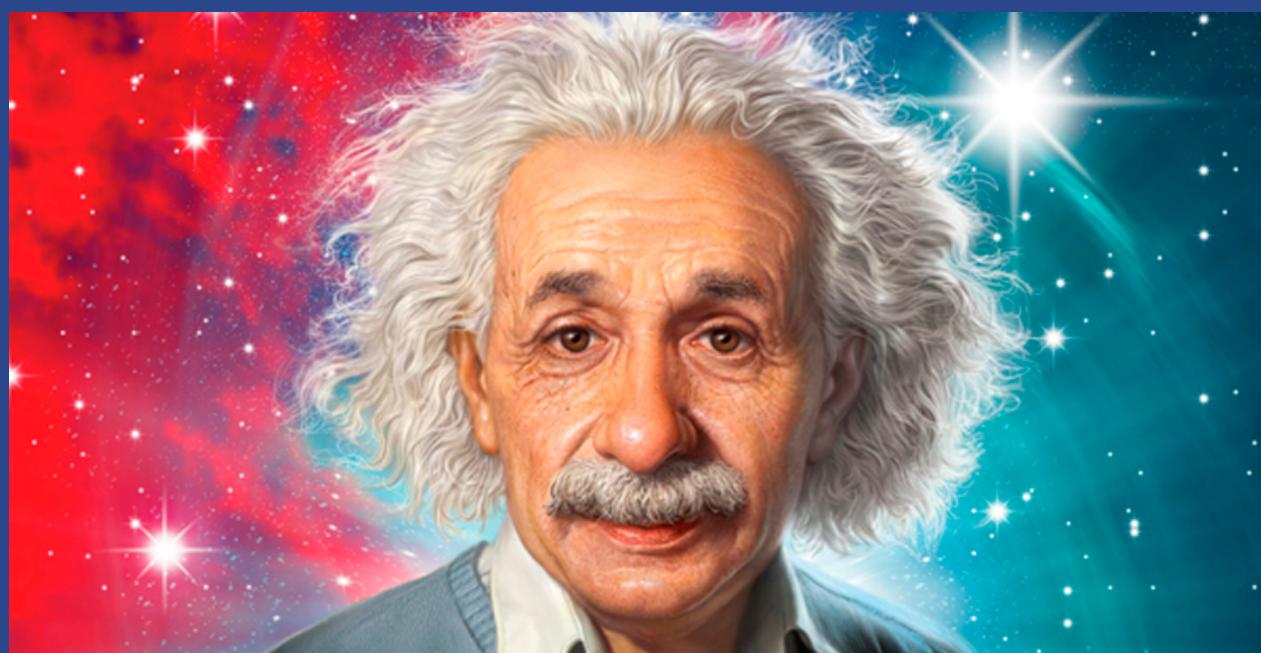


Einstein's Clock



By Peter Mahony
For Professor Mark Reed

Professor Mark Reed



Reed's teaching offerings include his "Science Fiction and Science Fact" course that draws students from all over the Yale campus. He admits the course has little to do with literature. The goal of the course, Reed says, is to teach the average humanities student about contemporary technology. Additionally, he believes it important for non-scientists to understand how a scientist approaches a problem and reasons. "It has turned out to be a very popular class," he says.

The Eccentric Genius Teaches non-science students

General Relativity

How to explain one of the most complex
non-intuitive theories to
non-science students?

