

# Effectiveness of Traditional Tests vs Science Lab Reports as Assessments

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## Background

- The research for my capstone project was conducted at Montezuma High school in Montezuma Iowa. The experiment was performed using students from my 11<sup>th</sup> grade chemistry class.
- Montezuma has been using NGSS for their science standards. The grading system at the school is standard based grading.

## Focus Questions

- Which form of assessment between tests and lab reports is a more effective strategy to assess a student's understanding?
- Are students interested in taking science courses?

## Conclusion

- Students prefer science lab reports over tests
- Students perform better on science lab reports than tests
- Students prefer hands on activities and working in groups
- Students get more out of writing science lab reports than taking tests

## Student Attitude

Students' attitudes toward tests was as expected. They do not like taking tests and feel they have some level of anxiety when taking tests.

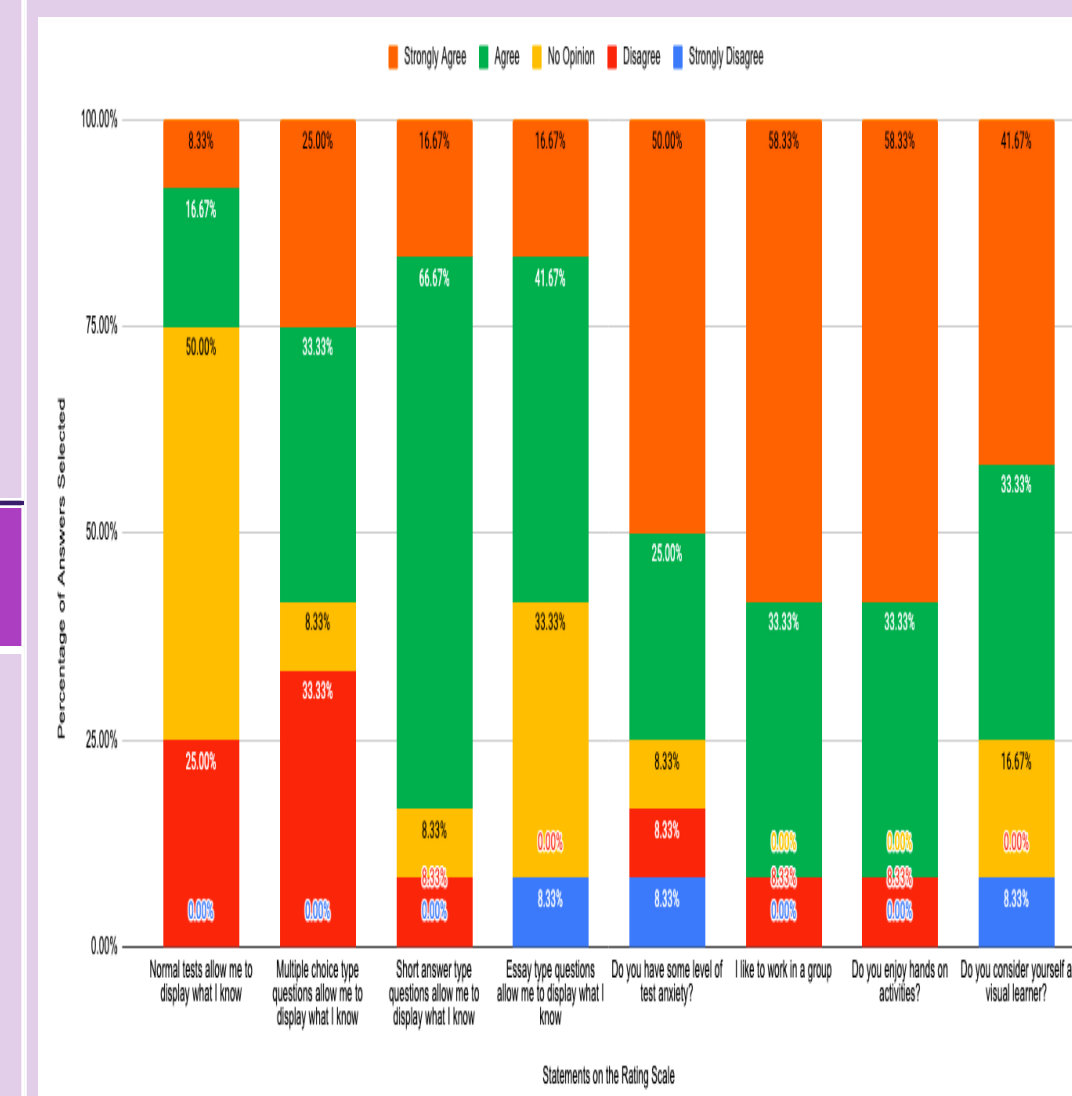


Figure 1. Stacked bar graph depicting students' responses from a rating scale related to how they feel about taking tests.

