Augusta Junior Rowing

Viewing Guide

General Information

In rowing, boats—also called *shells*—are divided into two categories, *sculls* and *sweeps*. In a scull, each rower has two oars, each about 9.5 feet long. Sculls can be *singles, doubles*, or *quads.* In a sweep, each rower has only one oar, 12 feet long. Sweeps come in *pairs* and *fours*, with or without a coxswain, and *eights* with a coxswain. In both kinds of racing boats, rowers are able to take long and powerful strokes with the oars because their feet are tied into shoes. They move back and forth on seats that roll on a track about 2.5 feet long and they have swivel oarlocks. Racing shells are light and streamlined, made out of special cedar wood skin or a thin carbon fiber composite less than an eighth of an inch thick. For example, an *eight* (a boat with eight rowers, each rowing one oar) is about 60 feet long, weighs less than 250 pounds, and can carry a crew weighing as much as 1,800 pounds. The common racing distance is 2,000 meters, or about 1.25 miles. Under good conditions, a world-class eight crew can row this distance in less than five minutes at an average speed of just over 13 mph. High school (junior) races are typically 1,500 meters.

Boat Positions

There are eight rowing positions in the largest racing shell. Seats 1 and 2 are referred to as the bow pair. This pair is special, as they "set the boat." Rowers in these positions must have smooth and fluid technique. Seats 3, 4, 5 and 6 are referred to as the power, or "engine room" seats. Rowers in these positions must be large and strong. Seats 7 and 8 are referred to as the stern pair. They set the stroke rate for each side of the boat. The 8 seat is usually the hardest to row. Bow seats require fluid and consistent rowers, but it's important to remember that all three sections of the boat are equally important. A winning boat consists of eight people rowing together as a team under the direction of their coxswain. The coxswains are team members who are often overlooked, receiving little praise or encouragement (other than being thrown into the water to celebrate a boat's victory). The coxswain is the eyes and ears of the boat. The coxswain has to be a good motivator because, once the race begins, the coxswain is the only one who can talk to the rowers. The coxswain must guide the boat to the starting line and get the boat lined up. Once the race begins the coxswain talks to the rowers, telling them where they are in relationship to the other boats and how much farther they have to go. A coxswain must know rowing technique, so that if a correction is necessary, he or she will know what to do and why to do it. It is vital that the coxswain communicates with the rowers in a motivating way. The coxswain steers by giving directions to the rowers, watches for competing boats ahead and behind, and keeps the boat in proper lane to avoid penalties.

Racing Fundamentals

In general there are two rowing seasons. Head races are conducted during the fall months. Some popular head races are The Head of the Charles held in Boston and The Head of the Hooch in the Southeast. In a head race crews race in staggered running starts for time over winding river courses lasting several miles. These races usually take between 15 and 20 minutes. Obviously these headraces require great endurance. The spring season is the season of the "Sprints". Crews are held stationary at the start and take off on the commands of the regatta official. Should a crew anticipate the command and cause a false start, the starter or referee will call all crews back to the start. A crew assessed two false starts may be disqualified. Once the race has begun, only the referee may stop the crews. A referee in a motor launch follows the race. The referee is the sole authority of whether the crews are complying with the rules of racing. The boats are to stay in their lanes. Crews that stray out of their lane will not necessarily be penalized as long as they do not interfere with or impede any other competitors. A group of judges at the finish determines the order of finish and takes times. The winning boat is the one whose bow first crosses the finish line. A good crew must be precise. The oars and rowers must move together as one. At the beginning of the stroke the oars should catch the water quickly. During the stroke, the oar blades should remain buried. At the finish of the stroke all oars should leave the water together without splashing. Between strokes, on the recovery, the oars are turned parallel to the water. This is called feathering and the purpose is to cut down wind resistance and avoid hitting the water. As the rower approaches the catch, the oar is squared up again. While the finish is obviously an exciting part of any race, the start is often the most thrilling part of rowing a race. The sight of six eight-oared shells pounding off the line at forty or more strokes a minute is one of the most exciting moments in crew. Even the most inexperienced spectator can spot a good crew. A well-rowed shell will run smoothly through the water with very little check between strokes.

