

## MITOCW | MIT8\_01F16\_DifferentialElements2016OCT26edit\_360p

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In many problems throughout this class, we will find it useful to consider how the mass of an object is distributed throughout the object.

To do this, we will define a small piece of that object and then consider the mass that's contained within that small piece.

For an object in one dimension, the differential element of length is  $\Delta l$ .

And that length contains a certain amount of mass,  $\Delta m$ .

We could also have a linear object in the shape of an arc or just an arbitrary path.

For an object in two dimensions, we have an area element,  $\Delta A$ , that contains a mass  $\Delta m$ .

For our volume, we have a volume element,  $\Delta V$ , which contains a certain amount of mass.

In this case, we can write the volume element  $\Delta V$  as the area  $A$  times this  $\Delta x$ .