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Bitcoin as Money: Fixed Supply and Halvings

How new bitcoins are created, why the total stops at 21 million, and what the halvings mean for its supply and its price

10 min read 8 quiz questions with answer key

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Bitcoin as Money: Fixed Supply and Halvings

IN ONE SENTENCE

Bitcoin's supply follows a public schedule that nobody can change on their own: new coins arrive with every block, the reward halves about every four years, and the total can never pass 21 million.

Money with no one in charge of the printer

In Lesson 1 we saw that today's money is managed by central banks. A committee meets, looks at the economy and decides whether to create more money or less. That flexibility is useful in a crisis, but it means the supply of money depends on decisions made by a small group of people.

Bitcoin replaces that committee with rules written into its software. The rules say exactly how many new bitcoins can be created, when, and by whom. Every computer that runs Bitcoin, called a **node**, checks each new block against these rules. A block that tries to create even a fraction of a bitcoin too much is rejected by the whole network, no matter who made it.

The result is something unusual in the history of money: a supply schedule that anyone can read in advance, decades into the future. This lesson walks through that schedule and what it means for bitcoin as money.

How new bitcoins are created

New bitcoins enter the world in only one way: as a reward to the miner who adds the next block to the chain. You met mining in Blockchain Lesson 6. A new block arrives about every 10 minutes, which is about 144 blocks a day.

The reward per block is called the **block subsidy**. It started at 50 bitcoins in 2009, and every 210,000 blocks, roughly every four years, it is cut in half. This event is the **halving**. Nobody votes on it and nobody announces it. When block number 210,000, 420,000, 630,000 and so on is reached, the lower reward simply applies.

Halving	Date	Block	Reward after
1st	28 November 2012	210,000	25 BTC
2nd	9 July 2016	420,000	12.5 BTC
3rd	11 May 2020	630,000	6.25 BTC
4th	20 April 2024	840,000	3.125 BTC
5th (expected)	around April 2028	1,050,000	1.5625 BTC

The date of the next halving is an estimate because blocks do not arrive at exactly 10 minutes. The block number, however, is fixed. Miners also earn the fees paid by users, which you will meet in later lessons, but the subsidy is the only source of new coins.

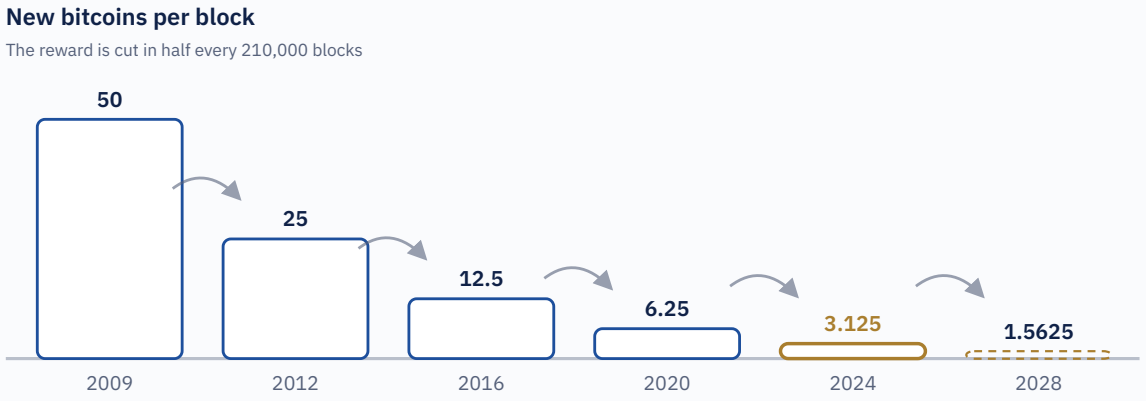


Figure 1. The block reward started at 50 BTC and halves every 210,000 blocks. It has been 3.125 BTC since April 2024, and the outlined bar shows the next halving, expected around 2028.

EXAMPLE: HOW MANY NEW BITCOINS PER DAY?