The Rowing Events

There are 24 events in the FISA World Championships – 14 for men and 10 for women. Events are divided into two disciplines: sweep rowing and sculling, and two categories within those: lightweight and open.

Sculling and Sweep Rowing

Athletes with two oars – one in each hand – are *scullers*. There are three sculling events: the single – 1x (one person), the double – 2x (two) and the quad – 4x (four).

Athletes with only one oar are *sweep* rowers. Sweep boats may or may not carry a coxswain (pronounced cox-n) to steer and be the on-the-water coach. In boats without coxswains, one of the rowers steers by moving the rudder with his or her foot. Sweep rowers come in pairs with a coxswain (2+) and pairs without (2-), fours with a coxswain (4+) and fours without (4-) and the eight (8+), which always carries a coxswain. The eight is the fastest boat on the water. A world-level men's eight is capable of moving almost 14 miles per hour. The pairs and fours with coxswain are sometimes the hardest to recognize because of where the coxswain is sitting. Although the coxswain is almost always facing the rowers in an eight, in pairs and fours the coxswain may be facing the rowers in the stern or looking down the course, lying down in the bow, where he or she is difficult to see. Their seat in the boat identifies athletes. The athlete in bow is seat No. 1. That's the person who crosses the finish line first (which makes it easy to remember – first across the line is No. 1 seat). The person in front of the bow is No. 2, then No. 3, No. 4, No. 5, No. 6, No. 7 and No. 8, a.k.a. the stroke. The stroke of the boat must be a strong rower with excellent technique, since the stroke sets the rhythm and number of strokes per minute the rest of the crew must follow.

The Race

All events at the FISA World Championships and Olympic Games are 2,000 meters, or approximately 1.25 miles. The racecourse is divided into six lanes and each 500-meter section is marked with buoys. The race begins with all boats aligned at the start in the lanes they've been assigned. Individuals in each lane hold the stern of each boat steady while an official, known as the aligner, ensures that each boat is even with the others and squarely facing the course. Each crew is allowed one false start; two means disqualification. If within the first 100 meters there is legitimate equipment breakage (e.g., an oar snaps in two), the race will be stopped and restarted with repaired equipment. The *stroke rate* (the number of rowing AJRC per minute that a crew is taking) is high at the start – maybe 45 to even 50 for an eight; 38 to 42 for a single scull. Then, the crew will "settle" into the body of the race and drop the rating back – 38 to 40 for an eight; 32-36 for a single. The coach and the way the race is going determine when the crew will sprint but finishing stroke rates of 46+ in the last 200 meters aren't unheard of. However, higher stroke rates are not always indicative of speed. A strong, technically talented crew may be able to cover more water faster than a less-capable crew rowing a high stroke rate. Unlike canoe/kayak competitions, rowers are allowed to leave their lanes without penalty, so long as they do not interfere with anyone else's opportunity to win. An official follows the crews to ensure safety and fairness. Despite the exhaustion of the race, the crew will row for five to 10 minutes afterwards in order to cool down. In rowing, the medals ceremonies include the shells. The three medal-winning crews row to the awards dock, climb out of their shells and receive their medals before rowing away.

The Stroke

The whole body is involved in moving a shell through the water. Although rowing tends to look like an upper body sport, the strength of the rowing stroke comes from the legs.

The stroke is made up of four parts: *Catch, Drive, Finish and Recovery.* As the stroke begins, the rower is coiled forward on the sliding seat, with knees bent and arms outstretched. At the *catch*, the athlete drops the oar blade vertically into the water.

At the beginning of the *drive*, the body position doesn't change – the legs do all the work. As the upper body begins to uncoil, the arms begin their work, drawing the oar blades through the water. Continuing the drive, the rowers move their hands quickly into the body, which by this time is in a slight "layback" position, requiring strong abdominal muscles.

