The Gold Market

Figures current as of October 2026

Gold: what it is and why it became money, the price and what moves it, who holds it, how it is mined and refined, the market's plumbing and its shadow trade, the metals that trade beside it, and its place in the monetary order of the 2020s.

MODULE 1 — Foundations

Goal: Establish the physical facts and the units before any market claim.

Why gold became money, the units in a table, the 222,600-tonne stock and its parts, and why the stock matters more than the flow, with a mine closure worked against copper.

MODULE 2 — A Brief History

Goal: Trace gold's monetary role from coinage to its 1971 divorce from the dollar.

Lydia to the end of gold's official role in a timeline, the classical standard, Roosevelt's revaluation worked, Bretton Woods and Nixon's window, and the floating era.

MODULE 3 — The Price

Goal: Read the price history era by era.

The record in a table; six eras and their turning points, from the 1980 peak and Brown's bottom to the 2013 crash and the January 2026 record; the real-terms record; and real returns from three entry points, worked.

MODULE 4 — What Moves the Price

Goal: Isolate the forces and weigh them.

Real rates and the cost of holding gold, worked; the dollar; fear and the war of 2026; the new buyer; and whether gold has broken free of real rates, argued both ways.

MODULE 5 — Who Holds How Much

Goal: Map the world's gold, official, private, and paper.

The official league table, what the numbers hide, Indian households, and the exchange-traded funds at a record.

MODULE 6 — Central Banks and the Reserve Revolution

Goal: Explain why official buying more than doubled in 2022.

Purchases by year, the freeze of Russia's reserves, who is buying and who sold in 2026, gold past the euro, and the floor and its trapdoor.

MODULE 7 — Extraction

Goal: Follow gold from deposit to doré.

Deposit types, mining and processing, the producing countries and companies in tables, and the artisanal fifth.

MODULE 8 — Mining Economics

Goal: Work the numbers of a gold mine.

All-in costs in 2026, a mine worked from grade to margin, why record prices have not raised supply, jurisdiction from Mali to Burkina Faso, and the miners' paradox.

MODULE 9 — Supply and Demand

Goal: Reconcile the flows.

The balance for 2024 and 2025 in a table, supply, the demand categories, 2025 and 2026 so far, and how the balance clears.

MODULE 10 — Refining, Trading, and the Flows

Goal: Explain the market's plumbing.

Swiss refining, the trading centers, the trade routes and India's duty, and the transatlantic drain of 2025.

MODULE 11 — Illicit Gold

Goal: Trace the shadow market the formal one launders.

The scale, conflict gold in Sudan, Congo, and the Sahel, sanctioned Russian gold through Hong Kong, and the limits of sourcing rules.

MODULE 12 — Gold as an Investment

Goal: Assess how gold behaves and how it is held.

Returns by decade, the ways to own it and their costs, a portfolio with and without gold in 2022, worked, whether gold is an inflation hedge, argued both ways, and paper against metal.

MODULE 13 — The Politics of Gold

Goal: Examine gold as an instrument of state power.

Sanctions, seizure, and custody; Fort Knox and America's gold, revalued in a worked example; gold for bitcoin and gold-backed money; whether America should revalue its gold, argued both ways; and the Fed in 2026.

MODULE 14 — Silver, Platinum, and the Other Precious Metals

Goal: Cover the metals that trade alongside gold.

The four metals; silver's deficits and the Hunt brothers' corner; the gold-silver ratio, traded in a worked example; platinum's surplus and palladium's duties; and how the four move.

MODULE 15 — Where Things Stand, and What to Watch

Goal: Assemble the picture and name the dates.

The argument on a page, five contradictions, a dated watch list from October 2026 into 2027, and a last word.

A note on the sources: the stock, supply, and demand figures come from the World Gold Council and the consultancy Metals Focus; official holdings from the International Monetary Fund (IMF), as compiled by the World Gold Council; prices from the London Bullion Market Association (LBMA) and the close of Wednesday, October 14, 2026, unless another date is given; and every real-terms figure from the American consumer price index. The course explains how the market works; it is not advice, and it does not forecast the price.

Market Snapshot

The gold market at the close of Wednesday, October 14, 2026

Measure	Level	Source
Gold, spot	About $4,106 an ounce: down 4.7% in 2026, and 25.4% below the record LBMA morning price of $5,501.70 on January 29	Spot market; LBMA
Gold in other currencies	€3,680; £3,112; ¥650,100; 27,480 yuan; 390,700 rupees before India's import duty	Derived from the dollar price and the day's exchange rates
Silver; platinum; palladium	About $55.66, $1,620, and $1,130 an ounce; the gold-silver ratio about 74	Dealers' quotes late in the day; derived
Ten-year real yield on Treasury Inflation-Protected Securities (TIPS)	2.84%	US Treasury
Dollar index	About 102.6, its highest since April 2025	Intercontinental Exchange (ICE), via Trading Economics
Federal funds rate	3.75-4.00%, raised on September 16; futures on October 16 priced about 1 chance in 6 of a rise on October 28 and about 9 in 10 by December	Federal Reserve; the Chicago Mercantile Exchange (CME) FedWatch tool
Gold held by exchange-traded funds	4,256 tonnes, a record, at the end of September	World Gold Council
Gold in London's vaults	9,821 tonnes at the end of September	LBMA
Central banks' purchases	289 tonnes in the second quarter of 2026, a record for a second quarter	World Gold Council
Brent crude	About $106 a barrel	ICE futures

The derived figures are computed from the prices and rates shown; the course's other figures are dated where they appear.

Module 1 — Foundations

What Gold Is and How Much Exists

Recommended Reading / Reference

Book: Peter Bernstein, *The Power of Gold: The History of an Obsession* (2000)

Reference: The World Gold Council's Goldhub (gold.org), the industry's data source and this course's; the LBMA's *A Guide to the Global Precious Metals Market*

1a. Why Gold

Gold became money in almost every civilization that found it, for reasons that are chemical before they are cultural. It does not corrode, tarnish, or react with air or water, so a coin buried two thousand years ago comes out of the ground as it went in. It is dense, so value is compact. It is soft enough to cut, weigh, and stamp, and it can be melted and recast without loss.

It is scarce but not too scarce: rare enough that a little carries value and common enough to be found on every inhabited continent. And it is nearly useless for anything else, which is a virtue in money, since little competes for it and it is not used up. Silver shares most of these properties but tarnishes and is far more abundant; platinum is rarer but melts at a temperature ancient furnaces could not reach.

Property	Gold	Silver	Platinum	Copper	Why it matters for money
Corrosion and tarnish	None	Tarnishes (sulfur)	None	Corrodes	Durability across centuries
Density (g/cm³)	19.3	10.5	21.4	9.0	Value per volume; hard to counterfeit by weight
Melting point	1,064°C	962°C	1,768°C	1,085°C	Workable in ancient furnaces, which platinum was not
Abundance in the crust	About 4 ppb	About 75 ppb	About 5 ppb	About 60 ppm	Scarce enough to carry value, found everywhere
Malleability	Extreme (1 g to 1 m² of leaf)	High	Moderate	High	Coinable, divisible, recastable
Industrial use	Small, about 7% of demand	More than half of demand	Most of demand, cars' catalysts the largest use	Nearly all	A monetary metal is not used up

ppb: parts per billion; ppm: parts per million.

1b. The Units

Unit	Equivalent	Where it is used	At $4,106 an ounce
Troy ounce	31.1035 grams, about 10% heavier than the 28.35-gram ounce of the kitchen	The world's price unit	$4,106
Gram	0.03215 troy ounces	Retail and jewelry in Asia	$132
Kilogram	32.15 troy ounces	Asian bars; Swiss refiners; the kilo contract on COMEX (New York's Commodity Exchange)	$132,000

Unit	Equivalent	Where it is used	At $4,106 an ounce
Tonne	32,151 troy ounces	Central banks, mine output, trade data	$132 million
Tola	11.66 grams	Jewelry and bars in India and Pakistan	$1,540
Hong Kong tael	37.43 grams	Tael bars traded in Hong Kong	$4,941
Good Delivery bar	About 400 troy ounces (350-430), at least 99.5% gold	The vaults of London and the central banks	About $1.64 million
Fineness	Parts per thousand: 999.9 ('four nines') for bullion, 995 the Good Delivery minimum	Bullion	—
Karat	Parts per 24: 24K pure; 22K (91.7%) in Indian and Gulf jewelry; 18K (75%) in Europe; 14K (58%) in America	Jewelry	—

Values at the spot price at the close of October 14, 2026.

The spot price is for gold delivered now in London; a futures price is for delivery later. The LBMA Gold Price, set by electronic auction in London at 10:30 and 15:00 each business day, is the benchmark most contracts, central banks' valuations, and exchange-traded funds refer to.

1c. How Much Gold Exists

All the gold ever mined, counted in the table below, would fit in a cube about 22.6 meters on a side, and at October 14's price it is worth nearly a fifth of the value of all the world's listed shares. Almost all of it still exists, because gold is not consumed: the small losses are to dentistry, electronics in landfills, and shipwrecks. About two-thirds of it was mined after 1950, so the modern mining industry, not the pharaohs or the conquistadors, dug most of the world's gold.

Holding	Tonnes	Share	Value at $4,106	Notes
Jewelry	About 99,700	45%	$13.2 trillion	India and China hold the most (Module 5)
Bars and coins	About 47,800	21%	$6.3 trillion	Held above all in India, China, Germany, Turkey, and the United States
Central banks and official institutions	About 39,000	18%	$5.1 trillion	Including the IMF (Module 5)
Over-the-counter investment	About 10,000	4%	$1.3 trillion	Held by funds and wealthy investors in vaults, outside the reported categories
Exchange-traded funds	About 4,000	2%	$0.5 trillion	Module 5
Other uses and unaccounted for	About 22,100	10%	$2.9 trillion	Electronics, dentistry, lost and unrecorded
Total above ground	About 222,600	100%	$29.4 trillion	—

World Gold Council, data to the end of June 2026. Part of the rise from the 216,265 tonnes counted at the end of 2024 is revision: Metals Focus, the consultancy behind the figures, has raised its estimates of past artisanal output.

1d. Why the Stock Matters More Than the Flow

This is the fact that makes gold behave unlike any other commodity. For oil or copper a year's production is consumed, so the year's supply and demand set the price. For gold a year's mine output is under 2% of a stock that is all, in principle, for sale (Module 9): every bar in every vault and every bangle in every household is supply at the right price.

The price is therefore set not by mines and jewelers but by the willingness of the holders of the stock to keep holding, which is a question about interest rates, currencies, and fear rather than geology. A strike at a large mine moves copper's price and barely registers in gold's, while a change in what central banks and investors believe about the dollar moves gold by hundreds of dollars.

Worked example — What a Mine Closure Does to Gold and to Copper

Gold. Suppose a large gold mine producing 30 tonnes a year shuts for a year. World mine supply, 3,672 tonnes in 2025, falls by 30 ÷ 3,672 = 0.8%, and the above-ground stock is untouched: the 30 tonnes are 30 ÷ 222,600 = 0.0135% of it. Holders need only release a sliver of what they hold to fill the gap, and the price barely moves. **Copper.** Now suppose Escondida in Chile, the largest copper mine, producing about a million tonnes a year, around 5% of world output, shuts for a year. Copper's stocks above ground cover only weeks of consumption, so the shortfall cannot be met from inventory: smelters run short, and the price jumps. **The lesson.** Gold's price is set by the holders of the stock, copper's by the year's flow.

Module 1 Key Points

Foundations

• Gold became money through chemistry: it does not corrode, it is dense and workable, and it is scarce but found everywhere.

• The troy ounce is 31.1 grams; a Good Delivery bar of about 400 ounces was worth about $1.64 million on October 14.

• About 222,600 tonnes have been mined, worth $29.4 trillion; 45% is jewelry, 21% bars and coins, 18% central banks.

• Two-thirds of all gold was mined after 1950, and almost all of it still exists.

• A year's mine output is under 2% of the stock, so holders, not miners, set the price.

Module 1 Quiz

Check Your Understanding

1. Why did gold become money in so many civilizations?

A) Governments decreed it money by law
B) It was the easiest metal to mine
C) Its chemistry: it does not corrode, and it is dense and workable
D) It was the most abundant metal in the earth's crust

2. How much heavier is a troy ounce than an ordinary ounce?

A) They weigh the same
B) Twice as heavy
C) About 10% lighter, at 25 grams
D) About 10%

3. What is the largest single use of the world's above-ground gold?

A) Bars
B) Jewelry
C) Central-bank reserves
D) Electronics and dentistry

4. When was most of the world's gold mined?

A) After 1950, about two-thirds of it
B) Before 1500, by the old empires
C) During the gold rushes of the 1800s
D) In antiquity, by Egypt and Rome

5. Why does a mine closure move copper's price but barely gold's?

A) Copper is priced in euros
B) Copper mines are larger than gold mines
C) Copper's stocks cover weeks
D) Gold's price is fixed by an international agreement

Module 2 — A Brief History

Gold as Money, From Lydia to 1971

Recommended Reading / Reference

Book: Barry Eichengreen, *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939* (1992)

Reference: The Federal Reserve History essays on the gold standard, the Gold Reserve Act of 1934, and the end of Bretton Woods

2a. The Timeline

Date	Event	Significance
c. 600 BC	Lydia, in western Anatolia, strikes the first coins, of electrum, a natural alloy of gold and silver	Money as a stamped, standard weight of metal
46 BC-AD 1453	Rome's aureus, then the Byzantine solidus, which keeps its weight and purity for some seven centuries	The reference coin of the Mediterranean world
1252-84	Florence's florin and Venice's ducat	Gold coinage returns to Europe for long-distance trade
1500s	Gold and, above all, silver from the Americas	The 'price revolution', a century of rising prices in Europe
1717	Isaac Newton, as Master of the Mint, sets the guinea at 21 shillings	Britain drifts onto a de facto gold standard
1821	Britain makes its notes convertible into gold at a fixed price	The first formal gold standard
1834-37 and 1900	The Coinage Act of 1834 values gold at about $20.69 an ounce, and that of 1837 at $20.67; the Gold Standard Act of 1900 makes gold the only standard	The dollar joins the system
1871-79	Germany, then most of Europe and the United States, adopt gold	The classical gold standard
1914	The First World War suspends convertibility	The classical standard ends
1925-31	Britain returns to gold at its prewar parity, then leaves it	Deflation and depression
1933-34	President Franklin Roosevelt ends private ownership and raises the price (2c)	The dollar devalued against gold
1944	The Bretton Woods agreement (2c)	The gold-exchange standard
1961-68	The London Gold Pool, until its collapse (2c)	Two prices, official and market
1971	President Richard Nixon suspends convertibility (2c)	The dollar floats
1974-78	Americans may own gold again from December 31, 1974; the IMF's amended articles end gold's official role in 1978	Gold becomes an asset like any other, on paper

2b. The Classical Gold Standard

From about 1870 to 1914 the major currencies were fixed weights of gold. The pound sterling was 113 grains of fine gold and the dollar 23.22 grains, which fixed the exchange rate between them at $4.87 to the pound. Gold flows were meant to correct trade imbalances on their own: a country in deficit lost gold, its money supply and prices fell, its exports grew cheaper, and the deficit closed.

