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Do you find it challenging to understand commercial real estate terminologies? Commercial real estate, which deals with property used for mainly business-related purposes, can be quite complex. Do you find the terminologies used in commercial real estate too complicated? We've prepared a comprehensive commercial real estate glossary containing 100 commercial real estate terms to know while buying and selling commercial property. You need this glossary of commercial real estate terms to learn new terminology and make informed decisions. It is comprehensive with definitions that are easy to understand. In this glossary, you'll find commercial real estate lease terms, commercial real estate loan terms, commercial real estate finance terms, and other important commercial real estate terms and definitions. Let's get started! Ultimate Commercial Real Estate Glossary and Resource 1. Absorption: Often reported as a property's absorption rate, an absorption is the amount of units or inventory of a particular type of commercial property that was occupied in a given market within a specified time period (usually not exceeding one year). The rate at which an empty space is leased or purchased within a specified period of time is known as the absorption rate. It is often expressed in square feet per year for commercial property and units or homes per year for residential property. (Source: Corporate Finance Institute) 2. Addendum: An addendum in real estate is a piece of additional information covering certain circumstances of a transaction and it is often added to a form contract as an attachment before execution of the contract or during escrow. Meanwhile, the part of the contract that doesn't need adjustment will remain the same irrespective of the addendum. Examples of these circumstances include variables like requirements relative to property inspections, financial contingencies, among others. They often apply to properties with long legal descriptions. Some real estate contracts require two or more addenda. 3. Adjustable-Rate Mortgage (ARM): ARM refers to an instrument that allows real property to be used as collateral for a promissory note, which must specify interest rates and how they are expected to change from time to time. An adjustable-rate mortgage comes with variable interest rates that are based on the outstanding balance of each period on the loan. You may begin with very low monthly payments unlike what is required for a fixed-rate mortgage, but expect the monthly payments to rise in the future as a result of fluctuating interest rates. When issuing an ARM, the three important features to consider are introductory rate, actual rate, and conversion option. 4. Amortization: Amortization is a process of using regular payments or installments to pay off debts, for example, a mortgage, over an agreed period of time. It keeps track of the amount of money assigned to the principal and interest for each installment. Usually, it takes between 15 to 30 years. At the end of the agreed term, the loan should be paid in full so there is no balance left. This progressive and gradual method that slowly eliminates loans can apply to capital investment or lending. However, not all loans are amortized completely. 5. Annual Percentage Rate (APR): It refers to how much a loan costs annually, and may include interest rate, broker fees, points, and some other credit charges required from a borrower. The APR serves as an estimate to help make informed decisions before starting a loan repayment plan. Under the Truth in Lending regulations, the APR must be reported by lenders. Also, the Annual Percentage Rate must include all charges not expected to come up in an all-cash transaction, such as charges paid to mortgage brokers and lenders. Examples include credit report fees, pest inspection fees, appraisal fees, as well as title insurance charges. 6. Appraisal: An appraisal involves having an opinion about the value of something, like a house, stock, or jewelry. Such an opinion has to reflect the amount a buyer would willingly pay a seller with neither party under any pressure or duress. It is often required before a real estate agent tries to market any financed property that differs from any property that is commonly sold in the marketplace. An appraisal must be carried out by an appraiser if a loan is placed on the property to ensure the bank is not lending too high an amount on the property. During the appraisal process, the appraiser examines the property to estimate its current value after comparing its initial purchase price to recent prices of similar properties in the area. 7. Appraiser: An appraiser is a professional whose duty is to conduct an analysis, also known as an appraisal, on a property with the aim of estimating its value. The analysis covers examples of sales involving similar properties. An appraiser must be licensed to conduct an appraisal of the real estate or personal property and often charges a fee. A commercial real estate appraiser estimates the value of several types of commercial properties, such as land, office buildings, shopping centers, hotels, and industrial buildings. This estimation requires different levels of expertise but must be completed using any one of these approaches: the income approach, the sales comparison approach, or the cost approach. 