

The Curious Atom

A SARK PROMOTIONS PUBLICATION



This issue of *The Curious Atom* is a celebration of how science connects with harmony, curiosity, and learning, offering a diverse collection of stories, activities, and experiments.

A serene dove soaring against a blue backdrop filled with science-inspired illustrations. The dove, symbolising peace, is uniquely designed with icons blending science and harmony beautifully.

Pg 8

DIY Solar Oven



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Note from the Editor:

Hey lil' scientists, this is the editor-in-chief! This issue is all about Science and Peace. It can be a bit boring, but not when you read all the interesting stories, science experiments and fun infographics.

In this edition of TQA, we explore how science can play a pivotal role in promoting peace—whether it's through the safe use of nuclear energy, the fascinating world of symbiosis, or the healing powers of sound therapy.

It's exciting to think about how innovation can help us solve the world's challenges, especially when science is put to work for peaceful purposes. On a more personal note, I find that exploring nature, understanding animal behavior, and learning about wildlife always sparks a sense of peace and awe. This is why I encourage all young minds to visit their local zoos—these places not only support wildlife conservation but also help us connect with the animals we share our planet with.

Remember, each visit, each new discovery you make, brings you one step closer to understanding the delicate balance of life and how science helps maintain it.

*Made with love, Kanira
World's Youngest Chief Editor*

*Next Issue of The Qurious Atom:
31 December 2024*

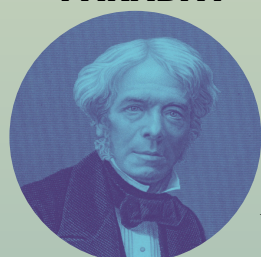
Theme: The Wonders of Weather

Science and peace are closely related since scientific discoveries frequently lead to increased world peace, better living standards, and the settlement of disputes. By tackling pressing problems like health crises, environmental concerns, and energy needs, discoveries of

SCIENCE & PEACE

scientists play a crucial part in fostering peace. Innovations in agriculture, renewable energy, and vaccines are just a few examples of how scientific research leads to solutions for human concerns. Throughout history, scientists such as Marie Curie, Albert Einstein, and Rachel Carson have used their knowledge to advocate for peaceful uses of technology, such as medicine, education, and sustainable development. These scientists have served as a bridge for global unity, peace and collective progress.

MICHAEL FARADAY



(1791–1867)

Famous for electricity and magnetism

Also called the father of electricity

JOSEPH HENRY



(1797–1878)

Worked on electromagnets, including Albany and

Yale Magnets

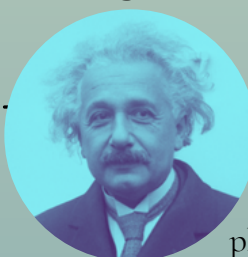
GREGOR MENDEL



(1822–1884)

Discovered the fundamental laws of inheritance and called the father of genetics

ALBERT EINSTEIN



(1879–1955)

Developed theory of relativity and

contributed to quantum physics & peace initiatives

MARIE CURIE



(1867–1934)

Discovered radioactivity and its use in cancer treatments

ALFRED NOBEL



(1833–1896)

Invented dynamite and other explosives. Also founded the Nobel Prizes.

NIELS BOHR



(1885–1962)

Created the Bohr atomic model

Also called the father of atomic physics

LINUS PAULING



(1901–1994)

A peace activist, he used quantum

mechanics to understand atomic bonding

RACHEL CARSON



(1907–1964)

A marine biologist that promoted peaceful existence with nature

JENNIFER DOUDNA



(b. 1964)

Co-developer of CRISPR gene-editing technology

promotes healthcare and agriculture innovations

CRAIG VENTER



(b. 1946)

Worked to sequence the human genome

Now trying to decode death

KATHERINE JOHNSON



(1918–2020)

A NASA mathematician that enabled peaceful space exploration while advocating equality

Partners in Nature: The Science of Symbiosis

Symbiosis is a long-term relationship between two organisms or living things belonging to different species. From coral reefs to human intestines, symbiosis can be found in almost every ecosystem.

