

Team scoring for single events

Athletpath suggested team scoring system for events with different categories, age groups, and genders.

System basis

Our system recommendation is based loosely on cross-country running scoring systems whereby teams have a certain number of scoring members, all athletes are ranked in a single uniform list, and the team score is generated by adding scoring members places. Teams are thus rewarded for having their athletes perform closer to the front of the race.

A common scoring system has teams comprised of 7 members, with 5 places scoring. So if Team A places 1st, 5th, 8th, 9th, 15th, 22nd, and 34th; then places 1, 5, 8, 9, and 15 are added to create a team score of 38. Places 22 and 34 are not counted in the scoring, but are kept in the place list as “displacers”, increasing the scores of other teams. Lowest score wins, so if the next lowest scoring team has 43 points, then Team A wins.

Cross-country scoring depends on all athletes to be in one race. This usually isn't a problem because the athletes are all of a similar age, the same gender, and competing for a school or country. Race directors for events in the general population, though, are challenged in that racers identifying with a team or club can be spread across ages and genders. A fair and compelling scoring system is thus difficult to calculate and as a result few events have them. When events do have them, points are often assigned at par across categories, which encourages “sandbagging” and damages the integrity of the result.

Athletpath believes that proper team scoring encourages the creation of teams and has the ability to grow race participation exponentially through peer encouragement.

Goals

For any scoring system a race director should ask themselves what their goals are, and to make sure the system rewards behaviours consistent with those goals. We defined several common goals when addressing the problem of series scoring.

- **Event participation** - We want as many racers as possible to feel encouraged by the team points race to participate in the event and improve their team's placing.
- **Simplicity** - A scoring system should be easy to understand so that competitors feel engaged by the system and know what they need to do in a particular race to achieve their team goals.
- **Gender and age equality** - Competitors are valued in the scoring by how they perform relatively to their age and gender cohorts. So a 10 year old Lance Armstrong who beats all the 8-12 year olds, is valued the same in team scoring as a 30 year old Lance Armstrong that beats all the 19-35's, is valued the same as a 70 year old Lance Armstrong that beats all the 65+ competitors.

Creating unified age/gender categories

A cross-country style scoring system relies on athletes having their places ordered. In a race where everyone starts together this isn't a problem, but when age groups are broken up by categories and racing at different times, such as in cycling events, athletes need to be arranged in order. Furthermore, sometimes categories can span core age groups, such as a Pro category with no age group distinction, or a Cat 1 45+ category while there are also Cat 2 45-55 and Cat 2 55+.

To solve the first problem, with categories racing at different times, our system prescribes that all categories by an age group be combined, with the highest-level (fastest) category coming first, followed by the athletes in the second category, then the third, etc.

Example

A cycling race with 3 categories (with A being the highest category)

	Category A 19-34	Category B 19-34	Category C 19-34
# of competitors	83	122	93
Race result places	1-83	1-122	1-93
Combined result places	1-83	84-205	206-298

In this case we've taken three races at potentially different times, distances, and conditions, and normalized them into one 298 person race.

Eliminating improperly categorized racers

A fear of any category system is "sandbagging" whereby a racer competes at a lower category than they're capable of in order to win the race (note that mass start races do not have this problem). At least from a team scoring perspective our system discourages this practice because **a racer in a lower category can score no better than the worst person in the category above.**

This introduces the problem of a reverse-sandbagger, though, whereby a racer competes at an inappropriate level in order to score more points for their team. One can imagine a scenario where a Category C racer enters the Category A race so they could score hundreds of points better in the team competition. We solve this problem by not scoring the bottom 10% of each category in the team competition, except for the lowest category, in which all competitors would be allowed to score.

Example

	Category A 19-34	Category B 19-34	Category C 19-34
# of competitors	83	122	93
Race result places	1-83	1-122	1-93

# of racers making the cut	75	110	93
Combined result places	1-75	76-185	186-278

The bottom 10% is a somewhat arbitrary number, and should preferably be chosen prior to the start based on the historical results of the event.

Integrating categories that span age groups

Sometimes an open Pro category exists with no age restriction, or a category will span age groups due to a lack of participation at some levels. To solve this issue, we merely distribute people from those categories to their underlying age groups (after first dropping the bottom 10% from their race if it's an upper-level category).

Example: Including Pro racers in age group scoring

Pros are positioned atop the category hierarchy, yielding the strongest points for their team within the age group. In this example the (35) pros aged 19-34 are scored atop the age group.

	Pro	Category A 19-34	Category B 19-34	Category C 19-44
# of competitors	70	83	122	93
Race result places	1-70	1-83	1-122	1-93
# of racers making the cut	63	75	110	93
# of remaining 19-34 yr/old racers	35	75	110	42
Overall result places	1-35	36-110	111-220	221-262

Normalizing scores of combined age/gender groups

Age groups can vary wildly by size, and as a result relatively uncompetitive categories can have an outsized influence on the results of the team competition. To account for this we normalize each place in an age/gender group on a 100 to 0 scale using the formula:

$$100 * (n - p + 1) / n$$

Where p is the place that someone got in the combined age/gender group, and n is the number of people in the age/gender group.

This means that the fastest people for their age group and gender all score 100 points, and the slowest can score no worse than just above 0 points. Everyone else is somewhere in between with a score corresponding to the percentile of their finish in their age group.

Combining all racers and team scoring

Once normalized scores have been established for each racer by their age/gender category, all racers can now be combined into a single pseudo race, ranked by their normalized score. So all the winners of the age-group are at the top with 100 points, and all the slowest people are at the bottom with a score approaching 0.

Team scores can now be established by tallying up the normalized scores of the top x members of each team, where x is the specified number of team members required to score in the event. The winning team then has the highest score. If a team has less than x members, they can still be scored by adding the points of as many members as they have.

Number of scorers

The maximum number of scorers for each team should vary by a particular event. Five racers (any combination of five across all age and gender categories) is a good baseline number, but a good rule is a look at historical results and pick a number of racers by which 80% of registered teams would have enough people to reach that number.

We suggest that the maximum number of scorers be published ahead of time to encourage teams to make sure a minimum number of people sign up for and compete in the event.

Pro and youth categories

Pro youth categories can either be integrated into their age groups as outlined, or scored separately depending on the flavor of the event.

Beginner categories

We feel that beginner categories are inappropriate for any type of scoring, since a beginner category is a chance for people to get acquainted with the sport in a non-competitive environment. This encourages competitive beginners to advance to scoring categories as soon as they're ready.

Ties

Ties are broken by whichever team has the lowest scoring team member. In the event of a subsequent tie it goes to the next lowest scoring team member and so forth.

Series scoring

Just like for individuals in a series category, teams accrue series points at races based on the Series Scoring for Individual Events.

Team series point schedule for each event

1 st	2 nd	3 th	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 st	12 th	13 th	14 th	15 th	16 th	17 th	18 th	19 th	20 th	21 st	22 nd	23 rd	24 th	25 th	26 th	27 th	28 th	29 th	30 th
100	80	60	50	45	40	36	32	29	26	24	22	20	18	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

We recommend that all events count towards series score, and that the team with the most points wins the series.

Alternate series scoring

Alternately, a running total of points could count towards series score, but this could amplify the effects of a poorly attended race.