Since April 2024 the reward is 3.125 BTC per block. With about 144 blocks a day, that is 3.125 × 144 = **450 new bitcoins a day**, or roughly 164,000 a year. Before the 2024 halving it was 900 a day. After the 2028 halving it will be about 225 a day.

Why the total stops at 21 million

Add up all the rewards and something interesting happens. The first 210,000 blocks create 10.5 million bitcoins. The next 210,000 create half of that, 5.25 million. Then 2.625 million, and so on. Each period adds half as much as the one before, so the total creeps closer and closer to 21 million but never goes past it.

This means most bitcoins were created early. Half of all bitcoins existed by the end of 2012. Three quarters existed by mid-2016. The 20 millionth bitcoin was mined in March 2026, so more than 95% of the final supply already exists. The last tiny fractions will keep trickling out until around the year 2140.

After that, miners will no longer receive new coins, only the fees that users pay. Whether fees alone will be enough to keep miners securing the network is a real and open debate, but it is a question for the next century rather than this one.

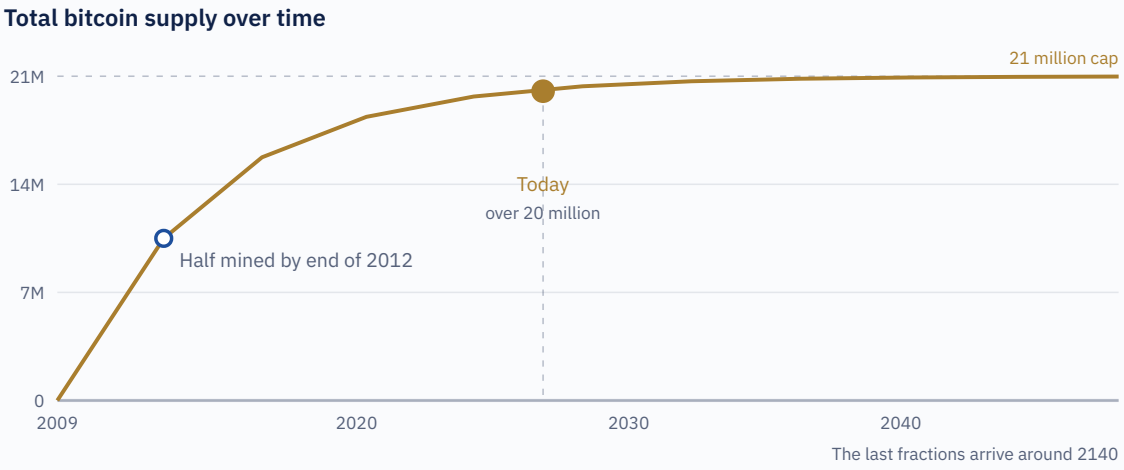


Figure 2. Bitcoin's total supply grows quickly at first, then ever more slowly, approaching the 21 million cap. More than 95% of all bitcoins already exist.

ANALOGY: WALKING HALF THE WAY TO A WALL

Stand 21 steps from a wall. Walk half the distance, then half of what is left, then half again. You get very close very quickly, but each move is smaller than the last and you never quite touch the wall. Bitcoin's supply works the same way: 10.5 million, then 15.75, then 18.375 and so on, always approaching 21 million.

An inflation rate that falls by design

A useful way to compare forms of money is to ask how fast their supply grows each year. This is sometimes called the supply inflation rate, and it is different from price inflation, which measures how fast prices rise.

In bitcoin's early years the supply grew fast: around 12% in 2013. Each halving cut that rate in half. In 2025 it was about 0.8%, and after the 2028 halving it will be roughly 0.4%.

Gold, the classic scarce money, grows more slowly than most people think, but steadily. According to the World Gold Council, miners produced 3,672 tonnes in 2025, the most on record, adding about

1.7% to the roughly 220,000 tonnes already above ground. Since the 2024 halving, bitcoin's supply has been growing more slowly than gold's.

There is one big difference. Gold's supply responds to its price: when gold gets more expensive, miners dig more. Bitcoin's supply does not respond to anything. Even if its price doubled tomorrow, the number of new coins would stay exactly the same.

