Your bow and instrument are *delicate* …

… handle them accordingly. Train yourself to be conscious of where the bow and instrument are and how you are handling them when they are outside the case.

- When you're carrying either one, hold it firmly and keep it close to you; don't bang it on things.
- Never leave a bow or instrument on the floor (it could be stepped on) or where they could be knocked off and land on the floor.
- Never leave one of them on furniture, where someone might accidentally sit on it.
- Don't ever applaud by tapping your bow on the stand. That's a "good" way to break a bow.
- Don't touch the bow hair! (The naturally occurring oil on your fingers can make the hair unable to take up rosin, and then you might have to have it re-haired.)
- Never use any chemicals or other liquids to clean the bow or instrument; they could damage it.

… adjust them correctly. Your bow and instrument will play its best when all parts are in good working order, the hair is properly adjusted and rosined, and the instrument is properly tuned.

- Before playing, turn the bow screw (at the very bottom tip of the bow) slowly, clockwise, to tighten the hair until it has a slight bounce when placed on the instrument strings. Don't tighten too much—the shape of the bow stick should not change. The hair should pull into a smooth, unified look.
- If there's hardly any tone and the bow slides on the strings, apply rosin until it doesn't slide and has a clear tone. If the tone is scratchy, there is too much rosin—play for awhile, until the excess rosin is gone.

… store them properly. Always store your bow and instrument in their proper places in your case.

- Before putting them away, use a microfiber cloth to remove any rosin (or rosin dust, oil and dirt will build up on them, and could permanently bond with and ruin the varnish).
- Use the screw to loosen the bow hair completely, and then tighten the screw one complete turn. (If you don't loosen the hair, it could shrink and damage or even break your bow.)
- Leave the case open for several hours in a bright room every day or two—preferably while you practice—to prevent bow hair damage.

Bow bugs!

Adult varied carpet beetle

Bow bugs, also known as carpet beetles and bow mites, can be members of several species of the *Dermestidae* family, in the larval stage. They're fairly common, even in scrupulously clean homes, and they love to eat bow hair as well as wool. If your bow hair is getting brittle or breaking in the middle, bow bugs have infested your case. If your case has bow bugs, you will need to have the bow rehaired professionally, and you or the luthier will need to clean and disinfect your case. Then you should follow some easy steps to ensure that they don't come back.

It is important not to store your bow in an unopened case for long periods of time, because bow bugs do best in dark, enclosed places.

Get rid of them

Larva of Anthrenus carpet beetle

1. Vacuum your case thoroughly, at least twice (or have the violin shop do this).
2. Leave your case open in a well -ventilated, bright area for a day or two.
3. Take your bow to be rehaired professionally. If the hair isn't yet broken, be sure to tell them about the bugs so they can take steps to protect the other bows and cases. (They won't think you're bad for having bow bugs; they've seen many before.)

Keep them from coming back

1. You can try putting cedar chips or moth balls wrapped in cloth in the case, but nos. 2 and 3 below are most important. **Don't** use an insecticide spray; the residue could damage your violin and bow.
2. Make a practice of periodically leaving your case open in a well-ventilated, bright area.
3. Keep your case open when you practice.

Humidity and heat extremes: enemies of your bow and instrument

- Both bow hair and wood stretch and expand in high humidity and shrink in low humidity. It's important to keep your instrument and bow in neutral humidity, as much as possible. The best way to do this is to **keep them in the case when you're not playing.**
- Bow and instrument varnish can be melt in hot temperature or in direct sunlight, even when it's not that hot outside. **Never leave your bow or instrument in a car (whether it's hot or cold outside) or in direct sunlight.**
- Wood can contract and crack in low temperature.
- Humidity and temperature can have even worse effects on a bow if the hair has not been loosened. If tightened hair shrinks, it can warp or break the bow stick. **Always loosen the hair when you're through playing.**

When to get professional help

For your bow

- Because playing eventually wears out the hair, your bow should be professionally rehaired at least once each year, and any time the hair has lost its bite (friction), is dirty and can't be cleaned well enough, or has lost a lot of hair.
- Dirty bow hair can be cleaned with *denatured* alcohol, but alcohol will damage the finish of the stick, so it's safer to have your luthier clean it.
- If the ivory or bone tip on the bow's head cracks or breaks, have your luthier replace it.
- If the bow's winding and leather grip are worn or missing, have them replaced.
- If turning the bow screw slowly in a clockwise direction fails to tighten the hair, your bow screw eyelet will need to be replaced.
- If for any reason the curve of the bow stick has been lost or distorted, take it to your luthier; the proper shape can be restored.
- If your bow breaks, take it to your luthier to see if the bow can be repaired so that it is playable, although it will lose some of its value.