Through this close living arrangement, the two organisms thrive in nature together. This symbiotic relationship can be both **positive** (beneficial) or **negative** (unfavourable to harmful) association.

This **biological relationship** can take various forms, including mutualism (both benefit), commensalism (one benefits, the other is unaffected), and parasitism (one benefits, the other is harmed).

The Oldest Symbiosis:

Lichens, a combination of fungi and algae, are among the oldest examples, with fossils dating back over 400 million years!



The images depict examples of mutualism - a relationship between two living organisms, where both benefit.



When species have very distinct needs for survival, **mutualistic** arrangements are more likely to form. There are numerous well-known instances of mutualistic partnerships, for e.g. **bees and flowers**. Bees get nectar from flowers for food, and in return, they help pollinate the plants, enabling reproduction. **Acacia trees** provide food and shelter to **ants**, and in return, the ants protect the trees from browsing herbivores and clear competing plants. Neither member can survive successfully without the other. In addition, **Oxpeckers** (birds) perch on **herbivore animals** like rhinos or buffalo, eating ticks and insects off their skin,



providing pest control while gaining a food source. Mutualism demonstrates the interconnectedness of ecosystems and how species co-evolve to support each other!

In biology, **commensalism** is the practice of two species' individuals obtaining food or other advantages from one another without causing harm or benefit to the other. The host species, which is unaffected, may provide **nourishment, shelter, support, or movement** to the commensal—the species that gains from the connection.

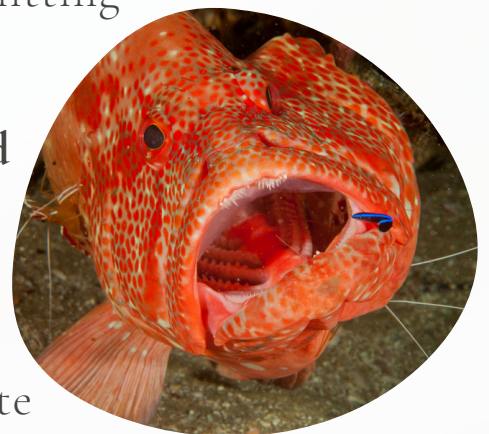
Usually, a larger host and a smaller commensal have a commensal relationship. For example **Cattle Egrets and livestock** association, where Egrets feed on insects stirred up by grazing cattle, while the cattle remain unaffected.



A symbiotic arrangement in which one species of plant or animal benefits at the expense of the other, sometimes without causing the host organism to die, is known as **parasitism**. There are two types of parasites: **endoparasites**, which can be either intracellular (inhabiting cells in the host's body) or intercellular (inhabiting spaces in the

host's body), and **ectoparasites**, which reside on the host's body surface and do not typically cause disease in the host. A quite common example of parasitism is when **ticks attach to mammals**, feeding on their blood and potentially transmitting diseases, harming the host.

Symbiosis, which comes from the **Greek word** for coexistence, is the result of pathogens, commensals, and mutualists interacting in a variety of ways throughout the evolutionary history of the "**partners**" involved. There are many symbiotic relationships that are intricate and do not neatly fall into one category.



LEARN ABOUT MARS

Mars is a rocky, red planet which is about half the size of Earth. Its surface is red due to the presence of iron oxide, thus this beautiful planet is called 'the Red Planet'. Red Planet Day is celebrated annually on 28th November. Let's learn more about this Mars-tastic planet!



On Mars, you can jump three times higher than on Earth. This is because the red planet has a weaker gravitational force. So much better than jumping on beds!

Mars is the second smallest planet in the solar system just after Mercury.

Humans have not yet gone to Mars, but rovers and landers like Viking, Spirit, Curiosity and other such missions have reached Mars.

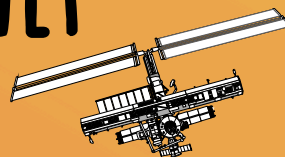


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Did You Know?

Similar to Earth, seasons, polar ice caps, volcanoes and canyons are also present on Mars. The atmosphere on Mars is extremely thin and mostly made up of carbon dioxide, nitrogen and argon. The air on Mars is not suitable for human breathing.