8. Appreciation (APP): An appreciation is defined as an increase in a property's market value or worth due to improvements or changing market conditions. Generally, real property is known to appreciate over time when properly maintained and repaired. Some factors that can lead to an increase in a property's value are inflation, economic growth of the area, increased demand for the property, population growth, changing interest rates, and lots more. Property appreciation occurs with almost any piece of real estate and under a wide variety of circumstances. (Source: Corporate Finance Institute) 9. As Is: A real estate term used to refer to a property that is in its present condition without the seller giving any guarantees. The term is used when a seller is selling a property in its current condition to a buyer, who is agreeing to purchase it with all its faults, including the faults that are not yet apparent. The purpose of the clause is to let the buyer know that the seller does not intend to make any repairs or improvements to the property. The "as-is" clause goes hand-in-hand with the "where-is" clause to ensure that the buyer has rights, and the seller is not absolved of all responsibilities. 10. Assessed Value: It refers to the value an appraiser places on a property for taxation purposes. When calculating property taxes, fire district dues, school taxes, and other related charges, a tax appraiser has to determine the fair value of the real property in the market. An assessed value is often calculated as a particular percentage of the appraised value, and this percentage varies depending on what the property is used for and any exemptions. 11. Assignment: An assignment shows the transfer of mortgage ownership from one person (the assignor) to another (the assignee). It is often used when an investor signs a contract allowing him to purchase a property but still maintains control or ownership of said property and reserves the right to assign the contract to a future business entity. More so, an assignment can be used when an investor desires to hide his or her identity when purchasing a property; this means the investor will need to employ a straw man who will sign the purchase contract before it is assigned to the main purchaser. Another way an assignment is used is when a speculative purchaser of property that will be built in the future signs a purchase contract at a fixed price, expecting prices to increase dramatically upon completion of construction for the purpose of making a substantial profit by assigning their contract to another purchaser. 12. Assumable Mortgage: An assumable mortgage is an existing mortgage loan that the buyer can take over or assume on the same terms the original borrower was given. This transaction involves a real property buyer taking over the existing mortgage of the seller. However, the seller will still be liable unless the lender releases him or her from the obligation. A loan is not likely to be assumed without the consent of the lender if the mortgage includes a due-on-sale clause. 13. Automated Valuation Model (AVM): A process of estimating many property values efficiently, and often accurately by using a computerized method. Tax appraisers often use the AVM to periodically reappraise real properties because of taxes. If the valuation is not accurate, a property owner can decide to appeal it by showing evidence of the mistake the computer made. (Source: Slideplayer) With advancements in technology, AVM artificial intelligence is now used by lenders to appraise property for the purpose of mortgage loans. The IRS also uses this artificial intelligence to evaluate the assets of a taxpayer. 14. Balloon Mortgage: A term used to describe a mortgage that comes with a final payment that is much more than the preceding payments. The monthly payments for the mortgage have an unpaid balance that is due after a specified period of time, usually in a lump sum payment. The payments are usually based 0n an amortization schedule of 30 years but the principal balance could be due from 5 to 7 years. Sometimes the mortgage contains an option to extend the due date if specific conditions are met and to reset the interest rate to the current rate in the market. 15. Blockbusting: Also referred to as panic peddling, blockbusting is an illegal practice whereby someone induces panic in another person or a neighborhood to make people sell or grant a listing contract. In this discriminatory practice, the person trades on fears that the neighborhood is changing in terms of race, family status, religion, sex, color, ancestry, or disability. Fair Housing laws prohibit such housing discrimination by landlords, lenders, real estate agents, and homeowners' insurance companies. 