The system delivered price stability over the long run, with British prices in 1914 about where they had been in 1870, and sharp deflations and banking panics in the short run. It worked because governments accepted that jobs at home would be sacrificed to the exchange rate, an acceptance that universal suffrage and organized labor ended. The First World War broke it. The interwar attempt to restore it at prewar parities, Britain's in 1925 above all, is widely blamed for deepening the Great Depression, and Eichengreen found that countries recovered in the order they left gold.

2c. Roosevelt, Bretton Woods, and 1971

On April 5, 1933 President Franklin Roosevelt ordered Americans to hand in their gold coins, bullion, and certificates at $20.67 an ounce. The Gold Reserve Act of January 30, 1934 moved the gold to the Treasury, and the next day Roosevelt set a new price of $35. That cut the dollar's gold content by 41%, and private ownership stayed illegal for four decades.

The Bretton Woods agreement of 1944 built on that price. The dollar was convertible into gold at $35 for foreign governments, and every other currency was fixed to the dollar. It worked while the United States held most of the world's monetary gold, about 20,000 tonnes around 1950, and it unraveled as dollars piled up abroad faster than the gold behind them. France under President Charles de Gaulle converted its dollars into gold, and the London Gold Pool, in which eight central banks sold gold to hold the market price at $35, collapsed in March 1968. American reserves fell to about 9,000 tonnes, and on August 15, 1971 President Richard Nixon suspended convertibility.

Worked example — What Roosevelt's Revaluation Did

The setup. In January 1934 the United States' monetary gold, about 6,000 tonnes, was carried at $20.67 an ounce, about $4.0 billion. **The revaluation.** At $35 the same gold was worth $35 ÷ $20.67 = 1.69 times as much, about $6.8 billion, so the Treasury booked a gain of about $2.8 billion, roughly 4% of that year's output. It put $2 billion of the gain into a new Exchange Stabilization Fund. **Who gained.** The citizens who had surrendered their gold at $20.67 received none of it. **The lesson.** A government that sets the official price of its gold can turn a stroke of the pen into money to spend, which is why the episode is the precedent in today's debate about America's own gold (Module 13).

2d. The Floating Era

Since 1971 no currency has been convertible into gold, and central banks hold it as a reserve asset beside currencies and bonds rather than as the base of their money. Yet the metal never stopped trading daily in every financial center, central banks never sold most of what they held, and in the 2020s their buying returned on a scale not seen since records began (Module 6). The floating era is the history of gold's second life as an asset, told through its price in the next module, and of the discovery, in each crisis, that it never entirely gave up the monetary role it officially lost.

Module 2 Key Points

A Brief History

• Gold became money as stamped metal in Lydia around 600 BC; Britain's 1821 standard and the classical system of 1870-1914 followed.

• The classical standard corrected imbalances through gold flows and deflation; countries recovered from the Depression in the order they left gold.

• Roosevelt confiscated gold at $20.67 in 1933 and set $35 in 1934: a 41% devaluation and a $2.8 billion Treasury gain.

• Bretton Woods fixed the dollar to gold at $35 for governments; the London Gold Pool failed in 1968, and Nixon closed the window in 1971.

• Since 1971 gold has had no official monetary role, yet central banks kept most of theirs and resumed buying in the 2020s.

Module 2 Quiz

Check Your Understanding

1. How did the classical gold standard correct a trade deficit?

A) Tariffs rose on the deficit country's imports
B) Gold outflows cut money and prices until exports recovered
C) Central banks bought gold to replace the outflow
D) The deficit country printed more of its currency

2. What did Eichengreen find about the interwar gold standard?

A) Countries recovered as they left it
B) It stopped the Depression from spreading abroad
C) It had no measurable effect on output or prices
D) It caused hyperinflation in the countries that kept it

3. What did the $35 price of 1934 do to the dollar?

A) Raised its gold content by 69%
B) Fixed it to the pound at $4.87
C) Tied it to silver at sixteen to one
D) Cut its gold content by about 41%

4. What was the London Gold Pool?

A) A vault under the Bank of England
B) A cartel of South African mining companies
C) Eight central banks selling gold to hold $35
D) London's twice-daily auction that sets the price

5. What official monetary role has gold had since 1971?

A) None, although central banks still hold it as a reserve
B) The IMF's unit of account for all of its lending
C) The legal backing of the euro's banknotes since 1999
D) The statutory base of the American money supply

Module 3 — The Price

1971 to Today, and Its Turning Points

Recommended Reading / Reference

Book: Timothy Green, *The Ages of Gold* (2007)

Reference: The LBMA's historical gold prices; the World Gold Council's price data on Goldhub; the Bureau of Labor Statistics' consumer price index, used for every real-terms figure in this course

3a. The Record

Year	Year-end price ($ an ounce)	In September 2026 dollars	What happened
1971	44	358	President Nixon closes the gold window (Module 2)
1974	187	1,211	Americans may own gold again (Module 2)
1980	590	2,303	The peak, then the Fed's rate rises (3b)
1999	290	581	Britain's sales, the low, and the Washington Agreement (3b)
2001	277	527	The trough (3b)
2008	870	1,394	The financial crisis (Module 4)
2011	1,531	2,286	The peak, during the euro crisis (3b)
2013	1,205	1,741	The crash (3b)
2015	1,060	1,510	The low of the cycle (3b)
2020	1,888	2,442	The pandemic peak (3b)
2022	1,812	2,057	Real yields up sharply, and gold flat (Module 4)
2024	2,611	2,787	A rise on central banks and China
2025	4,308	—	Up 65%, the best year since 1979
October 14, 2026	4,106	4,106	Down 4.7% in 2026, after the January record (3b)

LBMA year-end prices, rounded; the real-terms column is converted with the consumer price index to September 2026, the latest month published, and the 2025 row, less than a year earlier, is left unconverted.

3b. The Eras and the Turning Points

• **1971-1980: the first bull market.** Freed from $35, gold rose 24-fold to $850 on January 21, 1980, through two oil shocks, double-digit inflation, a falling dollar, the Iranian revolution, and the Soviet invasion of Afghanistan. The Federal Reserve under its chairman, Paul Volcker, ended it within weeks by raising interest rates toward 20%, and by June 1982 gold had fallen 65%, to $297.

• **1980-2001: the twenty-year bear.** With inflation beaten, real interest rates high, and the dollar strong, gold fell for two decades. The low came with the sellers. In May 1999 Britain's Treasury announced it would auction most of its gold, and it sold 395 tonnes, about 55% of the total, in seventeen auctions to 2002 at an average of $275, a sale known as 'Brown's bottom' after Gordon Brown, then Chancellor. The price touched $252.80 on July 20, 1999, and on September 26 fifteen European central banks signed the Washington Agreement, capping their sales at 400 tonnes a year. At October 2026's price the gold Britain sold would be worth about $49 billion more than it fetched.

• **2001-2011: the second bull market.** Gold rose every year from 2001 to 2012, from $256 in April 2001 to an intraday peak of $1,920 on September 6, 2011, on the dot-com bust, the Iraq war, a weakening dollar, Chinese and Indian demand, the first American gold exchange-traded fund (ETF), in November 2004, the 2008 financial crisis, and the quantitative easing that followed.

• **2011-2018: the crash and the range.** On April 12 and 15, 2013 gold fell about 14% in two sessions, as investors priced the end of the Fed's bond buying and reports said Cyprus might sell its gold. It lost 28% that year, the worst since 1981, as holders of exchange-traded funds sold about 880 tonnes. The low came at $1,049 on December 17, 2015, and gold then ranged between about $1,100 and $1,400 for three years.

• **2019-2023: the pandemic high and the decoupling.** Rate cuts, then the pandemic and its stimulus, took gold above $2,060 in August 2020. When real yields rose sharply in 2022-23 (Module 4), gold barely fell, because a new buyer had arrived (Module 6), and in 2023 it set records with the Fed's rate above 5%.

• **2024-2026: the third bull market and its break.** Gold rose 27% in 2024, crossed $3,000 in March 2025 and $4,000 in October, set 53 records in 2025, and passed $4,500 in late December. It then rose 30% from its year-end price in four weeks, to an intraday record of $5,608 on January 29, 2026; the LBMA's morning price that day, $5,501.70, is the official record. It broke the next day, when President Trump named Kevin Warsh to chair the Fed, with the steepest one-day fall since 1983. The war that began on February 28 did not lift it: from March 2 to March 23 gold fell 21% as the dollar and oil rose, and March was its worst month since 2013. It averaged $4,506 in the second quarter, 8% below the first quarter's record, and fell again after the Fed's rise in September (Module 4).

3c. Real Versus Nominal

Gold's records are nominal. In September 2026 dollars the 1980 peak was about $3,681, a level gold did not pass until 2025, and the 2011 peak was about $2,851. The January 2026 peak was a real record by a wide margin, about 1.5 times the 1980 peak's purchasing power.

Worked example — Real Returns From Three Entry Points

Each case takes a buyer from a famous turning point to October 14, 2026, when gold was $4,106, and divides the nominal gain by the rise in consumer prices to September 2026, the latest month published. **The 1980 peak.** Bought at $850 on January 21, 1980: the price rose 4.83 times, but consumer prices rose 4.33 times, so the real gain is 4.83 ÷ 4.33 = 1.115, or 11.5% in 46.7 years, about 0.2% a year. **The 2001 trough.** Bought at $256 in April 2001: the price rose 16.0 times and prices 1.90 times, so the real gain is 8.4 times, about 8.7% a year for 25.5 years. **The 2011 peak.** Bought at $1,920 on September 6, 2011: the price rose 2.14 times and prices 1.49 times, a real gain of 44%, about 2.4% a year for 15.1 years. **The lesson.** Gold has preserved purchasing power over the whole span, and the decade of entry decided whether it returned almost nothing or a fortune. The timescale on which it is a reliable store of value is longer than most holders' patience.

3d. Where It Stands

On October 14, 2026 gold closed at about $4,106 an ounce, 25.4% below the January record on the LBMA's measure. A Federal Reserve raising rates, a strong dollar, and high real yields are pressing down (Module 4); central banks and record holdings in exchange-traded funds (Module 5) are holding up. A metal that traded at $1,200 a decade ago is a $4,000 asset, and the next module isolates what moves it.

Module 3 Key Points

The Price

• Gold rose from $35 to $850 by January 1980; Volcker's rate rises ended the boom, and the price fell 65% by 1982.

• Britain sold 395 tonnes in 1999-2002 at an average $275, near the bottom of a twenty-year bear market.

• Gold fell 28% in 2013, its worst year since 1981, as real yields rose and fund holders sold 880 tonnes.

• It rose 65% in 2025, peaked at $5,608 on January 29, 2026, and was 27% below that intraday high on October 14.

• In today's dollars the 1980 peak was about $3,681; October's price is only 11.5% above it.

Module 3 Quiz

Check Your Understanding

1. What ended the 1970s gold boom?

A) The Soviet invasion of Afghanistan
B) Volcker's rate rises
C) Central banks selling their reserves
D) The end of the Iranian revolution in 1981

2. What did Britain's gold sales of 1999-2002 come to be called?

A) Black Friday
B) The Washington Agreement
C) The 1999 central-bank auction
D) Brown's bottom

3. What happened to gold the day after its January 29, 2026 record?

A) A new record, as fear of war grew in the Gulf
B) A trading halt in London as prices swung
C) Its steepest fall since 1983, on Warsh's nomination
D) It held steady as central banks kept buying

4. How much did the 1980 buyer gain in real terms by October 2026?

A) A real loss
B) About 11.5% in all
C) About 380%, or 3.4% a year
D) About 8.7% a year, like the 2001 buyer

5. What did gold do when the war began on February 28, 2026?

A) Fell 21% in three weeks
B) Rose to a new record within days
C) Held flat as investors sought a haven
D) Doubled as oil passed $100 a barrel

Module 4 — What Moves the Price

Real Rates, the Dollar, Fear, and the New Buyer

Recommended Reading / Reference

Reference: Claude Erb and Campbell Harvey, 'The Golden Dilemma', *Financial Analysts Journal* (2013); the World Gold Council's Gold Return Attribution Model on Goldhub; the weekly Commitments of Traders reports of the Commodity Futures Trading Commission (CFTC)

4a. Real Interest Rates

Gold pays no interest, so the return an investor gives up to hold it is the real interest rate: the yield on bonds protected against inflation, such as the ten-year Treasury Inflation-Protected Securities (TIPS). When safe real yields are high, holding gold costs more and gold tends to fall; when they are low or negative, it costs nothing and gold tends to rise. The bear market of the 1980s and 1990s, the rise of the 2000s, the crash of 2013, and the peak of 2020, when real yields were below zero, all fit. Erb and Harvey measured a correlation of about −0.8 between the real price of gold and the ten-year TIPS yield from 1997 to 2012.

