

Moving Plates

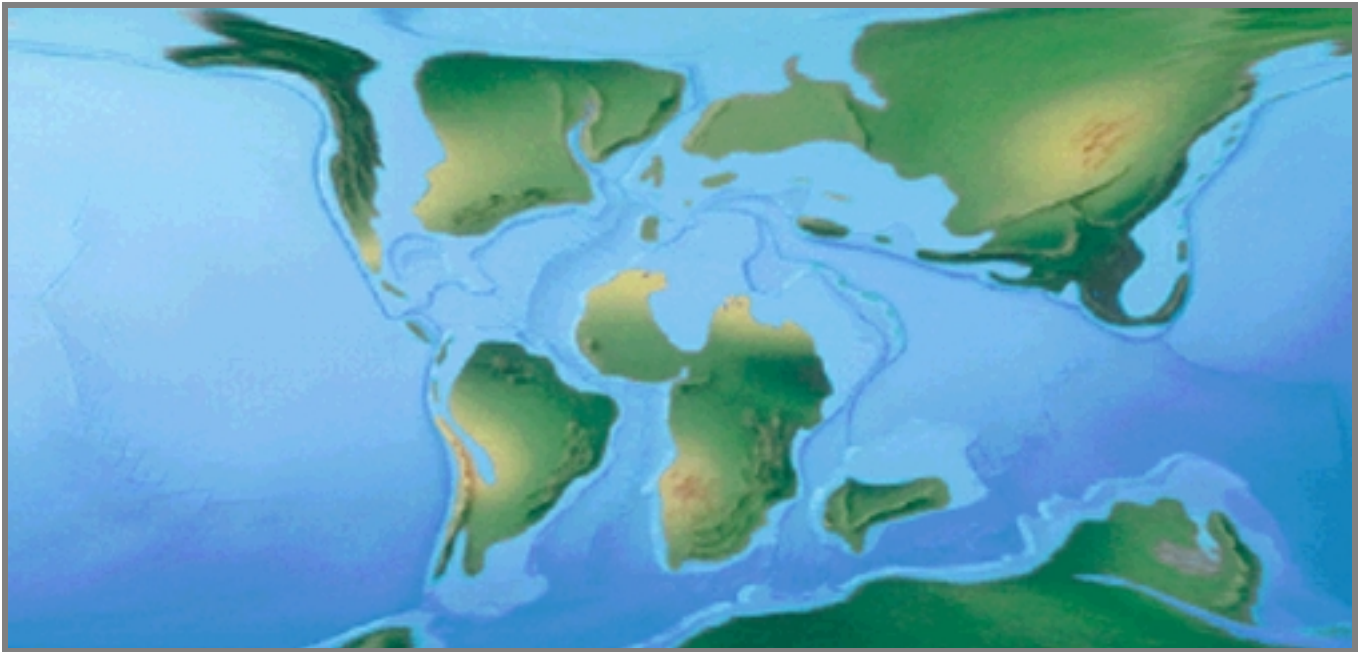


Introduction

The top map shows how the Earth may have looked 94 million years ago. The lower map shows how the Earth appears today. The motion of the continents is called plate tectonics.



How fast are the plates moving?





Taking Data

Measure the distance between the eastern "corner" of South America and the matching western corner of Africa. Call this distance d . Measure the width of the entire map. Call that distance L . Now measure the distance on the map between the matching corners of South America and Africa today. Call that measured distance f . (Be sure to use the same units for all three measurements!)



Analyzing Data

We know that L = the circumference of the Earth is actually 40,000 km. So the true distance between South America and Africa in the top figure, D , is given by d/L times 40,000 km.

What do you get for that number? _____ (km)

The true distance now, F , is given by (f/L) times 40,000 km.

What is that distance now? _____ (km)

So the distance the continents have moved in 94 million years is $F-D$.

What do you get for that number? _____ km)

The speed of the motion is then just $(F-D)$ divided by 94 million years.

How fast do the plates move apart, in km per million years? _____ km/Myr

How fast is that in centimeters per year? _____ cm/year
(1 km per million years is just 0.1 cm per year).

Can you walk that fast?