Rules of Ten

rules of thumb for data collection and processing

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1. **Collect at least 10 data points.** A data point is one pairing of independent and dependent variable measurements. Without enough data points, we cannot reliably find trends in the data.

2. **The largest independent variable measurement should be at least 10 times the smallest independent variable measurement.** Nature sometimes surprises us at larger or smaller scales than we think to look.

3. **We like the uncertainty in our measurements to be less than 10% of the range of the measurements.** There is no point in trying to understand our results mathematically if the variation we see is around the same size as the uncertainty in the measurements.

4. **We like the root mean square error (RMSE) for a fit to be less than 10% of the range of dependent variable measurements.** A large RMSE means that our mathematical model does not fit the data very well.

5. **We will consider the vertical intercept negligible if it is less than 5% of the range of the dependent variable measurements.** A vertical intercept is likely to be meaningful if it has a decent magnitude compared with our dependent variable measurements.

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Adapted from a list by Andrew Smith, Air Academy High School, Colorado Springs, CO