Then the link broke. From March 2022 to October 2023 the ten-year real yield rose from about −1% to about +2.5%, and gold barely moved. From 2024 to January 2026 real yields stayed near 2%, close to their highest since 2008, and gold nearly tripled, from $2,062 at the end of 2023 to $5,608. In 2026 the link came back: the real yield rose about a point and gold fell from its January record (Module 3).

Worked example — The Cost of Holding Gold

The setup. An investor has $1 million to hold for ten years, in gold or in ten-year TIPS. Gold pays nothing; TIPS pay the real yield, r, on top of inflation. **At October's real yield.** With r = 2.84%, the TIPS pay $28,400 a year above inflation in the first year, and after ten years of compounding the holding is worth $1 million × 1.0284^{10} = $1.323 million in today's money. For gold to keep up, its real price must rise 32.3% in the decade. **At the real yield of August 2020.** With r = −1.1%, the same TIPS lose purchasing power: $1 million × 0.989^{10} = $0.895 million. Gold that merely held its real value would end the decade 10.5% ahead. **The lesson.** The real yield is the hurdle gold must clear. A rise from −1.1% to 2.84% turns a ten-year head start of 10.5% into a handicap of 32.3%, which is why real rates have moved gold for most of the floating era.

4b. The Dollar

Gold is priced in dollars, so a weaker dollar raises its dollar price mechanically and makes it cheaper for buyers in other currencies. The 2001-08 fall in the dollar accompanied the second bull market, and the dollar's surge in 2022 capped gold. In 2025, when tariffs and doubts about American policy pushed the dollar down 9.4%, gold soared (Module 3). In 2026 the dollar recovered to its highest since April 2025, 4.3% above the end of 2025 on October 14, and gold fell. The relationship can turn when both are wanted as havens in a crisis abroad.

4c. Fear

Wars, financial crises, and inflation scares produce sharp rises that fade when the fear does. The Soviet invasion of Afghanistan helped drive the 1980 peak, the Gulf War of 1990 lifted gold for weeks, and Russia's invasion of Ukraine took it to $2,039 on March 8, 2022 before it fell back. In a panic for cash gold can fall with everything else, as it did after Lehman Brothers failed in September 2008, before recovering.

The war of 2026 showed that fear is not always the strongest force. Gold's peak came a month before the war began. Once the fighting closed the Strait of Hormuz, oil and the dollar rose, markets priced higher interest rates against the inflation to come, and gold fell hard (Module 3). A war that raises inflation and rates can weigh on gold more than its fear lifts it.

4d. The New Buyer

The fourth force is new: central banks, which since 2022 have bought gold as policy, at a scale and with an indifference to price that no other buyer has (Module 6). Their buying, with that of Chinese and Indian households, is why gold held up through the rate rises of 2022-23 that the old relationship said should sink it. Whether that buyer has replaced the old drivers or only raised the floor beneath them is the argument of 4e.

4e. Has Gold Broken Free of Real Rates?

The case that it has

Those who think the old model is dead point to 2022-25. Real yields rose sharply and gold held; they then stayed high and gold nearly tripled (4a). The buyers who set the price now, central banks above all, buy as policy, and they have reason to keep buying: a record share of central banks plan to add gold (Module 6). A reserve manager who fears sanctions or a debased dollar does not compare gold with a TIPS yield.

The case that it has not

Those who think the old forces are back point to 2026. Gold's January crash came on the day President Trump named Kevin Warsh, a hawk, to chair the Fed (Module 3). After the Fed raised rates in September, gold fell as real yields rose. Futures traders, the marginal Western buyers, still trade on real rates, and the official bid is not one-way: Turkey and Russia sold gold in 2026 when they needed money.

The evidence

From September 5 to October 14, 2026 the ten-year real yield rose about half a point, to 2.84%, and gold fell 7.7%. Hedge funds and other managed money cut their net long position on COMEX by about 84 tonnes in September, to 387 tonnes. Holders of exchange-traded funds kept buying that month, taking their holdings to a record (Module 5), and central banks bought a second-quarter record (Module 6).

The course's reading

Gold has not broken free of real rates. The buying of central banks and Asian households raised the level around which it trades, which is why its 2026 fall left gold above any price seen before October 2025. At the margin Western money still prices gold on real yields and the dollar, and in 2026 they decided its direction. The decoupling of 2022-25 was a rise in the floor, not the end of gravity. The signal that would change this reading is gold rising, not merely holding as it did in 2022-23, through another sustained increase in real yields.

Module 4 Key Points

What Moves the Price

• Gold pays nothing, so the real yield on safe bonds is its cost: at 2.84%, $1 million forgoes $28,400 a year.

• Real yields rose sharply in 2022-23 while gold held, and gold then nearly tripled by January 2026: the decoupling.

• In 2026 the link returned: as real yields rose about a point, gold fell back from its January record.

• A war can weigh on gold: in 2026 it lifted oil, the dollar, and expected interest rates, and gold fell.

• The course's reading: central banks raised gold's floor, but real rates and the dollar still set its direction.

Module 4 Quiz

Check Your Understanding

1. Why do rising real interest rates usually weigh on gold?

A) Because mines close when rates rise
B) Because jewelers buy less on credit
C) Because central banks sell to buy bonds
D) Because gold pays no interest at all

2. In the worked example, how much must gold's real price rise in ten years to match TIPS at 2.84%?

A) About 10.5% over the decade
B) About 32%
C) About 2.84% over the whole decade
D) Only inflation, since gold is a real asset

3. What did the war of 2026 show about fear and gold?

A) Wars always lift gold for at least a year
B) Gold ignores wars that do not involve America
C) A war that lifts inflation and rates can push gold down
D) Fear always outweighs interest rates when a war closes a sea lane

4. What does the course take as the lesson of 2022-26 for real rates and gold?

A) Central banks raised the floor; real rates still steer it
B) Real rates no longer matter to the price at all
C) Gold now rises whenever real interest rates rise
D) Real rates matter only for silver and platinum now

5. Which holders cut their positions in gold in September 2026, as real yields rose?

A) Central banks
B) Holders of exchange-traded funds
C) The People's Bank of China
D) Futures traders

Module 5 — Who Holds How Much

Official, Private, and Paper

Recommended Reading / Reference

Reference: The World Gold Council's monthly table of world official gold holdings, from the IMF's International Financial Statistics, and its monthly report on gold exchange-traded funds; Morgan Stanley's estimate of Indian household gold (October 2025)

5a. The Official League Table

#	Holder	Tonnes	Value at $4,106	Notes
1	United States	8,133	$1.07 trillion	Unchanged since the 1970s; carried at a statutory price (Module 13)
2	Germany	3,351	$442 billion	Part moved home from New York and Paris (Module 13)
3	IMF	2,814	$372 billion	Sales need an 85% majority of members' votes
4	Italy	2,452	$324 billion	Parliament fought in 2025 over who owns it (Module 13)
5	France	2,437	$322 billion	All of it held in Paris
6	China	More than 2,300 reported	More than $300 billion	Buying monthly (Module 6); true holdings believed higher (5b)
7	Russia	About 2,300	About $300 billion	Built from about 400 tonnes in 2006; some sold in 2026 (Module 6)
8	Switzerland	1,040	$137 billion	Sold 1,550 tonnes in 2000-08
9	India	About 880	$116 billion	Most of it now held at home (Module 13)
10	Japan	846	$112 billion	Unchanged
11	Poland	648	$86 billion	At the end of August 2026 (Module 6)
12	Netherlands	612	$81 billion	Moved part of its gold to London in 2026 (Module 13)
13	Portugal	383	$51 billion	Unchanged
14	Saudi Arabia	323	$43 billion	Unchanged
15	United Kingdom	310	$41 billion	Sold over half its gold at Brown's bottom (Module 3)
16	Lebanon	287	$38 billion	Untouched through the 2019 financial collapse
17	Spain	282	$37 billion	Unchanged
18	Austria	280	$37 billion	Unchanged
19	Belgium	227	$30 billion	Unchanged

The World Gold Council's table from IMF data, with Poland at August 2026 and Russia after its 2026 sales; values at the close of October 14, 2026. Ranks are among the holders shown: Turkey, Kazakhstan, Uzbekistan, Taiwan, Thailand, and Singapore also hold large amounts, some more than the lower rows, but their current holdings could not be confirmed for this edition. All official holdings are counted in Module 1.

5b. What the Numbers Do Not Tell You

Official figures are self-reported to the IMF and lag the facts, and several large holders are believed to report less than they own, China above all. Its central bank reported no change for years at a time, from 2009 to 2015 and from 2019 to 2022, then disclosed large jumps, and its state banks and sovereign funds hold gold outside the central bank's books. Analysts estimate its true holdings well above the reported figure (Module 6).

Location matters as much as quantity. Much of the world's official gold sits not at home but in the vaults of the Federal Reserve Bank of New York, about half a million bars, most of them for foreign governments and international bodies, and the Bank of England, about 400,000 bars. That arrangement is what let Venezuela's gold be withheld in London (Module 13). And holdings can be lent: central banks lease gold to bullion banks for a small return, so a tonne on the books may be a claim on a bank rather than a bar in a vault, a distinction that has not mattered for decades and would matter in a crisis.

5c. Private Holdings

Private holders own far more gold than governments. Jewelry and bars and coins make up two-thirds of the stock (Module 1), and in much of the world, India, China, the Middle East, and Turkey, jewelry is savings as much as adornment. On the older industry estimate and on Morgan Stanley's of October 2025 (table below), Indian households' gold exceeds that of the ten largest national central banks combined, which hold about 24,500 tonnes. They accumulated it as dowry, insurance, and the one asset a rural family trusted. China has been the largest market for bars and coins in recent years, as property and stocks disappointed its savers.

Vehicle	Holdings	Value	The largest	Flows
Gold ETFs, worldwide	A record 4,256 tonnes at the end of September 2026	$574 billion at the September price	SPDR Gold Shares (GLD) and iShares Gold Trust (IAU) in New York; funds in London, Europe, and China	Inflows in 2025 and of about 62 tonnes in the first quarter of 2026, outflows in the second (Module 9), and a record $31 billion in the third
Indian households (jewelry, bars, and coins)	25,000-34,600 tonnes, estimated	$3.3-4.6 trillion	—	The largest private hoard on earth

World Gold Council; Morgan Stanley; values at $4,106 unless stated.

ETFs are the way most Western investors now hold gold. Each share is backed by bars in a vault, usually in London, held by a custodian bank, and the funds buy or sell metal as investors buy or sell shares, which makes their holdings a running measure of Western demand. In September 2026 alone they took in 67 tonnes, led by North American and British buyers, even as futures traders sold (Module 4).

Module 5 Key Points

Who Holds How Much

• The United States holds 8,133 tonnes, worth $1.07 trillion in October, ahead of Germany, the IMF, Italy, and France.

• China reports more than 2,300 tonnes, but it has twice gone years without reporting a change, and its true holdings are believed higher.

• Much official gold sits in New York and London, so custody, not quantity, decides who can use it in a crisis.

• Indian households hold an estimated 25,000-34,600 tonnes, more than the ten largest national central banks combined.

• Gold ETFs held a record 4,256 tonnes, worth $574 billion, at the end of September 2026.

Module 5 Quiz

Check Your Understanding

1. Why are China's reported gold holdings treated with caution?

A) It reports its holdings only in taels
B) The IMF audits its vaults every month
C) It has never bought gold officially
D) It went years without reporting changes

2. Where does much of the world's official gold sit?

A) New York and London
B) At home
C) In Zurich
D) Singapore's free-port vault

3. How do Indian households' holdings compare with central banks'?

A) A tenth of America's
B) More than the top ten
C) Smaller than Japan's reserve
D) Smaller than Switzerland's reserve

4. What did gold ETFs hold at the end of September 2026?

A) Their least since 2019
B) About half of the 2025 level
C) A record
D) Only futures contracts, not metal

5. What does it mean that central banks can lease their gold?

A) A tonne on the books may be a claim on a bank
B) The IMF owns the gold on their behalf
C) They must sell the gold within a year
D) The gold is held in exchange-traded funds

Module 6 — Central Banks and the Reserve Revolution

Why Official Buying More Than Doubled in 2022

Recommended Reading / Reference

Book: Barry Eichengreen, Arnaud Mehl, and Livia Chiţu, *How Global Currencies Work: Past, Present, and Future* (2017)

Reference: The World Gold Council's *Central Bank Gold Reserves Survey* (June 2026) and its monthly central-bank statistics, drawn from the IMF's International Financial Statistics; the European Central Bank's (ECB) *The International Role of the Euro* (June 2026)

6a. Purchases by Year

Year	Net purchases (tonnes)	The largest buyers	The sellers	What drove it
2022	1,082	Turkey, Egypt, Qatar, Iraq, and, from November, China, plus large unreported buying	Few and small	The freeze of Russia's reserves (6b); the most since records began in 1950
2023	1,051	China (225), Poland (130), Singapore (77)	Turkey, briefly, to meet local demand	The second year above 1,000
2024	1,092	Poland (90), Turkey (75), India (73), China (44)	The Philippines, Uzbekistan	The third year above 1,000
2025	863	Poland (102), the largest buyer for a second year; Kazakhstan (57), its most on record; Brazil (43), back after four years; China and Turkey (27 each)	Singapore (15) and Russia (6)	Lower as the price soared (Module 3), still about twice the pre-2022 pace
2026, first half	About 345: about 56 in the first quarter, a record 289 for a second quarter	China, Poland, Uzbekistan	Turkey and Russia (6c)	The war, the March fall in the price, and two sellers defending a currency and a budget

World Gold Council, including its estimates of unreported purchases; the 2023 and 2024 totals as revised, and the first quarter of 2026 as revised in July from 244 tonnes to 56.5. Its monthly figures, from reported data, show net purchases of 41 tonnes in May and 39 in August 2026.

6b. The Turning Point

From 2011 to 2021 central banks bought a few hundred tonnes a year, reversing two decades of selling. Then, in the last days of February 2022, the Western powers froze about $300 billion of the Bank of Russia's reserves held abroad in dollars, euros, and yen. The European Union, which holds about €210 billion of them, €185 billion at Euroclear in Brussels, made the freeze open-ended in December 2025, and its plan to lend against them stalled in favor of a €90 billion loan for 2026-27.

