*** Sizing Charts ***

Use the charts below as a general guideline for determining **BAT LENGTH.**

BATTER'S HEIGHT / BATTER'S WEIGHT	3'-3'4"	3'5"-3'8"	3'9"-4'	4'1"-4'4"	4'5"-4'8"	4'9"-5'	5'1"-5'4"	5'5"-5'8"	5'9"-6'	6'1"-over
under 60lbs	26"	26"	28"	29"	29"	-	-	-	-	-
61-70	27"	27"	28"	29"	30"	30"	-	-	-	-
71-80	-	28"	28"	29"	30"	30"	31"	-	-	-
81-90	-	28"	29"	29"	30"	30"	31"	32"	-	-
91-100	-	28"	29"	30"	30"	31"	31"	32"	-	-
101-110	-	29"	29"	30"	30"	31"	31"	32"	-	-
111-120	-	29"	29"	30"	30"	31"	31"	32"	-	-
121-130	-	29"	30"	30"	30"	31"	32"	33"	33"	-
131-140	-	29"	30"	30"	31"	31"	32"	33"	33"	-
141-150	-	-	30"	30"	31"	31"	32"	33"	33"	-
151-160	-	-	30"	31"	31"	32"	32"	33"	33"	33"
161-170	-	-	-	31"	31"	32"	32"	33"	33"	34"
171-180	-	-	-	-	-	32"	33"	33"	34"	34"
over 180	-	-	-	-	-	-	33"	33"	34"	34"

Age	Length
5-7	24"-28"
8-9	27"-29"
10	28"-30"
11-12	30"-31"
13-14	31"-32"
15-16	32"-33"

Use the charts below as a general guideline for determining **BAT WEIGHT.**

Little League (8-10 yrs)	
Player Height	**Bat Weight**
48-50"	16-17 oz.
51-54"	17-18 oz.
55-59"	18-19 oz.
60+"	19-20 oz.

Youth League (11-12 yrs)	
Player Weight	**Bat Weight**
70-80 lbs.	18-19 oz.
81-100 lbs.	19-20 oz.
101-120 lbs.	20-21 oz.
121-140 lbs.	21-22 oz.
141+ lbs.	22-23 oz.

High School & College	
Player Height	**Bat Weight**
66-68"	27-28 oz.
69-72"	28-29 oz.
73-76"	29-30 oz.
77+"	30-31 oz.

*** Baseball Bat Types ***

- **Tee-Ball Bats**
  Tee-Ball bats are for ages approx 5 thru 7. They are generally used in tee-ball and coach pitch leagues. The bat barrel is 2 1/4 inch in diameter. Bat lengths range from 25 inch to 27 inch. Bat weight is measured in *weight drop*, which varies between brands and models. Heavier bats are around *minus 7* weight drop, lighter bats are around *minus 13*.

- **Little League Bats**
  Little League bats are for ages approx 7 thru 12. They are used in leagues including Little League, Babe Ruth, Dixie Youth, PONY, and AABC. The bat barrel is 2 1/4 inch in diameter. Bat lengths range from 28 inch to 32 inch. Bat weight is measured in *weight drop*, which varies between brands and models. Heavier bats are around *minus 7* weight drop, lighter bats are around *minus 13*.

- **Senior League Bats**
  Senior League bats are for ages approx 10 thru 13. They are used in certain travel and tournament leagues. The bat barrel is available in 2 5/8 inch (high school regulation), and 2 3/4 inch (*Big Barrel*). Bat lengths range from 28 inch to 32 inch. Bat weight is measured in *weight drop*, which varies between brands and models. Heavier bats are around *minus 5* weight drop, lighter bats are around *minus 11*.

- **High School / College Bats**
  High School / College bats are for ages approx 13 and up. They are used in most High School and College leagues. The bat barrel is 2 5/8 inch in diameter. Bat lengths range from 30 inch to 34 inch. Bat weight is measured in *weight drop*, which must be *minus 3*. Most leagues require an approved *BESR* stamp on the bat (Bat Exit Speed Rating).

*** Composite Baseball Bats ***

- **A word about Composite Baseball Bats**

  Composite Baseball Bats, such as the Easton Stealth Composite and Louisville Catalyst, are fairly new to the *Baseball* scene. They have been used in softball for many years. Early on, there seems to be some mixed reviews on the Composite baseball bats. I believe this is because the *baseball* world is not fully educated on these bats, and don't realize how to make a composite bat work for them.

