

Science Myths –

Real or Misconceptions ?

(40 cards playing deck for children)

Children always have questions about different aspects of the universe: How & Why? Sometimes, the answer or logic we give satisfies them and sometimes not. What satisfies them, increases their curiosity more and they become more interested. I think this is where they start showing analytical thinking which is fundamental for science.

But how to make things interesting for them? I guess this is the step where we need to involve fun like in games, in vibrant colors, in animated cartoons, in daily myths.....when we combine all these elements, the quest to seek answers becomes more interactive for them. And the concept behind this playing deck is solely based on this idea, with the aim to develop passion for science in children, especially, children aged 5 -12.

This idea came to my mind when I was organizing a science trivia event for children on Halloween in 2020. I realized that children were incredibly attracted to the questions which were in the form of a story depicted on colorful cartoon slides. And that was the moment when I started working on this project. It is a solo project;

I used my spare time, and I tried my best to answer as many myths as I could via colorful pictures. I also left a few cards for children to prepare their own questions and set their own rules as it can encourage them to seek the hidden and can ignite the creativity in them.

If kids like, they can set the game rules for all cards according to their choice. But as per my concept, I am describing the instructions below. (To give feedback, please visit: www.scientudio.biz/)

Key Points

1. For every correct answer, the answerer will get **5 points** and if he/she knows the scientific explanation too, then, additional **5 points**.
2. To keep the record of score, on correct answer, answerer will keep the card and write score on card (5 or 10) with erasable marker. For the wrong answer, the card will be out of the game.
3. For 25 science cards, there are three answers: “Yes, No, or Partially True”. If the myth is partially true, the answerer should say something like, “yeh, partially true, 50% true or yeh, somehow true but”.....

How to Play?

4. Shuffle the cards.
5. Then, put the card deck upside down. The shuffler will pick one card and ask the

question on the card to the kid sitting beside (clockwise order).

6. After, the answerer will pick the card and ask the question to the kid sitting beside.

7. This cycle will go on. For each correct one, the answerer will get 5 points (5 points for each of the 25 science myths questions).

8. Rules and points will be slightly different if the questioner picks up any of the following blank cards: bounce, double dip, backpedal, go choco, blank, ace, create, water, earth, fire, and air.

How to Use the Blank Cards ?

1. **Bounce:** the turn of the questioner will be skipped to the next kid to ask the question, but the questioner will be given 5 points.
2. **Double Dip:** the questioner will pick another card and ask the question, but the answerer will not get any points for the correct answer. Instead, the answerer will lose 5 points from total in case of no answer or wrong answer.
3. **Backpedal:** the cycle will be backtracked. The questioner will pick another card and ask the question to the kid on the other side (anticlockwise order). And the answerer will get 5 points for the correct answer.
4. **Go Choco:** The questioner will ask the kid which category the kid would like to

choose? (like any food item, specific TV shows, general knowledge etc.). After the category is selected, the questioner will ask the kid any question related to that category. For the correct answer, the answerer will get 10 points.

5. Blank: When the questioner picks this card, he / she can set the rules for the entire game according to his / her choice.

6. Create: Questioner can ask anyone any question which questioner likes or thinks of. And if the answerer gives the wrong answer, the questioner will get 10 points.

7. Water, Air, Fire, Earth Cards: Questions and rules/points for correct answers for these cards **SHOULD BE DECIDED AND WRITTEN BY THE KID WHO OWNS THE DECK**. The kid can write before starting the game. But the kid should not write the answers on cards. These cards will be used as: When the questioner picks any of these cards, he / she will ask the first question on the card and will tick-mark it with a pencil and will put it back in the middle of the deck. When the same card will be picked by another questioner, he / she will ask the next question on the card, tick-mark it and put it back in middle of the deck. And so on.

8. Ace: If the questioner picks this card, he / she must keep it for his / her turn as an answerer and can use it at any point during the game. It will be a lifeline bingo for one

difficult question as he / she can change the rule by either skipping, reversing, or asking for helpline. After keeping this card for him/herself, the questioner will pick another card to ask the question.

Science Cards Explanation

Card-1: Human eye has 6 million cones behind retina which are composed of three main types: blue (which detects blue and all shades of it), red (which detects red and all shades of it) and green (which detects green and all shades of it). In contrast, cattle lack red cones behind the retina and so are incapable of seeing red or its shades. A bull cannot see red, so it does not get angry by seeing red cape. Instead, it may be the movement of the cape that excites the bull.

Read More:

[What is it about red that makes bulls so angry?](#) (By Dr. Christopher S. Baird)

[The Retina](#) (By Neuroscience for Kids)

Card-2: Tryptophan, which is the main component in turkey meat, does not induce sleep. Instead, it is overeating and consumption of alcohol that causes it.