Every reserve manager drew the same lesson: a currency reserve is a claim on a foreign government that can be cancelled, and gold in one's own vault cannot be. Purchases more than doubled in 2022 and stayed above 1,000 tonnes for three years. In the World Gold Council's survey of June 2026 a record 45% of

central banks said they planned to add to their own gold within a year, and the motives they give are diversification, the absence of default risk, and performance in a crisis, not a view on the price.

6c. Who Is Buying, and Who Has Sold

Central bank	2026 so far	Stated motive
Poland	Approved 150 tonnes more in January to reach 700; buying monthly	Security against Russia (Governor Adam Glapiński)
China	Buying for 23 straight months through September, its largest monthly addition in three years that month; Goldman Sachs estimates its true buying at about twice the reported figure	Diversification from the dollar; insurance against sanctions
India	Bringing gold home from London (Module 13)	Diversification; custody at home
Uzbekistan	A net buyer, with 8 tonnes in August; gold is most of its reserves	Domestic producer, now accumulating
Turkey	Cut its gold by about 58 tonnes in two weeks of March to defend the lira, some of it possibly through swaps	Currency defense
Russia	Sold about 44 tonnes in the first half, a record, to cover the budget deficit	A war chest, now being spent
Kazakhstan	Still buying in the second quarter, with gold 78% of its reserves; plans sales toward a 75% share	Rebalancing a portfolio that rose with the price

Central banks and the World Gold Council, via press reports to October 13, 2026. Holdings are in Module 5.

The buying is broad, and the selling has grown. Over twenty institutions added gold in 2025, led by a recognizable set: Poland, which frames gold as insurance against Russia; China, buying every month and believed to buy more off the books; Kazakhstan, with a record 57 tonnes; the Czech Republic consistently; Brazil, back in 2025. In 2026 large holders sold to raise money: Turkey to defend its currency during the war and Russia to cover its budget deficit, while Kazakhstan plans sales to rebalance.

6d. Gold Past the Euro

At market prices gold made up about 27% of the world's official reserves at the end of 2025, more than the euro's 15% or the 22% held in Treasuries, by the ECB's count of June 2026. A year earlier it had counted gold past the euro for the first time. That is a price effect as much as a purchase effect: a central bank with 5% of its reserves in gold that watches the metal double is at about 10% without buying. Many have decided to let it ride, and a few, like Kazakhstan, to trim.

6e. Why It Matters for the Price

Central-bank demand has a property no other demand has: it does not respond to the gold price the way other buyers do. Jewelers buy less when gold rises and investors sell to take profits, while central banks buy as policy. In 2026 China bought faster as the price fell. That indifference is why analysts speak of a structural floor (Module 4).

The year also showed the floor's limit. Official demand is indifferent to price but not to need, and when a government needs money, gold is what it can sell. Turkey and Russia sold in the first quarter of 2026 as the price fell in March (Module 3), which is how buying shrank that quarter. If the official sector ever turned seller in earnest, as European central banks did in the 1990s (Module 3), the floor would become a trapdoor.

Module 6 Key Points

Central Banks and the Reserve Revolution

• Central banks bought 1,082 tonnes in 2022, 1,051 in 2023, 1,092 in 2024, and 863 in 2025: twice their earlier pace.

• The 2022 freeze of $300 billion of Russia's reserves taught reserve managers that currency can be frozen and gold at home cannot.

• Buying fell to about 56 tonnes in early 2026 as Turkey and Russia sold, then reached a record 289 for a second quarter.

• Poland (aiming at 700 tonnes) and China (23 months of reported buying) lead; Kazakhstan, 78% in gold, plans to sell.

• Gold was about 27% of official reserves at end-2025 prices, above the euro's 15%: the floor holds, with a trapdoor.

Module 6 Quiz

Check Your Understanding

1. What turned central banks into heavy buyers of gold in 2022?

A) The Fed's rate rises that spring
B) A collapse in mine output
C) The freeze of Russia's reserves
D) The euro's fall below parity with the dollar

2. How much did central banks buy in each year from 2022 to 2024?

A) About 400 tonnes
B) About 2,000 tonnes each year
C) Under 100 tonnes
D) More than 1,000 tonnes

3. Why did central-bank buying shrink to about 56 tonnes in the first quarter of 2026?

A) China stopped buying for the quarter
B) Turkey and Russia sold
C) Poland reached its target
D) The IMF sold part of its gold

4. By the ECB's count of June 2026, what share of the world's official reserves was gold at the end of 2025?

A) About 5%, unchanged for decades
B) About 46%, more than the dollar
C) About 27%
D) About 15%, level with the euro

5. What does the module mean by the floor becoming a trapdoor?

A) Mines expanding output faster than the market can absorb
B) ETF holders refusing to sell at any price
C) The IMF buying gold to support the price
D) Central banks turning sellers in earnest, as in the 1990s

Module 7 — Extraction

Geology, Mines, and Producers

Recommended Reading / Reference

Reference: The US Geological Survey's *Mineral Commodity Summaries: Gold* (2026); the World Gold Council's mine-production data, compiled by Metals Focus; the companies' quarterly reports

7a. Where Gold Sits in the Earth

Deposit type	How it formed	Typical grade	Examples
Orogenic, or lode and vein	Mountain-building squeezed gold-bearing fluids into quartz veins in metamorphic rock	5-15 g/t underground; 1-3 g/t in open pits	Canada's Abitibi, Australia's Kalgoorlie, West Africa's Birimian belt, Siberia
Epithermal	Volcanic hot springs deposited gold near the surface	3-30 g/t in rich veins; about 1 g/t in bulk	Nevada's Round Mountain, Mexico, Peru's Yanacocha, Papua New Guinea's Lihir
Carlin-type	Fine gold, invisible to the eye, spread through sedimentary rock	1-3 g/t	Nevada's Carlin trend, the largest American source
Porphyry, with copper	Huge low-grade bodies around cooled intrusions; gold comes as a byproduct of copper	0.2-1 g/t, plus copper	Indonesia's Grasberg, Mongolia's Oyu Tolgoi, Australia's Cadia, the Andes
Witwatersrand	A buried river system 2.8 billion years old	5-10 g/t, at depths to 4 kilometers	South Africa's Gauteng, the largest goldfield ever found
Placer, or alluvial	Gold weathered from rock and washed into rivers and gravels	Variable; nuggets	Every gold rush, from California to the Klondike; most artisanal mining today

g/t: grams of gold per tonne of rock.

Gold is scarce in the crust (Module 1), so mining it means finding the places where geology concentrated it a hundredfold or more. A growing share comes as a byproduct of copper mines, which ties gold supply to the copper cycle and to the demand for wire that electrification brings.

7b. Getting It Out

A modern gold mine moves mountains for grams. Typical ore grades are 1-2 grams per tonne, so a tonne of rock yields about a wedding ring's worth, while heap-leach operations can profit below half a gram. Open-pit mining strips the overburden and blasts the ore from the surface, cheap per tonne and the choice for large low-grade bodies; underground mining follows veins down shafts and ramps, dearer but suited to narrow, rich ore.

The ore is crushed and ground, and the gold is dissolved in a dilute cyanide solution. In carbon-in-leach plants this happens in agitated tanks, recovering 90-95% of the gold from higher grades; in heap leaching the solution trickles for months through piles of crushed low-grade ore on lined pads, recovering 60-80%. The dissolved gold is captured on activated carbon, stripped, and smelted into doré bars of 60-90% gold for a refinery. Ores in which gold is locked inside sulfide minerals first need roasting, pressure oxidation, or bacterial leaching.

Cyanide is the industry's standard and its environmental liability, and tailings dams, which hold the leftover slurry, are its worst failure mode. The collapses at Mount Polley in Canada in 2014, a gold-copper mine, and at Brumadinho in Brazil in 2019, an iron-ore mine that killed 270 people, are the cautionary cases.

7c. Who Produces

Country	2025 output (tonnes)	Notes
China	384	The largest producer; Zijin and Shandong Gold; nearly all of it consumed at home
Russia	345	Polyus and others, cut off from London since 2022 (Module 11)
Australia	293	Newmont's Boddington and Cadia, Northern Star's Kalgoorlie
Canada	213	Agnico Eagle's Abitibi mines and Detour Lake
Peru	209	Official output is about half the total; the rest is artisanal (7e)
Ghana	187	Africa's largest producer; much of it from artisanal 'galamsey' miners
United States	157	Nevada Gold Mines, the Barrick-Newmont joint venture, the largest
Uzbekistan	125	Muruntau, one of the world's largest open pits; state-owned Navoi
Mexico	114	Fresnillo; Newmont's Peñasquito
Indonesia	104	Grasberg, a copper mine that is also one of the largest gold producers

Compiled by Money Metals (August 2026) from industry estimates that add artisanal output to official figures; national statistics differ. World output is in Module 9.

South Africa, which mined over 1,000 tonnes in 1970, now produces about a tenth of that from deep, hot, dangerous mines. The Sahel and Sudan produce more each year, much of it informally, under military governments and in war (Module 11).

7d. The Companies

Company	Home	2026 guidance (million ounces)	All-in sustaining cost (AISC) guidance ($ an ounce)	Main assets and notes
Newmont	United States	About 5.3, after 5.9 in 2025	About $1,680	Boddington, Cadia, Peñasquito, Lihir, and the Nevada joint venture; 2026 a 'trough' year of mine sequencing and Boddington's bushfires; $4.5 billion raised from selling mines
Agnico Eagle	Canada	3.3-3.5	$1,400-1,550	Detour Lake, Canadian Malartic; the lowest-cost Western major; three deals in Finland in 2026
Zijin Mining	China	Target of 105 tonnes, about 3.4	—	90 tonnes in 2025, up 23%; buying mines across Africa and Central Asia
Barrick	Canada	2.90-3.25	$1,760-1,950	Nevada, Pueblo Viejo, Kibali, Loulo-Gounkoto; plans to list its North American gold mines separately by the end of 2026
AngloGold Ashanti	Primary listing in New York	2.80-3.17	$1,780-1,990	Geita, Obuasi, Sukari in Egypt, a share of Kibali

Company	Home	2026 guidance (million ounces)	All-in sustaining cost (AISC) guidance ($ an ounce)	Main assets and notes
Polyus	Russia	—	—	2.53 in 2025, down 16%; the lowest costs; sanctioned; owns Sukhoi Log, the largest undeveloped deposit
Gold Fields	South Africa	2.4-2.6	$1,800-2,000	South Deep, Salares Norte, Gruyere (wholly owned since 2025), the Windfall project in Quebec
Kinross	Canada	About 2.0	About $1,730	Tasiast in Mauritania, Paracatu in Brazil
Northern Star	Australia	Deferred	—	Sold 1.54 million ounces in the year to June 2026, short of its original guidance of 1.7-1.85 million

Company reports and guidance, February-August 2026; the cost measure is explained in Module 8. Together these companies produce about a quarter of world output; state companies, smaller miners, copper miners, and artisans produce the rest.

7e. The Artisanal Fifth

Beside the industrial miners, artisanal and small-scale mining, people digging by hand with pans, sluices, and small crushers, produces around a fifth of the world's gold and supports some 20 million people, on the World Gold Council's estimate of August 2026. Peru's artisanal output grew more than 160% in ten years, to about 100 tonnes in 2025.

Most of it uses mercury to bind the gold, which makes artisanal gold mining the largest single source of mercury pollution on the UN Environment Programme's count. Much of it operates in conflict zones or on land taken from forests and indigenous communities, from Brazil's Amazon to Ghana's riverbanks, and much of it reaches the market through the informal channels of Module 11. It is also the livelihood of last resort across the Sahel and the Andes, which is why no sourcing rule can simply exclude it.

Module 7 Key Points

Extraction

• Gold is mined at 1-2 grams per tonne of rock, dissolved with cyanide, and smelted into doré bars for refining.

• China (384 tonnes), Russia (345), and Australia (293) led output in 2025; South Africa has fallen to about a tenth of 1970's level.

• Newmont, Agnico Eagle, Zijin, and Barrick lead the companies; Agnico has the lowest costs among the Western majors.

• Artisanal miners produce about a fifth of the world's gold, and the work supports some 20 million people.

• Artisanal gold is the largest single source of mercury pollution, and much of it moves through informal channels.

Module 7 Quiz

Check Your Understanding

1. How much gold does a typical modern mine recover from a tonne of rock?

A) About 1-2 grams
B) A kilogram
C) 100 grams
D) About 10 kilograms in rich veins

2. What is the difference between tank leaching and heap leaching?

A) Heaps use mercury
B) Tanks suit richer ore
C) Tanks need no cyanide at all
D) Heaps recover more of the gold, over 95%

3. Which country was the largest gold producer in 2025?

A) South Africa
B) The United States
C) China, with 384 tonnes
D) Russia

4. What share of the world's gold comes from artisanal mining, on the World Gold Council's estimate?

A) About a fifth
B) Under 1%, and falling every year
C) About half, mostly in Asia
D) Nearly all of it, outside China

5. Why can't sourcing rules simply exclude artisanal gold?

A) It is legal everywhere
B) It is the livelihood of millions
C) It is all refined in Zurich
D) It is too small to matter in the market

Module 8 — Mining Economics

The Numbers of a Gold Mine

Recommended Reading / Reference

> **Reference:** The World Gold Council's guidance note on all-in sustaining costs and its quarterly cost data in *Gold Demand Trends*; S&P Global Market Intelligence's studies of gold discoveries and mine lead times

8a. What It Costs

The industry's measure of cost is the all-in sustaining cost (AISC): mining, processing, royalties, site and corporate administration, the exploration needed to replace reserves, and the capital needed to keep a mine running, per ounce produced. It leaves out the capital to build a mine, the exploration to find the next one, interest, and tax, which the broader all-in cost adds.

Costs rose in 2026. The industry's average AISC was $1,785 an ounce in the first quarter, up 16% in a year, as royalties, which are usually a share of revenue, rose with the price, and as labor, energy, and deeper, lower-grade ore pushed up the rest. Even so, against the quarter's average gold price of about $4,873 the margin was about $3,100 an ounce, the widest on record; at October 14's $4,106 it was about $2,320, or 57%.