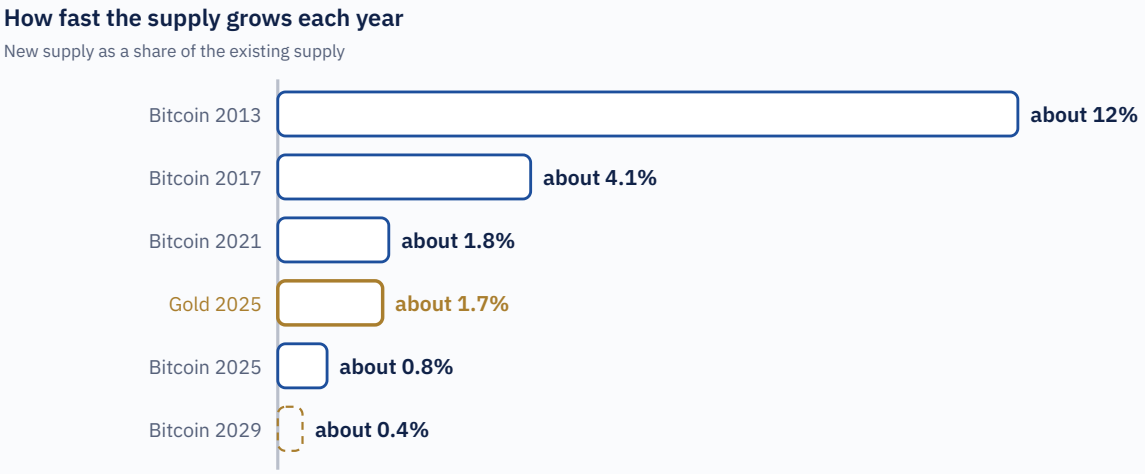


Figure 3. Bitcoin's yearly supply growth halves at every halving. Since 2024 it has been below gold's, which was about 1.7% in 2025. The outlined bar is a projection.

Small units: satoshis

A 21 million limit sounds small for a global form of money. The answer is divisibility. Every bitcoin can be split into 100 million smaller units called **satoshis**, or **sats**, named after Bitcoin's creator.

So 0.01 BTC is 1 million sats, and the smallest possible amount, 0.00000001 BTC, is one sat. Behind the scenes, the Bitcoin software actually counts everything in sats. The 21 million limit is really a limit of about 2.1 quadrillion sats.

This is why the price of one bitcoin does not matter much for using it. Nobody needs to buy a whole coin. If one bitcoin cost $100,000, one dollar would buy 1,000 sats. Many wallets and apps now let users show amounts in sats instead of in long decimals.

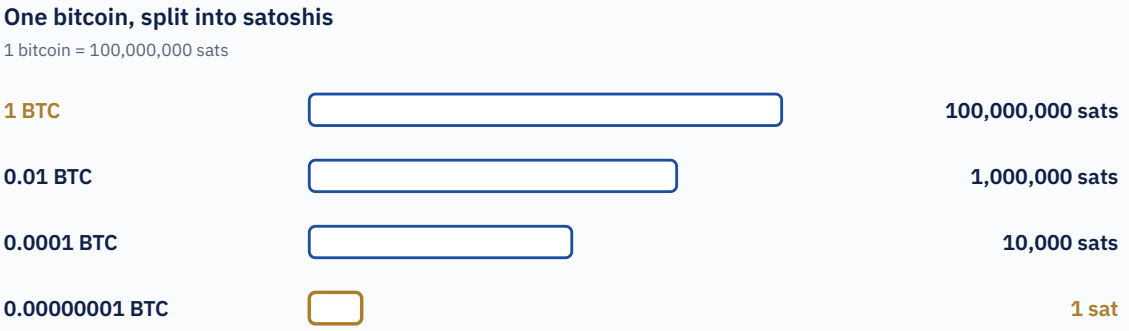


Figure 4. Each bitcoin divides into 100 million satoshis. The bars show how many digits each amount has in sats.

Lost coins and the real supply

Not every bitcoin that exists can actually be used. If someone loses the keys to a wallet, the coins inside stay on the blockchain forever, but nobody can ever move them. Early users mined coins when they were worth almost nothing, and many simply forgot about them or threw away old hard drives.