During the *finish,* the oar handle is moved down, drawing the oar blade out of the water. At the same time, the rower "feathers" the oar – turning the oar handle – so that the oar blade changes from a vertical position to a horizontal one. The oar remains out of the water as the rower begins *recovery,* moving the hands away from the body and past the knees. The body follows the hands and the sliding seat moves forward, until, knees bent, the rower is ready for the next catch.

The Equipment

Oars

Oars move the boat through the water and act as balancers. Sweep oars are longer than sculler's oars and have wooden handles instead of rubber grips. The shaft of the oar is made of extremely lightweight carbon fiber instead of the heavier wood used years ago. The popular "hatchet" blade – named because of its cleaver-like shape – is about 20 percent larger than previous blades. Its larger surface area has made it the almost-universal choice among world-level rowers.

The Boats – Sculls and Shells

All rowing boats can be called shells. Rowing boats with scullers in them (each person having two oars) are called sculls, e.g., single scull, double scull, quadruple scull. So, all sculls are shells but not vice versa! Originally made of wood (and many beautifully crafted wooden boats are made today), newer boats – especially those used in competition – are made of honeycombed carbon fiber. They are light and appear fragile but are crafted to be strong and stiff in the water. The smallest boat – the single scull – is approximately 27 feet long and as narrow as 10 inches across. At 58 feet, the eight is the longest boat on the water. The oars are attached to the boat with riggers, which provide a fulcrum for the levering action of rowing. Generally, sweep rowers sit in configurations that have the oars alternating from side to side along the boat. But sometimes, most typically in the 4- or 4+, the coach will rig the boat so that two consecutive rowers have their oars on the same side in order to equalize individual athlete power.

Race Watching

The crew that's making it look easy is most likely the one doing the best job. While you're watching, look for –

- Continuous, fluid motion of the rowers. The rowing motion shouldn't have a discernible end or beginning.
- Synchronization. Rowers strive for perfect synchronization in the boat.
- Clean catches of the oar blade. If you see a lot of splash, the oar blades aren't entering the water correctly. The catch should happen at the end of the recovery, when the hands are as far ahead of the rower as possible. Rowers who uncoil before they drop the oar blades are sacrificing speed and not getting a complete drive.
- Even oar blade feathering. When the blades are brought out of the water, they should all move horizontally close to the water and at the same height. It's not easy, especially if the water is rough.
- The most consistent speed. Shells don't move like a car – they're slowest at the catch, quickest at the release. The good crews time the catch at just the right moment to maintain the speed of the shell.
- Rowing looks graceful, elegant and sometimes effortless when it's done well. Don't be fooled. Rowers haven't been called the world's most physically fit athletes for nothing. A 2,000-meter rowing race demands virtually everything a human being can physically bring to an athletic competition: aerobic ability, technical talent, exceptional mental discipline, ability to utilize oxygen efficiently and in huge amounts, balance, pain tolerance, and the ability to continue to work when the body is demanding that you stop.

More Race-Watching Tips

- Race times can vary considerably depending upon the course and weather conditions. Tailwinds will improve times, while headwinds and crosswinds will hamper them.
- If a crew "catches a crab," it means the oar blade has entered the water at an angle instead of perpendicularly. The oar blade gets caught under the surface and will slow or even stop a shell.
- A "Power 10 or 20" is a call by the coxswain for 10 or 20 of the crew's best, most powerful strokes. Good coxswains read the course to know how many strokes remain to the finish.
- Crews are identified by their oar blade design. The USA blades are red on top and blue on the bottom, with a white triangle at the tip.

- It doesn't matter whether you win an Olympic medal or don't make the finals – each crew still carries their boat back to the rack.
- Their crews throw coxswains from first-place boats worldwide into the water.
- Coxswains don't now and probably never did yell "stroke! stroke!" Similar to a jockey, their job is to implement the coach's strategy during the race, in addition to steering and letting the rowers know where they stand in the race and what they need to do to win.