For your instrument

Have your luthier give the instrument a checkup occasionally, to be sure everything is in working order, and immediately if any of these occur:

- The pegs are hard to turn, or turn too easily.
- It's suddenly hard to tune the instrument and keep it tuned.
- A crack develops in the wood.
- The tone changes, and tuning won't make it better.
- There's a rattle inside the body of the instrument and the instrument's "voice" is gone.
- The fingerboard feels unsteady or loose.

What is rosin?

- **Bow rosin is made of tree sap** combined with small amounts of other ingredients (or not), poured into molds, allowed to dry and harden, unmolded, and polished.

Why rosin a bow?

- **Without rosin, the hair is too smooth**; it slides over the strings and the sound is faint and thin. When bow hair is filled with the right amount of rosin, the rosin particles "bite" or micro-pluck the strings, causing them to vibrate and create a beautiful tone.

What's the best rosin?

It depends. What instrument are you playing? Are you a professional? A casual player? A student? Does your teacher prefer that you use a certain rosin? There are many brands in both light and dark rosin, and at all price ranges. Each produces subtle differences in tone. In our experience, most people seem to prefer a medium amber rosin, but everyone has their individual preferences.

- **The sap for light rosin** is tapped in late winter or early spring, and generally is gold or light amber, and produces a light, smooth sound.
- **Dark-rosin** saps are tapped in summer and fall. Dark rosin generally produces a lower, grittier sound.
- **Additions to rosin** include metals that produce different tones: gold (warm, clear), silver (bright, clear), copper (warm, velvety), and lead (velvety). Dyes are sometimes added for appearance.
- **The amount of dust** produced during play varies with different types of rosin. Generally, the more expensive and lighter rosins produce less dust than the cheaper or darker rosins.
- **Price and quality** do generally go together in rosin. The more expensive professional rosins can make differences in tone that matter a lot to the professional, but aren't usually a consideration for beginning players on student instruments..
- **Information from manufacturers** can be useful when choosing your rosin.

How do you apply rosin?

- **Tighten the hair by** turning the screw (at the very bottom tip of the bow) slowly clockwise, tightening the hair until it has a slight bounce when placed on the strings. The hair should pull into a smooth, unified look. Don't tighten too much.
- **Hold the rosin in your left hand** (even if you're left-handed). With the bow in your right hand, make five to ten strokes across the rosin. (If the bow is new or newly haired, you may need to apply more.)
- **Apply a little more rosin to the hair near the bow tip and near the frog**—the ends should be more heavily rosined than the middle.
- You may need to **apply more rosin than usual before you play a long concert or a very fast piece.**

What problems could I have with rosin?

- **It could dry out and get too hard.** Always close the cloth or container after you use rosin, and keep it in the case when you're not using it.
- **Some people are allergic to rosin.** Be thoughtful and don't create clouds of rosin dust near other people.
- **Rosin buildup on the strings can cause sound problems** just like those caused by too much rosin in the hair. Keep you strings clean by wiping them with a clean microfiber or 100% cotton or silk cloth after you play.

Instrument Tuning

Tuning basics

Tuning your instrument is the most basic skill you must master to become a real player.

- Always begin with the A string. A is the orchestral standard note, and all instruments are tuned to the A.
- You can use an electronic tuner for all four strings, or you can tune the A string to a tuning fork, and then tune the remaining strings to the A and to each other. An electronic tuner gives you all four notes that you need but is more expensive and needs batteries. A tuning fork produces only the A, but is reliable, cheap, compact, and never needs batteries.
- If you're a beginner, your teacher may prefer that you start with the tuning fork and only consider an electronic tuner when that is mastered. It's best to ask before you buy either one.
- You tune your instrument by turning the pegs (just under the scroll) until the right pitch is achieved when you pluck the string or draw the bow across it.
- When your instrument is well tuned, it will gradually go slightly off tune in one or more strings. When it does, you can make slight adjustments with the fine tuners attached to the tailpiece. But with time and weather changes, the strings will go out of tune and you'll need to tune with the pegs again.