16. Bridge Loan: A bridge loan, also called a "swing loan," is a short-term loan that a borrower's present home (often for sale) secures to bridge the gap between transactions by using the proceeds for building or closing a new house before the final sale of the present home. This form of temporary financing is obtained at the completion of a construction loan period before arrangements can be made for permanent financing. Most times, such loans are offered by employers when they transfer employees to a new city. 17. Broker: A real estate agent who stands as an intermediary between sellers and buyers of real estate property. As soon as a written offer is received, a real estate broker submits it to the principal immediately and is not allowed to hold any offer if awaiting a juicier one. Moreover, the broker is not allowed to make contracts but owes the principal's or client's fiduciary responsibilities to carry out their duties in honesty, skill, integrity, and care. 18. Broker Price Opinion (BPO): A BPO also referred to as a broker opinion of value (BOV), is often obtained by lenders who are based outside a state but want to sell a distressed property. Most states only authorize a licensed appraiser to give a professional opinion on a property's value. However, a real estate broker may offer an offering as to the asking price of a property that is about to go on the market. Different approaches such as sales comparison, income capitalization, or cost analysis may be used when creating a broker price opinion. 19. Buydown: A buydown is a cash payment to a lender, meant to reduce a borrower's interest rate, and it is often measured in points. It comes up in a situation where a person pays discount points to reduce the interest placed on a mortgage loan so as to buy down the rate. In a buy down, additional points are paid on the loan in order to reduce the monthly mortgage. The property owner pays a lump sum into an escrow account to supplement the monthly payments of the debtor. This lump sum is often paid as a financial incentive to make their property more attractive for someone to purchase. Borrowers do not need to buy down their rates when dealing with residential loans. 20. Cap Rate: The cap for an adjustable-rate mortgage or loan is a limit placed on the amount that mortgage payments or interest rates may either increase or decrease. This maximum allowable increase or decrease is fixed for a specified amount of time. In commercial real estate, the capitalization rate is a metric used in estimating the potential rate of return of the commercial property, especially if purchased with cash. It is calculated as the ratio of Net Operating Income to the property asset value. (Source: EDUCBA) Cap rate varies widely depending on tenant base, asset class, property type, and the real estate market. The cap rate most properties trade in falls within the range of 3% to 10%. 21. Cash-Out Refinance: A transaction that creates a way for investors to benefit from their growing assets without selling them. This non-taxable event allows a property to be refinanced in an amount that can pay off existing debt while providing the owner with cash. In this transaction, the borrower gets additional funds that far exceed the amount required to repay the existing mortgage, points, closing costs, and other subordinate liens. Cash-out refinancing allows investors in commercial real estate to unlock the money that is stuck in an investment that has become illiquid. A cash-out refinancing deal can help to finance as much as 75% of a property's LTV. 22. Chain of Title: A history of all documents, from the earliest existing document to the most recent document, that have transferred title to an existing parcel of real property. In other words, it is a history of a property's conveyances and encumbrances from a starting point, in which the current owner derives title. This history of owners and lienholders of the real property contains the date of acquisition and the nature of the title. It covers who built the structure, who first owned it, who bought it, up to the present-day owner. If your rights to own property are ever questioned, the chain of title will come in handy to prove your ownership. 23. Clear Title: Refers to a land title, good title, or other marketable titles with no liens, mortgages, defects, legal encumbrances, or adverse claimants against it. A clear or clean title shows that you have acquired full ownership rights to real property without any type of claim or lien by creditors against the property. A title search is important to determine if you can receive a clear title in a commercial real estate transaction. It is important to find and review documents on the history of the property's ownership when conducting the title search. 24. Closing: It is the conclusion of a sales transaction that occurs when a seller transfers title to a buyer in exchange for consideration. Such proceedings are often held at a title company. A closing, which in essence, covers all processes involved in completing a financial transaction, requires that all necessary signatures be obtained, all required disclosures made, and all monies collected and disbursed before transferring title to real estate, and/or executing a mortgage. The Real Estate Settlement and Procedures Act regulates closings. Closing is also called "escrow" in some jurisdictions. 25. Closing Costs: These are costs, fees, or expenses a buyer has to pay when closing a sale or mortgage and may vary from one financial institution to the other. The buyer has to pay these costs in addition to the down payment, which may include title charges, points, document preparation fee, credit report fee, mortgage insurance premium, appraisals, inspections, deed recording fee, insurance, prepayments for property taxes, escrow fees, cost of survey, listing agent's commission, selling agent's commission, transfer taxes, and other potential expenses. The only exception is the lender fees and actual purchase price of the property. Instead of specifying that both the seller and buyer will share the closing costs equally, it is better to clearly state the allocation for payment and all anticipated expenses. 