Read More:

[Sleepy After the Thanksgiving Feast? Don't Blame the Turkey](#) (By Dr. Dr Rodolfo A Torres)

Card-3: Bats do see, and they have much sharper night vision than humans. But many bats do not have good color vision because they lack S- and L-opsin (a special light sensitive protein at the back of retina; S-opsin: for blue/UV or short wave; L-opsin: for red/green or long/medium wave). However, some bats do possess these proteins that are capable of color detection.

Read More:

[How bats lost their color vision](#) (By eLife)

Card-4: Jogging is good cardio-exercise. It keeps your heart and lungs efficient by improving your breathing rate and burning calories and fat.

Read More:

[Is Running the Best Form of Cardio?](#) (By Mattie Schuler)

Card-5: Banana plant is a tall perennial. Contrary to trees, it has succulent stem.

Read More:

[A Banana Is an Herb, Berry, and Other Little-Known Fruit Facts](#) (By Linda Ly)

Card-6: Not only milk (which has calcium for bones), but proper brushing, both in the morning and at night before sleep, are important for strong teeth.

Read More:

[Taking Care of Your Teeth](#) (By Dr. Kenneth H. Hirsch)

[Oral Health: Use Peppermint \(Mint\) For Keeping Your Teeth and Gums Strong](#) (By NDTV)

Card-7: Pure water cannot conduct electricity. However, when any salt is dissolved, it dissociates into electrically charged atoms, called ions, which move to opposite electrodes to constitute the electric current (positively charged ions (anions) will go to negative electrode i.e., anode and negatively charged ions will go to positive electrode i.e., cathode). Sea water does conduct electricity as it has lots of ionic salts dissolved in.

Read More:

[Conductivity \(Electrical Conductance\) and Water](#) (By USGS)

Card-8: Almonds do elevate the levels of acetylcholine (ACH) in brain which is a neurotransmitter and helps in enhancing memory function and preventing onset of cognition and dementia.

Read More:

[Getting Forgetful? 7 Easy Ways to Improve Your Memory Naturally](#) (By Tanvi Patel)

Card-9: Ostriches do not hide their heads in sand when they detect danger in vicinity. However, they run at the speed of 31-35

MPH. Their wings help them in keeping balance while running.

Read More:

[Do Ostriches Really Bury Their Heads in the Sand?](#) (By Bambi Turner)

Card-10: Wearing masks and keeping distance of at least 6 feet are particularly important to prevent the spread of corona. Coughing and sneezing are common symptoms of COVID19. When you cough, you release 3000 droplets at the speed of 50 MPH and when you sneeze, you release 100,000 droplets at the speed of 200 MPH in air.

Read More:

[How Far Do Airborne Pathogens Travel?](#) (By Surgically Clean Air)

[How Fast Is a Sneeze Versus a Cough? Cover Your Mouth Either Way!](#) (By Editorial Staff: American Lung Association)

Card-11: Mice do not frighten elephants. As elephants are big in size, it is hard to get a clear sight of any small or tiny object moving around them.

Read More:

[Are Elephants Afraid of Mice?](#) (By Linda Chivell)

Card-12: In nature, 4 states of matter exist. Three are solid, liquid, gas, and ionized

plasma. In universe, the ionized plasma is observed in stars, planets, and lightning. The fifth state of matter, which is another form of plasma, is the quark-gluon plasma (made at temperature 4-6-trillion°C, hottest ever made on earth and 100,000 times hotter than the center of the sun). The sixth and seventh states of matter are the forms of condensate: Bose-Einstein (Sixth state; formed when the solid is cooled at super low temperature such as zero Kelvin (absolute zero) and fermionic (Seventh state; superfluid state formed by fermionic particles at low temperature). (M=Melting, F=Freezing, V=Vaporizing, I=Ionizing, D=Deionizing, C=Condensing)

Read More:

[7 States of Matter](#) (By Mitchell Drennan)

Card-13: Humans have more than 5 senses. Some of those are: equilibrioception (sense of balance), proprioception (sense of knowing which body parts are where), kinaesthesia (sense of movement), thermoception (sense of environment temperature), nociception (sense to feel pain) and chronoception (sense of passing time).

Read More:

[Humans have more than 5 senses](#) (By Alex Gray)

Card-14: Glass is neither supercooled nor high viscosity liquid, instead, it is an

amorphous solid. It is made by cooling supercooled liquid which, in turn, is formed by cooling liquid silica quickly below its melting point.