  To start off with, composite bats have a much longer break-in period than aluminum bats, and hitting jugz balls will not do it. If you plan on breaking in these bats in the cages, you need to use real baseballs. Another common complaint in some reviews is the poor durability of these bats. But, what players and coaches must realize is that they are not just swinging a hunk of metal anymore. Composite bats should not be used in cold weather; temperatures less than 70 degrees they can easily break, as many are finding out. Another common complaint is the cost. Yes, they are expensive, but if broken in correctly and used correctly, you will get so much more out of your bat than the aluminum or hybrids of past years.

  There are several Pros and Cons (and misconceptions) about composite bats, but players and coaches need to have the correct information before making a judgment. After I explained the proper break-in and use of composites to a few of our high school players, they were amazed at the difference. At first, the ball will sound like it came off a wooden bat, which was another complaint in many reviews, but with proper effort and care you can break them in to the point where it sounds more like a *rifle* than wood. Players, coaches and parents need to know what they are buying. Without proper knowledge, they are just buying a $300 or $400 *Bat*, but with the correct knowledge they could be buying $300 *Lightning Rod*. Composite bats give a whole lot more forgiveness for the imperfect swing, and have the potential to make the average hitter a clean-up hitter.

  Coach C, Franklin Express.

- General Terms -

- **Weight Drop**
  - Weight Drop is a term used to describe the weight of the bat. Weight Drop is shown as a *minus* number, such as *minus 3* or *minus 12*. It refers to the difference between the length of the bat (in inches) and the weight of the bat (in ounces). Weight drop varies between brands and models. For example, a Little League DeMarini F3 bat is *minus 10*. It is available in lengths from 28 inch to 32 inch. The weight of the 28 inch would be 18 ounces, the weight of the 32 inch would be 22 ounces. Weight drop for Little League bats range from approx *minus 7* to *minus 13*. The higher the weight drop, the lighter the bat. High school and college bats must be *minus 3*.

- **Barrel Size**
  - This is the diameter of the largest part of the bat. Little League bats are 2 1/4 inch in diameter. Senior League bats are available

in 2 5/8 inch and 2 3/4 inch (*big barrel*). High school and college bats are 2 5/8 inch.
    - The longer and larger the barrel, generally, the larger the sweet spot for hitting the ball.
    - Some players prefer baseball bats with smaller barrels and lighter weight, which allows for more bat speed.

- **Bat Taper** (diameter of the bat's handle)
    - Standard baseball bats are tapered 31/32 of an inch but can be slightly larger or smaller depending on whether you want a lighter or heavier bat.
    - Some players like a narrower taper for the lighter weight and to rotate their wrists faster when hitting. Other players prefer the feel of a bigger bat taper, which can also reduce the sting when a ball isn't struck on the sweet spot.

- **Grip** (covering on the handle of aluminum bats)
    - Baseball bats with leather or synthetic leather grips give a tackier feel for a surer grip.
    - Rubber grips absorb more of the shock.
    - Some bats come with a cushioned grip to decrease the shock even more.

- Choosing Youth Baseball Bats -

- **First, three words about bats: "Lighter Is Better"**

  Barry Bonds, who weighs 195 pounds, uses a 28 ounce bat! A light bat is easier to control, and, contrary to old-school thinking, you can hit a ball harder and farther with a light bat than with a heavy bat because you can swing a light bat much faster. As acceptance of this fact has grown in recent years, the overwhelming trend in both baseball and softball has been to lighter bats. In case you need convincing, consider that NCAA and high school reviewing sports bodies have rules prohibiting baseball bats from being more than 3 ounces lighter in weight than the length of the bat in inches. This was done for safety reasons-it was thought that big, strong players swinging ultralight bats hit the ball so hard that infielders were at risk.

  In Little League, however, light bats are not considered to be unsafe for defenders, because the players aren't nearly as big and strong as their older counterparts. Even using an ultralight 19 ounce Little League bat, a typical 90 pound kid won't be able to make up for the disparity in size and strength between himself and a college player. In fact, to have any chance of swinging with proper technique, most Little League players need an ultralight bat.

  It's a bad idea to get a baseball bat that's too heavy for your Little Leaguer with the thought that he or she will "grow into it". Instead, your kid will learn bad habits trying to swing a bat that is too heavy. When in doubt about two bats, go with the lighter bat.

