

Remote Learning Packet

NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.

April 6-10, 2020

Course: Music

Teacher(s): Mr. Zuno leonardo.zunofernandez@greatheartsirving.org

Weekly Plan:

Monday, April 6

- Read [Ch 2 - Pitch, Dynamics, and Tone Color](#) (pp. 12-18) for 10 minutes
- Summarize: Write a summary for 5 minutes (instructions below).
- Check your work: Also, please go through the [Week 1 answers](#) and check your work for accuracy. If you have any questions, please let me know so I can explain or clarify.

Tuesday, April 7

- Read: [Ch 2 - Pitch, Dynamics, and Tone Color](#) (pp. 18-24) for 10 minutes
- Summarize: Write a summary for 5 minutes (instructions below)

Wednesday, April 8

- Listen to WRR 101.1 for 12 minutes and follow the next step.
- Write a short paragraph on the music you heard on the radio (instructions below).

Thursday, April 9

- Please answer the questions about [For the Beauty of the Earth](#).
- Please answer the questions about [Morning Has Broken](#).

Friday, April 10

No school!

Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

Student Signature

Parent Signature

Details for each assignment:

Monday, April 6

1) Read [Ch 2 - Pitch, Dynamics, and Tone Color](#) (pp. 12-18) for 10 minutes

Look for terms like: *frequency*, *pitch*, and *noise*, as well as *amplitude*, *forte*, *piano*, *mezzo*, *tone color*, and *timbre*.

2) Summarize: For 5 minutes, write a paragraph that summarizes what you learned or reviewed regarding this handout. Please keep summaries for these readings under one section of your notebook/binder, and make sure you write the title above each summary, so you can refer to these later for your final paper.

Be sure to include the following terms:

frequency, *pitch*, and *noise*, as well as *amplitude*, *forte*, *piano*, *mezzo*, *tone color*, and *timbre*. Make sure you understand the difference between each of these words. If you are not sure of their meaning after reading the text, do further research on these terms.

3) Check your work: Also, please go through the [Week 1 answers](#) and check your work for accuracy. If you have any questions, please let me know so I can explain or clarify.

Tuesday, April 7

1) Read: [Ch 2 - Pitch, Dynamics, and Tone Color](#) (pp. 18-24) for 10 minutes

2) Summarize: For 5 minutes, write a paragraph (different from yesterday's) that summarizes what you learned or reviewed regarding this handout. Please keep summaries for these readings under one section of your notebook/binder, and make sure you write the title above each summary, so you can refer to these later for your final paper. Be sure to include a brief summary on each family of instruments:

Strings, *woodwinds*, *brass*, and *percussion*. Also, please write about what an orchestra is and how it is formed.

Wednesday, April 8

1) Listen to WRR 101.1 for 12 minutes and follow the next step.

2) Write a short paragraph on the music you heard on the radio. The radio announcer will often name the piece and composer either before or after it is played on the radio. You have to listen attentively to make sure you catch that piece of information. *Please name the composer and the title of the piece and write a brief 2-3 sentence description of the music you heard: for example, what was the tempo like? Were the melodies beautiful? Were there many instruments playing, and if so, which ones? What was the overall feel of the piece?*

Please find a place where you can focus so you are really listening without distractions for 15 minutes.

We will call these summaries for listening your "*Listening Log*." Over the next few weeks, this listening log will continue to grow, and it will become the basis for your final paper.

-If you did the extra practice, please write 2-3 sentence description of what you practiced and how you practiced.

Thursday, April 9

1) Please write numbers for counting the melody (in both the Bass and Treble clefs) of [For the Beauty of the Earth](#). (I will provide an answer key at next week's packet.) Example: 1 2+ 3 4 = Quarter, 2 eights, quarter, quarter. And 1 2, 3-4 = quarter, quarter, half note.

Also, based on what you learned last week:

-What is the meter for this piece? (You learned about *meter* last week).

-What are the most common *rhythms* in this song?

2) Please do the same and answer the same questions for [Morning Has Broken](#).

*A note about the concert review: For obvious reasons, you are no longer required to attend a concert. Instead of doing that, you will gather information from your listening log and your notes from the readings I provide. You will take many notes over the next few weeks, so it is important that you keep these organized. In a week or two, I will assign the final project, which will include listening to a concert with a variety of classical music, and you will write a paper about it. You will be expected to use the terminology provided in the weekly handouts. More details to come.

If you already turned in your concert review, you will still be expected to do all of these assignments, and your final project will be somewhat reduced.

CHAPTER 2

Pitch, Dynamics, and Tone Color

If you have taken a course in physics, you know that sound is produced by vibrations that occur when objects are struck, plucked, stroked, or agitated in some other way. These vibrations are transmitted through the air and picked up by our ears.

For the production of sound in general, almost anything will do — the single rusted hinge on a creaky door as well as the great air masses of a thunderstorm. For the production of musical sounds, the usual objects are taut strings and membranes and columns of air enclosed in pipes of various kinds. These produce relatively simple vibrations, which translate into clearly focused or, as we say, “musical” sounds. Often the membranes are alive: They are called vocal cords.

Sound-producing vibrations are very fast; the range of sound that can be heard extends from around 20 to 20,000 cycles per second. The vibrations are also very small. To be heard, they often need to be *amplified*, either electronically or with the aid of something physical that echoes or *resonates* along with the vibrating body. In a guitar or violin, the resonator is the hollow box that the strings are stretched across.

Musical sounds can be high or low, loud or soft, and can take on different qualities depending on the materials used to produce them. The musical terms for these aspects of sound are pitch, dynamics, and tone color.



Natural objects can serve as resonators for musical instruments. Gourds are a favorite on two continents, used in Latin American maracas and the kalimba, an African “finger piano.”