Traditionally:

Complex Equations

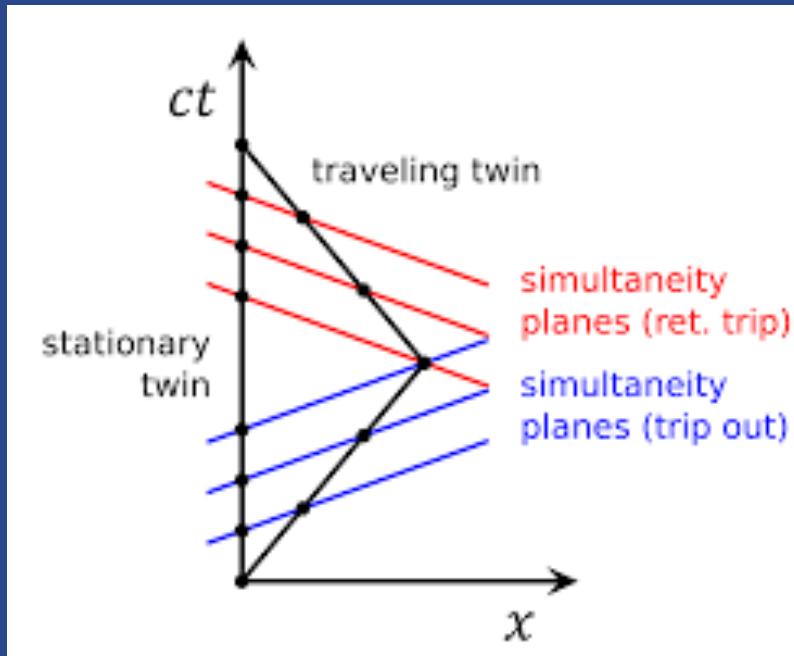
16.3 The Correspondence Principle

The relativity equations for time dilation, length contraction, and momentum are

$$t = \frac{t_0}{\sqrt{1 - (v^2/c^2)}}$$