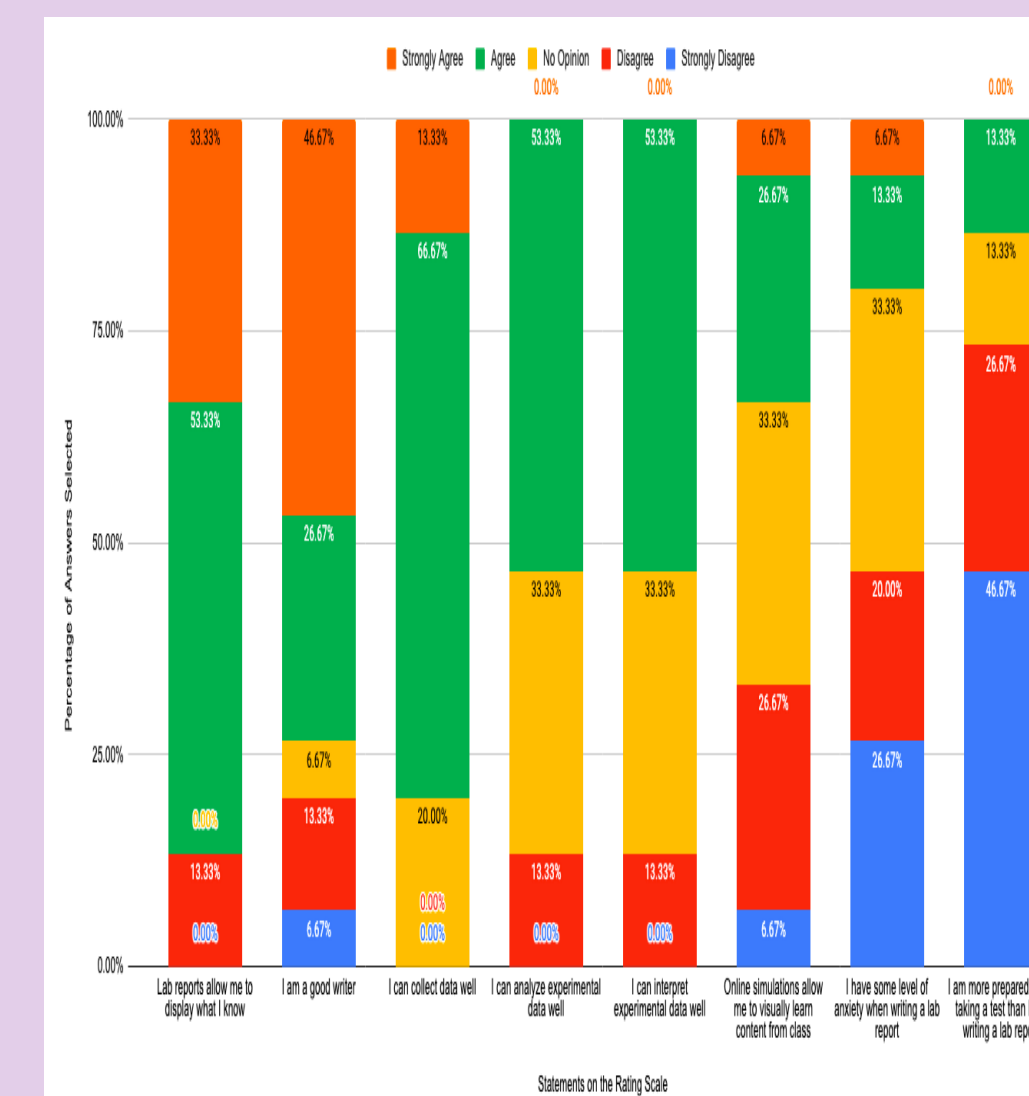


Figure 2. Stacked bar graph depicting students' responses from a rating scale regarding how students feel about conducting experiments.