1 Pitch

The scientific term for the rate of sound vibration is **frequency**. On the level of perception, our ears respond differently to sounds of high and low frequencies, and to very fine gradations in between. Indeed, people speak about “high” and “low” sounds quite unselfconsciously, as though they know that the latter actually have a low frequency — relatively few cycles — and the former a high frequency.

The musical term for this quality of sound, which is recognized so instinctively, is **pitch**. Low pitches (low frequencies) result from *long* vibrating elements, high pitches from *short* ones—a trombone sounds lower than a flute.

Noises, with their complex, unfocused vibrations, do not have pitch. Your college chorus divides up high and low pitches among four different groups of voices: sopranos (high females), altos (low females), tenors (high males), and basses (low males).

The totality of musical sounds serves as a kind of quarry from which musicians of every age and every society carve the exact building blocks they want for their music. We hear this totality in the sliding scale of a siren, starting low and going higher and higher. But musicians never (or virtually never) use the full range of pitches. Instead they select a limited number of fixed pitches from the sound continuum. These pitches are calibrated scientifically (European-style orchestras these days tune to a pitch with a frequency of 440 cycles), given names (that pitch is labeled A), and collected in *scales*. Scales are discussed in Chapter 3.

2 Dynamics

In scientific terminology, *amplitude* is the level of strength of sound vibrations—more precisely, the amount of energy they contain and convey. As big guitar amplifiers attest, very small string vibrations can be amplified until the energy in the air transmitting them rattles the eardrums.

In musical terminology, the level of sound is called its **dynamics**. Musicians use subtle dynamic gradations from very soft to very loud, but they have never worked out a calibrated scale of dynamics, as they have for pitch. The terms

LISTENING EXERCISE 3

Pitch and Dynamics



12

High and low *pitch* and loud and soft *dynamics* are heard so instinctively that they hardly need illustration. Listen, however, to the vivid way they are deployed in one of the most famous of classical compositions, the “Unfinished” Symphony by Franz Schubert. Symphonies usually consist of four separate big segments, called movements; musicologists are still baffled as to why Schubert wrote two superb movements for this work and started but never finished the rest.

		PITCH	DYNAMIC
0:00	Quiet and mysterious	Low range	<i>pp</i>
0:15	Rustling sounds	Middle range	
0:22	Wind instruments	High	
0:35	Single sharp accent		<i>sf</i>
0:47	Gets louder	Higher instruments added	Long <i>crescendo</i> , leading to <i>f</i> , then <i>ff</i> , more accents
1:07	Sudden collapse		<i>piano</i> followed by <i>diminuendo</i>
1:15	New tune	First low, then high	(Marked <i>pp</i> by Schubert, but usually played <i>p</i> or <i>mp</i>)
1:52	Cuts off sharply; big sound		<i>ff</i> , more accents
	<i>(Similar pitch and dynamic effects for the rest of the excerpt)</i>		
3:07	Sinking passage	Individual pitches, lower and lower	
3:45	Ominous	Lowest pitch of all	<i>pp</i>

used are only approximate. Like the indications for tempo, the terms used for dynamics are in Italian.

The main categories are simply loud and soft, **forte** (pronounced fôr-teh) and **piano**, which may be qualified by expanding to “very loud” or “very soft” and by adding the Italian word for “medium,” **mezzo** (mét-so):

<i>pianissimo</i>	<i>piano</i>	<i>mezzo piano</i>	<i>mezzo forte</i>	<i>forte</i>	<i>fortissimo</i>
pp	p	mp	mf	f	ff
very soft	soft	medium soft	medium loud	loud	very loud

Changes in dynamics can be sudden (*subito*), or they can be gradual—a soft passage swells into a loud one (*crescendo*, “growing”), or a powerful blare fades into quietness (*decrescendo* or *diminuendo*, “diminishing”).

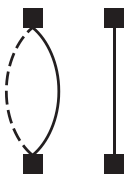
3 Tone Color

At whatever pitch, and whether loud or soft, musical sounds differ in their general *quality*, depending on the instruments or voices that produce them. **Tone color** and **timbre** (tám-br) are the terms for this quality.

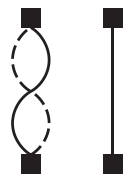
Tone color is produced in a more complex way (and a more astonishing way) than pitch and dynamics. Piano strings and other sound-producing bodies vibrate not only along their total length but also at the same time in half-lengths, quarters, eighths, and so on.

STRING VIBRATIONS

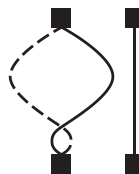
FULL-LENGTH:



HALF-LENGTH:



QUARTER-LENGTH AND THREE-QUARTER-LENGTH SIMULTANEOUSLY:



The diagrams above attempt to illustrate this. Musicians call these fractional vibrations **overtones**. They are much lower in amplitude than the main vibrations; for this reason, we hear overtones not as distinct pitches, but somehow as part of the string’s basic or fundamental pitch. The amount and exact mixture of overtones are what give a sound its characteristic tone color. A flute has few overtones. A trumpet has many.

Musicians make no attempt to tally or describe tone colors; about the best one can do is apply imprecise adjectives such as *bright*, *warm*, *ringing*, *hollow*, or *brassy*. Yet tone color is surely the most easily recognized of all musical elements. Even people who cannot identify instruments by name can distinguish between the smooth, rich sound of violins playing together; the bright sound of trumpets; and the woody croaking of a bassoon.

The most distinctive tone color of all, however, belongs to the first, most beautiful, and most universal of all the sources of music—the human voice.



The singing voice, the most beautiful and universal of all sources of music: Renée Fleming, star of the Metropolitan Opera in New York, excels in an unusually wide variety of roles and is often heard singing popular standards.