Layer	What it includes	Marker for 2026
Cash operating cost	Mining, processing, and site administration	AngloGold Ashanti guides $1,315-1,430 an ounce
+ Royalties and production taxes	Usually 2-5% of revenue, so they rise with the gold price	—
+ Sustaining capital, exploration, and corporate costs	Equipment, tailings dams, underground development, replacing reserves	—
= All-in sustaining cost (AISC)	The standard measure	Industry average $1,785 in the first quarter
+ Growth capital, interest, tax, and reclamation	New mines and expansions	—
= All-in cost	What it costs to keep producing and growing	Gold Fields guides $2,075-2,300

World Gold Council (first quarter of 2026) and company guidance; the companies' AISC guidance is in Module 7.

Worked example — A Mine From Grade to Margin

The mine. A hypothetical open-pit mine treats 10 million tonnes of ore a year at a grade of 1.2 grams per tonne and recovers 90% of the gold: 10,000,000 × 1.2 × 0.90 = 10.8 million grams, or 347,000 troy ounces. **Revenue.** At $4,106 an ounce it sells $1.43 billion a year. **Costs.** Cash costs of $1,000 an ounce ($347 million), royalties of 3% of revenue ($43 million), sustaining capital of $120 million, and administration and exploration of $40 million make $550 million, an AISC of $1,584 an ounce. **Margin and payback.** The mine earns $876 million a year before tax. It cost $1.2 billion to build and has twelve years of reserves, so it pays back in about 16 months, and the twelve years of margin are worth $7.76 billion today at a 5% discount rate, or about $6.6 billion after the cost of building it. **The leverage.** At $1,800 gold, the average of 2021 and 2022, the same mine would earn $99 million and might not have been built. A 10% rise in gold raises this mine's margin by about 16% at today's price but by about 61% at $1,800: the thinner the margin, the more a miner is a leveraged bet on the metal.

8b. Why Record Prices Have Not Raised Supply

Supply has responded to record prices only slowly: mine output reached a record in 2025 (Module 9) and a record for a second quarter in 2026, but it grows by about 1% a year. There are three reasons. Discovery has dried up. S&P Global counts about 350 major finds, of two million ounces or more, since 1990, but only five or six since 2020 and none at all in 2023 or 2024, and the average find has shrunk from 7.7 million ounces to 4.4.

Mines take a long time. S&P puts the average from discovery to production at 15.7 years for mines opened since 2002, and about 18 years for those opened in 2020-23; Russia's Sukhoi Log, found in 1961, is still being developed. And the majors chose discipline over growth: burned by the cycle of 2011-13, when they overpaid for mines and then wrote down their value heavily, they returned cash to shareholders and grew by buying one another. Mining deals came to $26.3 billion in the second quarter of 2026, among them Equinox Gold's $5.1 billion purchase of Orla Mining, agreed in May.

Reserves have held steady for decades because miners replace them as prices rise. The World Gold Council puts reserves at about 61,000 tonnes and cites a United States Geological Survey estimate of about 66,000, some 17-18 years of output, a figure that has never meant the world is running out.

8c. Capital, Jurisdiction, and the Miners' Paradox

A new mine costs from hundreds of millions to several billion dollars, and where it is built decides whether it is built. Nevada, Ontario, Quebec, and Western Australia attract the capital. In the Sahel the price has emboldened governments: Mali placed Barrick's Loulo-Gounkoto complex under a provisional administration on June 16, 2025, after a dispute over its new mining code, and returned control on December 16 under a settlement, after which the mine restarted; Burkina Faso nationalized five gold assets in 2025, including the Wahgnion and Boungou mines.

The miners' paradox is that record margins did not bring record valuations for most of the 2020s: gold-mining shares lagged the metal, because investors distrusted the industry's capital discipline and its jurisdictions. Only as margins widened in 2025 did the miners begin to outrun the metal, and the industry is still being reshaped, as Barrick's planned split shows (Module 7).

Module 8 Key Points

Mining Economics

• The industry's all-in sustaining cost was $1,785 an ounce in the first quarter of 2026, up 16% in a year.

• At $4,106 gold the average margin is about $2,320 an ounce, or 57%; in the first quarter it was a record $3,100.

• A 1.2 g/t mine treating 10 million tonnes earns $876 million a year at $4,106, and $99 million at $1,800.

• Major discoveries have nearly stopped, none in 2023 or 2024, and a new mine takes about 16 years to open.

• Jurisdiction decides what is built: Mali took over Barrick's mines in 2025, then returned them under a settlement.

Module 8 Quiz

Check Your Understanding

1. What does all-in sustaining cost include?

A) Only cash costs
B) Everything, including tax and interest
C) The capital to build a new mine
D) Running and sustaining a mine

2. What was the industry's average AISC in the first quarter of 2026?

A) About $900
B) About $4,106, the gold price
C) About $1,785 an ounce
D) About $1,200

3. In the worked example, what does the mine earn a year at $1,800 gold?

A) $876 million, as at $4,106
B) A loss of about $200 million
C) $1.43 billion, its revenue
D) $99 million

4. How many major gold discoveries did S&P count in 2023 and 2024?

A) None
B) Two
C) About 10 a year
D) Five or six each year

5. What happened to Barrick's Loulo-Gounkoto mines in Mali?

A) Sold to Zijin Mining in 2024
B) Seized in 2025, then handed back in a deal
C) Closed for good after the coup of 2021
D) Nationalized with full compensation

Module 9 — Supply and Demand

The Annual Balance

Recommended Reading / Reference

Reference: The World Gold Council's *Gold Demand Trends*, quarterly and full-year, compiled with Metals Focus; Metals Focus's annual *Gold Focus*

9a. The Balance Sheet

Tonnes	2024	2025	Change
Supply			
Mine production	3,650	3,672, a record	+22
Net producer hedging	−54	−74	Producers closing hedges
Recycling	1,365	1,404	+39
Total supply	4,962	5,002	+40
Demand			
Jewelry fabrication	2,027	1,638	−389 (−19%)
Technology	326	323	−3
Bars and coins	1,188	1,374	+186 (+16%)
Exchange-traded funds	−3	801	+804
Central banks, net (Module 6)	1,092	863	−229
Over-the-counter and other (the balancing item)	331	3	−328
Total demand	4,962	5,002	+40
Average price ($ an ounce)	2,386	3,432	+44%
Value of demand	About $383 billion	$555 billion	+45%

World Gold Council, *Gold Demand Trends: Full Year 2025* (January 29, 2026), rounded; jewelry is fabrication, and the over-the-counter line absorbs stock changes the categories do not capture.

9b. Supply

Annual supply is about 5,000 tonnes: mine output of about 3,700, recycling of about 1,400 from old jewelry and scrap, and a small, variable amount from producers' hedging, which turned negative as miners closed hedges to keep the whole of a rising price. Supply hardly responds to price. Mines cannot expand quickly (Module 8), and recycling rose only 3% in 2025 while the average price rose 44%, because most people who hold gold hold it precisely because they do not want to sell. Mine output rose again in 2026, to 966 tonnes in the second quarter, a record for a second quarter.

9c. The Demand Categories

• **Jewelry**, historically about half of demand, is the most price-sensitive category. Fabrication fell 19% in 2025, and consumers bought 18% less by weight, with China's purchases down 24% to their lowest since 2009, even as the value of the jewelry they bought rose by about a sixth, to about $170 billion. Indian buying is seasonal, peaking around weddings and Diwali, and sensitive to the import duty (Module

10).

• **Investment** in bars, coins, and exchange-traded funds rose 84% in 2025, to 2,175 tonnes, the largest category of the year. Bars and coins reached a twelve-year high, and the funds, which had shrunk in 2021-23 and stood still in 2024, turned to heavy inflows. Investment is also the most volatile category: the funds sold in the second quarter of 2026 (9d) and then bought a record amount in the third (Module 5).

• **Central banks** took about 17% of demand in 2025: price-insensitive buyers whose motives Module 6 describes.

• **Technology** is gold's industrial use: bonding wire, connectors, and plating in electronics, dentistry, and a few industrial processes. It is steady and small.

9d. 2025 and 2026 So Far

Demand passed 5,000 tonnes for the first time in 2025, a year of record prices (Module 3), and its value set a record (9a). The first quarter of 2026 set another record by value, $193 billion.

The second quarter was flat by weight, at 1,269 tonnes, but its parts moved apart. Jewelry fell 17% by weight, bars and coins 3%, and the funds sold 45 tonnes, while central banks bought a second-quarter record (Module 6) and over-the-counter buyers 327 tonnes. In the first half as a whole demand came to 2,522 tonnes, worth $380 billion.

9e. How the Balance Clears

Because supply barely moves, the balance clears through the price and through the swing in holdings above ground. When investors and central banks want more gold than mines and recyclers produce, the price rises until enough jewelry buyers hold back, enough households sell scrap, and enough marginal investors take profits to close the gap.

In 2025 the rise in the price did that: recycling added 39 tonnes, jewelry fabrication fell 389, central banks bought 229 fewer, and over-the-counter buying fell 328, while investment rose 990. The categories that respond to price, jewelry, recycling, and fund flows, are the shock absorbers, though in 2025 the funds were the shock. The buyers that do not, the central banks, are why the shock absorbers had so much work to do in 2022-24.

Module 9 Key Points

Supply and Demand

- Annual supply is about 5,000 tonnes: a record 3,672 mined in 2025 and about 1,400 recycled.
- Recycling rose only 3% in 2025 while the average price rose 44%: holders do not want to sell.
- Jewelry fabrication fell 19% in 2025; investment rose 84%, to 2,175 tonnes, the year's largest category.
- Demand passed 5,000 tonnes for the first time in 2025, worth $555 billion, up 45%.
- The balance clears through price: jewelry, recycling, and fund flows absorb what price-insensitive central banks take.

Module 9 Quiz

Check Your Understanding

1. How much gold was mined in 2025?

A) About 5,000 tonnes, all of it new
B) About 1,400 tonnes, mostly recycled
C) A record 3,672 tonnes
D) About 2,000 tonnes, as in the 1990s

2. How did recycling respond to the 44% rise in the average price in 2025?

A) It rose about 3%
B) It doubled
C) It rose about 40%
D) It fell by half as holders kept their gold

3. Which category of demand was largest in 2025?

A) Jewelry fabrication
B) Investment, at 2,175 tonnes
C) Central banks, at 863
D) Technology and electronics, at 323

4. What happened to gold demand in 2025?

A) It fell by a fifth as prices rose
B) It was flat at about 4,000 tonnes
C) It doubled to 10,000 tonnes
D) It passed 5,000 tonnes for the first time

5. Which categories act as the market's shock absorbers?

A) Central banks and the IMF in every year
B) Mine output, which rises with every rally
C) Jewelry, recycling, and fund flows
D) Technology demand from chipmakers and phone makers

Module 10 — Refining, Trading, and the Flows

The Plumbing of the Market

Recommended Reading / Reference

> **Reference:** The LBMA's guide to the London market and its monthly vault data; CME Group's COMEX warehouse reports; the Shanghai Gold Exchange's annual report; the World Gold Council's monthly trading-volume data

10a. Refining

Doré bars from mines and scrap from recyclers go to refineries that turn them into the 99.5% to 99.99% bars and grains the market trades. Switzerland is the hub. Four refineries there, Valcambi in Ticino, the largest, Argor-Heraeus, PAMP, and Metalor, process a large share of the world's gold, about a third of newly mined metal and a third to a half of all refined gold, by Swissinfo's estimate of November 2025. Other accredited refiners work in Germany, Turkey, the United Arab Emirates (UAE), China, India, Japan, South Africa, and the Americas.

The LBMA's Good Delivery list of refiners whose bars London's vaults will accept, audited for capacity, ownership, and responsible sourcing, is the market's quality standard. Being struck from it, as Russia's refiners were (Module 11), cuts a country's gold off from the mainstream market.

10b. The Trading Centers

Center	Form	What trades	Benchmark	Role
London	Over the counter, between banks	Gold held in London's vaults, mostly unallocated; 400-ounce bars	The LBMA Gold Price (Module 1)	The wholesale and central-bank market
New York (COMEX, owned by CME Group)	Futures and options	100-ounce futures, settled with bars in COMEX's warehouses	The front-month futures price	Price discovery, speculation, hedging
Shanghai Gold Exchange	Physical exchange	Kilo and 100-gram bars; every ounce China imports passes through it	The Shanghai Gold Benchmark, in yuan	The largest physical exchange, and China's gateway
Dubai	Physical trade and futures	Kilo bars; re-exports to India and the Gulf	—	The hub between Africa, the Gulf, and India, and the informal market's gateway (Module 11)
Mumbai, Istanbul, Hong Kong, Singapore	Regional exchanges and dealers	Retail and regional bars	—	Consumer markets

London is the wholesale center: a market in gold held in London's vaults, where most trading is in unallocated gold, a claim on a bullion bank's pool rather than a specific bar, settled through a handful of clearing banks in 400-ounce bars. Those vaults held 9,821 tonnes at the end of September 2026, worth about $1.3 trillion, including the Bank of England's. New York's COMEX is the futures center, where most price discovery and speculation happen. Shanghai is the world's largest physical exchange, with a yuan benchmark meant to make China a pricing center. In September 2026 the market as a whole traded about $423 billion a day, $229 billion of it over the counter, by the World Gold Council's count.

10c. The Flows

Route	What moves	Notes
Mines in Africa, the Americas, Australia, and Central Asia to Swiss and other refiners	Doré for refining	The start of the chain
Switzerland to China, India, the Gulf, and Turkey	Kilo bars and coins	Where most physical demand lives
London and Switzerland, both ways	400-ounce bars recast into kilos and back	The vault-to-refinery loop
London and New York, both ways	400-ounce and kilo bars	Driven by futures prices and tariff fears (10d)
Africa's artisanal mines to the UAE	Doré, much of it unrecorded	Module 11
Russia to Hong Kong, the UAE, Turkey, and China	Bars, often re-refined	Module 11

Gold's trade map runs from mines to refiners, and from Switzerland and London to China, India, and the Gulf, which absorb most physical demand. India's imports are a recurring strain on its balance of payments: $72 billion in the year to March 2026. On May 13, 2026 the government raised the import duty on gold, doré, silver, and platinum from 6% back to 15%, to save foreign exchange during the war, and Prime Minister Narendra Modi asked citizens to put off buying gold for a year. Imports fell 27% by value in April-September, and 81% in September alone.