Glossary

Beat: The number of rowing stokes per minute (spm); the number can range from 0 (the crew is sound asleep) to 50+, usually between 16 and 42, depending on the workout. Nothing to do with the power of the stroke, it is a measure of how frequently the crew is putting the oars in and out of the water.
Bow: The front of the boat; the end to which the rowers turn their backs. Bow is also the name given to the rower in the bow seat position.
Bowman: An old-fashioned term, no longer used in mixed company (now "bowperson" or "bow"), for the rower who sits nearest the bow of the shell.
Calling seats: In a race, coxswains do whatever they can to keep the rowers motivated and fierce.
One way is to "call seats" as a crew passes the competition, to indicate to the rowers exactly where they stand. "I've got three seat" means that he or she (the coxswain) is level with the competition's three-seat rower. The coxswain may do this through the boat, calling every one or two seats he or she has urged her crew to pass. Once the coxswain is even with the bowball (the front tip of the boat), he or she may scream "BOWBALL!"
Catch: The entrance of the oar blade into the water at the beginning of the stroke.
Coxswain: The crewmember who steers the boat, usually from a seat in the stern, but also in modern pairs and fours and some eights, while lying down in the bow. Pronounced *cox'n*.
Coxbox: A small microphone worn by the coxswain enabling the crew to hear the cox; coxes otherwise are in continuous danger of being unheard.
Crab: The oar blade gets twisted at an angle and gets caught; this is a stroke that goes bad and when really bad can catapult the rower right out of the boat.
Ergometer (erg): A stationary rowing machine used for training. It is instrumented to show the power produced.
Erg score: The score of any test on the erg machine. It may be in terms of time: the time it took to pull a certain number of meters, or in distance: the number of meters pulled in a certain time or in watts.
Double: A sculling boat for two rowers.
Eight: A sweep boat for eight rowers always with a coxswain.
Feather: To turn the blade over, parallel to the water, at the end of the pull-through, to lessen wind resistance. If feathered underwater a crab will result.
Finish: The part of the pull-through or stroke just before the oar is taken from the water.
FISA (Federation Internationale des Societes d'Aviron): the international governing body of rowing.
Four: A sweep boat for four rowers, with or without a coxswain. (4+ = with a cox; 4 - = no cox.)
Hatchet: A relatively new blade design, with a larger surface area and a shape like a hatchet or meat cleaver.
Henley distance: The length of the course at Henley-on-Thames: one and five-sixteenths miles; *see also* Olympic distance, for which it was the model.
Oar: Also called the ***sweep,*** if pulled by one or more rowers using both hands, and a "scull" if by one hand, that the rower pulls through the water to move the boat. It is about 12 feet long. The section between the end of the handle and the point at which the oar passes through the oarlock is called the ***inboard*** of the oar or the ***scull;*** the rest, out to the tip of the blade, is called the ***outboard.***
Oarlock: A U-shaped swivel of metal or plastic that holds the oar with a "gate" across the top.
Olympic distance: Two thousand meters (one and one-quarter miles). It is the nearest even metric to the Henley.
Outrigger: Also called the ***rigger,*** a metal or reinforced plastic extension framework used to support the oar.
Pair: A sweep boat for two people; a ***double*** is a two-person boat where each person has two oars.
Piece: A practice usually consists of a warm-up and a workout. The workout is broken down into segments, called "pieces," such as two 30-minute pieces, four 10-minute pieces, or a bunch of 20- stroke pieces.
Power Ten or Twenty: A tactical burst of speed for 10 or 20 strokes; frequently accompanied by an increase in the beat.
Port: The left side of the shell as one faces the bow.