Musical Instruments

► To listen to demonstrations of individual instruments, click on Instruments of the Orchestra at bedfordstmartins.com/listen

Different voices and different instruments produce different tone colors, or timbres. Enormous numbers of devices have been invented for making music over the course of history and across the entire world, and the range of tone colors they can produce is almost endless.

This section will discuss and illustrate the instruments of Western music that make up the orchestra, and a few others. Later, in our Global Perspectives sections, we will meet some instruments from other musical traditions.

Musical instruments can be categorized into four groups: *stringed instruments* or *strings*, *woodwinds*, *brass*, and *percussion*. Musical sound, as we know, is caused by rapid vibrations. Each of the four groups of instruments produces sound vibrations in its own distinct way.

Stringed Instruments

Stringed instruments produce their sound by means of taut strings attached to a *sound box*, a hollow box containing a body of air that resonates (that is, vibrates along with the strings) to amplify the string sound.

The strings themselves can be played with a bow, as with the violin and other orchestral strings; the bow is strung tightly with horsehair, which is coated with a substance called rosin so that the bow grips the strings to produce continuous sound. With guitars and harps, the strings are plucked or strummed by the fingers or a small pick. Strings can be plucked on bowed instruments, too, for special effects. This is called pizzicato (pit-tzih-cáh-toe).

🎻 *The Violin and Its Family* The violin is often called the most beautiful instrument used in Western music. It is also one of the most versatile of instruments; its large range covers alto and soprano registers and many much higher pitches. As a solo instrument, it can play forcefully or delicately, and it excels in both brilliant and songlike music. Violinists also play chords by bowing two or more of the four strings at once, or nearly so.

As with a guitar, the player *stops* the (four) violin strings with a finger—that is, presses the strings against the neck of the violin—to shorten the string length and get different pitches (see the illustrations below). Unlike a guitar, a violin has no frets, so the player has to feel for the exact places to press.

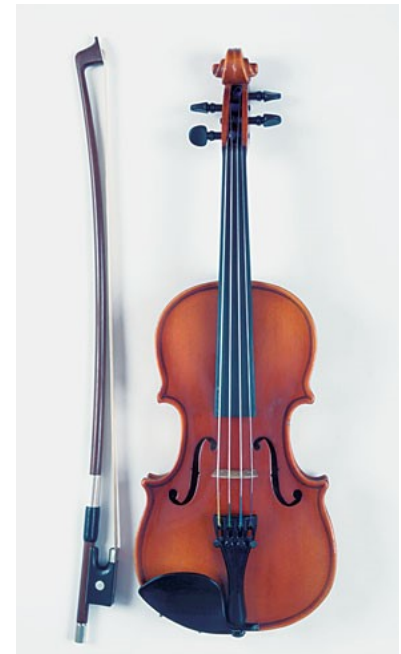
The violin is an excellent ensemble instrument, and it blends especially well with other violins. An orchestra violin section, made up of ten or more instruments playing together, can produce a strong yet sensitive and flexible tone. Hence the orchestra has traditionally relied on strings as a solid foundation for its composite sound.

Like most instruments, violins come in *families*, that is, in several sizes with different pitch ranges. Two other members of the violin family are basic to the orchestra. The **viola** is the tenor-range instrument, larger than a violin by several inches. It has a throaty quality in its lowest range, yet it fits especially smoothly into accompaniment textures. The viola's highest register is powerful and intense.

The **cello**, short for *violoncello*, is the bass of the violin family. Cellists play seated, with the instrument propped on the floor between their knees. Unlike the viola, the



The violin family: violin, viola, and cello



Violin and bow →



Chinese American cellist Yo-Yo Ma is perhaps this country's preeminent instrumentalist, and certainly the most versatile and most honored and admired. He has assumed the role of a national resource, playing at state occasions such as President Obama's 2009 inauguration. In 1998 he founded the Silk Road Project, a program of intercultural musical exchange along the Silk Road, the ancient trading route between China and the Mediterranean. His complete recordings to date fill ninety CDs!

cello has a rich, gorgeous sound in its low register. It is a favorite solo instrument as well as an indispensable member of the orchestra.

¶ **Double Bass** Also called **string bass** or just **bass**, this deep instrument is used to back up the violin family in the orchestra. (However, in various details of construction the bass differs from members of the violin family; the bass actually belongs to another, older stringed instrument family, the *viol* family.)

Played with a bow, the double bass provides a splendid deep support for orchestral sound. It is often (in jazz, nearly always) plucked to give an especially vibrant kind of accent and to emphasize the meter.

¶ **Harp** Harps are plucked stringed instruments with one string for each pitch available. The modern orchestral harp is a large instrument with forty-seven strings covering a wide range of pitches. In most orchestral music, the

swishing, watery quality of the harp is treated as a striking occasional effect rather than as a regular timbre.

Woodwind Instruments

As the name suggests, woodwind instruments were once made of wood. Some still are, while others today are made of metal and even plastic. Sound in these instruments is created by setting up vibrations in the column of air in a tube. A series of precisely spaced holes are bored in the tube, which players open or close with their fingers or with a lever device. This channels the air into columns of different lengths, producing different pitches.

Of the main woodwind instruments, *flutes*, *clarinets*, and *oboes* have approximately the same range. All three are used in the orchestra because each has a quite distinct tone color, and composers can obtain a variety of effects from them. It is not hard to learn to recognize and appreciate the different sounds of these woodwinds.

¶ **The Flute and Its Family** The **flute** is simply a long cylinder, held horizontally; the player sets the air vibrating by blowing across a side hole. The flute is the most agile of the woodwind instruments and also the gentlest. It nonetheless stands out clearly in the orchestra when played in its high register.