  (Article dated May, 1999)

- **THE RULES**

  Little League baseball bats must be 32" or less and have barrels no more than 2¼ in diameter. The bat must also be made of an approved material, but need not actually say "approved by Little League" on the bat. In practice, every major manufacturer uses approved materials.

- **LENGTH AND WEIGHT**

  Manufacturers typically print the bat's length in inches on the barrel or the handle. They also print the weight, either in ounces, or as "-something". The "-" stands for weight in ounces less than length in inches. In other words, a 30 inch bat designated as "-10" weighs 20 ounces. Weight: In general, buy a bat that is "-10" or lighter.

  The table below probably covers 80% of the players in a given division, but, as they say, "your mileage may vary". Some kids are bigger than others; some are strong for their size; some have already developed good technique. The best any article can give you is a rule of thumb.

  Division (age).....Bat Length, Weight
  Farm (7-8).....26" or 27", -10 or lighter
  Jr. Minors (8-9).....27" to 29", -10 or lighter
  Sr. Minors (9-12).....28" to 31", -10 or lighter
  Majors (10-12).....29" to 32", -9 or lighter

- **MATERIALS**

  Wood is out - has been for years. Wood baseball bats are heavier, less durable, and have less "pop" than aluminum bats. Leave wood to the pros. Most modern bats are made of aircraft-grade aluminum supplied by Alcoa or Kaiser. Variations in the alloy formula have resulted in stronger alloys, allowing the manufacturers to design bats with thinner shell walls, which in turn corresponds to lighter weight. All of these advanced alloys are known by trade names (usually a number), as well as brand names (sometimes the same grade will be marketed under a different brand name by different bat makers). The brand names are heavily hyped: you can be sure that if a bat is made of an advanced alloy, that fact will be trumpeted somewhere on the bat, usually in large bold letters. By the same token, you should beware of bats -11 or lighter that do not state the type of alloy used. They will probably be made of an alloy that is too weak to support the thinner wall required for the light weight.

  Standard aircraft aluminum is designated in the trade as "7046". Most budget bats are made of this grade. "7050" grade alloy includes a small amount of copper, and is about 33% stronger than 7046. About 12 years ago, Alcoa branded its 7050 grade "CU31" and began marketing it in Slo-Pitch bats as the first high performance alloy. The "CU" designation refers to the addition of copper to the alloy. Alcoa's "C405" is the next higher grade, supposedly about 10% stronger than CU31. C405 as introduced 8 or 9 years ago, quickly followed by C405 Plus and C405 Ultra, which are the same alloy manufactured under difference processes. The strength difference between C405 and C405 Ultra is only about 5%. C405 Ultra is, therefore, about 38% stronger than standard aircraft aluminum. "7075" is a new alloy by Kaiser that is claimed to be equal to or better than C405 Ultra. Kaiser's Sc500 Scandium, and Alcoa's C500 and C555 represent the next level up. C500 and Sc500 Scandium are about 3-5% stronger than C405 Ultra, respectively. C555 is claimed to be about 7% stronger than C405 Ultra, or about 40% stronger than standard aircraft grade aluminum.

The current king of the hill is SC777, made by Kaiser. While the other exotic alloys only offer incremental strength gains over CU31, SC777, if the claims are true, represents a truly big leap: about 50% stronger than C405. This means that SC777 is nearly twice as strong as standard aircraft aluminum.

(Article dated June, 2003)

- **WHY ALLOY GRADES MATTER (AND WHY THEY MAY NOT)**

  There's a lot of hype out there about the various alloys. Here's why alloy grade really matters. Manufacturers use advanced alloys in order to be able to make the walls of the barrel of the bat thin while still allowing the bat to be strong enough to resist denting. Thin walls equal light weight. Thin walls are also claimed to contribute to a "trampoline" effect, or rebound, when the bat strikes the ball. The rebound effect enhances power, and therefore, distance, given the same swing speed. Think of throwing a baseball against a wall made of superball material, then against a wall made of concrete.

  Other than allowing for thinner walls, however, there is little power to be gained from the exotic alloys themselves. The various alloys have virtually the same specific gravity, so the walls of a -11 CU31 bat are likely to be the same thickness as those of a -11 SC777 bat. There may be some difference in the trampoline effect, but it is negligible.