Read More:

[Fact or Fiction? Glass is a \(Supercooled\) Liquid](#) (By Ciara Curtin)

Card-15: The largest living being on earth is the humongous honey fungus in the Oregon Blue mountains. This fungus has 1000s of mushroom fruiting bodies spreading across 2.4 miles (3800 meter) whereas the largest whale is reported to have length of 29.9 meter (98 feet).

Read More:

[The Largest Living Thing on Earth](#) (By Nic Fleming)

[This Humongous Fungus Is as Massive as Three Blue Whales](#) (By Jason Daley)

[Strange but True: The Largest Organism on Earth Is a Fungus](#) (By Anne Casselman)

[Blue whale facts: How big is the blue whale?](#) (By M. Özgür Nevres)

Card-16: Humans have not evolved from apes but yes, they both do share a common ancestor.

Read More:

[Human evolution](#) (By Russell Howard Tuttle)

Card-17: When a goldfish learns some life saving techniques or anything else about the environment, it stays in its memory for around 3 months.

Read More:

[Do goldfish really have a 3-second memory?](#) (By Harry Baker)

Card-18: Duck's quacks, yelps, honks, and squeaks do echo like others, though, it may not be audible due to low volume sound.

Read More:

[Acoustics Professor Proves Ducks Do Echo](#) (By Tim Radford)

Card-19: Though opossums hang by the tail on trees, but they do not sleep in this posture as their musculoskeletal system does not allow it. However, baby opossums are capable of sleeping by hanging on their tail, but for a few moments only as blood flow to the brain can be fatal.

Read More:

[Opossum Facts](#) (By John Craton)

[Why do Opossums Hang Upside Down by their Tails?](#) (By Sue Anne Zollinger)

Card-20: The light from sun is white (mixture of all visible wavelengths; violet: the shortest; red: the longest), however, water droplets and gases in air (such as oxygen (21%), nitrogen (78%) absorb the

light of shorter wavelength and then, scatter it in all directions, so, sky appears blue. But light of longer wavelengths cannot be absorbed and is passed through easily, which makes the sun appear yellow in color. This phenomenon is called as the Rayleigh effect.

Read More:

[Why Is the Sun Yellow?](#) (By Dr. Anne Marie Helmenstine)

[Rayleigh Scattering Sunsets](#) (By Physics Central)

Card-21: The earth is flattened at poles and bulged at center because the rotational speed of earth at equator is 1037 MPH which gets slower to 733 MPH near the poles (south and north). This causes the mantle (gummy, plastic crust beneath earth) to be affected differently at center and poles, and so, it creates a bulge around the equator.

Read More:

[Is the Earth round?](#) (By National Ocean service)

[Shape of the Earth: The Oblate Spheroid](#) (By EarthHow)

[How Fast Is Earth Moving?](#) (By Elizabeth Howell)

Card-22: The gravitational interplay between moon, sun and earth causes tidal

pull. Moon alone cannot create it because the moon's force is highly weak (1/10,000,000th of earth's gravity). When the sun's gravity is opposite to that of the moon's, it creates lower than average tides, called as "neap tides" and when both add up, it leads to higher tides known as "spring tides".

Read More:

[Tide-y facts about the Moons effect on the Oceans](#) (By Star Name Registry.com)

[Tides and Water Levels Technical Workshop](#) (By OceanTeacher Global Academy)

Card-23: In dark (night), the temperature in space is -454°F which can freeze anyone to instant death. However, during the day, it rises to boiling 250°F. That is why astronauts wear white spacesuits to reflect the heat.

Read More:

[The Coldest Spot in the Known Universe & Staying Cool on the ISS](#) (By NASA)

Card-24: When severed, planarian flatworms can regenerate into two, but earthworms cannot. Only the head part is capable regenerating the tail part, but the lost tail part cannot.

Read More:

[How Many Times can a Worm be Split in Half and Still Grow Back?](#) (By Nikki Withers)

[These Flatworms Can Regrow A Body From A Fragment. How Do They Do it and Could We?](#) (By Gabriela Quirós)

Card-25: To simplify, planetary rotation is compared to the motion of orbiting electrons, but the fact is that planetary rotation around the sun is controlled by classic gravitational force whereas the orbiting of electrons is governed by quantum mechanics which means that electrons cannot be present at any specific arbitrary distance from nucleus. In atom (C-12 shown in card), the protons and neutrons are present in nucleus whereas electrons orbit around nucleus. Total number of protons and neutrons in atom is called as mass number (A) and the total number of protons in atom is called as atomic number (Z). In neutral atom, the number of protons is equal to the number of electrons.

Read More:

Card#25: [Orbits and Energy Levels](#) (By Britannica)

[The Bohr Model](#) (By Pas Rochester)