26. Co-Borrower: A borrower, who isn't the first borrower, but whose name is on both the application and mortgage note. It does not matter whether the person is a joint owner with the first borrower and also shares liability for the mortgage note. The income and the credit history of the co-borrower are used to qualify for the loan and all parties involved are also obliged to repay the loan. A co-borrower becomes very useful when a debtor cannot qualify for a loan. Moreover, with multiple borrowers on a loan, the amount of principal credit that will be approved on the loan will also increase. 27. Commission: A fee or compensation that is charged by and paid to a licensed real estate broker for services performed in connection with a lease, exchange, or sale of a property. It is often a percentage of the property's selling price and can also be paid by the broker to a salesman in exchange for services rendered. A real estate agent, for example, earns a fee on the sale of real property. However, a broker is only entitled to a commission if there is a licensed written contract for the services. The broker only earns the commission after producing a buyer who is ready and able to close based on the terms already specified in the written contract. 28. Common Area Maintenance (CAM): Any space that two or more tenants commonly use without one tenant having exclusive access to the space is referred to as a "common area." Maintaining the common area is the responsibility of the landlord or the property management company. CAM covers costs needed for the pro-rata portion of a tenant's upkeep of amenities and common areas, including parking lots, street cleaning, external lighting, and trash removal. The fees for the maintenance of the common area are collected from the tenants and used to oversee the management of that space. However, landlords and tenants need to negotiate the charges before executing the lease. 29. Construction Loan: A loan taken to provide payment for any construction work, improvements to a property, or development in a subdivision. The lender disburses the loan payments to the builder at regular intervals while the improvement, construction, or development is in progress. Also called a self-built loan, this short-term loan, which typically lasts for a year, is riskier than conventional mortgage loans and incurs a higher interest rate. Most construction loans require full payment of the balance by the end of the project. Many lenders demand a down payment of not less than 20% on a construction loan. National banks and local credit unions are known to provide construction loans. 30. Contingency: A condition that the parties involved in a contract must meet before the contract becomes legally binding. This provision included in a contract states that some or all the contract's terms will either be altered or voided if a specific event occurs. (Source: Real Estate Skills) No commercial real estate contract is complete without a few contingency plans in place as a safety measure for both the buyer and seller. Commercial property investors can benefit from having contingency plans as they help to mitigate lots of unnecessary risks. It is important to decide on the contingencies that work best for your needs. 31. Conventional Mortgage: A mortgage loan neither insured nor guaranteed by the federal government or any of its agencies, such as the U.S. Department of Veterans Affairs (VA), the Rural Housing Service (RHS), or the Federal Housing Administration (FHA). The conventional loan is one of the financing options to consider when purchasing a commercial real estate building. Most people use a conventional mortgage when purchasing an investment property that is stabilized. A credit union, bank, or other traditional financial institution provides this loan and will accept any form of commercial real estate as collateral. The timing for closing this loan ranges from 60 to 90 days after the term sheet has been issued. 32. Cost of Funds Index (COFI): COFI is an index used in determining changes in interest rates for particular adjustable-rate mortgage loans. Also known as a yield index, it is based on the cost of funds to loan and savings institutions in the San Francisco Federal Home Loan Bank District. COFI mortgages and loans have interest rates that fluctuate more slowly than variable-rate loans which are linked to other indices. Most professionals use this index to either adjust or change the interest rates on adjustable-rate mortgages (ARMs). 33. Covenant: A restriction that governs the use of real estate, found in deeds or documents, binding every landowner in certain development. It could be a requirement that properties in a particular area be used for residential purposes only. A person can write this restrictive agreement regarding real property usage into the real estate records and it will remain binding on all owners irrespective of whether it is included in their particular deed or not. 34. Debt-to-Income (DTI) Ratio: The percentage of the gross monthly income used for paying installment debts like monthly housing expenses, car payments, alimony, and child support. It is also used to pay for open-ended accounts like credit cards. Lenders use the DTI ratio to determine a person's borrowing risk. A borrower with a low DTI ratio is considered to have a more sufficient income and is more likely to pay off debts on time. A borrower with a DTI of 43% (the highest ratio) can still be qualified for a mortgage. However, most lenders prefer ratios not exceeding 36%. 