10d. The 2025 Transatlantic Drain

The map reversed in early 2025. Fear that new American tariffs would cover gold, which had never been tariffed, opened a gap between COMEX futures and the London price, and traders closed it by flying metal to New York, much of it through Swiss refineries that recast London's 400-ounce bars into the kilo bars COMEX accepts. More than 600 tonnes crossed in three months, the wait to withdraw gold from the Bank of England stretched to four to eight weeks, and the cost of borrowing gold in London jumped. The exemption of bullion from the tariffs announced on April 2 sent some of it back to London.

A second scare came in August 2025, when an American customs ruling classed Swiss kilo bars as liable to the 39% tariff on Swiss goods: Swiss exports of gold to the United States fell 99% that month, even as exports to China more than tripled, to 35 tonnes, until the White House said gold would not be tariffed. In 2026 the flow ran the other way: COMEX's stocks fell from about 1,129 tonnes in January to about 869 by mid-June. The episode showed that the plumbing can seize on a rumor, and that London's tonnage is less liquid than it looks, because most of it belongs to central banks and funds that do not lend it.

Module 10 Key Points

Refining, Trading, and the Flows

• Switzerland's four big refineries process a large share of the world's gold; the LBMA's Good Delivery list is the standard.

• London trades unallocated gold against 9,821 tonnes in its vaults; COMEX sets futures prices; Shanghai is China's gateway.

• India raised its gold import duty from 6% to 15% in May 2026, and September imports fell 81%.

• Tariff fears pulled more than 600 tonnes from London to New York in early 2025, before bullion was exempted.

• The plumbing can seize on a rumor, because most vaulted gold belongs to holders that do not lend it.

Module 10 Quiz

Check Your Understanding

1. What does 'unallocated' gold mean in London?

A) Gold that has no registered owner
B) A claim on a bank's pool of gold, not a bar
C) Gold not yet mined but sold forward
D) Gold held by the Bank of England

2. How much gold did London's vaults hold at the end of September 2026?

A) 9,821 tonnes
B) 600 tonnes
C) About 39,000 tonnes
D) About 222,600 tonnes

3. Why must all gold imported into China pass through the Shanghai Gold Exchange?

A) It refines the gold
B) It stores the reserve
C) It taxes imported gold at 50% for the state
D) It is the state's designated gateway

4. What did India do to its gold import duty in May 2026?

A) Cut it to zero
B) Raised it to 15%
C) Cut it from 15% to 6%
D) Banned imports of gold for a year

5. What happened in the transatlantic drain of early 2025?

A) Gold flowed from New York to London
B) Trade between the two stopped
C) China banned gold imports for a quarter to defend the yuan
D) Tariff fears pulled 600-plus tonnes to New York

Module 11 — Illicit Gold

The Shadow Market the Formal One Launders

Recommended Reading / Reference

Book: Tom Burgis, *The Looting Machine: Warlords, Oligarchs, Corporations, Smugglers, and the Theft of Africa's Wealth* (2015)

Reference: SWISSAID, *On the Trail of African Gold* (2024); the UN Group of Experts on the Democratic Republic of the Congo (reports of 2025 and 2026); the Organisation for Economic Co-operation and Development's (OECD) due-diligence guidance for minerals from conflict areas

11a. The Scale

Gold is the ideal illicit commodity. It is dense, anonymous once melted, legal to own everywhere, and convertible into cash in any city. SWISSAID, a Swiss development group, estimated in 2024 that 435 tonnes of gold were smuggled out of Africa in 2022 alone, most of it from small artisanal mines and most of it to the UAE, whose recorded imports from Africa exceed what African countries record exporting. SWISSAID valued it at more than $30 billion; at October 2026's price it is worth about $57 billion.

It is not a separate market. Smuggled gold is refined, stamped, and sold into the same vaults in London, Shanghai, and Mumbai as everything else, usually within weeks of leaving the ground.

Source	Where the gold goes	Who profits	How it works
Sudan	The UAE, through Chad, Egypt, and South Sudan	The Rapid Support Forces, from Darfur's mines, and the army, through Port Sudan	Both sides of the war that began in April 2023 pay for it with gold
Eastern Congo (Ituri and the Kivus)	Rwanda and Uganda, then Dubai	The M23 rebels, other militias, soldiers, and traders	Conflict gold laundered through neighbors whose exports exceed their own output
Mali, Burkina Faso, and Niger	The UAE and Togo	The military governments, Russian security contractors paid in concessions, and jihadist groups that tax the mines	The Sahel's war economy
Ghana	The UAE	Unlicensed miners, the 'galamsey', and their patrons	Artisanal gold sold outside the official buyer
Peru, Colombia, and Brazil	The United States, Switzerland, and India, through shell exporters	Illegal miners and the cartels that launder cocaine money through gold	Mercury-laden mining in the Amazon
Venezuela	Turkey and the UAE	The former government and the armed groups of the Orinoco Mining Arc	Sanctions evasion
Russia (sanctioned, legal in origin)	Hong Kong, the UAE, Turkey, and China	Russian producers	Rerouting since 2022 (11c)

SWISSAID, the UN, Amnesty International, and press reports; the illicit share of world supply cannot be measured, only estimated.

11b. Conflict Gold, 2025-26

In three regions gold is the financial engine of war. In Sudan both armies still fund themselves from the mines, and a mine collapse in September 2026 showed what the trade asks of the people who dig. In eastern Congo the UN's experts reported in July 2025 that mineral smuggling into Rwanda had reached unprecedented levels, and in July 2026 that flows from Ituri into Uganda were rising. In September 2026 Amnesty International accused M23 fighters of abusing miners and trafficking gold to Rwanda, which it said may amount to war crimes.

In the Sahel the military governments have taken more of the industrial output too, the most prominent case being Mali's takeover of Barrick's mines (Module 8). In Latin America, Bloomberg reported on October 2, 2026 that illegal mining now supplies most of Peru's gold exports, outpacing the country's large mining companies. Ghana is the warning from inside the formal system: SWISSAID estimated in June 2025 that about $11 billion of its gold had been smuggled out, mostly to the UAE.

11c. Sanctioned Gold

Russia, the world's second-largest producer, was cut off from London on March 7, 2022, when the LBMA suspended its refiners from the list of those whose bars London accepts (Module 10). In June 2022 the Group of Seven (G7) governments banned imports of newly produced Russian gold, and the European Union followed in July.

The gold did not stop flowing; it changed route, often re-refined to hide its origin. In 2026 Hong Kong became the main gateway: about 100 tonnes, worth $14.5 billion, went there in the first seven months of the year, more than in all of 2025. Russia's central bank absorbed part of the output after 2022, and in 2026 it began selling (Module 6). The rules can exclude a producer from London and New York; they cannot keep its gold out of the world.

11d. Responsible Sourcing and Its Limits

The formal market's answer is provenance. The LBMA's Responsible Gold Guidance requires accredited refiners to audit their supply chains against conflict and crime, and a tenth version went out for public consultation in June and September 2026. The OECD's due-diligence guidance sets the standard, the European Union's conflict-minerals regulation binds importers, and Section 1502 of the Dodd-Frank Act requires American companies to disclose gold from Congo and its neighbors. The UAE tightened its rules after the Financial Action Task Force put it on its grey list in March 2022, and it was removed in February 2024.

The limits are structural. Artisanal gold from a war zone becomes indistinguishable from any other the moment a trader melts it with other gold. The UAE left the grey list while its African imports remained unexplained. And no rule addresses the fact that many of the miners at the bottom have no legal channel to sell into and no other living. The shadow market persists because the formal one needs the gold and the miners need the money.

Module 11 Key Points

Illicit Gold

• Gold is the ideal illicit commodity: dense, anonymous once melted, and legal everywhere; 435 tonnes left Africa unrecorded in 2022, mostly for the UAE.

• Gold pays for war in Sudan, eastern Congo, and the Sahel, and mineral smuggling from Congo to Rwanda reached unprecedented levels in 2025.

• Illegal mining now supplies most of Peru's gold exports, on Bloomberg's October 2026 reporting.

• Russia's refiners lost access to London in March 2022; its gold rerouted, with about 100 tonnes to Hong Kong in January-July 2026.

• Sourcing rules audit refiners, but melted gold cannot be traced and many miners have no legal market.

Module 11 Quiz

Check Your Understanding

1. Why is gold called the ideal illicit commodity?

A) It is anonymous once melted
B) It is easy to trace to its mine by assay
C) It is bulky and costly to move across borders
D) It is illegal for individuals to own in most countries

2. How much gold did SWISSAID estimate was smuggled out of Africa in 2022, and where did most of it go?

A) About 50 tonnes, mostly to Switzerland
B) About 4 tonnes, mostly to China
C) About 435 tonnes, most of it to the UAE
D) About 4,000 tonnes, mostly to India

3. What became Russia's main gateway for gold in 2026?

A) Dubai
B) New York's COMEX
C) Zurich's refineries
D) Hong Kong

4. What did Bloomberg report about Peru in October 2026?

A) Its mines were nationalized in September
B) Illegal gold now leads its exports
C) Its gold exports stopped for a month
D) It banned exports of unrefined gold to Switzerland

5. What is the structural limit of responsible-sourcing rules?

A) They apply only to refiners in Britain
B) They were repealed in the United States in 2025
C) Melted gold cannot be told apart from any other gold
D) They cover silver and platinum but not gold

Module 12 — Gold as an Investment

How It Behaves and How It Is Held

Recommended Reading / Reference

Reference: Claude Erb and Campbell Harvey, 'The Golden Dilemma', *Financial Analysts Journal* (2013); the World Gold Council's *The Relevance of Gold as a Strategic Asset* (annual); Aswath Damodaran's annual returns on stocks, bonds, and gold since 1928 (New York University)

12a. How Gold Behaves

Period	Gold, a year	Inflation, a year	Gold after inflation, a year	What happened
1971-1980	+31.8%	8.0%	+22.0%	The inflation decade, and gold's best
1981-1990	−4.1%	4.5%	−8.3%	High real rates and a strong dollar; shares and bonds won
1991-2000	−3.4%	2.7%	−5.9%	Central banks sold; gold was irrelevant
2001-2010	+17.8%	2.3%	+15.1%	Two stock crashes and a weak dollar
2011-2020	+3.0%	1.7%	+1.2%	A crash, a range, and a pandemic peak
2021 to October 14, 2026	+14.4%	4.6%	+9.4%	The central banks' bull market
1971 to October 14, 2026	+8.8%	3.9%	+4.7%	The floating era as a whole

Compound annual rates from year-end LBMA prices, starting from $37.38 at the end of 1970, to $4,106 on October 14, 2026; inflation is the consumer price index to September 2026.

Over the floating era gold's swings have been closer to those of shares than of bonds. Its record comes in long waves: two decades of strong real gains, the 1970s and 2000s, against two of real losses, the 1980s and 1990s, when American shares returned well over 10% a year. It pays no income, so its return is entirely the change in its price.

Its relation to shares is what earns it a place in many portfolios. Over long periods the two have moved largely independently, and gold has often risen when shares fell: in 2008, when the S&P 500 lost 37%, gold rose about 4%. But not always. In March 2026, as the war began, gold fell sharply (Module 3) while American shares fell too, because both were sold as interest-rate expectations rose (Module 4).

12b. The Ways to Own It

Vehicle	Cost to buy and sell	Cost to hold	Counterparty	Typical use
Coins (the American Eagle, the Maple Leaf, the Krugerrand, the Britannia)	A premium over the metal of a few percent for one-ounce coins, more for small ones	Storage and insurance, or a safe	None, if held oneself	Small physical holdings
Bars, from 1 ounce to 1 kilogram	A smaller premium	Storage	None, if held oneself	Larger physical holdings
Allocated storage with a vault operator	Small	A storage fee	The custodian, though the bars are the owner's	Institutional physical holdings
Unallocated account at a bank	Very small	Very small	The bank: a claim, not bars	Trading; the cheapest exposure

Vehicle	Cost to buy and sell	Cost to hold	Counterparty	Typical use
Exchange-traded funds	A broker's commission	GLD 0.40%, IAU 0.25%, SGOL 0.17%, GLDM 0.10% a year	The fund's custodian and trust	Most investors' route
COMEX futures, 100 ounces	A margin deposit, a fraction of the contract's value	The cost of rolling contracts forward	The clearinghouse	Leverage, hedging, speculation
Mining shares and their funds	A broker's commission	Fund fees	The company and its jurisdictions	Leveraged exposure to the price (Module 8)
Royalty and streaming companies (Franco-Nevada, Wheaton Precious Metals)	A broker's commission	—	The company	Gold revenue without running mines
Tokens backed by gold (PAX Gold, Tether Gold)	Exchange fees	The issuer's fees	The issuer and its custodian	Holders of crypto assets

Fund fees as published in July 2026. GLD is SPDR Gold Shares; IAU, iShares Gold Trust; SGOL, abrdn Physical Gold Shares; GLDM, SPDR Gold MiniShares.

Worked example — A Portfolio With and Without Gold, 2022

The setup. One investor holds $1 million, 60% in American shares and 40% in bonds. A second holds 55% in shares, 35% in bonds, and 10% in gold. **The year.** In 2022 the S&P 500 returned −18.11% with dividends, the Bloomberg US Aggregate bond index −13.01%, and gold about −0.3%. **The first portfolio.** 0.60 × −18.11% + 0.40 × −13.01% = −16.07%, a loss of $160,700. **The second.** 0.55 × −18.11% + 0.35 × −13.01% + 0.10 × −0.3% = −14.54%, a loss of $145,400, 1.5 points less, because gold fell neither with bonds nor with shares in a year when rising rates hit both. **The other side.** The same sleeve would have cost the second investor in the 1980s and 1990s, when gold lost value in real terms while shares and bonds compounded. What gold adds to a portfolio depends on which kind of decade follows.

