

The Earth is a perfect sphere.

The Earth is much fatter around the equator.

The shape of the Earth causes huge misconceptions with students. Early in their life, they probably think that the Earth is a perfect sphere. Later on, they're taught that the Earth is much flatter along the equator than it is along the poles. Neither of these is truly accurate.

The origin of this misconception begins with the story of the early Earth. The Earth was once much more molten than it is today and was spinning quickly. A spinning, molten sphere will be fatter around the middle. So far, so good. As a result, the Earth is much fatter in the middle. That's where the story goes wrong.

Remember when we talked about the eccentricity of Earth's orbit? It was 2% longer in one direction than the other and it was virtually indistinguishable from a perfect circle. Keep that in mind. 2% flattened is a perfect circle for all intents and purposes.

The equatorial diameter of the Earth is 7,930 miles. The polar diameter is 7,917 miles. That's only a difference of 0.16%! If 2% is indistinguishable from a perfect circle, then 0.16% is 13 times more difficult to discern than the 2% difference was.

I'll include with the transcript of this podcast, a PowerPoint that will alternately flash a perfect circle and a circle that has been squashed 0.16%. Then it will overlay a perfect circle over a circle that has been squashed 0.16%. I think that you'll agree that they are indistinguishable and that our common picture of a fat Earth is very highly exaggerated.

Possibly, the more important point here is that even if the Earth were highly oblate, as most people believe, it would have no effect on our everyday lives.

So, is the Earth a perfect sphere or highly oblate? Neither one. It's a sphere that is very very very very close to perfect.

To battle this misconception, we can first not teach students that it is a highly squashed sphere in the first place. Second, if they come to us with this misconception, walk through the mathematics and show them a circle that has been squashed 0.16%. This is not a misconception that comes from a misinterpreted experience. If we don't teach this misconception in the first place, students won't even have it. But, if someone else teaches it before students arrive at our door, then we have to deal with it.

To summarize, the Earth is NOT a perfect sphere, but it is also not a highly flattened sphere. It is so slightly flattened that it is indistinguishable from a perfect sphere.