

## Do I Grade on a Curve?

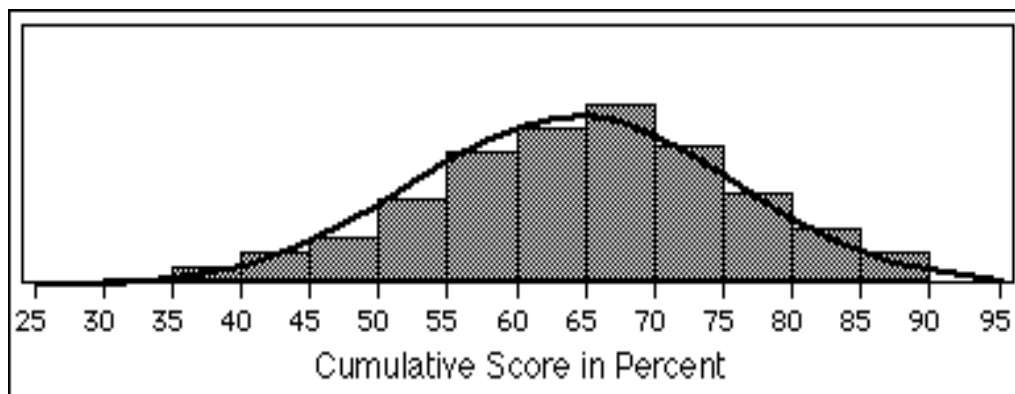
### Grading on a “Curve” versus Grading based on “Mastery of the Material”

Course grades are an essential way to gauge the mastery of the material presented in a course. Tests, quizzes, practicals, lab reports and homework assignments all motivate the student to learn the material. Even the actual process of taking an exam has been found to improve the long-term retention of a subject. Something about the potential reward of a “good” grade and the tension of the “anxiety” of a possible poor performance stimulates learning of the material. As human beings we like to have indicators of who has done more or less well. Grades are a reward and they are a punishment. Thus grades are not only related to motivation and evaluation, but also serve our sense of “just rewards”.

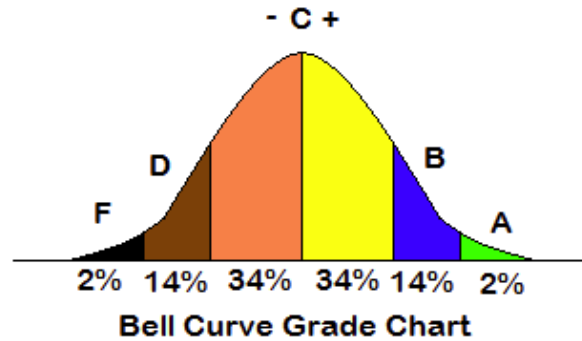
All instructors strive to create grading schemes that reward activities that they think correlate with learning. The instructor wants to know how much you have learned compared to what you could have learned. For whatever purposes, people can judge you as knowing little about a subject if you got a D, minimally competent if you got a C, on top of things with a B, and very good at the subject with an A.

The instructor also wants his course grades to be roughly comparable to the kinds of grades you are likely receive in other courses. For example, if one professor gives you a C instead of D or F, other professors interpret that to mean that you know enough to not drag down the classes you take from them, especially classes that depend on the material for which you just got that C grade. Grading is a complex, imprecise process. How to grade can create considerable controversy, since there is more than one grading method from which to choose.

Many instructors have a tendency to place students on a **Curved Grading Scale** based upon the ‘average’ student's performance during the semester. This is often done because it makes it easy for professors to assign final grades. Instructors can also feel more comfortable about their exams because any unfair questions will be normalized out through the curve. It is comfortable to use a curved scale, too, because many of the courses the instructors had were taught on curved grading scales.



The "bell curve" is used in statistics to show the distribution of any set of data. It's called a *bell curve*, because once the data is plotted on a graph, the line created usually forms that shape. In a 'normal' distribution, most of the data will be near the middle or the 'mean', with very few figures toward the outside of the bell. Grading on a curve implies that there are a fixed number of A's, B's, C's, D's and F's. Most of the grades will be C's; there will be as many D's as B's; and, there will be as many F's as A's.



In using a bell curve for grading, any allowance for a judgement of a student having actually mastered the material is trivialized. Curved grading scales are based upon statistical assumptions that the class is large and that the student body is randomly dispersed over a wide range of performance. However, most course sections are quite small and rather than having hundreds of students may have only a dozen or two; the small size of the class could dramatically skew the results such that students who do actually master the material may be "downgraded" and some who have not really mastered it will receive a considerably higher grade. A small test population with a minimal difference between the highest score and the lowest score will not result in an effective bell curve scale.

Further, such grades may actually pit students against each other. If there are only so many A's to be had in a class, students are competing for the A's. One person doing well makes it harder for another to get an A. It gives no reward for students helping each other. Both high performing and low performing students will often change how they allocate their efforts among their classes when a curved grading scale is used in one or several of them. Students who normally do very well in their courses compared to their peers may choose to allocate less effort in a course when it is graded on a curve. Students performing poorly may feel that investing more time in study is not going to improve their grade. Students on curved grading scales are generally motivated by grade-based considerations to learn material instead of an innate 'desire to learn'.