## Student Performance

Students performed much better on lab reports than they did tests. Lab reports had three standards to assess students whereas the tests only had one. The lab report standards were averaged to compare with the test scores.

### Gas Law unit

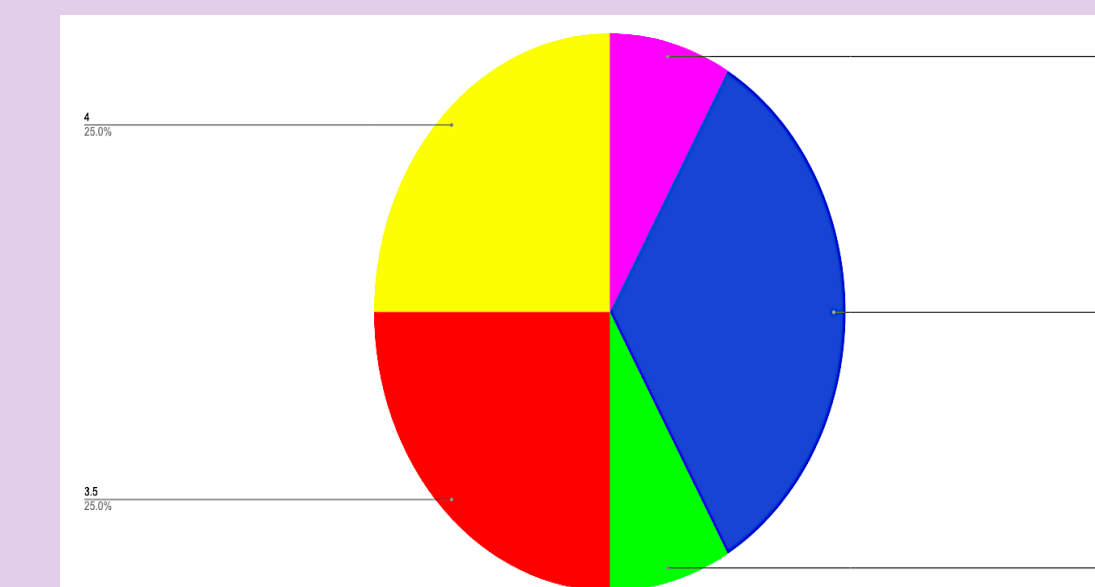


Figure 4. Test scores for the gas law unit. Note: 4= A, 3.5= B+, 3= B-, 2= C-, 0= F.

