```
function numberDead = doseResponse(dose, LD50, sigma, doseGroupSize)
% function numberDead = doseResponse(dose, LD50, sigma, doseGroupSize)
%   This function computes the number of animals of a specified dose group
%   which will die when dosed with a specified dose amount given a specified
%   "true" LD50 value.
%
%   Inputs:     dose - amount of dose
%               LD50 - value of "true" LD50
%               sigma - value of standard deviation of LD50 values
%               doseGroupSize - number of animals in a dose group
%
%   Outputs:    numberDead - the number of animals that die under the input
%                        conditions
%
%   NOTE: Ensure that the units and logged/unlogged status is the same for
%   the 'dose', 'LD50', and 'sigma' inputs.


% Compute the probability that an animal will die with this dose, given the
% "true" LD50 value from the data and the choice of sigma.
deathProb = normcdf(dose, LD50, sigma);

% Compute the number of animals out of the total dose group quantity that
% will die given the above probablility.
numberDead = binornd(doseGroupSize, deathProb);
```