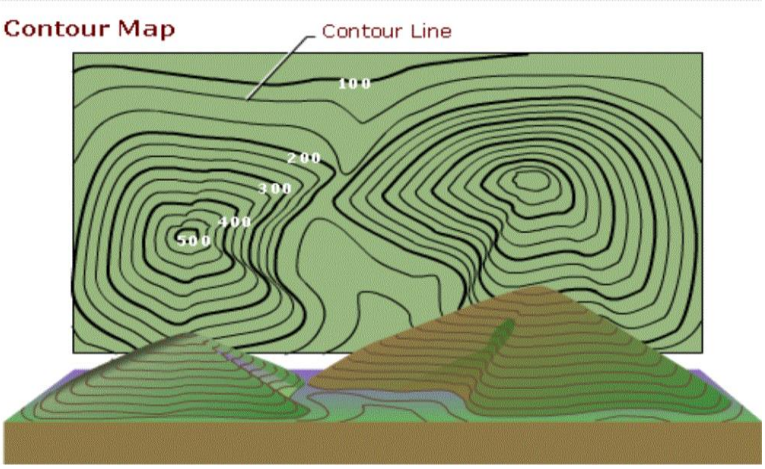
08-07 Equipotential Lines Lab *Name:* _____

Objective: Find the relationship between equipotential lines and field lines.



Materials

- Play-Doh or clay
- Ruler
- Marble

Observe

1. Electric force and gravitational force work very similarly. In this lab, you will be drawing equipotential lines and field lines for gravitational force. Then you will be applying that to electric force.
2. Use the Play-Doh to make an interesting "mountain" with some steep sides and some gently sloped sides.
3. A marble will roll down your mountain from high points to low points.
4. Draw a top view of your mountain on a piece of paper.
5. Use the ruler to help you sketch lines on your drawing that represent equal heights. Try sketching 6 lines that are evenly spaced heights. (See example picture) These are **equipotential lines** because they have equal potential energies.
6. All the lines should be evenly spaced vertically up your mountain, but are they all spaced evenly horizontally?
   _____
7. Describe the steepness of the areas where the equipotential lines are close together.
   _____
8. Describe the steepness of the areas where the equipotential lines are far apart.
   _____

Hypothesis

9. Write a hypothesis about how a marble will roll down your mountain by referring to your equipotential lines.
   _____

Test

10. Roll your marble down several sides of your mountain. Does this match your hypothesis? _____
11. Draw the paths that your marble took as it rolled down the mountain. Make sure you have several paths evenly spread around the mountain. How are these new lines (**field lines**) related to the equipotential lines?
    _____
12. Here is a drawing of equipotential lines around some electric charges. Using the same principle as step 11, draw the electric field lines for the charges.