English Horn. It is neither English nor a horn at all, but rather a larger low-pitched Oboe. The richness and expressiveness of its oboe-like tone are enhanced by the lower pitch.

The Bassoon first appeared in the 16th century. The tone of the Bassoon is considerably smoother than that of the Oboe, especially in the lower registers. Its role in the orchestra is to reinforce the bass, to fill up the harmony in the middle, to double a melody played by some other instrument, and/or to play the melody alone.

The Double Bassoon is about six feet tall, twice the size of the standard Bassoon, and its pitch is one octave lower. It is used mainly to provide deep tones and to provide a solid foundation for the Woodwinds.
Woodwinds

The Single-Reeded Woodwinds are played with a single cane reed lying on the nearly flat surface of the mouthpiece. The reed vibrates and causes the instrument to produce a particularly resonating sound.

There are two different Clarinets in use in the orchestra, pitched to A and Bb. The Clarinet is the most prominent single reed Woodwind. The standard Clarinet has the greatest range of the Woodwinds and can produce low mellow tones, clear and sweet middle tones; and sharp, shrill high notes. The shape of the Clarinet distinguishes it from the Oboe. It has a cylindrical bore unlike the conical tube of the Oboe. This difference in shape is responsible for the more hollow sound of the Clarinet.

There are Clarinets in use in the orchestra. The most prominent is the A Clarinet, but you may also see the Bb Clarinet. The four valves allow for the low notes and the radiance of the instrument to be the most prominent. The single reed gives the instrument a unique sound that is not found in any other woodwind instrument.
The Harp is one of the most ancient instruments: pictures of it can be seen on ancient Greek vases and it is mentioned in the Bible. Unlike the Piano, in which the strings are hammered to produce sound, the strings of the Harp are plucked with the fingers. The modern "double action" Pedal Harp was perfected early in the 19th century. It has pedals for raising the lowest pitch of any string or strings by either one-half or one whole tone. The modern Harp has 47 strings and 7 pedals. Though it is technically a String instrument, its unique construction and the fact that it is plucked rather than bowed places the Harp in a unique category within the orchestra.

The Piano (or Pianoforte) (from Italian: soft-loud) acquired its name from its ability to pass through gradations from soft to loud and back again by touch alone. In the 19th century, a desire for ever greater volumes of sound invited a response from many orchestral instrument makers. In the case of the Piano, the strings were made thicker, and the sound of the Piano, though amplified, lost some of its color and brilliance. These losses are reduced somewhat by the use of foot pedals, which either soften and mute the tones (the soft pedal) or cause them to be rich, full, and colorful (the loud or sustaining pedal).
There are two groups of Percussion instruments: those with metal or wood surfaces which are struck with a mallet to produce sound; and those with stretched membranes which are played by striking the membrane with a drumstick or mallet or the palm of one’s hand.

The Xylophone is in the first group of Percussion instruments. It is made of bars of hardwood, arranged much like a piano keyboard. The bars vary in size and length and thus are pitched in different notes. The tone that is produced by striking the wooden bars with a mallet is clear and brilliant.

The Glockenspiel (or Orchestra Bells) looks like a small Xylophone except that the bars are made of steel instead of wood. In the orchestra the clear sweet tones of the Glockenspiel are used to create special ethereal effects. Wagner, Tchaikowsky, and Debussy often used the Glockenspiel in their orchestral pieces.

The Cymbals are metal discs that can be suspended or hand held. If suspended, they are played with a mallet or wire brushes to produce a wide variety of sounds ranging from staccato accent notes to soft hushed tones. When the Cymbals are hand held and brought together with great force, the sound produced is quite loud, and is used in orchestral music to emphasize crescendos and add fullness to the overall sound of the orchestra.

The Tam-Tam (or Gong) is of Chinese origin, and can range in size from two to six feet in diameter. Its sound is brassy and low. The Tam-Tam is generally used for solemn or mysterious effects.

There are several minor percussion instruments in this group as well: the Triangle, Castanets, Finger Cymbals, the Chimes, and the Celesta among others. These instruments are generally used to create special moods and effects.
Percussion

The Timpani (or Kettledrums,) as they are also known, have been called the most important Percussion instruments in the orchestra. Timpani are huge brass or copper kettles with calfskin stretched tightly over the top. The pitch of the drum can be raised or lowered by a pedal system, which tightens and loosens the tension of the drum head.

Drums of other types have been known from earliest times. Some-time after the Crusades, the Snare Drum and the Bass Drum became permanent members of the Percussion family. These drums are very similar in shape, but their size and their sound are very different. The Snare Drum is made of wood and has “snares”—taut spun strings fitted beneath the stretched skin—which make a bright crisp sound. The Bass Drum comes in several sizes and is used for special effects and to increase the volume of sound in the orchestra.

The Tambourine is also a member of this group of Percussion instruments. It is a small, circular wooden frame with a stretched membrane across one side and loose metal discs that are fitted into holes in the frame itself. The metal discs make the sound for which the tambourine is best known, a metal rattling sound that is often heard in Gypsy dance music.