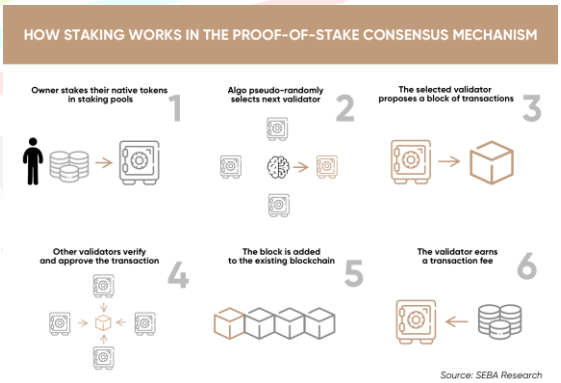
Proof of stake vs proof of work

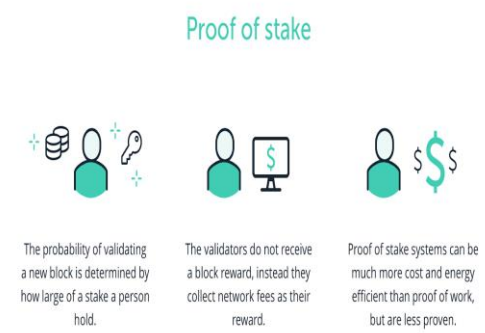
The story so far

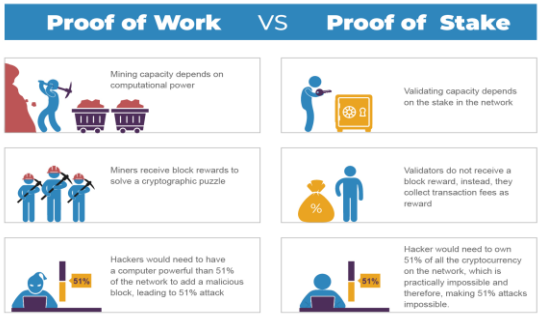
- On September 15, the Ethereum blockchain fully transitioned to a new way of processing transactions.
- This is an important day for crypto trackers as the Ethereum's Merge event, as it is known, could change the nature of crypto and Web3 itself.
- Developers say the transition to what is called a 'proof-of-stake' consensus mechanism will cut Ethereum's energy consumption by 99.95%.

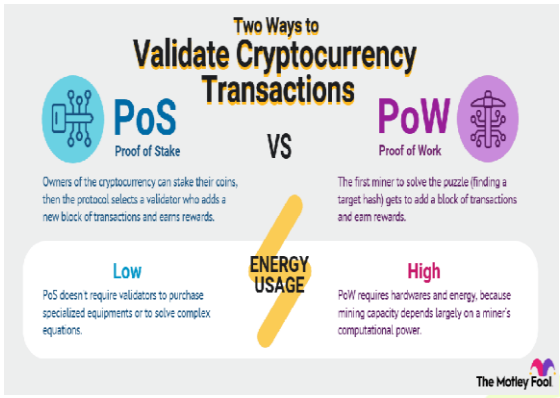
What is Ethereum?

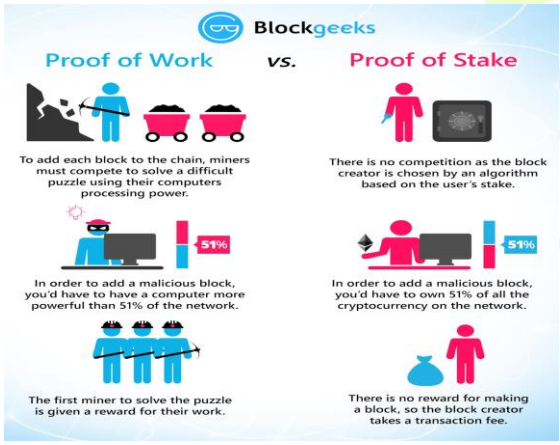
- Ethereum is one of the most used platforms by developers to build decentralised apps (dApps), smart contracts, and even crypto tokens.
- The platform's currency, Ether is only second to Bitcoin (BTC) in terms of market capitalisation.
- The change in the way Ethereum builds the blockchain comes with not just environmental consequences, but also major cyber and financial security implications.
- What is the importance of consensus mechanisms? Why is there a need for a new mechanism?
- Decentralised transactions are processed on blockchains using consensus mechanisms.
- Ethereum's former method, 'proof-of-work', which is also used by Bitcoin, needs powerful mining hardware that consumes a lot of electricity and generates enormous amounts of heat.
- This energy is then used to process extremely difficult mathematical puzzles, the solution of which would let new transactions be added to the blockchain so as to reward the miners with crypto.