Puddles: The swirls of water left by the stroking oars. The distance between sets of puddles (spacing) is a measure of the boat's pace when adjusted for different stroke rates.
Pull-through: The effort of the stroke.
Quad: A boat with four scullers, using 8 oars.
Racing Start: The first 20 to 40 *AJRC* of a race, quicker than those of the rest of the race; the first few are also shorter in pull-through.
Rating: The number of stokes per minute; the rate of striking or cadence. The Juniors range between 25-34 strokes / minute.
Ratio: The balance between the time spent on the recovery and the time spent on the pull through; an effective ratio produces the best results for the power expended and will vary for every crew
Recovery: The part of the stroke between the release and the catch during which the oar travels in air and the seat usually returns to the stern end of the slide.
Release: The maneuver in which the oar is taken from the water and feathered.
Rigger: Either an "outrigger" - The device which allows the oarlock to be outside of the shell which permits longer oars and better leverage, or a person who rigs boats (a "rowing" mechanic).
Rigging: The complex relationship between the oar, the rigger, and the position of the rower. Changing the rigging means changing the leverage, just as a bicycle rider changes gears. Most crews have an optimum number of strokes per minute (usually 32-36) depending on their size, strength, and experience. The rigging is adjusted to keep them rowing at that rating whether they have a headwind or tailwind.
Rudder: A steering device at the stern, controlled by the coxswain.
Shell: A narrow, light monocoque racing boat.
Scull: a) An oar shorter than a sweep; between 9 ft. 6 in. and 10 ft., used for singles, doubles, or quads.
b) A monocoque racing boat that is propelled by sculls.
Single: A sculling boat for one person.
Starboard: The right side of the boat as one faces the bow.
Stern: The back of the boat, toward which the rowers face.
Stroke: a) The rower nearest the stern, who sets the rhythm and cadence for the crew.
b) The complete action of the rowing motion: the catch, pull through (drive), finish, release and feather,
Stroke Rate: The number of strokes per minute.
Stroke Watch: A stop-watch specially calibrated to give stroke ratings over 3 or 4 strokes.
Sweep or Rowing Sweep: Rowing with one oar per person, as distinct from sculling.

Rowing Books, Websites, and other Sources of Information

Websites

The following sites are a good place to start when exploring rowing on the web.

row2k.com
rowersworld.com
usrowing.org
fisa.org

Books

- *American Rower's Almanac* (also order through www.rowersalmanac.com) Very helpful to high school juniors and seniors and their families for information on all the colleges that have varsity and club crew teams, plus division, size of team, coaches' names, etc. Produced every two years (2000, 2002, 2004, etc.)
- *The Shell Game* by Stephen Kiesling
- *Wanted: Rowing Coach* by Brad Lewis
- *Rowing* by Silken Laumann
- *Assault on Lake Casitas* by Brad Lewis
- *The Amateurs* by David Halberstam
- *Finding Happiness Sitting on Your Butt Going Backwards* by Mike Davenport
- *Coxswain's Manual II* by Joe Keeley
Covers technique and the coxswain's view of rowing skills; the only comprehensive book on

coxing and it's also useful for rowers. See below for related videos.

- *Rowing — The Skills of the Game* by Rosie Mayglothing

Clear explanations with photos on equipment, safety, skills, and training. A wonderful first book for beginners; highly recommended.

- *Sports Nutrition* by Nancy Clark

Training diets to improve performance; includes recipes. The author writes a bi-weekly column in The Independent Rowing News. $30 annual bi-weekly subscription. See below under magazines.

- *The Heart Rate Monitor Book* by Sally Edwards

Straightforward explanations of training based on heart rates; a clearly written guide for both recreational and competitive rowers.

- *The Complete Book of Rowing* by Stephen Redgrave

Britain's five-time Olympic medallist covers all aspects of rowing. This, the most up-to-date, encyclopedic source, is highly recommended.

Videos

- The Coxswain's Video, 1 and 2, by John Keeley

#1 is an introduction to rowing and coxing and includes 25 drills.
#2 covers advanced drills and racing tactics and discussions about common errors and how to correct them recommended for coaches and rowers.

- Comprehensive Sculling Technique by John Marden

Technique, drills, slow-motion clips, and stroke analysis. Marden is an Olympic rower.

Magazine Subscriptions

- Independent Rowing News: Call 603-643-0059 $30/year.