



## Use Mathematically Accurate Grading Scales

The goal of grades is to provide an accurate description of what students have learned (Guskey, 1996) related to course outcomes. To ensure this, instructors must consider: (a) the effect of calculating central tendency or an average; (b) the effect of extreme marks, especially zeros; and (c) the possible use of incomplete grades (O'Connor, 2010).

### The 100-Point Scale

Although there are exceptions, most grading systems rely on a 100-point scale. The scale itself is problematic because 60% of the scale represents failing (0%–59%), whereas just 21% represents a B or above, the grades that most often represent meeting standards. The 100-point scale is simply mathematically unsound, particularly when we assign a zero (Feldman, 2018).

Consider a student who earns a 95, 85, 75, and 65 on four of the course assignments and then receives a zero for failing to submit the final assignment. Based on the first four grades, the student has an average of 80%. However, when we add the 0 into the calculation, the grade is reduced to a 64%, or a D. The increased negative impact of a zero, because of the lopsided scale, often makes it a challenge, if not impossible, for a student to recover from that failure. Feldman and others recommend two more accurate alternatives: minimum grading and the 0–4 point scale.

### Minimum Grading

Minimum grading works to correct the 100-point-scale problem by ensuring that each grade level be represented by an equal number of points. This requires setting a minimum score above zero, often set at 50%, which ensures that the number of points from an F to a D is the same as from a B to an A.

90–100 = A

80–89 = B

70–79 = C

60–69 = D

50–59 = F

You may worry that this process results in grade inflation. Peer-reviewed research conducted by the University of Massachusetts (Carifio & Carey, 2013) found that minimum grading used over a seven-year period at a local high school did not lead to widespread grade inflation. Carifio & Carey (2013) note how minimum grading yields more equitable results for students:

Students fail for many reasons, but minimum grading is a specific grading practice targeted at a very specific cause of student failure: poor performances early in the learning process that put the student in so deep of a hole that recovering is not a reasonable possibility. As such, minimum grading targets a small but well-defined subgroup of students. Further, students who consistently post failing grades are not likely to benefit from minimum grading. Nor will students who consistently post good grades. Only students whose failing performances are intermittent, and who are now failed when their course grade is unfairly skewed by one or two failing performances, will benefit from receiving a minimum grade. (Carifio & Carey, 2013 p. 20)



## The 4-Point Scale

Another approach to minimizing the negative effects of the 100-point scale is to use a 4-point scale instead. The 4-point scale should be familiar because it is most often used to calculate a grade point average or GPA.

The table below from *Grading for Equity* (Feldman, 2018 p. 89) compares the 100-point scale to the 4-point scale.

|                   | # of gradations | Scores that representing failing | % of scale that represents failing | Scores that represent meeting standards (B or above) | % of scale that represents meeting standards |
|-------------------|-----------------|----------------------------------|------------------------------------|--|--|
| 0–100 Point Scale | 100             | 0–59                             | 60%                                | 80–100   | 21%  |
| 0–4 Point Scale   | 4               | 0                                | 20%                                | 3–4  | 40%  |

Nearly two thirds of the 0–100 point scale is dedicated to failure and one fifth to success, whereas in the 0–4 point scale, one fifth is dedicated to failure and two fifths to success.

In the 4-point scale a 4 = A, 3 = B, 2 = C, 1 = D, and 0 = F. Say a student has earned an 85 on two of three assignments and failed to pass on the third. On the 100-point scale, this student would earn 57% or an F ( $85 + 85 + 0/3$ ). On the 4-point scale, the student would have earned two 3s ( $85 = B = 3$ ) and one 0 for an average of 2 or a C.

If the goal of grades is to provide an accurate description of what students have learned, our grading scales and calculations should be mathematically correct and equitable.

### Sources

Carifio, J., & Carey, T. (2013). The arguments and data in favor of minimum grading. *Mid-Western Educational Researcher*, 25(4), 19–30.

Feldman, J. (2018). *Grading for equity: What it is, why it matters, and how it can transform schools and classrooms*. Corwin.

Guskey, T. R. (1996). *Communicating student learning*. ASCD.

O’Connor, K. (2010). *A repair kit for grading: 15 fixes for broken grades*. Pearson Assessment Training Institute.