

10-29-2004

Reaction Rates

Frank Rinere
The College at Brockport

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Rinere, Frank, "Reaction Rates" (2004). *Lesson Plans*. 242.
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CMST SCOLLARCITY Lesson Plan Template-Lesson Plan using **TI Technologies**
(Due Tuesday, July 27th)

Submit as hard copy AND electronically through ANGEL

Name: Frank Rinere
Grade level(s)/Subject taught: Chemistry and Science 8
Objectives: <i>In a lab setting, students will gather data and use the TI-84 to help them understand their findings.</i>

Items to include in your TI Technologies lesson plan: (use *your* area/discipline/concepts).

For the Science teacher:

Write the Science Concept or “key idea” that TI Technologies will be used to teach:

Students will gather information on reaction rates through measurement, organize the data and determine the relationship that exists. They will support their findings using graphing and a linear regression.
--

I plan on having my students examine the relationship between reaction rate and temperature. As an introduction to the lesson, I will demonstrate two versions of the same reaction, an iodine clock. One will occur in ice water while the other will occur in hot water. The change is very dramatic. Once they have seen the reaction, we will discuss reasons why one may have been faster and if it true for all reactions.

The students will mix equal size pieces of Alka-Seltzer with water. The first will contain 50 mls water at 20C. A stopwatch will be used to determine the amount of time needed to form bubbles. The test will be repeated using 50C water and 65C water. The data will be collected and the rate (grams/second) will be calculated. The rate versus time will be graphed, a linear regression will be used to find the best fit line and a prediction will be made for an untested temperature.

Once the students have completed the lab they can enter the data into the TI-84. To create a data table for graphing press STAT then EDIT then ENTER

L1	L2	L3	1
████████	-----	-----	
L1(1) =			

The data can then be entered. L1 will hold the temperature values and L2 will hold the reaction rates.

L1	L2	L3	3
23.600	.033	████████	
53.400	.060		
64.000	.065		
-----	-----		
L3(1) =			

Once the data is entered, STAT PLOT is used to graph the information.

```

STAT PLOTS
1: Plot1...On
   L1 L2
2: Plot2...Off
   L1 L2
3: Plot3...Off
   L1 L2
4: PlotsOff
  
```

```

Plot1 Plot2 Plot3
Off Off Off
Type: [ ] [ ] [ ]
      [ ] [ ] [ ]
Xlist:L1
Ylist:L2
Mark: [ ] + .
  
```

ENTER yields a new screen which allows you to set your axis

ZOOM will get the information ready to graph, and ZOOM STAT will graph the data

```
ZOOM MEMORY
1:ZBox
2:Zoom In
3:Zoom Out
4:ZDecimal
5:ZSquare
6:ZStandard
7↓ZTrig
```

To do the linear regression, QUIT, go to STAT, CALC then LinReg (ax + b)

```
CALC TESTS EDIT TESTS LinReg(ax+b) ■
1:Edit... 1:1-Var Stats
2:SortA( 2:2-Var Stats
3:SortD( 3:Med-Med
4:ClrList 4:LinReg(ax+b)
5:SetUpEditor 5:QuadReg
6:CubicReg
7↓QuartReg
```

Go to LIST, find the column of data needed hit ENTER separating each L value with a comma.

```
LinReg(ax+b) L1,
L2, ■
```

You then go to the VARS key go to Y-VARS and press ENTER to get Y1

```
VARs Y-VARS LinReg(ax+b) L1,
1:Function... L2, Y1 ■
2:Parametric...
3:Polar...
4:On/Off...
```

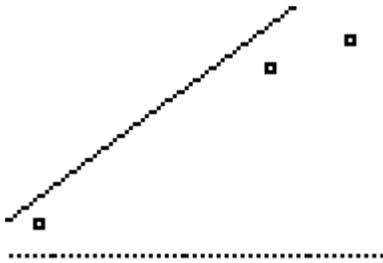
ENTER again will give slope, y-intercept and correlation coefficient.

```

LinReg
y=ax+b
a=8.168E-4
b=.014
r2=.988
r=.994
    
```



Y= pastes the equation to the graph and GRAPH plots the points and draws the line.



Once the activity is completed, student will submit a written report and selected groups will be asked to present their findings to the class. The guide below will be used to grade the project.

Target	Acceptable	Unacceptable
Experiment completed properly		
Calculations completed.		
<i>Data collected properly entered into TI-84</i>		
Graphing completed		
<i>Linear Regression completed</i>		
Analysis of findings reported		
Student able to orally present findings to class		