35. Deed: A written instrument or document that bears the description of a particular property to allow conveyance of the title for the property. It must be properly signed, acknowledged, and delivered. A deed is a crucial part of a commercial property agreement. A commercial property deed must contain restrictions for how the property is used and upkeep, including rules for maintaining the property's common areas. The restrictions in a deed apply to even successive owners and tenants of the commercial property and can only be changed before renting or leasing the commercial space. 36. Deed-in-Lieu of Foreclosure: A document or instrument that transfers a real property title to a mortgage lender without going through the process of foreclosure. Lenders find this procedure attractive because it is fast, lacks defenses, and eradicates the fear of last-minute borrower bankruptcy. However, lenders face some risk if intervening liens are present. Borrowers also like it because it contains no foreclosure to credit records. If other liens were recorded after a deed of trust or mortgage, the foreclosure will destroy them. 37. Default: The inability to meet certain legal obligations or perform certain duties on time. It includes failure to perform a non-monetary service or pay on a financial obligation. Loan agreements, property agreements, and lease agreements are some of the types of contracts that include a default clause. A default clause in a commercial lease agreement is included to allow the landlord to demand that their tenants comply with all the requirements of the agreement. It also explains how an eviction will be carried out if the tenant violates any rule of the agreement or defaults on their obligations. 38. Delinquency: The failure to make payments at the scheduled due date. It is sometimes referred to as a loan that is past its due date by 30 days or more. A loan may accrue interests and some penalties if your mortgage becomes delinquent. However, you may not necessarily lose your property simply because your mortgage is delinquent if you can make payments of any amount to stop a foreclosure while the loan is delinquent. Delinquency is not so bad if you are aware of it. It even helps to avoid foreclosure. 39. Down Payment: A percentage of the price of a real property that is not borrowed and often paid in cash. This amount of money, paid up-front by the buyer to the seller, is often the difference between the mortgage amount and the purchase price, usually ranging between 3 to 20 percent. Providing a substantial down payment will help to reduce the monthly payments needed to complete the transaction, and also reduce the amount of interest to be paid over a long term. However, some loans do not require any down payments. 40. Due Diligence: The due diligence process involves investigating the facts, rules, conditions, laws, financial considerations, regulations, and other related matters that are likely to affect a person's decision to purchase real property. Investigations vary from one property to another and could include a home inspection, review of restrictive covenants, and termite report – if related to the purchase of a home. Investigations regarding the purchase of raw land for development may include possible environmental contamination, issues with zoning, soil compaction studies, surveys, analysis of developmental cost versus the value of the property upon completion, etc. (Source: SlideShare) 41. Earnest Money: It is a deposit, usually held by a title company in an escrow account, made by a buyer as evidence while offering to purchase a property and ensure the contract is secured. Earnest money is paid in the period between when the contract is accepted and when it is closed. Basically, it shows that you are committed to purchasing the real estate property and can proceed to close. Also, it serves as a hostage value such that once the seller accepts the offer, it will not be refunded unless one or more contingencies of the sales contract is not fulfilled. 42. Easement: It is a non-possessory right to use someone's property without unduly burdening the property. It is usually created by prescription (unrestricted use of the property over a period of time, which could result in property rights), by necessity (when the law enforces grant of egress and ingress rights for a landlocked property), or by express words of grant (written in a document). Property owners often grant easements for utility trenches, sewer lines, water lines, or utility poles to be placed on their property. Easements can be either appurtenant or gross. 43. Easements Appurtenant: This is a type of easement that remains with the land irrespective of the owner or the number of times the property changes hands; for example, a right-of-way easement is also called a right to travel over someone's land. If an easement is an appurtenant, then it benefits one property (also referred to as the dominant estate, dominant hereditament, or dominant tenement) while burdening another (the property with the burden is often referred to as the servient estate, hereditament, or tenement). 