Orchestral harp



Flute, recorder, and clarinet

The **piccolo**, the smallest, highest member of the flute family, adds special sparkle to band and orchestral music. The **alto flute** and **bass flute**—larger and deeper flutes—are less frequently employed.

The **recorder**, a different variety of flute, is blown not at the side of the tube but through a special mouthpiece at the end. Used in older orchestral music, the recorder was superseded by the horizontal, or *transverse*, flute because the latter was stronger and more agile. In the late twentieth century recorders made a comeback for modern performances of old music using reconstructed period instruments. The instrument is also popular (in various family sizes) among musical amateurs today. The recorder is easy to learn and fun to play.

7 **Clarinet** The **clarinet** is a slightly conical tube made, usually, of ebony (a dark wood). The air column is not made to vibrate directly by blowing into the tube, as with the flute. The player gets sound by blowing on a reed—a small piece of cane fixed at one end—in much the same way as one can blow on a blade of grass held taut between the fingers. The vibrating reed vibrates the air within the clarinet tube itself.

Compared to the flute, the clarinet sounds richer and more flexible, more like the human voice. The clarinet is capable of warm, mellow tones and strident, shrill ones; it has an especially intriguing quality in its low register.

The small **E-flat clarinet** and the large **bass clarinet** are family members with a place in the modern orchestra. The tube of the bass clarinet is so long that it has to be bent back, like a thin black saxophone.

7 **Oboe** The **oboe** also uses a reed, like the clarinet, but it is a double reed—two reeds lashed together so that the air must be forced between them. This kind of reed gives the oboe its clearly focused, crisply clean, and sometimes plaintive sound.

The **English horn** is a larger, lower oboe, descending into the viola range. It is often called by the French equivalent, *cor anglais*; in either language, the name is all wrong, since the instrument is not a horn but an oboe, and it has nothing to do with England.



Orchestras usually have two or three *oboes*.

7 **Bassoon** The **bassoon** is a low (cello-range) instrument with a double reed and other characteristics similar to the oboe's. It looks somewhat bizarre: The long tube is bent double, and the reed has to be linked to the instrument by a long, narrow pipe made of metal. Of all the double-reed woodwinds, the bassoon is the most varied in expression, ranging from the mournful to the comical.

The **contrabassoon**, also called the **double bassoon**, is a very large member of the bassoon family, in the double bass range.

7 **Saxophone** The **saxophone**, invented by the Belgian instrument maker Adolphe Sax, was first used around 1840 in military bands. The instrument is sometimes included in the modern orchestra, but it really came into its own in jazz. Saxophones are close to clarinets in the way they produce sound. Both use single reeds. Since the saxophone tube is wider and made of brass, its tone is even mellower than that of the clarinet, yet at the same time

more forceful. The long saxophone tube has a characteristic bent shape and a flaring bell, as its opening is called.

Most common are the **alto saxophone** and the **tenor saxophone**. But the big family also includes *bass*, *baritone*, and *soprano* members.

Brass Instruments

The brass instruments are the loudest of all the wind instruments because of the rather remarkable way their sound is produced. The player's lips vibrate against a small cup-shaped mouthpiece of metal. The lip vibration itself vibrates the air within the brass tube. All brass instruments have long tubes, and these are almost always coiled in one way or another. This is easy to do with the soft metal they are made from.

7 **Trumpet** The **trumpet**, highest of the main brass instruments, has a bright, strong, piercing tone that provides the ultimate excitement in band and orchestral



Bassoon, double bass, accordion (*not* an orchestral instrument!), and violin



Two French horns, trumpet, trombone, and tuba

music alike. Pitch is controlled by three pistons, or valves, that connect auxiliary tubes with the main tube or disconnect them, so as to lengthen or shorten the vibrating air column.

🦄 **French Horn** The French horn has a lower, mellower, thicker tone than the trumpet. It is capable of mysterious, romantic sounds when played softly; played loudly, it can sound like a trombone. Chords played by several French horns in harmony have a specially rich, sumptuous tone.

🦄 **Trombone** The tenor trombone and the bass trombone are also pitched lower than the trumpet. The pitch is controlled by a sliding mechanism (thus the term *slide*

trombone) rather than a valve or piston, as in the trumpet and French horn.

Less bright and martial in tone than the trumpet, the trombone can produce a surprising variety of sounds, ranging from an almost vocal quality in its high register to a hard, powerful blare in the low register.

🦄 **Tuba** The bass tuba is typically used as a foundation for the trombone group in an orchestra. It is less flexible than other brass instruments. And like most other deep bass instruments, it is not favored for solo work.

🦄 **Other Brass Instruments** All the brass instruments described so far are staples of both the orchestra and the band. Many other brass instruments (and even whole families of instruments) have been invented for use in marching bands and have then sometimes found their way into the orchestra.

Among these are the *cornet* and the *flügelhorn*, both of which resemble the trumpet; the *euphonium*, *baritone horn*, and *saxhorn*, which are somewhere between the French horn and the tuba; and the *sousaphone*, a handsome bass tuba named after the great American bandmaster and march composer John Philip Sousa.

Finally there is the *bugle*. This simple trumpetlike instrument is very limited in the pitches it can play because it has no piston or valve mechanism. Buglers play “Taps” and military fanfares, and not much else.

Percussion Instruments

Instruments in this category produce sound by being struck (or sometimes rattled, as with the South American maraca). Some percussion instruments, such as drums and gongs, have no fixed pitch, just a striking tone color. Others, such as the vibraphone, have whole sets of wooden or metal elements tuned to regular scales.

🦄 **Timpani** The *timpani* (or *kettledrums*) are large hemispherical drums that can be tuned precisely to certain low pitches. Used in groups of two or more, timpani have the effect of “cementing” loud sounds when the whole orchestra plays, so they are the most widely used percussion instruments in the orchestra.

