

# Potential Wells and Wave Functions

## Apparatus

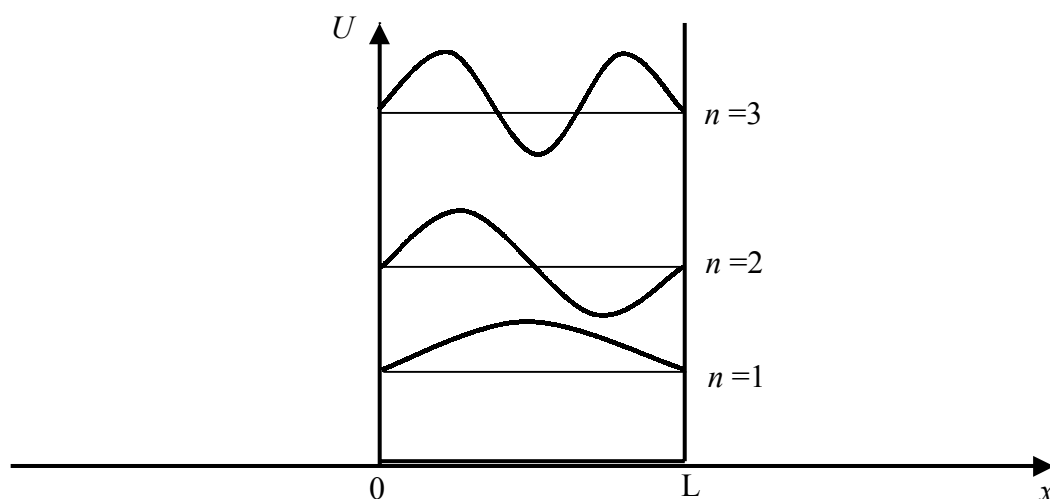
A computer simulation, such as CUPSQM, which can generate wave functions for particles in potential wells or a set of diagrams showing wave functions for particles in potential wells

## Action

The students identify the axes, and that the wave function is superimposed over the potential well, and is **not** measured in units of energy.

## The Physics

The potential well has a vertical axis representing potential energy, which is infinite at the edges of the well. The horizontal axis represents displacement. The wave function represents the square root of the probability density, and is **not** measured in terms of energy. It is superimposed *over the well*. Many students find these diagrams particularly abstract and difficult to interpret – particularly as there are generally no units given on the axes, and they may not be aware that this is really two plots in one.



## Accompanying sheet:

### Potential Wells and Wave Functions

Examine the drawings of the wave functions for particles in potential wells.

What do the axes represent?

What does the wave function represent, and what are its units?