RED PLANET DAY



The Mariner 4 Spacecraft was launched on November 28, 1964 and since then the day is observed as 'Red Planet Day' each year.

Mars is home to the largest mountain in the Solar System - Olympus Mons, a volcano around 3 times the height of Mount Everest at 24 kilometres.

The Red Planet is around a whopping 4.57 billion years old.

687 DAYS

ONE YEAR ON MARS

number of earth days it takes for Mars for 1 revolution around the sun

-55 DEGREE CELCIUS

the average temperature on Mars

24 HOURS

39 MINUTES

35 SECONDS

the length of one day on Mars, known as "SOL"

24 KILO-METERS

height of Mt. Olympus Mons, highest mountain in the solar system

Water Vapour has been found on Mars.

4TH PLANET
FROM THE SUN



DIY Solar Oven

Materials Required:

A cardboard box with a lid (similar to a pizza box), Aluminium foil, Black construction paper, Clear plastic wrap or a transparent oven bag, Tape or glue, A stick or straw (to keep the lid open), Scissors or a utility knife

Instructions:

1. Cut a three-sided flap in the box lid, leaving about a 1-inch border. Fold this flap upwards to act as a reflector.
2. Line the inside of the flap and the bottom of the box with aluminum foil, ensuring the shiny side is facing out to reflect sunlight.
3. Place black construction paper on the bottom of the box (over the foil) to help absorb heat.
4. Secure a layer of clear plastic wrap over the opening made by the flap to keep the heat inside.
5. Use the stick or straw to hold the flap open, allowing sunlight to enter the box.
6. Add food items (like s'mores or a small piece of bread) inside the box. Position the solar oven in direct sunlight, adjusting the flap to optimize sunlight reflection.

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How It Functions:

The aluminum foil reflects sunlight into the box, while the black paper absorbs the heat, increasing the temperature. The plastic wrap traps this heat, creating a greenhouse effect. Over time, the oven heats up enough to cook simple foods.

What is Renewable Energy?

Renewable energy is energy that comes from a source that won't run out. They are natural and self-replenishing, and usually have a low- or zero-carbon footprint.

What Are Clean Fuels?

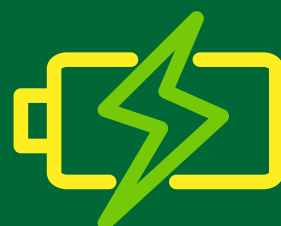
The topic of clean fuels is crucial for peace, environment and health. Clean fuels are energy sources that release minimal pollutants when burned, compared to conventional fuels like coal and petrol. Examples include compressed natural gas (CNG), electricity, hydrogen, biogas, and ethanol blends. They are vital in reducing air pollution and combating climate change.

Why Do We Need Clean Fuels?

1. **Pollution Control:** Burning fossil fuels emits harmful pollutants like carbon monoxide (CO), particulate matter (PM), and sulfur oxides (SO_x). Clean fuels reduce these emissions.
2. **Health Benefits:** Cleaner air leads to fewer respiratory diseases like asthma and bronchitis.
3. **Sustainable Future:** Clean fuels are often renewable, meaning they won't run out as fossil fuels might.



Clean Fuels



What Can You Do?

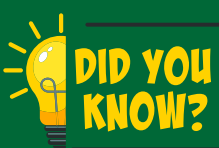
Clean fuels are not just a scientific advancement—they are a necessity for a healthier planet and a peaceful future.

1. Use public transport, carpool, or walk whenever possible.
2. Advocate for renewable energy and cleaner fuel technologies in your community.
3. Spread awareness about air pollution and the benefits of clean fuels.

Let's take a pledge today to reduce pollution and support cleaner energy choices!

Understanding PM and CO levels.

When talking about air pollution, two critical terms often come up: PM levels and CO levels. Particulate Matter (PM) is a mixture of tiny particles and droplets in the air that we can inhale into our lungs. Carbon Monoxide (CO) is a colourless, odourless gas produced by the incomplete combustion of fuels.