Timpani are tuned by tightening the drumhead by means of screws set around the rim. During a concert, one can often see the timpani player, when there are rests in the music, leaning over the drums, tapping them quietly to hear whether the tuning is just right.

🦄 **Pitched Percussion Instruments** Pitched percussion instruments are *scale instruments*, capable of playing melodies and consisting of whole sets of metal or wooden bars or plates struck with sticks or hammers. While they add unforgettable special sound effects to many compositions, they are not usually heard consistently throughout a piece, as the timpani are. They differ in their materials.

The *glockenspiel* has small steel bars. It is a high instrument with a bright, penetrating sound.



Drum kit with cymbals

The **xylophone** has hardwood plates or slats. It plays as high as the glockenspiel but also lower, and it has a drier, sharper tone.

The **marimba**, an instrument of African and South American origins, is a xylophone with tubular resonators under each wooden slat, making the tone much mellower.

The **vibraphone** has metal plates, like a glockenspiel with a large range, and is furnished with a controllable electric resonating device. This gives the “vibes” an echoing, funky quality unlike that of any other instrument.

Also like the glockenspiel, the **celesta** has steel bars, but its sound is more delicate and silvery. This instrument,

unlike the others in this section, is not played directly by a percussionist wielding hammers or sticks. The hammers are activated from a keyboard; a celesta looks like a miniature piano.

Tubular bells, or **chimes**, are hanging tubes that are struck with a big mallet. They sound like church bells.

7 **Unpitched Percussion Instruments** In the category of percussion instruments without a fixed pitch, the following are the most frequently found in the orchestra.

Cymbals are concave metal plates, from a few inches to several feet in diameter. In orchestral music, pairs of large cymbals are clapped together to support climactic moments in the music with a grand clashing sound.

The **triangle**—a simple metal triangle—gives out a bright tinkle when struck.

The **tam-tam** is a large unpitched gong with a low, often sinister quality.

The **snare drum**, **tenor drum**, and **bass drum** are among the unpitched drums used in the orchestra.

The Orchestra

The orchestra has changed over the centuries, just as orchestral music has. Bach’s orchestra in the early 1700s was about a fifth the size of the orchestra required today. (See pages 114, 161, and 232 for the makeup of the orchestra at various historical periods.)

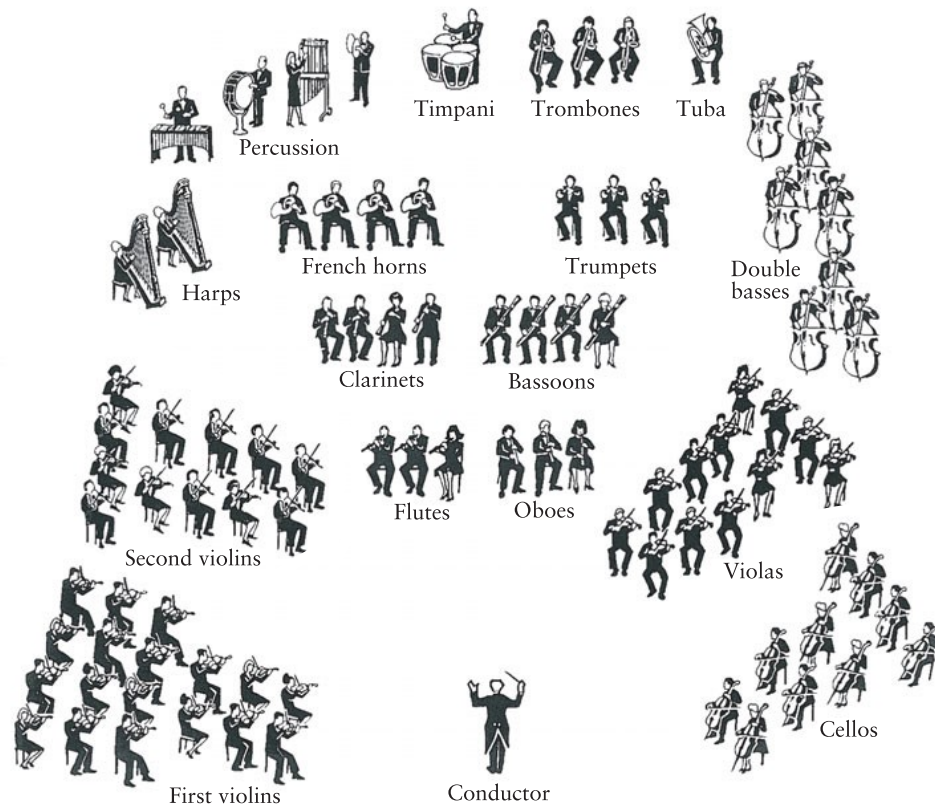
So today’s symphony orchestra has to be a fluid group. Eighty musicians or more will be on the regular roster, but some of them sit out some of the pieces on many programs. And freelancers have to be engaged for special compositions in which composers have imaginatively



French horn and timpani



ORCHESTRAL SEATING PLAN



LISTENING EXERCISE 4



The Orchestra in Action

Take a break from reading now and listen to *The Young Person's Guide to the Orchestra*, a work devised by Benjamin Britten in 1946 to introduce the many tone colors of orchestral instruments. A full chart of this work is given on page 45. For now, the chart below will lead you one by one through the various sections and instruments of the orchestra.

