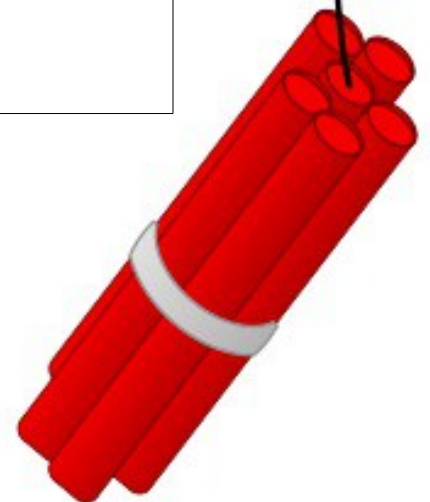
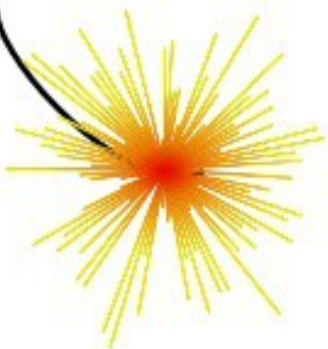


Earthquakes and Explosions

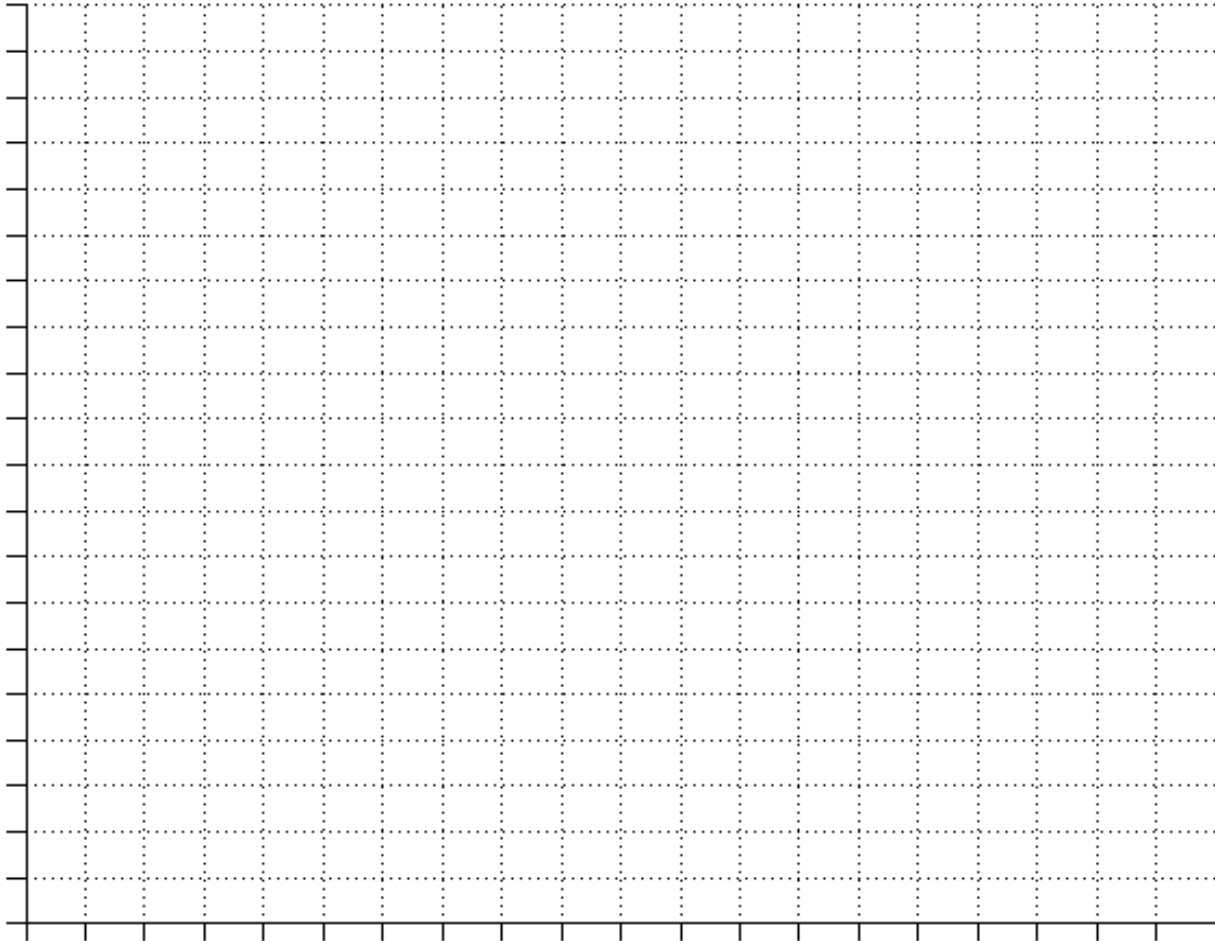
The magnitude of an earthquake is determined by measuring the intensity of the earthquake. For this activity, we will be thinking of intensity in terms of the grams of TNT that would be required to release an amount of energy equivalent to that of the earthquake.

