

GK-12 Lesson Plan

Teacher: Steven MacDonald

Period: **Class:** Lawrence High School Statistics Class

Date(s): 11/21/2013

SETTING THE STAGE	
<u>Essential Question</u>	Linear regression.
<u>Content Objective(s)</u> (Student-friendly)	Students investigate a dataset from the textbook and learn to perform a linear regression using R's tools.
<u>Connection to previous or future lessons</u>	Students use R, along with the statistical concepts introduced in previous classes.
<u>Critical Thinking Questions</u>	While linear regression is a powerful tool, what are some problems you can run into.
<u>Key Vocabulary</u>	Linear Regression, .CSV file
<u>Materials Needed/Safety</u>	Computer, R Studio
ACTIVE INSTRUCTION	
Launch (Engage)	R can be used to make analysis of large or complicated datasets much simpler.
Investigation (Explore)	Students are provided with an excel file containing the data found on p.197 of their textbook. They are asked to import the dataset into R and perform a linear regression on it, before answering problems 41 and 44.
TIME FOR REFLECTION	
Summarization (Explain & Extend)	Students learn to perform and plot linear regressions using R, while reinforcing previously introduced concepts such as data importation and identifying whether regression is appropriate.
Homework	None

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#Problem 41

```
corolla<-(read.csv("Problem41.csv", header=TRUE))
```

```
age<-corolla$Age
```

```
price <- corolla$Price.Advertised
```

```
plot(age,price)
```

```
regression<-lm(price~age)
```

```
residual<-resid(regression)
```

```
abline(regression)
```

```
plot(age,residual)
```

```
abline(h=0)
```

#Problem 44

```
birthrate <- (read.csv("Birthrates.csv", header=TRUE))
```

```
year<-birthrate$Year
```

```
rate<-birthrate$Rate
```

```
plot(year,rate,type="l")
```

```
regression<-lm(rate~year)
```

```
abline(regression)
```

```
residual<-resid(regression)
```

```
plot(year,residual)
```

```
predictedrate <- vector()
```

```
as.numeric(regression$coefficients[2]*2100 + regression$coefficients[1])
```

```
for(i in 1:2025){
```

```
  predictedrate[i]<-as.numeric(regression$coefficients[2]*i + regression$coefficients[1])
```

```
}
```