19	0:00	Full orchestra
	0:42	WOODWIND choir
	1:11	BRASS choir
	1:42	STRING choir
	2:07	PERCUSSION
	2:26	Full orchestra
20	2:50	Flutes and piccolo
0:39	3:29	Oboes
1:42	4:32	Clarinet family: bass clarinet (1:42), clarinet (1:57), and E-flat clarinet (1:46)
2:24	5:14	Bassoon
21	6:11	Violins
0:45	6:56	Violas
1:34	7:45	Cellos
2:32	8:43	Double bass
3:29	9:40	Harp
22	10:31	French horns
0:40	11:11	Trumpets
1:16	11:47	Trombones, tuba
23	12:48	PERCUSSION
24	14:43	Full orchestra

expanded the orchestra for their own expressive purposes. A typical large orchestra today includes the following sections, also called *choirs*.

🎷 **Strings:** about thirty to thirty-six violinists, twelve violists, ten to twelve cellists, and eight double basses.

🎷 **Woodwinds:** two flutes and a piccolo, two clarinets and a bass clarinet, two oboes and an English horn, two bassoons and a contrabassoon.

🎷 **Brass:** at least two trumpets, four French horns, two trombones, and one tuba.

🎷 **Percussion:** one to four players, who between them manage the timpani and all the other percussion instruments, moving from one to the other. For unlike the violins, for example, the percussion instruments seldom have to be played continuously throughout a piece.

There are several seating plans for orchestras; which is chosen depends on at least two factors. The conductor judges which arrangement makes the best sound in the particular hall. And some conductors feel they can control the orchestra better with one arrangement, some with another. One such seating plan is shown on page 21.

Keyboard Instruments

Though most orchestras today include a pianist, the piano is a relatively new addition to the symphony orchestra. In earlier times, the orchestra regularly included another keyboard instrument, the harpsichord.

The great advantage of keyboard instruments, of course, is that they can play more than one note at a time. A pianist, for example, can play a whole piece on a keyboard instrument without requiring any other musicians at all. Consequently the solo music that has been written for piano, harpsichord, and organ is much more extensive than (accompanied) solo music for other instruments—more extensive and ultimately more important.

🎷 **Piano** The tuned strings of a piano are struck by felt-covered hammers, activated from a keyboard. Much technological ingenuity has been devoted to the activating mechanism, or *action*.

The hammers must strike the string and then fall back at once, while a damping device made of felt touches the string to stop the sound instantly. All this must be done so fast that the pianist can play repeated notes as fast as the hand can move. Also, many shades of loudness and softness must lie ready under the player's fingers. This dynamic flexibility is what gave the piano its name: *piano* is short for *pianoforte*, meaning “soft-loud.”

The list of virtuoso pianists who were also major composers extends from Mozart through Frédéric Chopin to Sergei Rachmaninov. In the nineteenth century, the piano became *the* solo instrument. At the same time, nearly every middle-class European and American household had a piano. Piano lessons served and still serve for millions of young people as an introduction to the world of music.

🎷 **Harpsichord** The **harpsichord** is an ancient keyboard instrument that was revived in the 1900s for the playing of Baroque music, in particular.

Like the piano, the harpsichord has a set of tuned strings activated from a keyboard, but the action is much

An organ with five (!) keyboards. The player pulls out the white knobs (stops) to change the sets of pipes that sound.



An elaborately painted eighteenth-century harpsichord, with two keyboards

simpler. There is no damping, and instead of hammers striking the strings, little bars flip up with quills that pluck them. This means, first, that the tone is brittle and ping-y. Second, it means that the player cannot vary dynamics; when a string is plucked in this way, it always sounds the same.

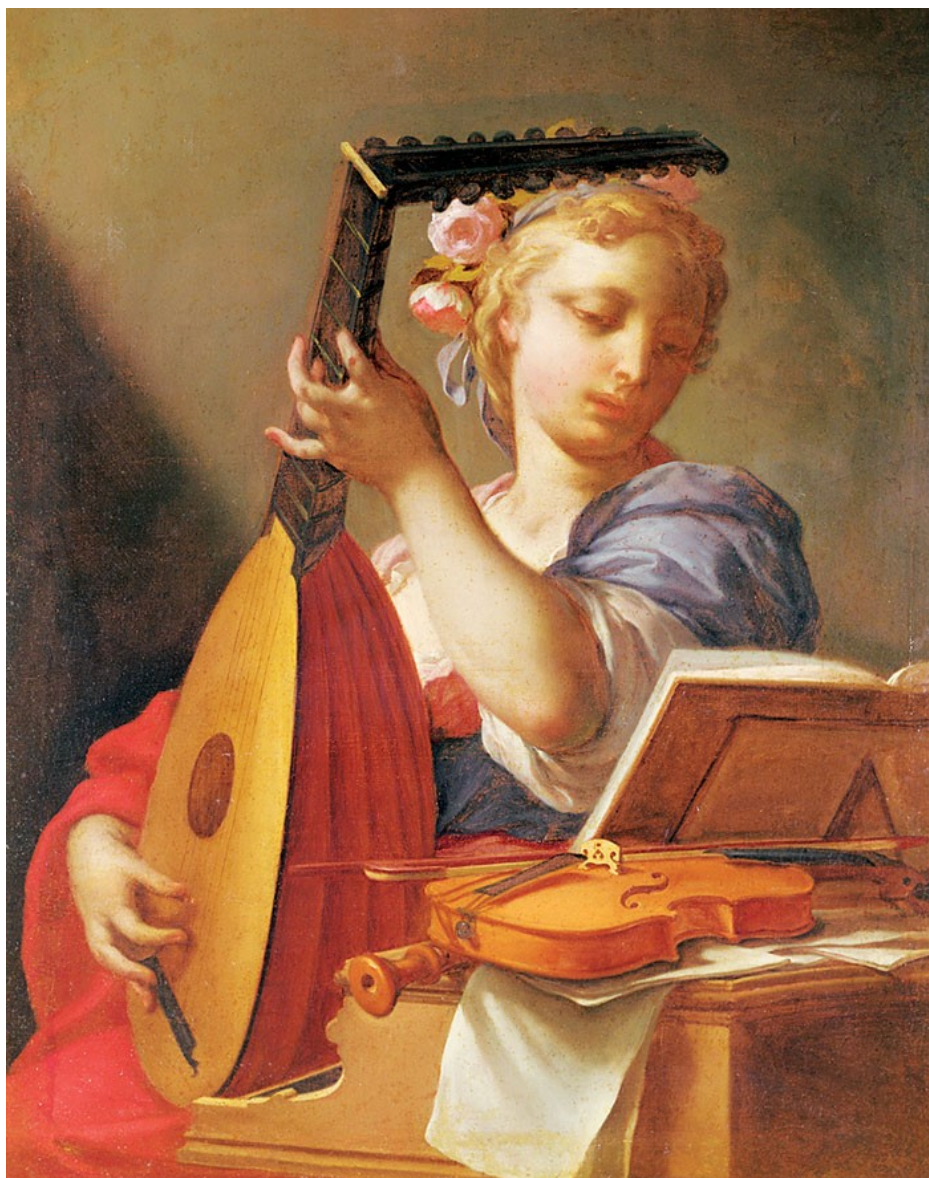
Harpichord makers compensated for this limitation in dynamics by adding one or two extra full sets of strings, controlled by an extra keyboard. One keyboard could be soft, the other loud. A mechanism allowed the keyboards to be coupled together for the loudest sound of all.