### Reaction Rate Unit

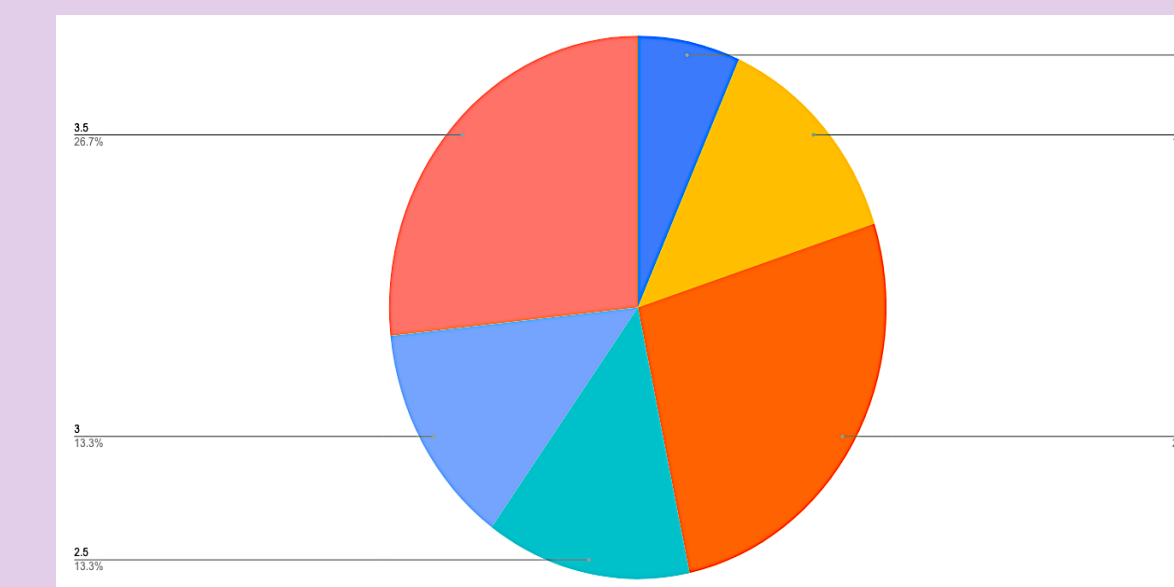


Figure 6. Test scores for the reaction rate unit. Note: 3.5= B+, 3= B-, 2.5= C, 2= C-, 1= D, 0= F.

Students' attitudes toward science as a subject received mixed results. They do not want to pursue a career in science, overall, but there is some sort of interest level in science as a class.

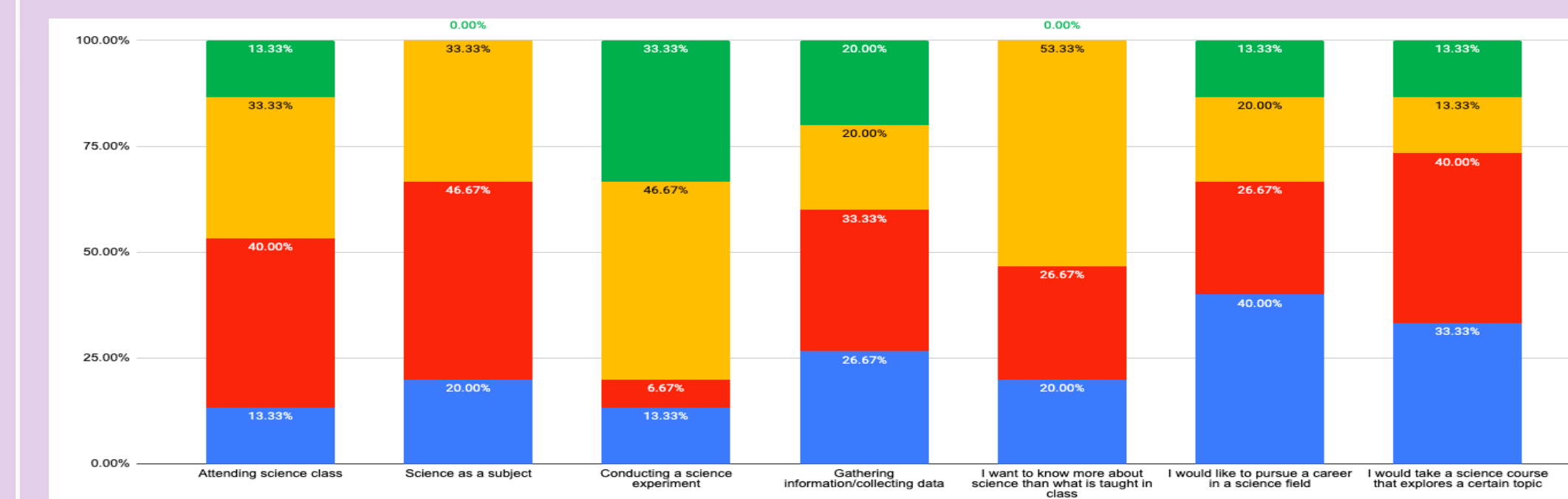


Figure 3. A TORSAs survey asking students how they feel about science classes and the likelihood they pursue a career in science. Note: 4= most interested, 3= somewhat interested, 2= somewhat disinterested, 1= most disinterested.

