Reaction of Acid and Marble

What science says

The scientific model says that the time rate at which the acid and marble react depends only on the concentration of the acid, the temperature, and the surface area of the marble (how 'broken up' it is).
The greater the concentration, the temperature and the surface area the faster the reaction. The rate is linearly dependent on the concentration and surface area and exponentially dependent on the temperature. At a fixed temperature
Rate of reaction = k.(Surface area).[Acid]^x.
Where:
k is the rate constant that depends on the reaction and the temperature
[Acid] is the concentration of the acid
x is a constant - usually a small (1,2) whole number

Capturing the data

How will you accurately measure the rate of reaction?
How will you measure the concentration?
What assumptions are you making in taking these measurements?
What shape do you expect the mass/time and/or volume of gas/time curves to have?

Modelling the data

What variable will you use for your model?
What variable(s) will you empirically adjust?
Why might the model not fit your data?

Extensions

What might you (or children) expect to affect the rate of reaction that does not appear in the model?
How could you test whether this/these variables really do have no effect?
Use the model to make a prediction - then test this empirically.