

Averages: Still Flawed

MIT BLOSSOMS Lesson

Teacher's Guide

Hello! Welcome to the Teacher's Guide for our Averages: Still Flawed BLOSSOMS lesson!

Right from the start, and as we also state in the related module "Flaws of Averages", we want to be clear on one point: we are **not** trying to send the message that averages are inherently bad. Averages are often worthwhile representations of a set of data by a single descriptive number. Our objective with both of these modules is simply to point out a few pitfalls that could arise if one is not attentive to details when calculating and interpreting averages.

The Flaws of Averages that we have included in the "Averages: Still Flawed" module are as follows:

- #1: All children in Lake Wobegon **can** be above average
- #2: The average may not be a possible outcome of the original situation
- #3: Regression toward the mean, which is really a flaw of **interpreting** averages
- #4: The Friendship Paradox, where your friends have more friends than you, on average
- #5: You can't take the average of the average

These and the flaws from the original Flaws of Averages module are not necessarily the only flaws of averages, and we encourage you to include other examples that you have encountered and find relevant when discussing this material with your class.

When designing the Averages: Still Flawed module, our goal was to make the video segments as clear as possible conceptually so that most students at any level in high school could understand the concept of these flaws of averages. The **essential prerequisite** knowledge for our Averages: Still Flawed module is the ability to calculate an average from a set of numbers.

In between the video segments, we have some recommendations of what to discuss and the activities to do, as discussed in the teacher's video segment at the end of the module. We also have a few supplemental materials with some ideas for extensions for more advanced students on the web page. This will clearly depend on your students' background and knowledge of mathematics. The **total length of the in-class video segments is only 12 minutes**, leaving lots

of time in a typical class session for you to work with the students on the activities and discussions of the ideas presented here.

Thanks for your interest in our Averages: Still Flawed module! We hope you find it useful for your curriculum either as a continuation of our original Flaws of Averages module or on its own!