In spite of its brittle tone and its lack of flexibility in dynamics, the harpsichord can be a wonderfully expressive instrument. Good harpsichord playing requires, first and foremost, great rhythmic subtlety.

Another keyboard instrument of early times, the **clavichord**, has the simplest action of all. Its tone is much too quiet for concert use.

¶ **Organ** Called “the king of instruments,” the **pipe organ** is certainly the largest of them (see page 150). This instrument has to provide enough sound to fill the large spaces of churches and cathedrals on a suitably grand scale. The organ has a great many sets of tuned pipes through which a complex wind system blows air, again activated from a keyboard. The pipes have different tone colors, and most organs have more than one keyboard to control different sets of pipes. A pedal board—a big keyboard on the floor, played with the feet—controls the lowest-sounding pipes.

Each set of tuned pipes is called a *stop*; a moderate-sized organ has forty to fifty stops, but much bigger organs exist. One organ in Atlantic City, New Jersey, has 1,477 stops, for a total of 33,112 pipes. A large organ is capable of an almost orchestral variety of sound.



Artists loved to paint the lute—a beautiful instrument and a triumph of woodworking craft. Here Francesco Trevisani (1656–1746) includes also a violin, a recorder, and a harpsichord.

The organ is not a member of the orchestra, but because the grandest occasions call for orchestra, chorus, vocal soloists, and organ combined (e.g., Handel’s *Messiah* at Christmastime; see page 146), a major symphony hall has to have its organ—usually an imposing sight.

✎ **Electronic Keyboard Instruments** Today *keyboard* or *organ* generally means an electronic instrument. Synthesizers simulate the sound of organs, pianos, and harpsichords—and many other sounds as well.

Modern concert music, from the 1960s on, has occasionally used electronic keyboards. On the whole, however, synthesizers have been used more to compose concert music than to play it. And of course electronic keyboards play major roles in today’s popular music.

Plucked Stringed Instruments

Plucked stringed instruments figure much less in art music of the West than in Asian countries such as India and Japan, as we shall see. One exception is the orchestral harp; see page 16. The acoustic **guitar** and the **mandolin** are used very widely in Western popular music, but only occasionally in orchestras.

However, a now-obsolete plucked instrument, the **lute**, was of major importance in earlier times. One of the most beautiful-looking of instruments, the lute sounds rather like a gentle guitar. Large members of the lute family were the **theorbo** and the **archlute**.

Like keyboard instruments, plucked stringed instruments have been revolutionized by electronic technology. **Electric guitars** dominate rock music, though they have only occasionally found their way into concert music.

SHALL WE GATHER AT THE RIVER

Student

Robert Lawry
(1826-1899)



Flowing gently

Handwritten piano accompaniment for 'Shall We Gather at the River'. The score is in 4/4 time and consists of two systems of music. The first system has four measures, and the second system has four measures. The music is written in treble and bass clefs. Handwritten annotations include chord symbols (D, F#G, A, F#, G/D, G, G, A, G, F#, A7/C#, A, F#, F#, F#, F#, G, A, F#, F#, G, E, E, F#, G, F#, E, D), fingering numbers (1, 2, 3, 4, 1-2, 3-4, 1, 2, 3, 4, 1-2, 3-4, 1, 2, 3, 4, 1-2-3-4), and dynamic markings (mf, mp). The first system ends with a fermata over the final measure.

SHALL WE GATHER AT THE RIVER

Accompaniment

Flowing gently

Handwritten piano accompaniment for 'Shall We Gather at the River'. The score is in bass clef and consists of two systems of music. The first system has four measures, and the second system has four measures. The music is written in a simple, flowing style. Handwritten annotations include dynamic markings (mf, mp) and a 'rit.' marking under the final measure of the second system.

DEF#GA
Do Re Mi Fa Sol

a. Dis Do

b. A is Do

In a canon, one melodic line/voice imitates another.

c. Practice this exercise in various major and minor keys of your choice.

CANON G is Do

FOR THE BEAUTY OF THE EARTH

Student

Piano 1

Conrad Kocher (1786-1872)
Arranged by E. M.



Stately

mp

1 2 3

5

9

mf

f

Piano 2

Stately

2

mp

5

9

mf

f

MORNING HAS BROKEN

Student

Gaelic
Arranged by E. M.