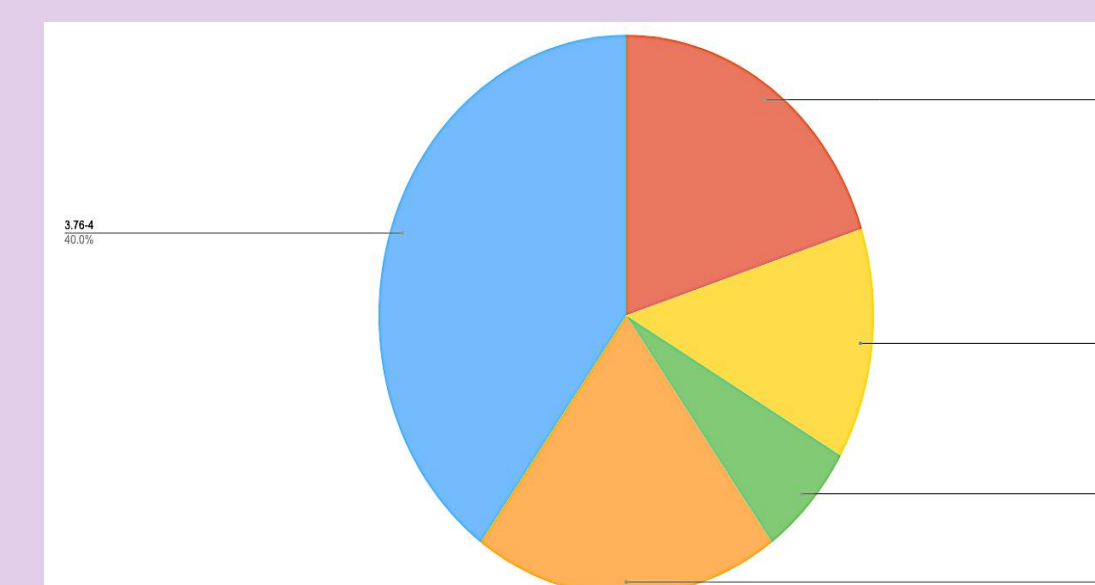


Figure 5. Science lab report score for the gas law unit. Note: 3.76-4= A, 3.51-3.75= A-, 3.26-3.5= B+, 3.01-3.25= B, 2.76-3= B-.

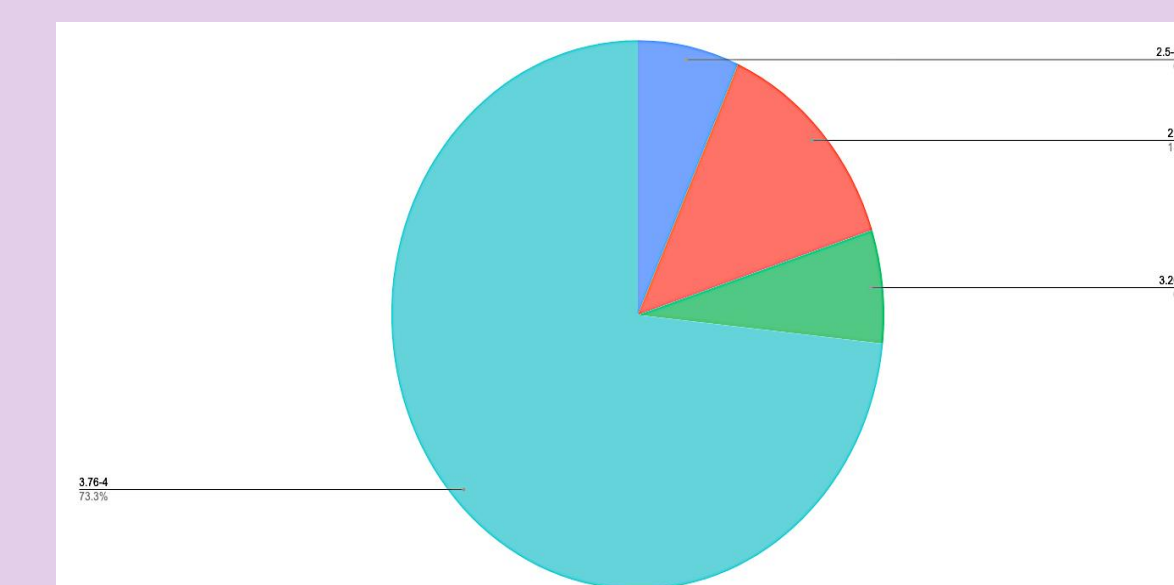


Figure 7. Science lab report scores for the reaction rate unit. Note: 3.76-4= A, 3.26-3.5= B, 2.76-3= B-, 2.5-2.75= C+, 2.25-2.5= C.