Nobody knows the exact number. In 2017 the research firm Chainalysis estimated that between 2.8 and 3.8 million bitcoins were probably lost. The roughly 1.1 million coins believed to belong to Satoshi Nakamoto, which you met in Blockchain Lesson 4, have never moved either, and many estimates count them among the coins that are effectively out of circulation.

This makes bitcoin's usable supply smaller than the headline number. A coin that is lost cannot be sold, which is one reason some holders describe bitcoin as even scarcer than 21 million suggests. Keep in mind that these are estimates, and some coins thought lost could one day move again.



Figure 5. A simplified view of the 21 million: coins already mined, the share estimated to be lost, and the coins not yet mined. Lost coin figures are estimates.

Could anyone change the 21 million rule?

Bitcoin's rules are software, and software can be changed. So why do people trust the limit? Because no single person or company can change it. A new version of the software only matters if the people running nodes choose to install it. A version that created more coins would be rejected by every node that kept the old rules, so its coins would not be accepted by the rest of the network.

In practice, the 21 million limit is the rule bitcoin's users care about most. Any proposal to raise it would face overwhelming opposition, because the fixed supply is the main reason many people hold bitcoin in the first place. That shared commitment, more than any line of code, is what protects the limit.

EXAMPLE: THE 184 BILLION BITCOIN BUG

On 15 August 2010, someone found a bug that let them create more than **184 billion bitcoins** in block 74,638. Within about five hours, a fixed version of the software was released. Users switched to it, the faulty block was abandoned, and the chain continued without those coins. It remains the clearest example of the network rejecting coins that broke the supply rules.

Halvings and the market

Because each halving cuts the flow of new coins, many people expect it to push the price up: if demand stays the same while new supply drops, buyers compete for fewer coins. Miners also sell part of their rewards to pay for electricity and equipment, so a halving reduces that steady selling.

The history so far looks striking. After each of the first four halvings, bitcoin went on to set new record highs, with the peak of each cycle arriving roughly 12 to 18 months after the halving. Its record of about $126,000 came on 6 October 2025, about 18 months after the 2024 halving.

But look closely at the size of those moves. From the price on halving day to the next peak, bitcoin rose roughly 90 times after 2012, 31 times after 2016, 8 times after 2020, and about 2 times after 2024. Each halving now cuts a smaller share of a much larger supply, while other forces such as interest rates, global liquidity and the US spot bitcoin ETFs have grown in importance. Four cycles are also far too few to call it a law. Treat the four year pattern as one input among many, not a forecast.



Figure 6. Bitcoin's price on each halving day and at the peak that followed. New highs came after every halving so far, but each rally was smaller than the last. Past cycles do not predict future ones.

Why this matters for traders

- **The halving is the best known date on the crypto calendar.** Its block number is fixed years in advance, so the event itself brings no surprise. What moves price is how traders position before and after it, and whether reality matches the story.
- **Watch the shrinking effect.** Each halving removes less new supply than the last, and the size of the rally that followed has shrunk every cycle so far. Traders who rely on old cycle charts without adjusting for this may expect too much.
- **Miners are a source of supply.** Miners sell coins to cover costs. Lower rewards squeeze their profits, and some weaker miners may sell more of their holdings or shut down around a halving. Miner flows are tracked by on-chain analysts for this reason.
- **Fixed supply means demand does the work.** Because new supply cannot react to price, every big move in bitcoin comes from changes in demand: ETF flows, leverage, news and sentiment. That is part of why bitcoin moves so sharply in both directions.

Key terms

Block subsidy	The new bitcoins created as a reward for each block. It is the only way new coins enter circulation.
Halving	The automatic cut of the block subsidy by half, every 210,000 blocks, roughly every four years.
Supply cap	The maximum number of bitcoins that can ever exist: 21 million.
Supply inflation rate	How fast the total supply of a form of money grows each year, as a percentage of what already exists.