44. Eminent Domain: Sometimes referred to as expropriation, an eminent domain is the right or power of a government to use a court action (called condemnation) to retrieve a private property for public use – any use sanctioned by the legislative body at the federal or state level, such as roads, schools, parks, hospitals, reservoirs, etc. The United States Constitution (Fifth Amendment) permits this action if the owner is justly compensated by being paid a fair market value for the property. 45. Encumbrance: A burden, claim, limitation, or charge placed upon real property by a party who doesn't own the property. In addition to a mortgage, an encumbrance may also include liens, covenants, licenses, encroachments, deed restrictions, unpaid taxes, and easements. It is present in an abstract of title and can restrict the ability of an owner to transfer title to a property or reduce its value until the encumbrance is lifted. Not all encumbrances are financial and they can apply to personal property as well. 46. Equal Credit Opportunity Act (ECOA): A 1974 federal law found under the Consumer Credit Protection Act (Title VII), requiring fairness and impartiality with no form of discrimination on the basis of color, race, religion, sex, national origin, or marital status. It ensures that customers and businesses have equal chances to get credit as long as they meet all the legitimate and legal underwriting guidelines. Different agencies are in charge of enforcing this law, depending on the credit grantor's identity. A private individual who faces such violations may bring a private or class-action lawsuit against an offender. 47. Equity: The difference between a real property's value and the amount of the mortgage debt on it. For example, if you owe $50,000 on your home but its total worth is $150,000, it means you have an equity of $100,000. Under federal law, private mortgage insurance should be canceled automatically (if it was already in place) when a person's equity in the property gets to 22% of the value of the real property (that is, the mortgage is reduced to 78% of the value of the real property). 48. Escrow: The process in which a disinterested third party (called an escrow agent) holds money or documents in trust for the purpose of consummating the instructions of the concerned parties as written in their contracts. Usually, an escrow agreement contains a clause that allows the escrow company to pay all the money in its possession into court (this action is referred to as an interpleader) if the parties have a dispute that they are unable to resolve. Furthermore, the escrow company will name the parties in dispute as defendants, disclaim any of its interest in the said property apart from the reimbursement for expenses of bringing the action to court, and allow them to resolve their differences in court. By doing so, the escrow company will avoid liability and take itself out of any dispute. 49. Estoppel: A doctrine that prevents a person from taking a course of action or denying facts because it wouldn't be fair under particular circumstances. It could be as a result of some other person relying on past statements of fact or relying on a situation that a party allowed to exist but the said party can no longer change the situation. Tenants usually sign estoppel certificates before the sale of a property that will yield income to acknowledge that they have no claims or defenses against the landlord. 50. Exclusive Agency Listing: A relationship in which a real estate broker reserves the exclusive right to list a property and get a commission. Under this listing agreement, a listing broker acts as an exclusive real estate agent for the purpose of helping a property owner to sell the property. If, however, the property owner finds the buyer instead, the listing broker may be paid no commission or a reduced commission at most. A listing agreement like this can give the property owner limited options of real estate brokerage services instead of the regular full range. If, however, a selling broker (a second real estate broker) finds a buyer for the property instead, this selling broker will receive some commission. 51. Fair Credit Reporting Act (FCRA): A federal law put in place and enforced by the Federal Trade Commission to remedy abuses from credit bureaus and other credit reporting agencies, lenders and businesses that get reports from credit bureaus, and parties furnishing consumer information to credit bureaus. The law does not permit reporting any credit information that is erroneous or outdated. Examples of adverse information that cannot be reported include paid tax liens of over seven years, civil judgments or suits older than ten years, and any other information older than seven years, except crimes. (Source: Slidetodoc) 52. Fair Market Value (FMV): The amount agreed upon for a property to be transferred between a willing buyer and a willing seller, both of whom know and understand all the pertinent facts and are buying or selling the property without being forced or pressurized to do so. It is also known as a market value. The conditions for FMV are: the parties involved are not under any pressure to buy or sell, both parties are aware of all the facts, they both have ample time to decide on an amount, and they are performing the transaction in their own best interest. 