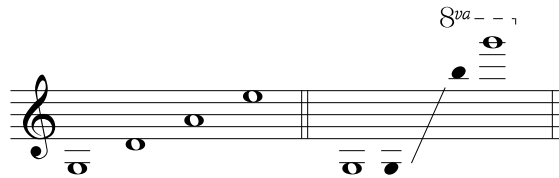


The Violin

Strings, Tuning, and Range: The violin's strings are tuned in fifths to G D A and E:



The color of the individual strings may be characterized as follows:

G = Full, dark, and rich. Gains emotional intensity higher up on the string.

D = Less dark but is still rich in timbre.

A = Considerably brighter than the D string.

E = Brilliant and capable of great carrying power.

Fingerboard: The violin's fingerboard is where the player stops the strings with a left hand finger. It is important to know that as the player plays higher up on the fingerboard the notes becoming increasingly closer together. Because of this, in the extreme upper range, fingering problems develop and intonation becomes risky. Avoid the upper register if you are writing for inexperienced players. Notes beyond the interval of a 10th above the open strings are seldom used, except for on the E string and for coloristic purposes on the G string. Finger tremolos should not exceed a diminished fifth.

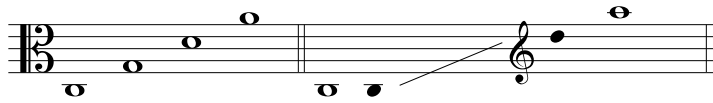
Construction and Acoustics: The violin is the only member of the string family in which the resonances of the middle two open strings match the resonances of the body. This fact produces a very rich sound that has great carrying power.

Strengths: Great melody instrument due to its immense carrying power. Very agile. Capable of fast and highly virtuosic passages. Very colorful.

Weaknesses: none.

The Viola

Strings, Tuning, and Range: The alto clef is normally used. If a section of music stays above B4 for a long stretch, treble clef may be used to avoid ledger lines. The viola's strings are tuned in fifths to C G D and A:



The color of the individual strings may be characterized as follows:

C = The only string that does not appear on the violin and therefore the most individually characteristic of the instrument. Very warm, full, deep, dark, and rich with a somewhat melancholy tone.

G = Warm.

D = Less warm.

A = Nasal. Many violists regard the A string as the worst sounding of the four. However, the A string on some violas have a very pleasing tone.

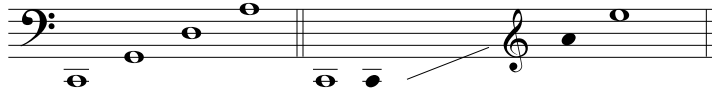
Construction and Acoustics: The viola is too small to properly support its pitch register. The body size should actually be much larger in order for the resonances of the body to match the resonances of the G and D strings. A larger body would make playability much more difficult, however, so the flaw in the construction is allowed. The body, while different from instrument to instrument, is larger than the violin. This results in two main concerns: (1) the distance between notes is greater than the violin. There is therefore more time needed to go from note to note. The result is that the instrument cannot play as technically demanding ideas as the violin. Finger tremolos should not exceed the perfect fourth. (2) The ability to reach notes in the upper register is hindered by the left hand's ability to get over the body of the instrument. It therefore does not have the range of the violin. It is also heavier than the violin which compounds this problem.

Strengths: The tone of the C string is unlike any of the other string instruments. Therefore, a melody played solely on the C string, especially the bottom fifth of the string, would be most representative and individual of the instrument. Due to the viola's dark, introspective tone, styles such as melancholy, lacrimae, and mournful are most successful. The viola is sometimes referred to as the busiest instrument in the string section. This is because the viola often plays an arpeggiating accompaniment to a melody played by the violins, and a bass line played by the cellos and perhaps basses.

Weaknesses: Does not carry well and may be covered up easily when given a solo role. Lacks brilliance. Limited range. Not nearly as agile as the violin and a little clumsy. Somewhat more limited in expression than the violin.

The Violoncello

Strings, Tuning, and Range: The bass clef is normally used. If a section of music stays above B3 for a long stretch, the treble clef may be used to avoid ledger lines. The tenor clef may also be used if the melody wanders around C4. The cello's strings are tuned in fifths to C G D and A (one octave lower than the viola):



The color of the individual strings may be characterized as follows:

C and G = Dark, rich and full-bodied.

D = Warm and mellow.

A = Vibrant with an intense cantabile character. Becomes increasingly more intense and poignant as one climbs the string.

Construction and Acoustics: Like the viola, the body is too small to support the resonances of the middle two strings. It therefore lacks the proper resonance.

Triple and Quadruple Stops: Will be arpeggiated. It is usually best to have at least a 5th between the lowest two notes. Use an open string to create better resonance.

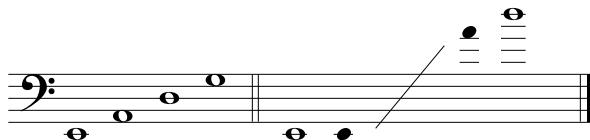
The Thumb Technique: The left hand thumb may be used when playing in the upper register on the A string. The use of the thumb effectively increases the upper range of the instrument.

Strengths: The cello (NOT THE DOUBLE BASS) functions as the bass voice in the string ensemble. It is often doubled by the bass an octave lower. Produces an articulated bass tone. For a very passionate and expressive tone, a melody may be played on the A string into the upper register (see Messian's Quartet for the End of Time, 5th mvt.). Pizzicato is very effective. Remarkably agile and capable of highly virtuosic passages.

Weaknesses: None.

The Double Bass

Strings, Tuning, and Range: The bass clef is normally used. Unlike the other string instruments in the orchestra, the bass is a transposing instrument. The actual sound of the notes played are an octave lower than written. Also unlike the other string instruments, the bass's strings are tuned in fourths to E A D and G:



The color of the individual strings may be characterized as follows:

E = Very deep, dark tone.

A and D = Slightly less deep.

G = The least dark of the four.

Construction and Acoustics: Like the viola and cello, the body is too small to support the resonances of the middle two strings. It therefore lacks the proper resonance. The body size and shape varies from instrument to instrument. Most instruments are four strings. In Europe, a five string bass exists which adds a low C string required for some repertoire.

Strengths: The bass has an extended harmonic technique. Because of the fat strings, natural harmonics are numerous and can be used to extend the range of the instrument. Unique in its register, the bass extends below the cello range by as little as a sixth and as much as an octave (with the low string extension). Best used to color the bass line supplied by the celli by doubling it at the octave below. Can add a distinct low rumble to the orchestral sound. Pizzicato is very effective and provides a relief for bowing.

Weaknesses: Lacks agility. Lacks carrying power as a solo instrument. Lacks articulation. Triple and quadruple stops should be avoided for all but the most experienced players. Even then, the musical result is not very satisfying. Double stops are best avoided but are possible. Better to use an open string when writing double stops for the bass. Since fast running lines in the low register sound muddy, the bass is best off playing simple single-note lines. Often the bass will play a simplified cello part. Avoid constant playing and use the bass tone as a spectral accent (like the piccolo).