Dear Editor:

Murray Jensen and Mike Smith make interesting observations regarding the importance of scientific and academic honesty in their article, “What To Do When Mice Die,” (Murray & Smith 1999). They discuss problems with laboratory preparation that have led to improper representation of scientific concepts in laboratory experiences. One describes a deliberate mislabeling of mice supposedly treated with hormones; the second discusses improper vial stocking of Drosophila to properly predict Mendelian inheritance. Both note the inappropriateness of their actions but appear to dismiss the significance. Surely scientific misconduct such as forging or “making up” data would be intolerable by any researching standard. Phony data passed off as legitimate would undermine the basic tenant of truth and understanding of science. False data or data collection methods, therefore, are unacceptable in the science classroom under any and all circumstances.

We, as science educators and leaders, must not fall prey to allowing poorly designed laboratories, or laboratories that consistently generate erroneous data to be part of our curriculum. I offer the following two suggestions:

A Proposal for Uniform Symbols for Codominance

Textbooks are using a variety of symbols for expressing codominance or lack of dominance among alleles. One of the most common and yet inconsistent ways is to use the same upper case/lower case system as in a regular dominant/recessive pair, e.g. $RR =$ Red, $Rr =$ Pink, and $rr =$ white. Students are told that this is an example of codominance in which the heterozygous genotype results in a phenotype that is a blend of the two codominant traits. This is inconsistent and confusing.

Although the most recent edition of BSCS Biology . . . An Ecological Approach (Cairney 1998) still does not use any symbols for codominance, see pp. 175–176. On page 176, the authors use the system that many of us use for blood types, i.e. superscripts on a base for multiple alleles that show codominance, e.g. $I^A =$ gene A; $I^B =$ gene B.

This is so sensible I propose that for all codominant situations a capital letter (base) should be used to designate the trait and a capital letter designating the specific alleles be shown as a superscript.

For example, in four o’clocks, flower color is a codominant feature.

Use the following symbols:

$C =$ color. $C^A =$ Red; $C^W =$ White. A red flower would be $C^A C^W$, a pink flower would be $C^A C^W$, and a white flower would be $C^W C^W$.

There is an apparent inconsistency when using this “new” system and then later discussing X-linked traits. Here the basic letters X and Y are chromosomes, not genes. Since chromosomes, not genes, are involved, there should be no problem. I have tried this in my own classes where it is quite successful. Try this in your own classes. Good luck. I would like to thank my Biology colleagues here at Highland Park High School for their review of this idea.

References


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When the Mice Die . . .