

PHYSICS

CALIPER WITH ATOM

RADIOACTIVITY SYMBOL

COMPUTER CHIP

CLOCK

DICE IN HAND

PEACE SYMBOL

PUZZLE PIECES

SUN

BLACK HOLE

CALIPER WITH ATOM: In 1905 scientists weren't convinced that matter was made of atoms. Einstein not only showed them that molecules exist, but also how to figure out how big they were.

RADIOACTIVITY SYMBOL: If you change matter into energy, photons with a lot of energy are released. This is called radiation. Radiation can sometimes be dangerous. This sign is used to warn people that radiation may be present.

COMPUTER CHIP: In order to make computer chips, we need to understand and be able to control the surfaces all of the tiny parts. This means that we need a good understanding of the atoms that make up the silicon and metals used to make chips.

CLOCK: The theory of relativity explains that time is not absolute. A clock on an airplane flying around the world will tick slower than a clock staying stationary for the same interval.

DICE IN HAND: Einstein once said "God does not play dice with the universe," but in this case Einstein was wrong. Much of nature is guided by the dice-like randomness of quantum mechanics.

PEACE SYMBOL: Einstein was an influential and outspoken advocate for peace and human rights around the world.

PUZZLE PIECES: Einstein tackled a problem and continued working on it until he found an answer. He was particularly good at fitting together pieces in ways no one had tried before.

SUN: The famous equation $E=mc^2$ explains how the sun shines. Each second, the sun converts a small fraction of its mass into energy. The mass is multiplied by the square of the speed of light, c . This is a very large number, so the amount of energy released each second is enormous.

BLACK HOLE: A large, heavy star can collapse into black hole. Black holes should give off "signals" called gravitational waves if Einstein's general theory of relativity is true. Large experiments are now searching for this strange kind of wave.

SPHERICAL HARMONICS: Electrons don't orbit around the nuclei of atoms as people once thought. Instead, we can only know where an electron is probably located. This is represented by a cloud of probability that can look like connected lobes, discs, spheres or rings.

$E=mc^2$: This famous equation says that matter (m) and energy (E) are two forms of the same thing. The speed of light (c) is an enormous number, so Einstein's equation shows that a very tiny amount of matter is the same as a huge amount of energy.

SPHERICAL HARMONIES

$E=mc^2$

LIGHT CONE

TRAIN

CATS

$E=h\nu$

IONIZATION REACTION

VIOLINS

HAND AND ATOM

LIGHT CONE: The light cone is a picture that helps scientists visualize how things move in the four dimensions of spacetime. In 2005, a light cone was the international symbol of the World Year of Physics.

TRAIN: A pair of lightning bolts striking opposite ends of a train car may seem to passengers on board to hit simultaneously, but not to bystanders alongside the track. Special Relativity, another Einstein result from 1905, explains how the passengers and bystanders can both be right even though they disagree.

CATS: Particles on a microscopic scale can have properties that seem to be contradictory. Physicist Erwin Schrödinger gave an example of what this would be like on a larger scale, which became known as "Schrödinger's cat."

$E=h\nu$: This equation says that the energy of a particle of light (E), called a photon, is proportional to its frequency (ν), by a constant factor (h). This means that photons with low frequencies, like radio waves, have lower energies than photons with high frequencies, like x-rays.

IONIZATION REACTION: If a photon hits an atom with enough energy, the atom may absorb it and kick out an electron. This is called an ionization reaction, and is at the heart of the photoelectric effect. Einstein received the Nobel Prize in Physics for his explanation of the photoelectric effect.

VIOLINS: Einstein was a music lover and a talented violinist.

HAND AND ATOM: Einstein dreamed of one day finding a Grand Unified Theory that combines all of physics together into one, beautiful theory. Although he died before his dream came true, Einstein's ideas smashed many older scientific theories and showed the world the power of the atom – the tiny particles that form matter. Scientists are still building on Einstein's work, trying to find a Grand Unified Theory.

COMPASS: When he was five years old, Einstein's father gave him a compass. Einstein said that playing with the compass, "made a deep and lasting impression on me. Something deeply hidden had to be behind things."

THE DESIGN FOR THE "ACCELERATE YOUR MIND" POSTER IS BASED ON SOME OF THE GLASS PANELS FROM "A NEW WORLD VIEW," AND INCLUDES MANY MORE OF THE CHILDREN'S PHOTOGRAPHS. USE THIS REFERENCE PAGE TO IDENTIFY THE MEANING OF THE SYMBOLS IN THE ARTWORK AND HOW THEY RELATE TO EINSTEIN.

COMPASS

ACCELERATE YOUR MIND