53. Fixture: A personal property that is attached (usually in a permanent manner) to real estate and now becomes a part of the real property. A fixture may be made a part of the property intentionally or designed to be adapted especially to the real property. It is usually considered immovable since its removal could damage the real property it is attached to. It is important to determine which object is classified as a fixture. There are guidelines to follow, some of which include, method of attachment, adaptability, intention, relationship between the buyer and seller, etc. 54. Flex Facility: An industrial building specially designed for various uses and situated in an industrial park area. Examples of specialized flex facilities include showrooms, offices, service centers, warehouses, etc. Sometimes referred to as a flex building or flex space, this industrial building is a speculative, often one-story, low-rise building designed for either single or multi-tenant use. It typically accommodates several offices and work areas, according to the needs of the lessee. A flexible facility is very versatile and attracts different types of businesses including manufacturing, construction, logistical distribution, e-commerce, and medical businesses. 55. Force Majeure: An unforeseen or unplanned event beyond the control of the parties to a contract and prevents the parties from fulfilling the terms of the contract. Examples of such disruptive events include Acts of God such as hurricanes, floods, tornadoes, etc.) or acts of man (such as terrorist attacks, strikes, wars, fires, etc.). A force majeure can be found in construction contracts as a clause that removes liability for impacts caused by said unforeseen events and often suspends the time limits specified in the contract. 56. Foreclosure: The process of destroying the rights of a borrower in mortgaged property. This legal process is instituted by the lien creditor or mortgagee when the borrower defaults according to the terms of the mortgage. It usually segregates into judicial and nonjudicial foreclosures, but could vary among states. A lender can foreclose (retrieve the property from a borrower) and put the commercial property up for sale. Avoiding a commercial real estate foreclosure will go a long way to ensuring that your credit rating does not suffer any serious hit. Some options to consider before opting for foreclosure include forbearance, loan modification, short sale, deed in lieu of foreclosure, and bankruptcy. 57. Gross Lease: A commercial real estate type of lease in which a tenant pays an agreed amount of rent monthly or yearly, regardless of the operating costs of the landlord, such as taxes, maintenance, and insurance. The tenant may consent to a 'gross lease with stops,' which means that the tenant has agreed to pitch in and help with payment if the operating costs of the landlord rise above a particular level. The point at which the tenant starts contributing is referred to as the 'stop level,' because the landlord's share of the costs will stop at that level. 58. Ground Lease: A long-term land lease where the tenant can erect improvements at his or her own expense in order to gain access to valuable and well-located real estate. In some cases, the owner may not be willing to sell the property or is prohibited from selling it for a period of time. (Source: Wall Street Mojo) All improvements made to the property become the landowner's property when the lease comes to an end. Ground leases often occur between commercial landlords, who often lease land to tenants for 50 to 99 years. Such leases may not favor a landlord as they attract higher tax implications for the landlord, depending on the location of the property. 59. Ground Rent: An amount paid for the use of land (usually on which to erect a building) even though the title to the property is being held as a leasehold estate. The borrower may have a long-term lease on the property (for as long as 90 years or more) but does not actually own it because the lessor still retains title to the land. Ground-rent arrangements are typically used by hotels and office buildings. The tenant has to pay monthly land rents to the landlord while using the land. Unlike ground leases that last for 10 or 15 years, ground rent is automatically renewable and continues as long as the annual ground rent fees are paid. 60. Hard Cost: Readily identifiable construction costs, such as the site, landscape, construction management fees, labor costs and materials, safety equipment and systems, HVAC, groundskeeping, and so on. They are sometimes referred to as direct costs. They are not as tricky and as 'full of surprises' as soft costs. Rather, hard costs are tangible, which makes them easier to deal with and easier to identify – especially for estimation purposes. One can easily estimate what they will be and try to find other options for reducing the costs. 61. Highest and Best Use: When land or buildings are used in such a way that they bring in the highest possible economic return over a given financially feasible and appropriately supported period of time. This legal and reasonably probable use of an improved property or vacant land often results in the greatest financial return. How a site is optimally used is often determined by its location, local zoning regulations, neighboring properties, and deed restrictions. Commercial property is more likely to meet its optimum economic potential. 