

Celebrate Einstein's Birthday!

Speed of Light Match Up

We sometimes use letters to represent numbers, like Einstein's famous formula: $E=mc^2$

E stands for energy. **M** is for mass, which is the amount of matter in an object. **C** is the speed of light in a vacuum, 186,000 miles per second, which is theoretically the fastest anything can move. In Einstein's equation, **C** is multiplied by itself (squared) because it represents two factors – distance AND time.

Even if you could travel at the speed of light, distances in space are HUGE. Can you match each object with the amount of time it would take to travel there at the speed of light? **Hint:** Start by matching the nearest object with the shortest time span.



1. From Earth to our Moon

2.5 million years



2. From Earth to the Sun

8.3 minutes



3. From the Sun to the nearest neighboring star, Proxima Centauri

13.8 billion years



4. From one side to the other, across the Milky Way galaxy

1.25 seconds



5. From our spiral galaxy, the Milky Way, to Andromeda, the next closest spiral galaxy

100,000 years



6. From Earth to as far as we can see into space

4.24 years

Experiment at Home!



Einstein was interested in the motion of atoms and studied movements of water molecules. You can make water molecules move using static electricity. This experiment works best in dry (winter) weather and with recently washed hair. All you need is a plastic balloon.

1. Fully blow up the balloon.
2. Start a thin stream of water flowing from a tap.
3. Rub the balloon across your hair at least 10 times. Do not let it come into contact with any other objects.
4. Move the balloon close to, but don't touch, the water. You should see the stream bend towards it as water molecules are attracted to the balloon's static electricity charge.
5. Search online for more kid-friendly experiments with static electricity.

Design an Exhibit!

How would you teach visitors about Einstein's life and work? Make a drawing or write your ideas below or on another piece of paper. If you like, send a photo or scan of your idea to einsteinmuseum@fastmail.com. Who knows? Maybe someday you'll see your idea in the Princeton Einstein Museum of Science!

Keep up with our progress. Sign up for the quarterly newsletter at <https://PrincetonEinsteinMuseum.org/contact>

My idea is:

Answers to the Speed of Light Matchups

1. 1.25 seconds
2. 8.3 minutes
3. 4.24 years
4. 100,000 years
5. 2.5 million years
6. 13.8 billion years

Drawings by Daniel Austin Romanau. Thanks to Dr. Joseph Taylor, Jr. for science guidance.