- Many environmentalists, policy makers, and regulators have strongly criticised the impact of Bitcoin mining on local communities.
- Common centres for mining included China (before a near total crypto ban), the U.S., Russia, and Kazakhstan countries with cheap electricity rates and colder climates.
- Ethereum's website admitted that their crypto's total annualised power consumption nearly matches that of Finland while its carbon footprint is comparable to Switzerland.
- For some time, European countries even mulled a crypto mining ban, while China actually carried out a nationwide crackdown on crypto miners, sending them fleeing overseas.
- Ethereum has decided to switch to a 'proof-of-stake' consensus mechanism, where Ether owners will stake their own coins in order to serve as collateral and help process new blockchain transactions, in return for rewards.
- Some Bitcoin supporters go so far as to say that miners' activities, though harmful to the environment now, will help bring about an energy revolution and the faster adoption of solar, wind, gas, and nuclear energy.
- However, consequences of crypto mining across the globe have included mass electricity blackouts, fire accidents, overburdened grids, struggles between locals and crypto miners for more control over the energy supply, and even crypto mining on indigenous land.

- Scandinavian countries have these features in common reliance on representative and participatory democratic institutions where separation of powers is ensured;
- A comprehensive social welfare schema with emphasis on publicly provided social services and investment in child care,
- Education and research among others, that are funded by progressive taxation;
- Presence of strong labour market institutions with active labour unions and employer associations which allow for significant collective bargaining.

THE HINDU

Death penalty and mitigating circumstances

- Trial judges are called upon to make a decision on whether only a death sentence will meet the ends of justice, or a life term will be enough.
- As a salutary norm, the Supreme Court has laid down that the death penalty can be imposed only in the "rarest of rare" cases.
- Subsequent judgments have sought to buttress this principle by holding that the gruesome nature of the offence may not be the sole criterion to decide what brings it under the 'rarest of rare' category.
- The offender, his socio-economic background, and his state of mind are also key factors in this regard. In practice, the sentencing part of the trial takes place after the court records a conviction.
- It is often done on the same day as the verdict, with only some limited arguments being heard on 'mitigating circumstances' from the convict's side and on the 'aggravating circumstances' from the prosecution.
- Same-day sentencing has been upheld by several judgments, with the Supreme Court often saying where a meaningful opportunity has been given to the convict to present mitigating factors, the mere fact that death was awarded on the same day would not vitiate the sentence.
- Some High Courts have given a chance to convicts to present mitigating factors so that the inadequacy of the sentencing

process in the trial court does not matter.

- Present thinking, however, is veering towards the view that courts must elicit reports from the jail authorities, probation officers and even trained psychologists to assess the mitigating factors in favour of not imposing the death penalty.
- In its referral order, the Bench has also raised the question as to the stage at which mitigating factors are to be presented. It has noted that the scales are tilted against the convicts now, as it is only after conviction that they are able to speak about mitigating circumstances.
- The prosecution, on the other hand, presents its case from the beginning on how heinous the crime was, and how much the accused deserved maximum punishment.
- The Constitution Bench may come up with new guidelines under which the trial courts themselves can hold a comprehensive investigation into factors related to the upbringing, education and socio-economic conditions of an offender before deciding the punishment.

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Essential practice doctrines

- The essential practices doctrine owes its existence to a speech made by B.R. Ambedkar in the Constituent Assembly.
- "The religious conceptions in this country are so vast that they cover every aspect of life, from birth to death," he said. "…I do not think it is possible to accept a position of that sort… we ought to strive hereafter to limit the definition of religion in such a manner that we shall not extend beyond beliefs and such rituals as may be connected with ceremonials which are essentially religious. It is not necessary that… laws relating to tenancy or laws relating to succession, should be governed by religion."
- In a series of cases, the Court has assumed something akin to an ecclesiastical power and determined whether a practice which was religious in nature was also "essential" to that religion.
- The upshot is a conflation of tests through which the Court is now deciding not only when the state could lawfully interfere in the interests of social welfare and reform, but also which practices are deserving of constitutional protection in the first place.

- The effects the embedding of this test in the Court's jurisprudence has achieved at least two things, neither of which is particularly desirable.
- First, it has allowed the Court to narrow the extent of safeguards available to religious customs by directly impinging on the autonomy of groups to decide for themselves what they deem valuable, violating, in the process, their right to ethical independence.
- Second, it has also negated legislation that might otherwise enhance the cause of social justice by holding that such laws cannot under any circumstances encroach on matters integral to the practice of a religion.
- For example, in 1962, the Court struck down a Bombay law that prohibited ex-communications made by the Dai of the Dawoodi Bohra community when it held that the power to excommunicate is an essential facet of faith and that any measure aimed at social welfare cannot reform a religion out of its existence.
- The essential practices test is not without alternatives. In his concurring opinion, in the case concerning the ban on entry of women into the Sabarimala temple, Justice D.Y. Chandrachud proposed one such doctrine: a principle of anti-exclusion.
- Its application would require the Court to presume that a practice asserted by a religious group is, in fact, essential to the proponents of its faith.
- But regardless of such grounding, the Constitution will not offer protection to the practice if it excludes people on grounds of caste, gender, or other discriminatory criteria.
- As Justice Chandrachud put it, "the anti-exclusion principle allows for due-deference to the ability of a religion to determine its own religious tenets and doctrines.
- At the same time, the anti-exclusion principle postulates that where a religious practice causes the exclusion of individuals in a manner which impairs their dignity or hampers their access to basic goods, the freedom of religion must give way to the over-arching values of a liberal constitution.

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