**Light attenuation in the ocean challenge**

Light is easily absorbed by ocean water and this absorption is expressed in the following formula;

 (1)

Where Iz=light intensity at a distance z from the source expressed as a per cent of the intensity

 at the source.

 Io= light intensity at the source. This is defined as 100%.

 k= the attenuation coefficient for the water with units of m-1.

 z= the distance between the light source and where the intensity is measured,

 expressed in m.

Can you manipulate equation (1) so that it looks like equation (2)? Use the math that you know and the following facts.

For a transmissometer the distance between the light source and the place where intensity is measured, z, is the path length. For this exercise we used an instrument with a path length of 0.25 m. And k, the attenuation coefficient can be given in two parts, the part due to pure water, kw, and the part due to suspended particles, PBAC. kw has a value of 0.364 m-1. So substitute 100% for Io, 0.25 m for z, and (0.364+PBAC) m-1 for k. Insert these values into equation (1) and do some manipulation of the formula to get equation (2). Write the steps below and check your units, PBAC has units of m-1.

 (2)

Program the spreadsheet to calculate PBAC from the given Iz values.