The tuning fork

A tuning fork is a specially made two-tined fork that produces a specific constant note (A440) when struck against something or with something. The note lasts quite awhile, and while it is sounding, you turn the peg or fine tuner to make your A string sound exactly the same. Once you have the A string correct, you tune the other strings to the A string. You can read more about tuning forks at http://en.wikipedia.org/wiki/Tuning_fork.

- A major advantage of the tuning fork is its simplicity: it needs no batteries, is small and easily kept in your instrument case.
- Some tuning forks are mounted on “resonater boxes.” These make the sound louder and it lasts longer, but they are not easily portable. Your luthier will probably have one, and your teacher might, too.

The electronic tuner

Most electronic tuners are pocket-size and require batteries (so you’ll need to carry extra batteries). (There are larger, more expensive ones that are used by luthiers and other professional music technicians and players.)

- The simplest electronic tuners use LED lights or a needle to indicate approximately whether the pitch of the note played is lower, higher, or approximately equal to one pitch (often "A" or "E") or for a small number of set pitches.
- Chromatic tuners cover all 12 notes of the scale.
- One of the most useful electronic tuners combines a metronome and a tuner in one unit.
- Some electronic tuners offer additional features that are most useful to professional players.

See more about electronic tuners at http://en.wikipedia.org/wiki/Electronic_tuner.

How to tune

As discussed above, you can use a tuning fork or an electronic tuner to strike the note(s) to which you tune your instrument. It doesn't take long for your ears to learn to hear the "grind" of a pair of strings slightly out of tune with each other.

These are the notes the strings (from highest to lowest and left to right, with you facing your instrument) should make. Below the notes are the order in which you should tune them:

Instrument	Left (highest)			Right (lowest)
Violin	E	A	D	G
	2	1	3	4
Viola	A	D	G	C
	1	2	3	4
Cello	A	D	G	C
	1	2	3	4
Bass	G	D	A	E
	2	3	1	4

Tuning with the pegs

- First, check the bridge to be sure it is in position and straight.
- Always begin with the A string. If your pegs fit well (they don't stick and they aren't too loose in the peg holes) tune with the violin on your shoulder, while bowing the string. Relax the string a bit, lowering its pitch, then draw the bow across it and turn the peg just a little." Keep bowing and turning the peg until the string reaches its true pitch, as compared to the tuning fork or measured by the electronic tuner.
- If the pegs slip when you turn them, you may need to push in slightly as you turn them. If they stick or slip a lot, you can hold the instrument in your lap, pluck the string, then turn the peg as you brace the bottom of the pegbox with your other hand. (In this case, before long you should take the violin to your luthier and have the pegs adjusted or replaced.)
- The secret to successful peg-turning is to listen carefully to the string as it comes closer to the correct pitch. By listening as you twist the peg, you will soon know how much peg movement is needed.
- Now tune the other strings to the A string or to the proper pitch on the electronic tuner.
- Steel strings are more sensitive to turns of the peg than nylon strings, and gut strings are the least sensitive.
- Sooner or later, you probably will twist a peg so hard that the string breaks. Don't be too concerned; use the experience to learn how NOT to do that and practice at changing strings.
- Because wood swells and shrinks with changes in the weather, sometimes pegs get tight, and sometimes they pop loose. For this reason, it's a good idea to **work the peg**s every so often, even if the violin stays in tune so well that all it usually needs is a tweak of the fine tuners.

Using fine tuners

- When you have your instrument well tuned and the weather hasn't changed much, may only need to use the fine tuners on the tailpiece before you start playing. Use your tuning fork or electronic tuner, and make tiny turns with these tuning screws in the same order as when tuning with pegs.
- **Note:** The levers of fine tuners screwed all the way down and never relaxed can leave a mark in the finish of your violin, so occasionally back them out and tune the strings with the pegs.