

# Factors Affecting Reaction Rates

## Summary

Student will investigate variables that have an effect on the rate of a reaction. They will design part of the experiment themselves.

## Time Frame

2 class periods of 90 minutes each

## Group Size

Pairs

## Materials

- [student instructions/worksheet](#)

(attached)

acidified\* 0.4 M Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> (sodium oxalate)

acidified 0.1 M FeSO<sub>4</sub>

0.02 M KMnO<sub>4</sub>

0.01 M MnCl<sub>2</sub>

set of 6 small test tubes

distilled water

stopwatch

heat source

\* *acidified means that the solution contains also 1 M H<sub>2</sub>SO<sub>4</sub> (aq). The reaction won't occur unless there are some H<sup>+</sup> ions around.*

## Background for Teachers

### Time Needed:

Day 1, 89 min. Day 2, 50 minutes.

### Safety considerations:

Lab glasses, standard chemical safety handling

## Instructional Procedures

Prepare solutions and gather other lab materials.

Go over procedures for Day 1 with student and allow them to complete the experiments.

Summarize the results with students and make sure they understood the procedures and were able to consistently gather results.

Allow time to plan the Day 2 experiment. Provide students with the scoring guide below to help them design the research. Encourage students to work creatively and not duplicate other groups work. If you are finding that students are missing an important variable (heating or concentration) encourage groups that are struggling for an idea to use them.

Check student design for safety and scientific thought before allowing students to perform the experiment.

Allow time on Day 2 for students to perform their experiment and report their results to the class. Use the scoring guide to grade student work as they report on their experiment.

## Assessment Plan

Use the [scoring guide](#) attached.

## Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Adapted from: <http://www.hwscience.com/smarsden/>

## Authors

[Utah LessonPlans](#)