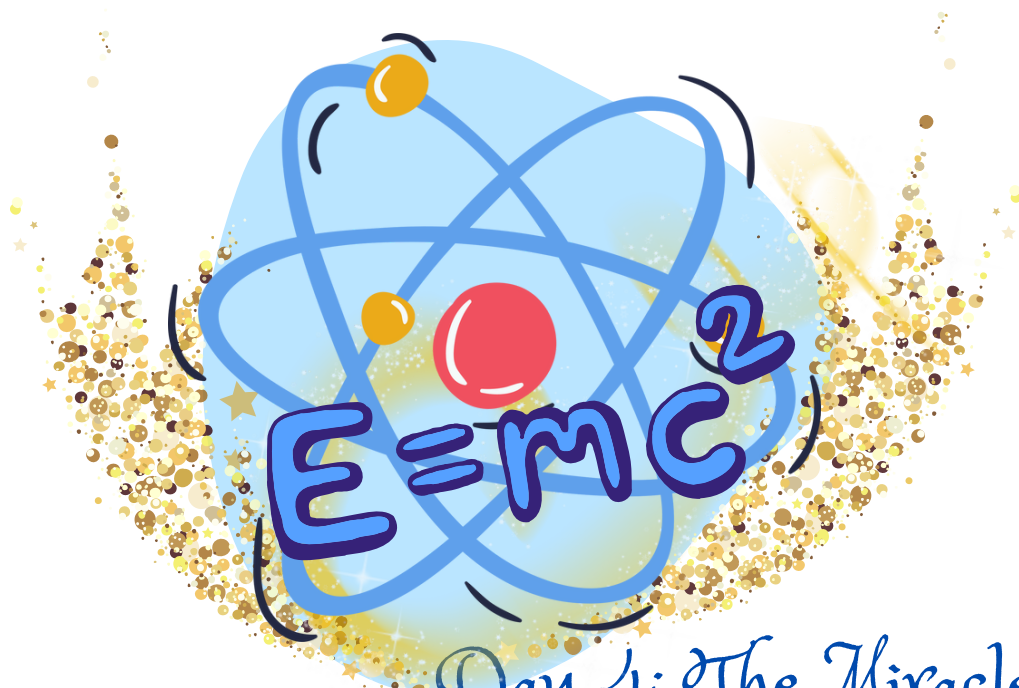


Day 4:
The Miracle Year!



Day 4: The Miracle Year!

Interactive Story Ideas!



Background scene:

Play this video in the background on a big screen, smart board, or laptop.

Riding Light - Traversing the Solar System at the speed of light

(https://www.youtube.com/watch?v=1AAU_btBN7s)



Storytelling Role-Play: 1-5 sand dollars each

(2 Students to help cut out props and 6 students to role play)

Choose 3 girl students and 3 boy students to portray Einstein, the bus driver, an atom, a photon (beam of light), another scientist (representing the shock and initial lack of understanding) and the clock. Tell students to listen for their parts.



New word: 1-5 sand dollars

Atom: Atoms are the building blocks that make up all the things around us. They are very, very tiny, but they have even tinier parts inside. Atoms fit together with each other to create things. Atoms can't be seen with the naked eye. Even the most powerful microscope can rarely see a single atom.

*Remind the students that they can earn a sand dollar if they tell you some time during the day what the new word means. If they get it wrong, remind them of the definition and have them try again in a few minutes.

Day 4 Albert Einstein: The Miracle Year

What would it be like to travel on a beam of light? That's the thought experiment Einstein is thinking about.

It is 1905, and 26-year-old Einstein is riding the city bus to work. Suddenly, his eyes fix upon the clock tower. He wonders, *what if my bus was moving at the speed of light?* (Sunbeam headband prompt; go very, very fast!)

Light is fast. It moves at 186,292 miles per second, meaning it could travel in a circle around the world 7.5 times in 1 second! Riding his imaginary light bus, Einstein sees the world whizzing by. He imagines the hands of the clock begin to slow down, (Clock hands prompt, shuffle slowly and stop) because they can't keep up with how fast light is. Einstein feels like a storm has broken in his mind.

"Your stop?" calls out the bus driver. "Thank you," says Einstein, "I could have gone very far indeed." The bus driver tips his cap. (Bus driver cap prompt, tip it politely and smile).



Questions/Reading discussion: 1-5 sand dollars

Ask: How fast does light travel?

Example: 186,292 miles per second, or traveling in a circle around the world 7.5 times in 1 second!

Ask: Why did Einstein imagine the hands of the clock slowing down?

Example: I think Einstein imagined the clock wouldn't be able to keep up with the speed of light and it would look like time slowed down.

Day 4 Albert Einstein: The Miracle Year

Einstein writes his ideas down. In this year, he publishes four scientific papers! That is an amazing amount of research and truly a miracle!