12c. Is Gold an Inflation Hedge?

The case that it is

Its defenders point to the long record. Since 1971 gold has kept its purchasing power and more, and it gained strongly in the inflations of the 1970s and of 2021-26 (12a). No central bank can print it, so it is a hedge against the debasement of money itself, which is the inflation that matters over a lifetime.

The case that it is not

Its critics answer that over the spans investors live by, gold's real price swings far more than inflation does. Erb and Harvey showed in 2013 that gold has been an unreliable inflation hedge over short and medium horizons, and the record supports them: from 1981 to 2000 gold lost value in real terms while prices rose every year, and the buyer at the 1980 peak has earned almost nothing after inflation since (Module 3). In 2022, when American consumer prices rose 6.5% over the year, gold ended flat.

The evidence

Over decades gold's margin over inflation ranged from 22 points a year, in the 1970s, to minus 8, in the 1980s. In the short run its price has moved with real interest rates and the dollar rather than with inflation itself (Module 4).

The course's reading

Gold hedges the debasement of money over generations, and crises of confidence in it, not the inflation rate of the next few years. An investor who buys it as an inflation hedge for five years is really betting on real interest rates. The signal that would change this reading is gold tracking inflation steadily over five- or ten-year spans, which it has not yet done.

12d. Paper Versus Metal

The gold market's oldest argument is the ratio of paper claims to physical metal. Futures on COMEX and unallocated positions in London represent far more gold than the bars that could be delivered against them, which works because almost no one asks for delivery. The drain of 2025, when holders did ask and hundreds of tonnes had to be flown across the Atlantic (Module 10), was a reminder that the system rests on that assumption.

Many holders draw the line this way: funds, futures, and unallocated accounts for trading and for a portfolio allocation, and coins, bars, or allocated storage for the scenarios that made them want gold in the first place, such as sanctions, capital controls, a failed custodian, or a market that closes. The premium paid for coins over a fund is the price of that insurance.

Module 12 Key Points

Gold as an Investment

• Since 1971 gold has returned about 8.8% a year, and 4.7% after inflation, in long waves of gains and losses.

• Gold has often risen when shares fell, as in 2008, but in March 2026 both fell together.

• A 10% gold sleeve cut a 60/40 portfolio's 2022 loss from 16.1% to 14.5%; in the 1980s it would have cost.

• Gold funds charge from 0.10% to 0.40% a year; coins carry premiums; futures add leverage.

• The course's reading: gold hedges debasement over generations, not the inflation rate of the next few years.

Module 12 Quiz

Check Your Understanding

1. How did gold perform after inflation from 1981 to 2000?

A) It lost value each decade
B) It doubled
C) It matched inflation
D) It gained more than shares in both decades

2. In the worked example, how much did a 10% gold sleeve reduce the 2022 loss?

A) It doubled the loss to about 32%
B) It turned the loss into a gain of 5%
C) About 1.5 points, from 16.07% to 14.54%
D) Not at all, since gold fell with bonds

3. What does the course take as gold's role against inflation?

A) A reliable hedge month by month
B) Debasement over generations
C) No hedge at all
D) A hedge only in years of deflation

4. What happened to gold and shares in March 2026?

A) Gold rose as shares fell
B) Gold set a new record
C) Shares rose as gold fell by a tenth
D) Both fell

5. What is the annual fee of the cheapest gold fund in the module's table?

A) 0.10%, for GLDM
B) 0.40%
C) 1.5%, for SGOL
D) 2%, the usual fee

Module 13 — The Politics of Gold

Gold as an Instrument of State Power

Recommended Reading / Reference

Book: Benn Steil, *The Battle of Bretton Woods* (2013)

Reference: The US Treasury's monthly *Status Report of U.S. Government Gold Reserve*; the Congressional Research Service's reports on the Gold Reserve Act and the Federal Reserve's gold certificates

13a. Sanctions, Seizure, and Custody

Gold's monetary role never entirely ended because states never stopped using it as the asset of last resort, the one a foreign central bank cannot freeze, a foreign court cannot cancel, and a foreign government cannot inflate, provided it sits at home. The cases below made that concrete.

Case	Years	Gold at stake	What happened	The lesson drawn
Venezuela's gold at the Bank of England	2018-26	31 tonnes, about $4.1 billion	Withheld after Britain recognized the opposition as Venezuela's government; fought through British courts from 2020; in August 2026 Venezuela asked for it back, and in September talks were reported on moving it to the New York Fed	Gold abroad is a relationship, and recognition decides who can touch it
Libya	2011	About 144 tonnes	Held largely in Tripoli, the gold of Libya's ruler, Muammar Gaddafi, stayed beyond the sanctions that froze his government's assets abroad	Gold at home can fund a regime in crisis
Iran	2012-13	Several billion dollars a year	Turkey paid for Iranian gas in gold to get around sanctions on dollar payments; American prosecutors later charged Turkey's Halkbank over the scheme	Gold is a sanctions-evasion medium
Russia	2022-26	About 2,300 tonnes, nearly all at home	Its currency reserves abroad were frozen and its gold was not; in 2026 it sold some of the gold (Module 6)	Gold at home cannot be frozen, and it can be spent
Afghanistan	2021	Reserves of about $7 billion at the New York Fed	Frozen when the Taliban took power; half later moved to a fund in Switzerland	Custody follows recognition
Germany, the Netherlands, Poland, and India	2013-26	Hundreds of tonnes	Germany moved 674 tonnes home from New York and Paris in 2013-17; the Netherlands 122 tonnes from New York in 2014; Poland 100 tonnes from London in 2019; India 104 tonnes from London in the year to March 2026, leaving 77% of its gold at home	Sovereignty requires custody
The Netherlands again, and Germany and Italy	2025-26	Hundreds of tonnes in New York	The Dutch central bank moved 86 tonnes from the United States and Canada to London in 2026; German lawmakers renewed calls in January 2026 to bring home the gold in New York; Italy's parliament fought over who owns its reserves	The ally question

Values at $4,106 an ounce, the close of October 14, 2026. Sources: the Bank of England litigation record, press reports, and the central banks.

Gold at home is sovereignty; gold abroad is a relationship. Poland's repatriation of 2019, India's flights home from London, and the German and Dutch decisions are the same conclusion drawn by allies of the United States, not only by its adversaries.

13b. Fort Knox and the Revaluation Question

The United States holds 8,133 tonnes (Module 5): about 4,580 at Fort Knox, 1,680 at West Point, 1,360 at Denver, and most of the rest at the New York Fed. A statute of 1973 fixes the price at which it is carried on the books. The Treasury's inspector general audits the reserve every year, checking sealed vaults and testing samples, but no complete independent count has been published in decades.

Calls in 2025 to 'check the gold' produced assurances rather than a count. In July 2026 Treasury Secretary Scott Bessent, who had not visited, said on his staff's word that the gold was 'present and accounted for'. In August Senator Rand Paul spent an hour or two inside Fort Knox and said 'the gold is there, all (approximately) 147 million ounces'. Calls for an independent audit continue.

Worked example — Revaluing America's Gold

The holding. 8,133 tonnes is 261.5 million troy ounces. At the statutory $42.22 it is carried at $11.0 billion; at the October 14 price of $4,106 it is worth $1,073.7 billion. **The gain.** Marking it to market would book the difference, $1,062.7 billion, about 53% of the $1,993 billion federal deficit of fiscal 2026. **The mechanism.** Under the Gold Reserve Act the Treasury issues gold certificates to the Federal Reserve against its gold at the official price. If Congress raised that price, the Treasury could issue certificates for the difference and the Fed would credit the Treasury's account with about $1.06 trillion, money the government could spend without borrowing or taxing. **The catch.** The Fed's credit is newly created money: once the Treasury spent it, it would add the same amount to banks' reserves, much as quantitative easing does but without any bond purchase, and the gold itself would not change. Who would gain, and at whose cost, is the debate in 13d.

13c. Gold for Bitcoin, and Gold-Backed Money

In 2025 Senator Cynthia Lummis's BITCOIN Act proposed buying a million bitcoin over five years and paying for part of it with a revaluation of the Treasury's gold certificates. It has not passed. The administration created a Strategic Bitcoin Reserve by executive order on March 6, 2025 from coins the government had seized, and it has bought none since.

At the other pole, the BRICS group (Brazil, Russia, India, China, South Africa, and the members added since 2024) has discussed a gold-linked unit for settling trade, and its New Delhi summit of September 12-13, 2026 adopted none. Zimbabwe's ZiG (Zimbabwe Gold), launched in April 2024 and backed in part by gold, lost about 43% of its value in a devaluation that September, and has been steadier since as the central bank kept buying gold. The practical form of moving away from the dollar has been central banks accumulating gold (Module 6), not gold-backed money.

13d. Should America Revalue Its Gold?

The case for

Its advocates say America is sitting on a trillion-dollar asset carried at a price set in 1973. Other central banks value their gold at market, and the European Central Bank and the Bundesbank revalue theirs every quarter. A revaluation would let the Treasury fund a sovereign wealth fund, a bitcoin reserve, or debt reduction without borrowing a dollar, and it would only make the books show what the country owns.

The case against

Its critics answer that the gain is an accounting entry that becomes money only when the Fed creates it. Crediting the Treasury with a trillion dollars would be monetary financing of the government by another name, at the moment the Fed is raising rates against 3.7% inflation. It would invite the reading that the United States monetizes its assets when it is pressed for money, which is the fear a higher term premium on Treasuries already reflects. And it would draw the Fed into fiscal policy just as its independence is being tested.

The evidence

Roosevelt's revaluation of 1934 shows the mechanism works and that the gain goes to the Treasury, not to the holders of the gold (Module 2). Changing the official price needs an act of Congress. As of October 2026 no bill to revalue had advanced and the Treasury had announced no plan, although the idea is discussed in markets.

The course's reading

A revaluation would create money and leave the gold unchanged, so its effects would depend entirely on what the Treasury did with the credit. Spent, it would add a trillion dollars of reserves to a banking system the Fed is trying to tighten; held, it would change nothing but the books. The larger cost would be to the separation of the Fed's balance sheet from the Treasury's budget. The signal that would change this reading is a bill that pairs a revaluation with a rule the Fed controls, such as sterilizing the credit with sales of its own bonds.

13e. Gold and the Fed in 2026

The institution that matters most for the gold price is the Federal Reserve, because it sets the real interest rate that is gold's opportunity cost (Module 4). Under Chair Kevin Warsh, in office since May 2026, it raised rates on September 16 to 3.75-4.00%, its first rise since 2023, and on October 16 futures priced about nine chances in ten of another by December.

The politics run underneath. The administration has pressed the Fed in public to cut, the Supreme Court's ruling of June 29, 2026 in Trump v. Cook kept Governor Lisa Cook in office, and reserve managers abroad read both as signs about the dollar's future. Which force sets gold's price over the next year, a Fed raising real rates or buyers who hold gold against the policies of governments, is the question the decoupling debate turns on (Module 4).

Module 13 Key Points

The Politics of Gold

• Gold at home cannot be frozen; Venezuela's 31 tonnes in London and Afghanistan's reserves in New York show what custody abroad risks.

• India brought 104 tonnes home in the year to March 2026; the Dutch moved 86 tonnes from North America to London.

• America's 8,133 tonnes sit on the books at $42.22 an ounce, $11 billion, against $1.07 trillion at October's price.

• Revaluing would credit the Treasury with about $1.06 trillion of newly created money; no bill had advanced by October 2026.

• No gold-backed BRICS unit exists; the BITCOIN Act stalled; Zimbabwe's partly gold-backed ZiG lost 43% in 2024.

Module 13 Quiz

Check Your Understanding

1. Why did Venezuela's gold at the Bank of England become a precedent reserve managers noticed?

A) Britain withheld it over who governs Venezuela
B) It was sold at a loss by the Bank of England
C) It was found to be missing when audited in 2020
D) It was returned to Caracas in 2023

2. At what price does the US Treasury carry its gold, and what is it worth at October's price?

A) At market, about $1.07 trillion, revalued monthly
B) $42.22 an ounce: $11 billion, against $1.07 trillion at market
C) $35 an ounce, the 1934 price, about $9 billion
D) $4,106 an ounce, about $11 billion on the books

3. What would the Fed's credit to the Treasury be, if America revalued its gold?

A) A loan the Treasury repays
B) Proceeds of selling the gold
C) Newly created money
D) A transfer from tax revenue

4. What did the BRICS summit in New Delhi in September 2026 do about a gold-linked unit?

A) Created one
B) Pegged it to the yuan at a fixed rate
C) Backed it with the IMF's gold
D) Adopted none

5. What does the course take as the larger cost of a revaluation?

A) The loss of the gold itself, which would have to be sold
B) The blurring of the Fed's balance sheet with the Treasury's budget
C) A fall in the gold price as the Treasury's holdings come onto the market
D) The end of the Treasury's annual audits of the reserve

Module 14 — Silver, Platinum, and the Other Precious Metals

The Metals That Trade Alongside Gold

Recommended Reading / Reference

Book: Stephen Fay, *Beyond Greed* (1982), on the Hunt brothers' silver corner

Reference: The Silver Institute's *World Silver Survey 2026* (April 2026); the World Platinum Investment Council's *Platinum Quarterly* (September 2026)

14a. The Four Metals

Metal	Price, October 14, 2026	Record	Industry's share of demand	Largest producers	Character
Gold	$4,106	$5,608, January 29, 2026	About 7%	China, Russia, Australia	Monetary; priced by the holders of its stock
Silver	About $55.66, its low for 2026	$121.62, January 29, 2026	More than half	Mexico, China, Peru	Half monetary, half industrial, and more volatile
Platinum	About $1,620	About $2,920, January 26, 2026	Most, with cars' catalysts the largest use	South Africa by far, then Russia and Zimbabwe	Industrial, with a jewelry and investment market
Palladium	About $1,130	About $3,440, March 7, 2022	About four-fifths, mostly catalysts for gasoline cars	Russia and South Africa	Industrial, and exposed to electric cars
Rhodium	—	$29,800, March 2021	Nearly all, in catalysts	South Africa	A byproduct, with violent swings

Silver, platinum, and palladium are dealers' spot quotes late on October 14, not benchmark prices; records from exchange and dealer data.