A common variation of "grading on a curve" is to use a variety of different methods to adjust the test grade in some way. Most of the time, this type of grading boosts the students grade by moving his or her actual percentage up a few notches or boosting the letter grade. Grades for

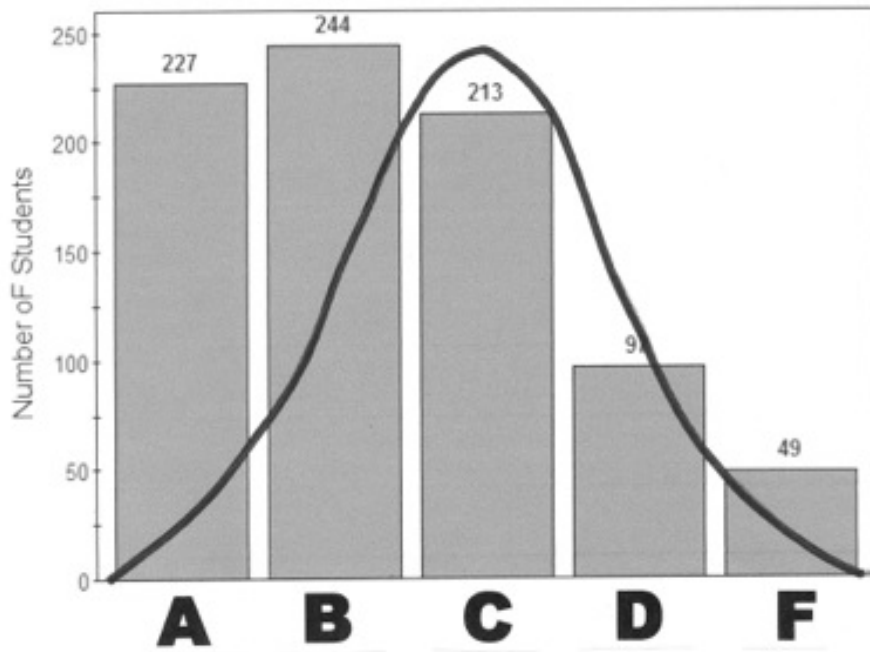
each test become a “moving target”. This method of grading can be unfair and irritating to students because some grades might be adjusted at a higher percentage than others thus negating any extra effort by the best students and rewarding students who did not actually perform as well as their new grade might indicate.

**Performance Based Grading** assigns a grade cutoff before the semester begins with no limits on the number of A's, B's and C's. For example, everyone with a total score over 80 would get a B. Performance based grading requires a significantly greater level of objectivity by the instructor. Any seasoned instructor worth their salt has a reasonably accurate assessment of what constitutes A, B, C or D level work in their courses. That instructor can easily evaluate when a student is not performing up to acceptable standards for each grade.

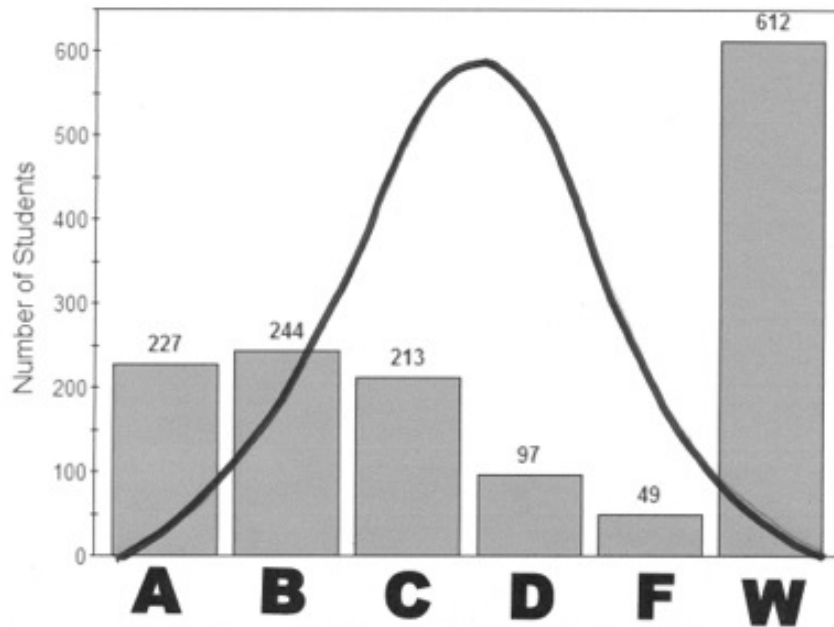
However, there is still room to make slight adjustments in the overall difficulty of the materials or the tests throughout the semester depending on the general nature of the small group of students in each section and how well they seem to be understanding and mastering the material. But rather than adjusting the students' grades *after* testing to fit some fluctuating curve that trivializes the accomplishments of the A students and often rewards the lower scoring students, everyone now is tested on the same scale. There is no “moving target”.

Grades should mean something more than flattery. Grades speak to the world, not just to students. An instructor does not give grades, the grade is earned and reflects the amount of dedication and effort a student gives to the course.

Below are the actual **Performance Based** grades for all of the Introductory Anatomy & Physiology students I have had over the past 30 years of teaching the course compared to what the grade distribution “should be” based on a **Curve**:



All grades for Steve Ziser’s Introductory Anatomy & Physiology (830 students in 76 sections from fall 1985 to fall, 2014) excluding withdrawals. If a “straight curve were used there would have been many fewer A’s and B’s and many, many more C’s & D’s.



All grades and withdrawals for Ziser’s Introductory Anatomy & Physiology (1442 students in 76 sections from fall 1985 to fall, 2014). The average withdrawal rate for students in ALL of ACC’s Math and Science courses varies from 40 to over 50%; my course average rate of withdrawal over the past 20 years is 42%. Even including all those who withdrew, a straight curve would produce many fewer A’s and B’s and many many more C’s, D’s and F’s