He is confident that his thoughts and ideas matter and that he can help change the way we think about the entire universe! He is right.

He explores light, atoms (**Atoms prompt, point out the smaller parts**) and energy. He even connects space and time to call it 'spacetime', meaning a fabric of the universe where heavy objects like planets and the Sun can make spacetime bend. He changes the way we understand gravity, time and the universe.

Some scientists don't understand his ideas yet, but Einstein keeps going.

"Life is like riding a bicycle. To keep your balance, you must keep moving," he says.



Questions/Reading discussion: 1-5 sand dollars

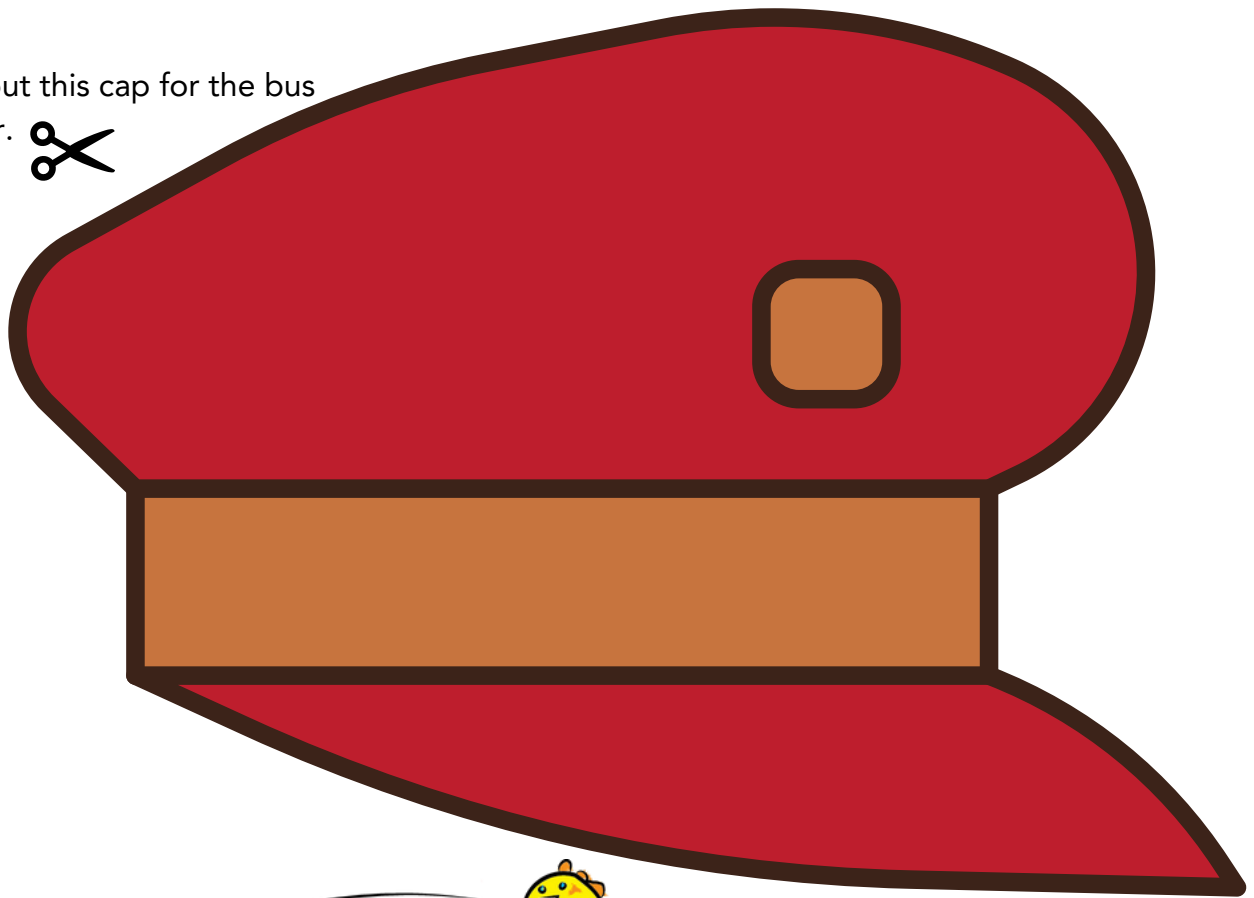
Ask: Why is 1905 called the miracle year in Einstein's life?

Example: It is called a miracle year in Einstein's scientific journey because he wrote 4 papers and had lots of amazing new ideas.