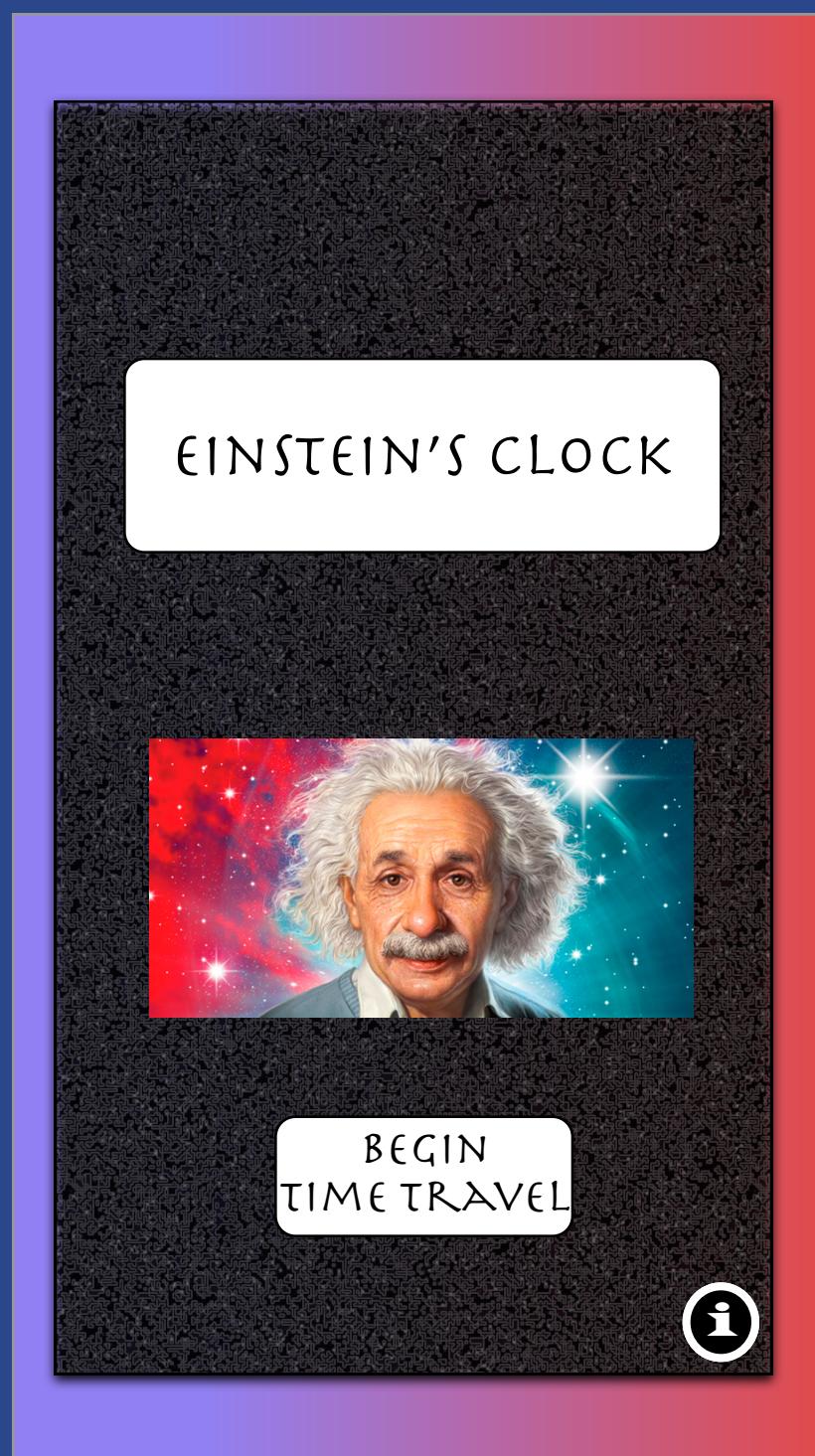
$$L = L_0 \sqrt{1 - (v^2/c^2)}$$

$$P = \frac{mv}{\sqrt{1 - (v^2/c^2)}}$$



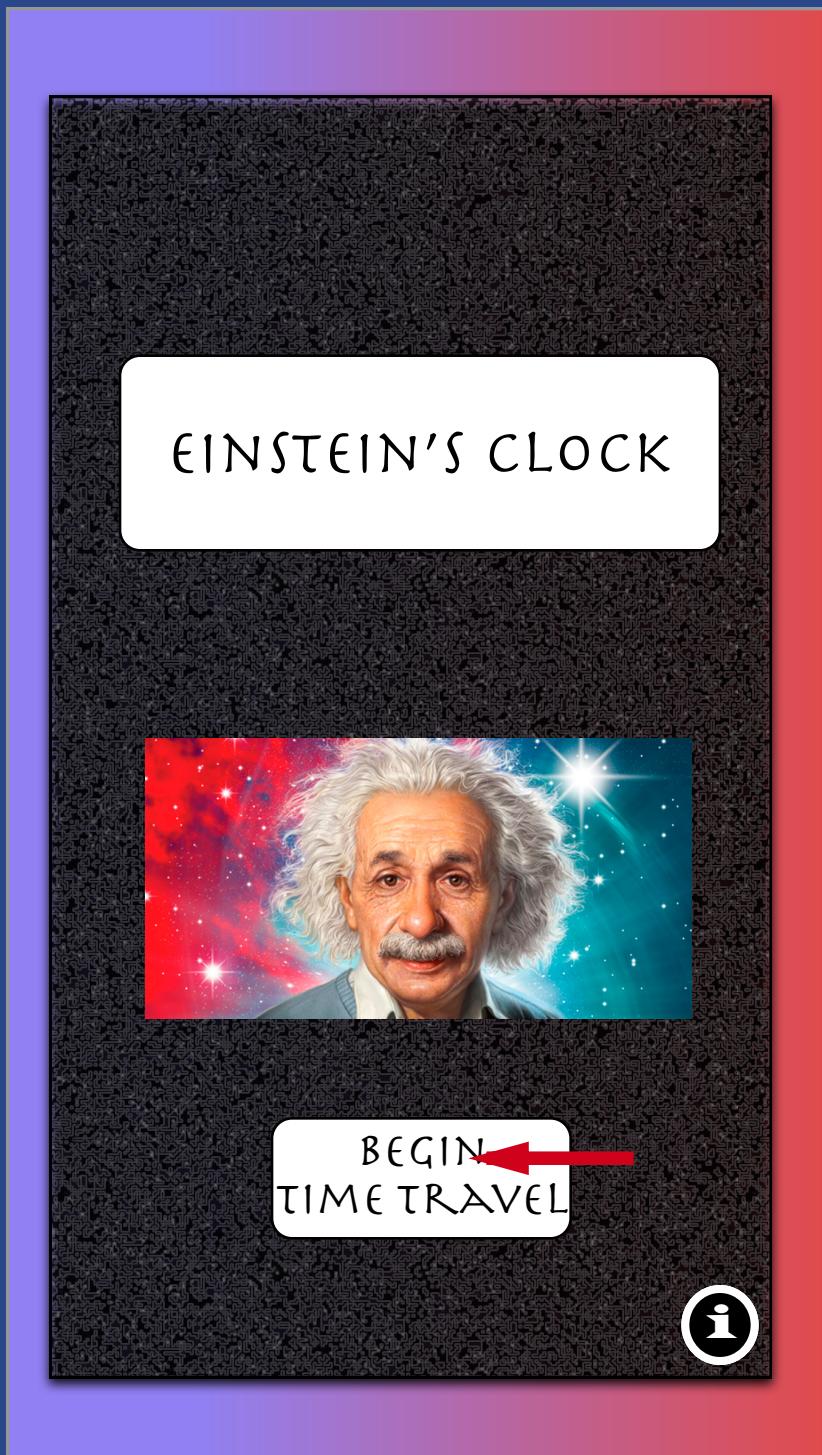
Strange paradoxes/
World Line diagrams

Solution?



A quirky app that allows Mark Reed's students to better understand General Relativity by internalizing how it effects their daily experience of time, while ideally reflecting Professor Reed's spunky personality.

1.



Selecting the “begin time travel” will bring the user to speed of light and force of gravity page.

