

1154-97-2414

Dylan P Noack* (dnoack@yccd.edu) and **David Weisbart**. *Using Manipulables to Teach Non-linear Scaling*. Preliminary report.

Students in precalculus classes tend to have difficulty in using spacial reasoning to answer questions involving non-linear scaling. Even after significant prompting, our experience has shown that significantly fewer than five percent of the students in our precalculus classes can answer the following question.

If it takes 15 grams of paint to spray paint a ball that has a volume of 10 cubic inches, then under the assumption that the paint is negligibly thin, how many grams of paint does it take to spray paint a ball that has a volume of 20 cubic inches?

To encourage critical thinking and spacial reasoning as opposed to memorization of specific formulae, we have introduced wooden blocks as manipulables in collaborative learning workshops that cover non-linear scaling. Students are put into groups and given worksheets that walk them through the use of blocks as tools for visualizing problems. Manipulating the blocks increases students' willingness to draw pictures, visualize problems and engage their physical intuition. (Received September 17, 2019)