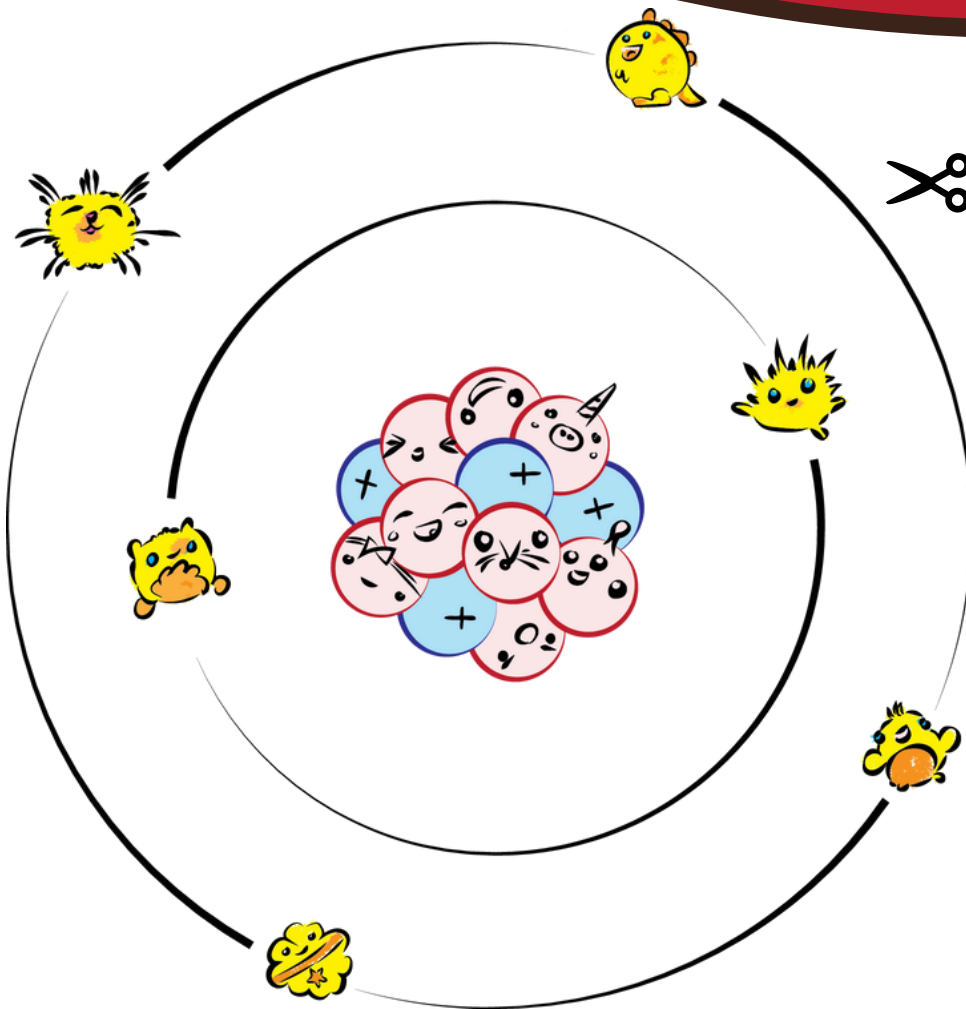
Ask: What is spacetime?

Example: It is like a connected fabric of time and space.

Cut out this cap for the bus driver.



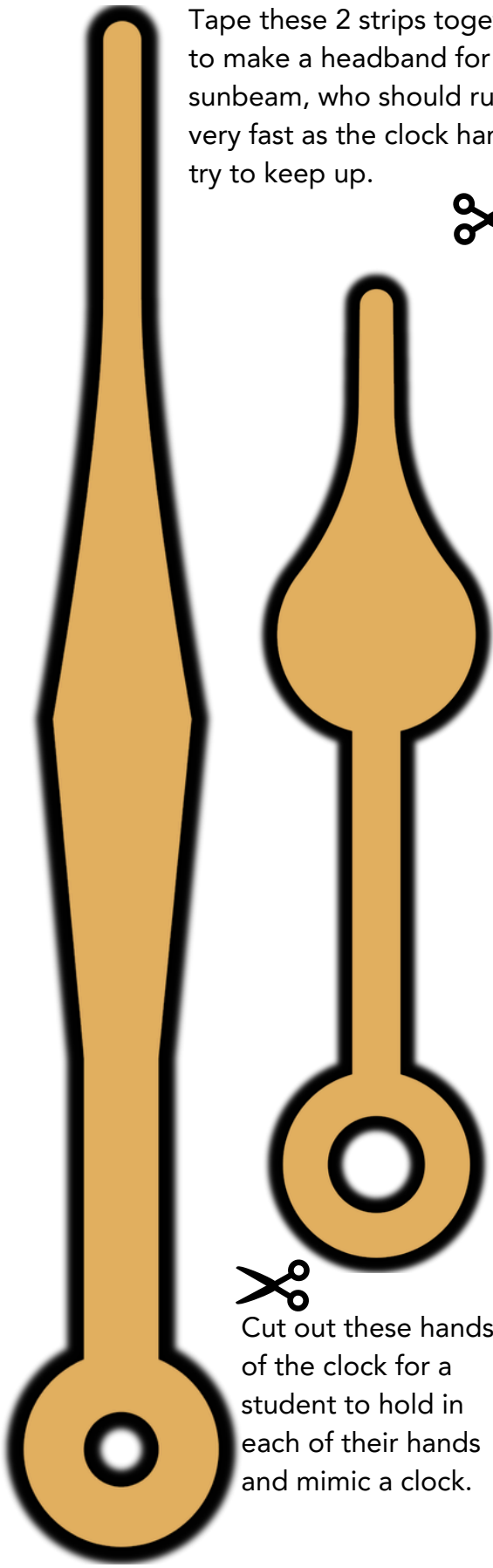
Cut out this model of an atom.