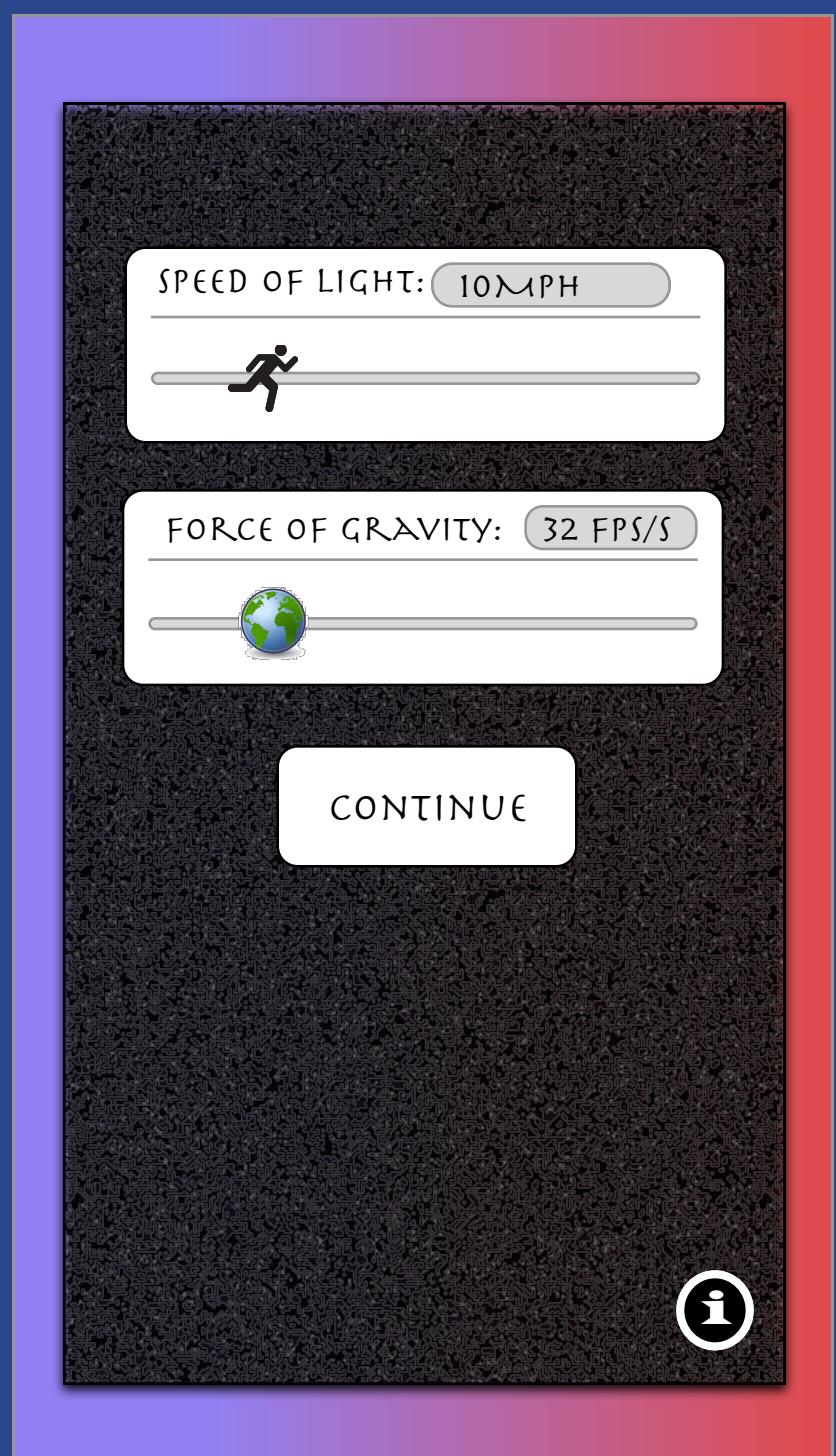
2.

Sliders allow the user to select the speed of light and force of gravity.

The Sliding Icon for the speed of light will change shape from a running man to a car to a plane ect. as the slider is moved to the right to reflect a faster speed.

Similarly the sliding icon for Force of gravity will cycle through the larger planets and eventually stars and finally black holes as the slider is dragged to the right to reflect higher gravity.

Selecting the “continue” sends the user to the clocks page.



3.

The two clocks would run at different speeds depending on the velocity the phone was traveling (the standard time would always follow the standard stationary 1 second).

The current velocity would display the speed of the user and would change the display of the stickfigure from walking to running through faster modes of transportation ect.

The accumulated dilation would display the amount of time difference accumulated since the app had been opened.