Satoshi (sat)	The smallest unit of bitcoin: one hundred millionth of a bitcoin, or 0.00000001 BTC.
Node	A computer running Bitcoin software that checks every block against the rules, including how many new coins it may create.
Lost coins	Bitcoins whose keys are gone, so they still exist on the blockchain but can never be moved.

Key takeaways

1. Bitcoin has no central bank. New coins are created only as block rewards, following rules that every node checks.
2. The reward halves every 210,000 blocks, about every four years. It is 3.125 BTC since April 2024, which means about 450 new bitcoins a day.
3. Because each period adds half as much as the last, the total supply approaches but never passes 21 million. More than 95% already exists.
4. Bitcoin's supply growth now runs below gold's and keeps falling, and unlike gold it does not respond to price.
5. Each bitcoin divides into 100 million sats, and millions of coins are estimated to be lost forever.
6. Halvings have been followed by new record highs so far, but each rally has been smaller, and four cycles are not enough to rely on.

Test yourself

Circle one answer for each question. The answer key with explanations is on the next page. You can also take this quiz online at markettalks.info and see your score instantly.

1. How do new bitcoins enter circulation?

- (A) A central bank issues them
- (B) As rewards to miners who add new blocks
- (C) Exchanges create them when demand rises
- (D) The founder releases them each year

2. How often does the halving happen?

A Every year on 1 January
B Every 21,000 blocks
C Every 210,000 blocks, roughly every four years
D Whenever miners vote for it

3. What is the block reward after the April 2024 halving?

A 50 BTC
B 6.25 BTC
C 3.125 BTC
D 1.5625 BTC

4. Why can the total supply never go above 21 million?

A Miners agreed to stop at that number
B Each four year period adds half as much as the one before
C Exchanges limit how many coins can be listed
D Computers cannot store larger numbers

5. How many satoshis are in one bitcoin?

A 1,000
B 1 million
C 21 million
D 100 million

6. What is one key difference between the supply of bitcoin and the supply of gold?

A Gold's supply never grows
B Bitcoin's supply grows faster than gold's today
C Bitcoin's new supply does not react to its price, while gold mining increases when prices rise
D Gold has a fixed cap of 21 million ounces

7. What happened in the August 2010 value overflow incident?

A. Satoshi created extra coins for himself

B. A bug created over 184 billion bitcoins, and the network quickly switched to fixed software that rejected them

C. The 21 million limit was raised to 184 billion

D. An exchange lost 184 billion dollars

8. What does the history of halvings and price suggest?

A. Price always doubles exactly one year after a halving

B. Halvings have no connection to the market

C. New highs followed each halving so far, but each rally was smaller and four cycles are too few to rely on

D. The price falls after every halving

Answer key

1 B

As rewards to miners who add new blocks

The block subsidy, paid to the miner of each new block, is the only way new bitcoins are created. Nodes reject any block that tries to create more than the rules allow.

2 C

Every 210,000 blocks, roughly every four years

The halving is tied to block numbers, not dates. Every 210,000 blocks the reward is cut in half, which works out to roughly four years.

3 C

3.125 BTC

The reward went from 6.25 to 3.125 BTC at block 840,000. The next halving, expected around April 2028, will cut it to 1.5625 BTC.

4 B

Each four year period adds half as much as the one before

10.5 million, then 5.25 million, then 2.625 million and so on. The additions keep halving, so the total gets ever closer to 21 million without passing it.

5 D

100 million

One bitcoin is 100 million sats, so the smallest amount is 0.00000001 BTC. Nobody needs to buy a whole coin to use bitcoin.

6 C

Bitcoin's new supply does not react to its price, while gold mining increases when prices rise

Higher gold prices encourage more mining. Bitcoin's schedule is fixed, so a higher price does not create a single extra coin.

7 B

A bug created over 184 billion bitcoins, and the network quickly switched to fixed software that rejected them

A fixed version was released within about five hours and users moved to it, so the faulty block and its coins were abandoned. The supply rules held.

8 C

New highs followed each halving so far, but each rally was smaller and four cycles are too few to rely on

The gains from halving day to the next peak shrank from about 90 times to about 2 times. Other forces now matter more, so the pattern is one input, not a forecast.

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