According to the WHO, PM_{2.5} levels should not exceed 15 µg/m³ annually to maintain healthy air.

The average CO levels should remain below 9 ppm (parts per million) over an 8-hour period.

Peaceful Uses of Nuclear Energy

Nuclear energy is a powerful type of energy that comes from the nucleus of an atom. It's created through nuclear fission, when the nucleus of an atom changes, and can be released in the form of heat and radiation. Nuclear reactors use nuclear fuel to sustain a nuclear chain reaction. The most common nuclear fuels are uranium-235 and plutonium-239.

Nuclear energy was discovered in the early 1900s by scientists studying radioactivity.

Nuclear energy is considered dangerous due to risks like radiation leaks, exemplified by the Chernobyl disaster of 1986, which exposed over 200,000 people to harmful radiation.

Nuclear energy can be used in many peaceful ways, including: Medicine, Public health, Agriculture, Food security, Water resources management, Sustainable energy, etc. Below are some relevant facts.

10% of the world's electricity is generated using nuclear power

426 nuclear power reactors are now operating in over 30 countries with no carbon wastage

Over **25** countries use sterile insect technique of pest control, saving crops worth millions

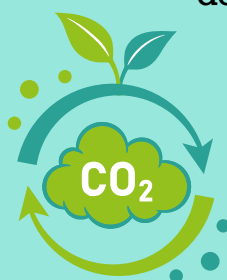
30 times less CO₂ is emitted by nuclear power than coal

Over **60** countries use nuclear techniques to irradiate food to prevent spoilage and reduce food waste

About **40** million medical procedures worldwide utilise radioactive isotopes produced in nuclear reactors every year

80000 cubic meters of freshwater per day is produced by nuclear desalination plants, addressing water scarcity in arid regions

95% of used nuclear fuel can be recycled



Nuclear energy presents both significant benefits and challenges, making it a complex issue in the context of peaceful and sustainable use. Hence this balance must be carefully managed.

Sound healing is an ancient practice rooted in science and is used to promote peace and relaxation. It employs various tools, such as singing bowls, tuning forks, gongs, or even vocal chanting, to create calming or therapeutic effects. Sound therapy involves using sound vibrations and frequencies to improve mental, emotional, and physical well-being. The healing therapy works on the principle that sound frequencies can influence brainwave activity, balance energy, and alleviate stress by harmonising the mind and body.

**WHY ?
WHAT ?
HOW !**



Sound healing has been shown to slow down brain waves and provide a calming, dreamy condition in our bodies. Additionally, it could be able to improve immunological function and help with some mental and physical health issues. Ancient cultures considered sound to be a sacred instrument with great power and the capacity to promote spiritual growth and healing. It has been shown through research to be more successful than prescription medications at lowering anxiety levels before surgery.

Conditions Where Sound Therapy Helps:

STRESS AND ANXIETY: Sound therapy can help relax the mind, reduce stress, and lower anxiety levels by encouraging deep relaxation and mindfulness.

SLEEP DISORDERS: The calming effects of sound therapy can improve sleep quality by aiding relaxation and reducing insomnia.

CHRONIC PAIN: Vibrational therapy can stimulate circulation and release tension, potentially reducing pain symptoms.

MENTAL HEALTH ISSUES: It may alleviate symptoms of depression or PTSD by improving mood and promoting a sense of calm.

COGNITIVE FOCUS: Sound frequencies can enhance concentration, memory, and clarity.

TINNITUS: Specialised sound treatments can help manage and reduce the perception of ringing in the ears.

CHAKRA BALANCING: Some sound therapy practices aim to align energy centres, believed to promote holistic healing.

AUTISM AND ADHD: It may help individuals with neurodivergent conditions improve focus and sensory regulation.

BLOOD PRESSURE AND HEART RATE: Deep relaxation from sound therapy may lower blood pressure and stabilise heart rate.



Sound therapy is often used in wellness clinics, yoga classes, or as part of integrative medicine. While promising, it is essential to consult healthcare professionals to determine its suitability for specific medical conditions.