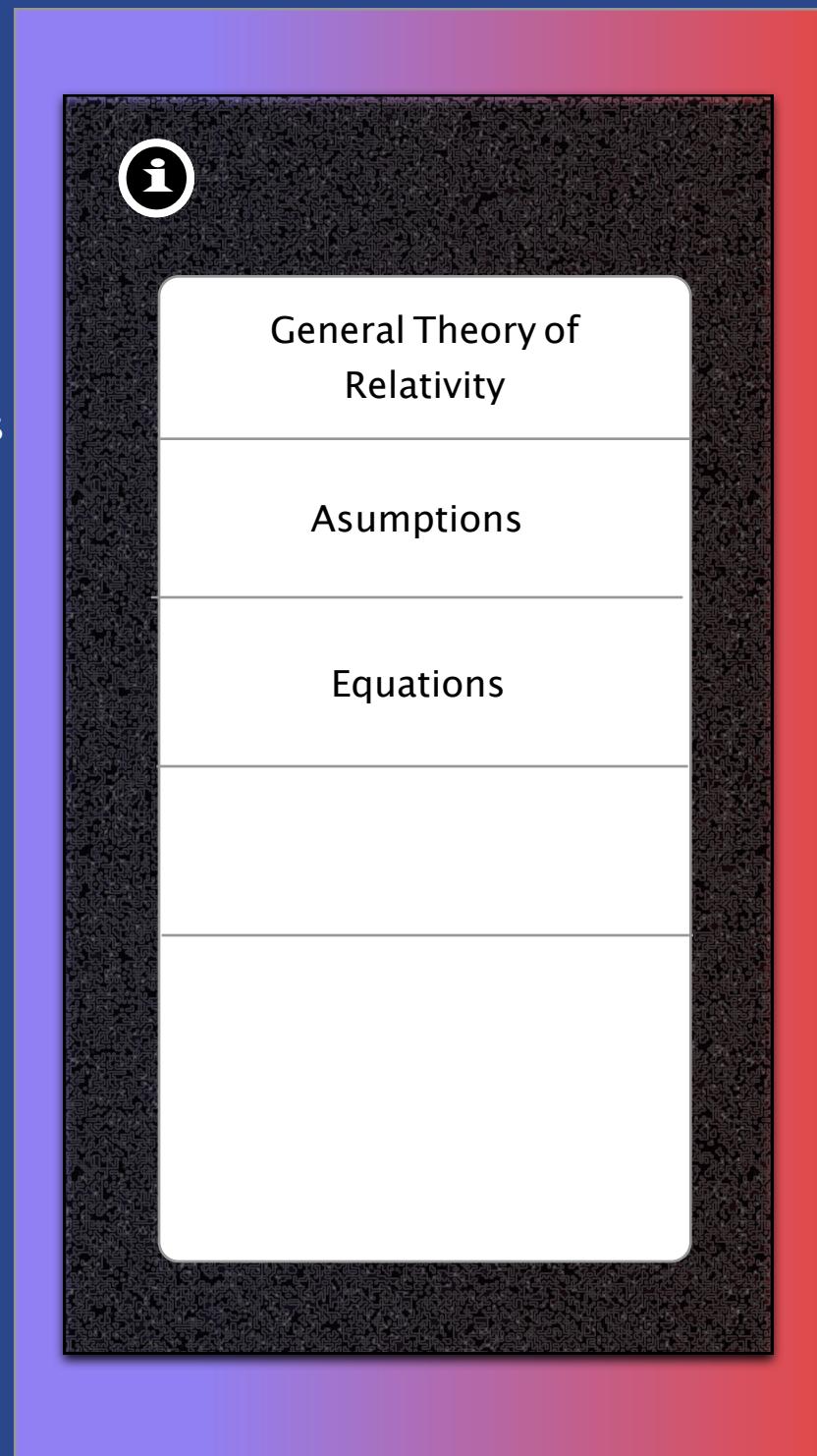
The dilation from velocity and gravity would simply show the sec/s dilation attributable to the users velocity and gravity.



4.

On every page there is a information symbol in the bottom right and when selected there will be an accordion file that includes an explanation of the General Theory of Relativity, the assumptions of the app and the general relativity equations and whatever other pages Professor Reed would want to include.

Selecting the “i” in the top corner will return the user to what ever page they selected the info tab from.



5.

When any of the tabs are selected the others will drop down to reveal the information. Selecting the dropped down tab, in this case the assumptions tab would bring the assumptions tab back up to the General Theory of Relativity tab, thus closing the accordion.

i

General Theory of Relativity

General relativity (GR, also known as the general theory of relativity or GTR) is the geometric theory of gravitation published by Albert Einstein in 1915[2] and the current description of gravitation in modern physics. General relativity generalizes special relativity and Newton's law of universal gravitation, providing a unified description of gravity as a geometric property of space and time, or spacetime. In particular, the curvature of spacetime is directly related to...

Assumptions