14b. Silver, the Ratio, and the Hunt Brothers

Silver is gold's volatile cousin. It was money for three thousand years, and the dollar itself was defined in silver in 1792, before the West moved to gold after the 1870s. Today more than half of its demand is industrial: solar cells, electronics, electric cars, and brazing. Most of it is mined as a byproduct of copper, lead, zinc, and gold in Mexico, China, Peru, Chile, and Poland, so supply barely responds to silver's own price. America added it to its list of critical minerals in November 2025.

The market has run short for years. The Silver Institute forecasts a deficit of 46.3 million ounces in 2026, the sixth in a row, bringing the shortfall since 2021 to 762 million ounces met from stocks, even as demand from solar panels, which use less silver per cell each year, falls 19%. With a small and speculative investor base, that makes silver swing further than gold in both directions. In 2026 it reached its record on January 29 (14a) and fell 31% the next day, its worst day in 46 years.

The most famous attempt to corner it ended the first silver boom. In 1979 the Texas oil heirs Nelson Bunker and William Herbert Hunt, with Saudi partners, bought physical silver and futures on a scale estimated at more than 100 million ounces, and the price rose from about $6 to about $50 by January 1980. COMEX raised margins and, on January 21, 1980, allowed only trades that closed positions; households melted

silverware into the rally; and Paul Volcker's rate rises raised the cost of the Hunts' borrowing. On March 27, 'Silver Thursday', the price halved in a day to $10.80. The Hunts lost more than a billion dollars and later went bankrupt: a corner fails when the holders of the stock sell into it.

Date	Gold-silver ratio	Context
1792	15	America's Coinage Act fixes the ratio for its two-metal standard
1873-1900	16, rising to 35	Silver demonetized across the West
1940	About 100	Silver's low and the ratio's high to that point
January 1980	About 17	The Hunt brothers' corner
1991	About 100	Silver's trough after the corner
April 2011	About 32	Silver near $49
March 2020	About 125, the record	The pandemic crash, silver near $12
January 29, 2026	About 45	Both metals at records; silver ran ahead

Worked example — Trading the Ratio

The setup. The gold-silver ratio is the number of ounces of silver an ounce of gold buys. On October 14 it was $4,106 ÷ $55.66 = 73.8. An investor who thinks it will fall sells 100 ounces of gold for $410,600 and buys $410,600 ÷ $55.66 = 7,377 ounces of silver. **If it works.** Gold stays at $4,106 and the ratio falls to 60, so silver rises to $4,106 ÷ 60 = $68.43, and the silver is worth $504,800: a gain of 23% with no view on gold's direction. **If it fails.** The ratio rises to 90, silver falls to $45.62, and the silver is worth $336,600: a loss of 18%. **The bet.** The trade pits silver's industrial cycle and speculative appetite against gold's monetary bid. Investors who made it in 2025, with the ratio near 90 for much of the year, were well ahead by January (the table above) and had given back much of the gain by October.

14c. Platinum, Palladium, and Rhodium

The platinum-group metals are industrial metals with precious-metal habits. Most platinum and palladium goes into catalysts that clean car exhausts, palladium mainly for gasoline engines and platinum for diesel, which ties both to the car industry and to the shift to electric vehicles, which need neither. Palladium reached its record in March 2022 on fears for Russian supply (14a), and has since lost two-thirds of that. American producers asked for duties on Russian palladium, and the Commerce Department set them at 132.83% and 109.1% in the spring of 2026, but the International Trade Commission voted 3-0 on May 29 that the imports had not injured the industry, so no duties will be levied. Rhodium, a byproduct mined at small scale in South Africa, went from about $600 to its record (14a) and has fallen back since.

Platinum, cheaper than gold since 2015 after trading above it for most of the previous century, has had three years of deficits, in 2023-25, as South African output, deep, power-starved, and costly, struggled to keep up with demand. It peaked in January (14a) and has since lost about 45%. In September the World Platinum Investment Council revised its forecast for 2026 to a surplus of 265,000 ounces, the first since 2022, as investors sold, after a deficit of more than 1.4 million ounces in 2025; even so, it expects stocks above ground to cover only about 3.4 months of demand at the end of 2026.

14d. How They Move Together and Apart

The four metals share vaults, exchanges, and investors, and they part on fundamentals. Gold trades on real rates, the dollar, fear, and central banks; silver on gold plus the industrial cycle plus speculation, with larger swings in both directions; platinum and palladium on cars, South African mines, and Russia. In January 2026 all of them soared together and broke together, which is what a monetary panic and its end look like.

In an industrial recession gold tends to hold up while the others fall; in a bull market led by central banks, as in 2024-26, gold leads and silver follows late. Central banks of any consequence hold no silver or platinum in their reserves, so gold alone has an official bid, which is why the ratio rarely stays low for long.

Module 14 Key Points

Silver, Platinum, and the Other Precious Metals

• Silver is more than half industrial; its 2026 deficit is forecast at 46.3 million ounces, the sixth in a row.

• Silver hit $121.62 on January 29, 2026, fell 31% the next day, and was about $55.66 on October 14.

• The Hunt brothers' corner took silver to about $50 in 1980; it halved on Silver Thursday as holders sold.

• The gold-silver ratio fell from near 90 in 2025 to about 45 in January 2026, and was about 74 in October.

• Platinum swings to a 2026 surplus as investors sell; palladium duties on Russia died at the trade commission.

Module 14 Quiz

Check Your Understanding

1. What is the gold-silver ratio?

A) The share of silver in a gold jewelry alloy
B) Gold's price divided by platinum's price
C) The share of silver demand that is industrial
D) Ounces of silver one ounce of gold buys

2. What happened to silver on January 30, 2026?

A) It fell 31%, its worst day in 46 years
B) It set a record above $150
C) The IMF added it to its reserves
D) It traded flat as gold fell sharply

3. What broke the Hunt brothers' silver corner in 1980?

A) A mine strike
B) A US ban on silver exports
C) Holders sold into it
D) The Saudi partners bought out the Hunts' futures

4. What did the World Platinum Investment Council forecast in September 2026?

A) A record deficit of 5 million ounces
B) A 2026 surplus
C) A doubling of demand from cars
D) A shortage of rhodium for catalysts

5. Why did no American duties on Russian palladium take effect?

A) Russia stopped exporting it
B) Congress repealed the duty law in April
C) The Commerce Department set the margins at zero
D) The trade commission voted no

Module 15 — Where Things Stand, and What to Watch

The Argument on a Page, and the Dates

Recommended Reading / Reference

Reference: The World Gold Council's *Gold Demand Trends* (quarterly) and *Gold Outlook*; the Federal Reserve's statements and projections; the LBMA's monthly vault data

15a. The Argument on a Page

Gold is priced by the holders of its stock, not by its miners. A year's mine output is under 2% of the 222,600 tonnes above ground, so the price moves when holders change their minds about real interest rates, the dollar, and the safety of the alternatives, and supply cannot respond for years when they do.

For fifty years the marginal holder was a Western investor who priced gold against real yields and the dollar. Since 2022 a second market, central banks and Asian households that hold gold as insurance and do not sell it when rates rise, has grown large enough to raise the floor under the first. The two markets now share a price. In 2026 the first reasserted itself at the margin, when a hawk was named to chair the Fed and the Fed raised rates, and the second kept the level above any price seen before October 2025.

The turning points have come from holders, too. The boom of 1980 ended when Volcker's rate rises made holding gold costly; the bottom of 1999 came when governments sold; and the crash of 2013 came when fund holders answered rising real rates. The freeze of 2022 created a buyer indifferent to price, the drain of 2025 showed how thin the deliverable stock is, and the record of January 2026 broke on a change at the Fed. The question to ask of any move in gold is which holder is buying or selling, and whether that holder cares about the price.

15b. Five Contradictions

- **Record margins, and supply that barely grows.** Costs rose 16% in a year and margins still hit records, yet mine output grows about 1% a year and no major discovery was made in 2023 or 2024. The reward for finding gold has never been higher, and the finding has nearly stopped (Modules 8 and 9).
- **A war, and the haven fell.** When war closed the Strait of Hormuz, gold fell 21% in three weeks, because the war raised oil, the dollar, and expected interest rates faster than it raised fear (Modules 3 and 4).
- **Record fund holdings, and a falling price.** Exchange-traded funds held a record 4,256 tonnes in September 2026, as gold fell, because futures traders sold more than fund buyers bought (Modules 4 and 5).
- **Sovereignty kept abroad.** Central banks buy gold because no foreign government can freeze it at home, yet much of the world's official gold sits in New York and London, and in 2026 the Dutch moved 86 tonnes from North America to London rather than home (Modules 5 and 13).
- **A price-insensitive buyer that sells.** Central banks are the buyers who ignore the price, yet in the quarter the price fell most, Turkey and Russia sold, because a government that needs money sells what it can (Module 6).

15c. What to Watch

Date	What to watch	Why it matters
October 27-28, 2026	The Fed's meeting	Another rise now or in December: the real-rate force the course's reading turns on (Module 4)
October 28 and November 9	Kinross's and Barrick's results for the third quarter	Whether all-in costs keep rising toward $2,000 an ounce (Module 8)
Late October (October 30 in 2025)	The World Gold Council's demand figures for the third quarter	Central banks after a record second quarter; the funds' record quarter; jewelry under India's 15% duty (Modules 9 and 10)
November 3	The American midterm elections	The pressure on the Fed and the tariffs that moved gold in 2025
Early November	China's central bank reports its October reserves, and India celebrates Dhanteras and Diwali	A 24th month of reported buying; the first festival season since the duty went back to 15%
December 8-9	The Fed's meeting and projections	Whether the rises continue into 2027
By the end of 2026	Barrick's planned listing of its North American gold mines; Gold Fields' decision on Windfall	The industry's answer to record margins: break-ups and new mines
Pending, no date	Venezuela's gold moving from London to New York; Poland's path to 700 tonnes; Kazakhstan's sales; the LBMA's new sourcing rules	Custody, the official bid, and the rules on illicit gold (Modules 6, 11, and 13)
Late January 2027	The World Gold Council's full-year 2026 figures	Whether official buying in 2026 returned to the 1,000-tonne pace of 2022-24
June 2027	The World Gold Council's survey of central banks and the ECB's report on reserves	Whether the record 45% intending to buy holds after a year of selling by some

Scheduled dates are as announced by the institutions concerned; the World Gold Council's release dates follow its usual calendar.

15d. The Last Word

The reader who has followed the stock from the vault to the holder, the price from the Fed to the funds, and the metal from the mine to the smuggler can read the next record, the next crash, and the next headline about the end of the dollar for what they are. Of every move in gold, ask three questions: what the real interest rate is doing, who is buying, and whether that buyer cares about the price. Gold's price is a measurement of the world's trust in the alternatives, and in October 2026 it was measuring a Fed that had started raising rates again against governments still buying insurance against one another.

Module 15 Key Points

Where Things Stand, and What to Watch

• Gold is priced by the holders of a 222,600-tonne stock, not by miners adding under 2% a year.

• Since 2022 central banks and Asian households have raised the floor; Western money still sets the direction.

• Turning points came from holders: Volcker's rate rises, government sales, fund selling, the 2022 freeze, and a change at the Fed.

• Five contradictions: record margins with flat supply, a war that sank gold, record funds with a falling price, sovereignty abroad, a price-blind buyer that sells.

• Watch the Fed on October 27-28 and December 8-9, and the third-quarter demand figures in late October.

Module 15 Quiz

Check Your Understanding

1. What sets the gold price, in the module's argument?

A) The year's mine output
B) The cost of mining the marginal ounce
C) The willingness of the stock's holders to hold
D) Jewelry demand in India and China in the wedding season

2. What happened to the two markets in 2026, on the module's account?

A) Western money set the direction; central banks held the level
B) Central banks set the direction of the price alone
C) Both markets left gold for silver and platinum
D) Western money stopped trading gold futures in 2026

3. Which contradiction involves the funds in September 2026?

A) Record holdings, falling price
B) Record sales and a record price
C) Funds closed
D) Funds bought only silver and platinum

4. What three questions does the last word say to ask of every move in gold?

A) The cost of mining, the grade, and the jurisdiction
B) Real rates, who is buying, and whether they care about price
C) The ratio to silver, to oil, and to copper
D) The size of the vaults, the weight of the bars, and the number of refiners

5. Which comes first on the module's watch list?

A) The Fed's meeting of December 8-9
B) The central-bank survey of June 2027
C) Barrick's planned listing of its mines
D) The Fed's meeting of October 27-28, 2026

Answer Sheet

Answers to every module's Check Your Understanding quiz.

Module	Answers
Module 1 Quiz	1. C 2. D 3. B 4. A 5. C
Module 2 Quiz	1. B 2. A 3. D 4. C 5. A
Module 3 Quiz	1. B 2. D 3. C 4. B 5. A
Module 4 Quiz	1. D 2. B 3. C 4. A 5. D
Module 5 Quiz	1. D 2. A 3. B 4. C 5. A
Module 6 Quiz	1. C 2. D 3. B 4. C 5. D
Module 7 Quiz	1. A 2. B 3. C 4. A 5. B
Module 8 Quiz	1. D 2. C 3. D 4. A 5. B
Module 9 Quiz	1. C 2. A 3. B 4. D 5. C
Module 10 Quiz	1. B 2. A 3. D 4. B 5. D
Module 11 Quiz	1. A 2. C 3. D 4. B 5. C
Module 12 Quiz	1. A 2. C 3. B 4. D 5. A
Module 13 Quiz	1. A 2. B 3. C 4. D 5. B
Module 14 Quiz	1. D 2. A 3. C 4. B 5. D
Module 15 Quiz	1. C 2. A 3. A 4. B 5. D