The Curious Chronicles of Jungle Grove

Ch-15 : Mandy's Harmonious Journey of Science and Peace

It was World Science Day for Peace and Development, and Ms. Dorothea Deer had an exciting announcement for her students. "Today, we're hosting a Peace and Science Workshop to explore how science can build a better, more peaceful world," she said. The class buzzed with excitement as she outlined the topics they'd be learning about: renewable energy, the peaceful uses of nuclear power, and the importance of harmony in nature.

Mandy the Monkey, always curious, couldn't wait to learn. During the workshop, she discovered how solar and wind energy reduced pollution and conflicts over fossil fuels. She was fascinated to learn that nuclear power, though often seen as dangerous, could also provide clean, sustainable energy when used responsibly. "Science isn't just about experiments; it's about creating balance," Ms. Deer explained, leaving the students inspired.

Later that week, the school announced a Peace and Science Fair where students could showcase projects symbolizing the connection between peace and science. Mandy teamed up with her best friend, Emma the Elephant, and brainstormed ideas. After much thought, they decided to create "The Garden of Harmony," a vibrant miniature ecosystem.

STORY



Their display featured a variety of plants coexisting peacefully in different layers of soil. Each plant played a role: sunflowers provided shade, creeping thyme spread like a green carpet, and marigolds protected the soil from pests. Mandy and Emma added labels explaining how biodiversity promotes balance and how humans could learn from nature's harmony. They even powered their display with a small solar panel to show renewable energy in action.

On the day of the fair, the students set up their creative projects. Mina the Mouse and Tanya the Tiger presented an impressive “Peaceful Powerhouse”—a model of a city powered entirely by renewable energy sources. Their project earned them first place, while Mandy and Emma’s “Garden of Harmony” proudly took second.

Though they didn’t win, Mandy and Emma felt proud. “Science and peace go hand in hand, just like we worked together on this project!” Emma said with a smile.

Ms. Deer ended the day with a warm message: “Each of you showed how science can inspire peace, collaboration, and creativity. That’s the real victory!”

As Mandy walked home, she felt a deep sense of fulfillment. The fair had not only been fun but had also taught her the power of science to make the world a better place.

Who Am I? QUIZ!



I am a physicist who warned the world about the dangers of nuclear weapons and helped develop theories used in quantum mechanics. My equation is world-famous. Who am I?

I led efforts to fight smallpox globally and was instrumental in creating the vaccine that saved millions. My work was pivotal for peace in health. Who am I?



I pioneered the Green Revolution, using science to improve crop yields and fight hunger globally. My contributions won me the Nobel Peace Prize in 1970. Who am I?

I discovered radioactivity and won two Nobel Prizes for my work in physics and chemistry. My research paved the way for medical applications of radiation. Who am I?



I contributed to the structure of the atom and emphasised the peaceful use of nuclear energy, advocating for international cooperation in science. Who am I?

Science Story

DEEP IN THE AMAZON

Harman's heart raced with excitement as their boat glided through the waters of Manú National Park in Peru. He scanned the dense Amazon Rainforest, hoping to spot crocodiles, monkeys, otters, or at least the sleek shadow of a jaguar.

"The jaguar population is decreasing," the guide, Maria, said. "That's why it's important to save them."

"Why are they disappearing?" Harman asked, his curiosity piqued.

"Habitat loss and poaching," Maria explained, her expression serious.

"But we can protect them if we raise awareness."

Just then, a flicker of movement caught Harman's eye. He pointed excitedly. "Look!" A majestic jaguar sauntered along the bank, its coat shimmering in the dappled sunlight. Harman held his breath, mesmerised.

As the jaguar vanished into the jungle, he felt a surge of determination. "We have to do something!" he declared, already imagining ways to spread the word.

Maria smiled. "Every action counts. Let's inspire others, Harman." And with that, a plan began to form in his mind, fuelled by the wild beauty he had just witnessed.

Saving Jaguars

Did you know, International Jaguar Day is celebrated every year on 29th of November to celebrate the third largest feline animals? Let's learn how to leave these round-headed creatures in peace:

1. Engage in reducing deforestation.
2. Donate to WWF (World Wildlife Fund).
3. Raise awareness about conserving wildlife.