Intensity of Earthquake (Grams of TNT)	Magnitude of Earthquake (as Measured on the Richter Scale)
30	0.2
85	0.5
480	1
2700	1.5
15000	2

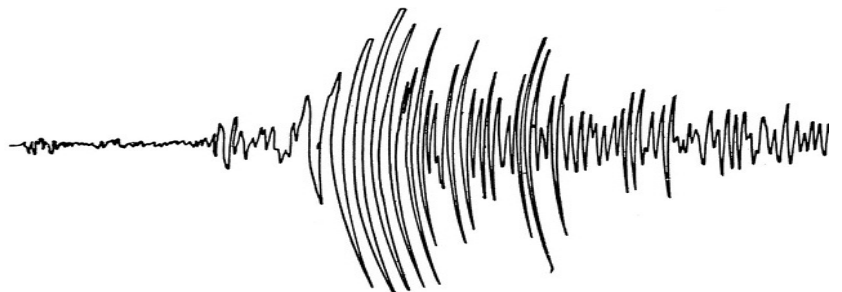


Use the data from the table to produce a scatter plot on your graphing calculator. Since magnitude depends on intensity, the independent variable should be intensity.

1) Draw a scatter plot of the data below; choose and record an appropriate window. Be sure to title the graph and label its axes.



```
WINDOW
Xmin=
Xmax=
Xscl=
Ymin=
Ymax=
Yscl=
Xres=
```



2) Find a mathematical model to represent the data regarding earthquake magnitude and intensity. .

a) Based on your scatter plot from part 1, predict what type of mathematical model (linear, quadratic, exponential, logarithmic) would best represent the relationship between the intensity of an earthquake and the magnitude of the earthquake on the Richter Scale.

b) Perform a regression on the provided data. Identify which mathematical model best represents the relationship between intensity and magnitude. Record your regression equation below. Round decimals to nearest thousandth.

c) State the domain and range of your regression equation in interval notation.

3) Given the recent rise in the number of earthquakes in Oklahoma, Charles and Dana eagerly discussed the latest earthquakes. On June 18, 2014, a 4.1 magnitude earthquake was recorded in Edmond, OK. On that same day, a 4.3 magnitude earthquake was recorded in Choctaw, OK. Having felt both earthquakes, Charles remarked, "I could really feel a difference between the two earthquakes. The Choctaw earthquake was much stronger!" Dana had only felt one of the earthquakes, but she reasoned, "Since the magnitudes of the earthquakes are so close together, there should be no way that you could feel the difference."

a) Calculate the intensity of the Edmond earthquake in terms of grams of TNT. Show all your work.

b) Calculate the intensity of the Choctaw earthquake in terms of grams of TNT. Show all your work.

c) How many more times powerful was the Choctaw earthquake than the Edmond earthquake? Based on your findings, critique Dana's argument. Is it feasible that Charles felt a noticeable difference in the earthquakes? Support your reasoning with your calculations.