  A good rule of thumb: stick to baseball bats made of CU31 or 7050 alloy or better for -10 bats, at least C405 for -11 bats, and C500 or better for -12 bats. If your child is 11 or 12 and uncommonly large and strong, consider Sc777. If the bat is -9 or heavier (I do not recommend bats heavier than -9 in Little League), alloy grade is not that important.

- **OTHER DESIGN FEATURES**

  In addition to advanced alloys, manufacturers also tout special features or manufacturing processes that supposedly increase the durability of their high-performance bats. Easton C-Core and Z-Core bats have carbon fiber bonded to the inside of the barrel walls for increased strength and durability. Easton C-Core and Z-Core bats do have a reputation for durability; whether their durability derives from the carbon fiber is anyone's guess. Worth puts out several bats that hype a "cryogenic" manufacturing process. Testing by B&N Softball, an independent tester of slo-Pitch bats, has shown that "cryogenic" bats offer no strength advantage over non-cryogenic bats of the same alloy.

  (Admittedly, this testing is now 2 years old; perhaps Worth's newest "cryogenic" bats do offer some advantage. Personally I doubt it.) Worth also makes bats that employ variable wall thickness. This supposedly allows stronger, thicker areas to be adjacent to thinner areas, somehow making it less likely that the bats will dent. Louisville Slugger"Air" bats and some Nike bats are filled with pressurized nitrogen to keep the bat from denting. Seems to me that this would affect, and maybe even compromise, the trampoline effect, but I don't know of any testing on the subject.

- **SHOPPING FOR A BAT**

  You can expect to pay anywhere from $40 to $200 for a Little League bat (yes! $200 for a kid's bat!), so it pays to shop around, including on the Internet. As baseball bats become more and more of a status item, like

skis, manufacturers come out with new designs, or at least new paint jobs, every year. Sometimes you can find last year's model for a lot less than the current model, and sometimes last year's model will actually be better.

- Metal vs. Wood -

Metal baseball bats significantly outperformed wooden bats according to a recent study by a group of Brown University bioengineers, confirming a belief widely held by players and coaches. The average speed of a ball off the fastest bat, a metal model, was 93.3 mph; the average off the slowest bat, a wooden model, was 86.1 mph. Only 2 percent of hits made with wooden bats exceeded 100 mph, while 37 percent of the hits with the fastest metal bat were more than 100 mph, according to Joseph J. Crisco, associate professor of Orthopaedics at the Brown Medical School. The findings were published in the October 2002 issue of Medicine and Science in Sports and Exercise.

Although there is a general consensus that metal bats outperform wooden bats, few scientific studies have documented performance differences. In addition, the study confirmed the notion of a "sweet spot" associated with maximum ball speeds – those within the top 20 percent of the fastest hits from each bat model. The sweet spot was located approximately the same distance from the tip of wooden bats as it was from the tip of metal bats. Researchers concluded the metal bats produced faster batted ball speeds in part due to faster swing speeds, and in part to greater elastic properties found in nearly all of the metal bat models. In general, the lighter bats were swung faster and were associated with faster batted ball speeds.

Nineteen baseball players at the level of minor league, collegiate, and high school participated in the study. They used two wooden and five aluminum models from four manufacturers. Researchers measured batted ball speed, bat swing speed, bat impact location, and the elastic performance properties of the bats. Each player faced 10 to 20 pitches from a pitching machine with each bat. Researchers surrounded home plate with scaffolding supporting four infrared-sensing cameras to track the three-dimensional trajectory of the bat before impact as well as the pitched and batted ball; the cameras sensed reflective tape affixed to the bats and the balls. More than 1,000 pitches were recorded, of which about half were able to be analyzed. The others resulted in foul balls, pop-ups, missed pitches, or incomplete data.

The findings contribute to an ongoing dialogue about whether metal baseball bats increase the chance of injury to a pitcher – something this study did not examine – and therefore should be regulated. Currently high school and college players use aluminum and other metal alloy bats, while wooden bats are used in major and minor league baseball. However that may change. A recent decision by the Massachusetts Interscholastic Athletic Association, which regulates high school play, requires wooden bats in the 2003 tournament. Metal bats were introduced in the 1970s as a cost-saving alternative to wooden bats that were prone to break. A decade later, a general consensus had developed among players and coaches that metal bats could outperform wooden ones. In the late-80s, the National Collegiate Athletic Association implemented guidelines for weight and length of bats.