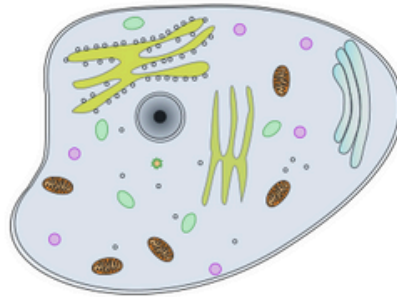


ACTIVITY TIME

Meer got a science assignment on cell biology. Help him understand these tricky terms by solving the word search.

CELL STRUCTURE AND FUNCTION

eukaryotes
cell membrane
cell wall
centrioles
chloroplasts
chromatin
chromosomes
cytoplasm
cytoskeleton
endoplasmic reticulum
genetic material
golgi apparatus
lipid bilayer
lysosomes
mitochondria
nuclear envelope
nucleolus
organelles
osmosis
prokaryotes
ribosomes
vacuoles



O	H	V	J	A	J	B	Y	J	U	P	E	I	P	U	K	D	K	F	D	S	M	V	H
X	O	V	K	T	G	R	A	Q	H	H	W	C	E	L	L	W	A	L	L	M	N	R	X
U	N	Z	O	K	O	X	L	N	W	B	R	I	B	O	S	O	M	E	S	V	G	K	F
X	C	D	N	K	L	E	N	J	C	A	A	O	H	C	Y	T	O	P	L	A	S	M	K
E	Y	Z	O	K	G	E	F	N	U	C	L	E	O	L	U	S	I	M	H	E	Z	Q	N
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T	O	T	M	N	A	Y	I	H	E	I	Y	C	K	N	U	L	R	G	O	D	U	Z	N
E	S	V	O	J	P	Y	T	G	U	Y	N	H	R	H	C	I	G	I	K	O	P	T	G
K	K	A	S	Y	P	W	N	X	D	Z	P	R	C	V	L	P	A	S	I	P	R	L	E
M	E	C	I	V	A	X	N	J	N	H	P	O	E	J	E	I	N	Y	U	L	O	Y	N
I	L	U	S	N	R	R	S	O	V	K	Q	M	N	P	A	D	E	R	O	A	K	S	E
T	E	O	X	D	A	X	F	Z	O	O	U	A	T	P	R	B	L	Y	L	S	A	O	T
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C	O	E	K	U	U	W	Y	J	Z	N	C	I	I	Q	N	L	E	I	E	I	Y	O	C
H	N	S	O	K	S	T	H	C	U	I	O	N	O	P	V	A	S	J	L	C	O	M	M
O	X	E	U	K	A	R	Y	O	T	E	S	A	L	A	E	Y	D	V	L	R	T	E	A
N	V	S	R	R	H	P	Z	T	S	Y	W	C	E	Q	L	E	B	E	M	E	E	S	T
D	Y	O	Y	L	O	M	V	G	A	Y	V	N	S	H	O	R	R	A	E	T	S	S	E
R	I	L	F	Y	E	X	L	B	V	Z	R	X	J	O	P	M	H	T	M	I	A	Z	R
I	L	Q	E	P	S	G	S	U	U	I	Z	E	M	T	E	G	M	E	B	C	I	R	I
A	A	U	A	T	I	Y	E	U	K	Q	O	X	D	Q	D	A	Y	Q	R	U	B	F	A
C	C	H	R	O	M	O	S	O	M	E	S	L	Y	N	W	E	Q	Q	A	L	J	U	L
O	W	G	C	H	L	O	R	O	P	L	A	S	T	S	F	W	N	Q	N	U	H	J	S
S	T	E	T	A	A	X	L	G	Z	O	G	D	U	P	R	G	I	C	E	M	S	P	Z

A cell is the smallest part of which any living organism and tissues are made up of.

KNOW
THE
FACTS

George Emil Palade (1912–2008) is known as the father of cell biology. His work on cell structure and function included the discovery of ribosomes and secretory protein activity. He was a Nobel laureate who laid the foundation for understanding the transport and synthesis of proteins.

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