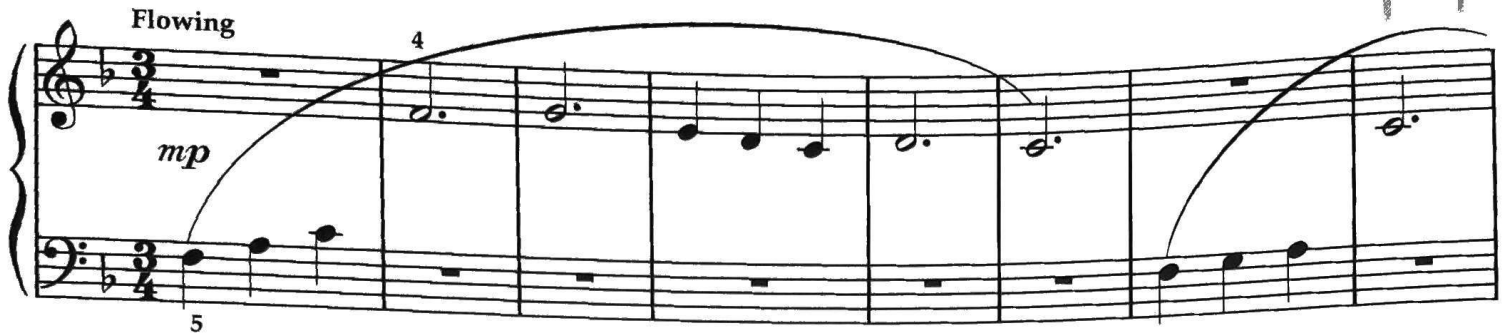


Flowing

4

mp

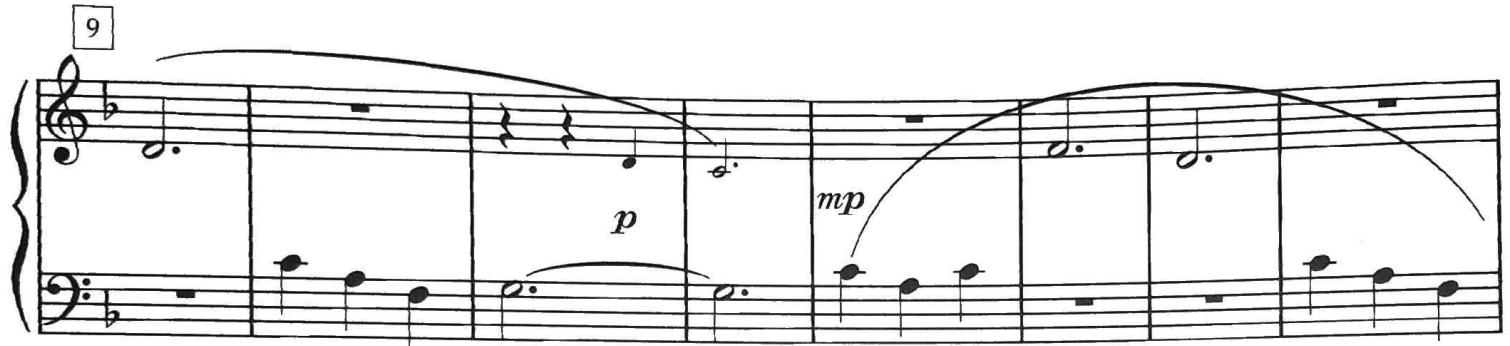
5

Musical notation for measures 1-8. The piece is in 3/4 time with a key signature of one flat. The melody in the right hand is marked 'Flowing' and 'mp'. A slur covers measures 1-8. Measure numbers 4 and 5 are indicated.

9

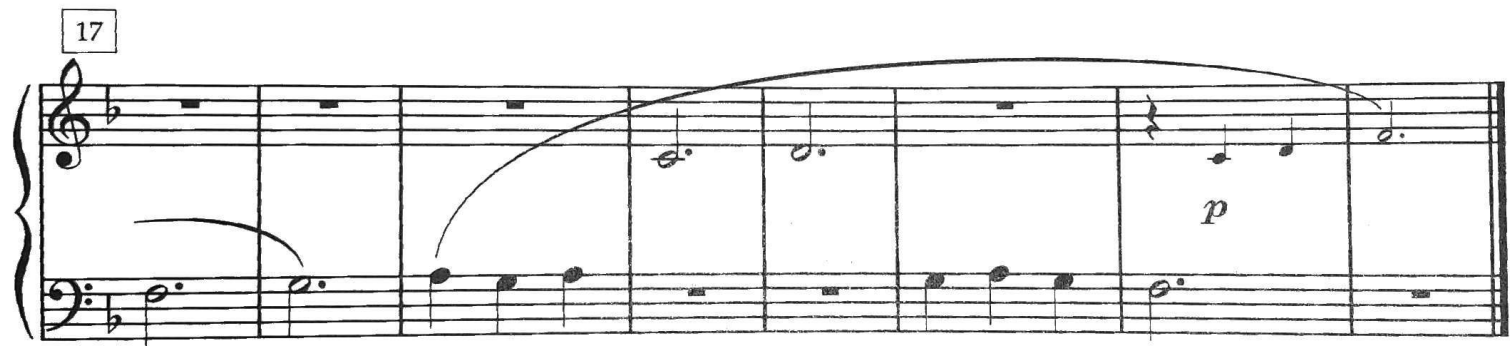
p

mp

Musical notation for measures 9-16. The melody in the right hand has a dynamic of 'p' in measure 10 and 'mp' in measure 12. A slur covers measures 9-16. Measure number 9 is indicated.

17

p

Musical notation for measures 17-24. The melody in the right hand has a dynamic of 'p' in measure 20. A slur covers measures 17-24. Measure number 17 is indicated.