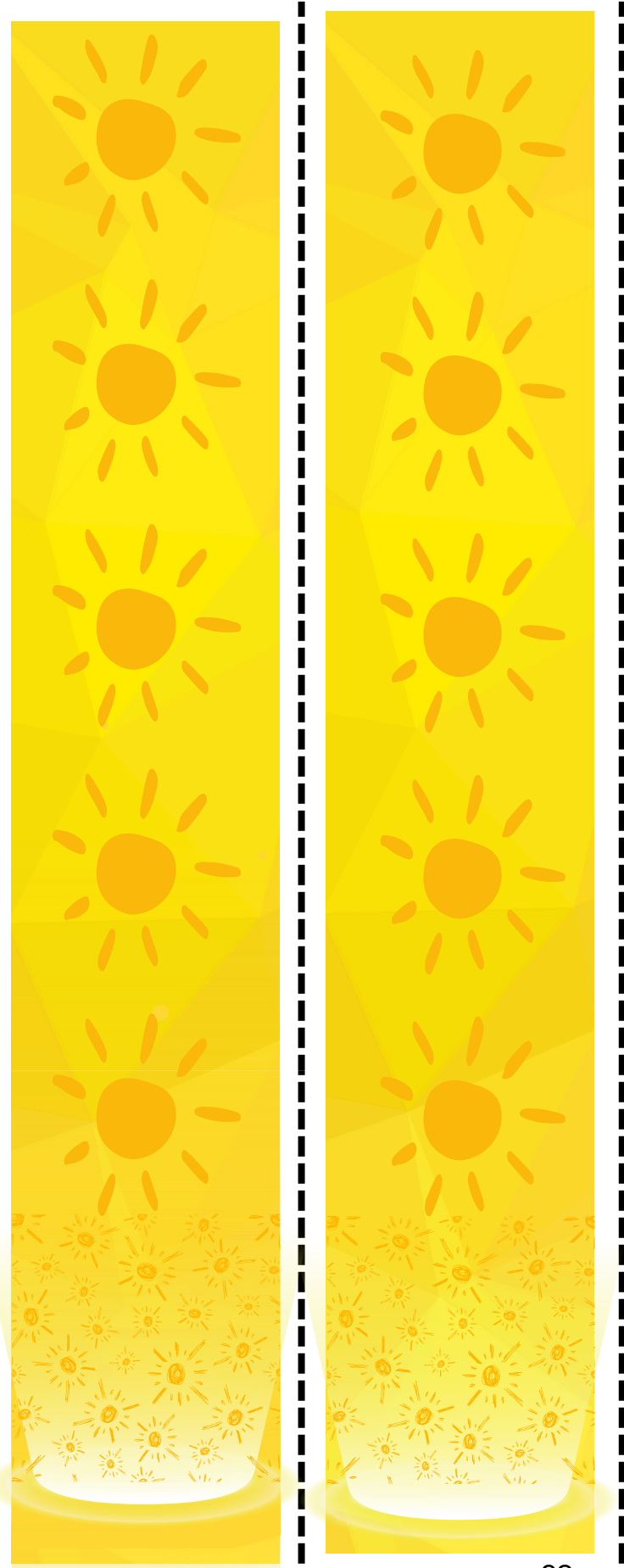
Bus driver: Tip your cap to Einstein when you remind him of his stop.

Einstein: Study the structure of this atom.

Tape these 2 strips together to make a headband for the sunbeam, who should run very fast as the clock hands try to keep up.



Cut out these hands of the clock for a student to hold in each of their hands and mimic a clock.



Clock Hand: Minute hand slows down as lightbeam speeds up.

Clock Hand: Hour hand stays slow and still.

Sunbeam: Sunbeam runs faster and faster.