62. Internal Rate of Return (IRR): A percentage rate that is earned on the money remaining in an investment every year. Also, it can be seen as the annual rate of earnings on an investment which equals the value of the cash returns with cash invested, while also considering the power of compounding interest. (Source: Dreamstime) For income properties, the IRR can be either the interest or discount rate required to discount the total amount of future net cash flows (which may include amortization, payments of loans, and depreciation of the real property), to an amount that equals the initial equity of the said property. Meanwhile, for development projects, IRR is defined as the interest or discount rate required to discount (or reduce or convert) the sum of all development expenditures and incomes in order to equal zero. 63. Judicial Foreclosure: Foreclosure proceedings on real property where the mortgage does not have a "power of sale" clause. This commercial foreclosure mechanism, which some states apply, involves an action that must be filed with a court before the foreclosure process begins. In a judicial foreclosure procedure, the lender seeks a "judgment of foreclosure" and an "order for sale" of a mortgaged property after commencing a court action against a borrower. If the court grants the order, debt fees will be fixed and the court will order for a foreclosure of the property. The lender will then be free to sell the property. 64. Jumbo Mortgage: A loan whose amount exceeds the size limits set by the Federal Housing Finance Agency (FHFA). It cannot be guaranteed, purchased, or scrutinized by Fannie Mae or Freddie Mac. Hence, the lender's risks are increased. Jumbo loans are recommended when purchasing a high-priced investment property that is too expensive or beyond the limits of a conventional conforming loan. Such a loan has to either remain in the portfolio of the lender or, as difficult as it may be, it will be sold to investors. Some banks charge higher interest rates for loans sold to investors. 65. Key Performance Indicator (KPI): This metric is used when measuring a property's performance. Accessing these KPIs on a daily basis will help to maximize a commercial real estate investor's profits. More so, tracking and exceeding the KPI targets will make an investor more proactive in keeping occupancy high, reducing vacancy, lowering expenses, and maximizing income. The best KPIs for a commercial real estate include aged receivables, daily resident activity (including lease renewals, move-outs, and move-ins), financial statements, occupancy, prospect conversion ratios, make ready/spec suits, work orders, evictions, budget to actuals, tenant analytics, job cost, and portfolio analytics, among others. 66. Lease: A contract (in the form of either an oral or written agreement) that creates a relationship between a lessor (the landlord) and a lessee (the tenant). This contractually binding agreement grants a right to use of property or exclusive possession of the property, usually in return for a rent. A lease must cover basics like rent or other costs, restrictions on the way the property is used, when the lease will start and when it is expected to end, how payments will be made, etc. (Source: My Smart Move) 67. Leasehold Estate: This form of real estate, which is more common in commercial real estate, allows a tenant to construct permanent structures on a parcel of leased land, and, during the lease period, also use or get income from the structures. Usually, leasehold estates involve long-term leases (ranging from 20 years to 99 years) and landowners can have their property developed without spending a dime. Another benefit to landowners is that they retain their rights to the land and still get a steady stream of income from it without having to sell it. Meanwhile, a leasehold estate allows the tenant to save the costs of initial land acquisition and gain easy access to real property that may not be available otherwise. 68. Letter of Intent (LOI): A written document reinforcing the commitment of a tenant to lease the property. Terms of the lease that should be included in the LOI include negotiations, timeframes, and concessions. A letter of intent must be signed before a lease or purchase agreement. A broker is responsible for evaluating an LOI, assessing the seriousness of the tenant or buyer, and making sure no stone is left unturned before closing a deal. In some cases, more than one Letter of Intent may be necessary to make it easier to pick the most suitable tenant or buyer for a property. 69. Loan-to-Value Ratio (L/V): An amount of money that was borrowed based on a property's total market value (appraised value). It also refers to the relationship between the amount taken as a loan and the value of the property (often, this property is pledged as security) expressed as a percentage of the value of the property. The formula is expressed as the amount of loan divided by the value of the property. (Source: The Truth about Mortgage) LTV or L/V ratios may affect interest rates, lender requirements for both PMI and escrow accounts, and loan qualifying criteria. For example, a $100,000 commercial building with a mortgage of $80,000 has an L/V of 80%. 70. Master-Planned Community: A mixed-use, large-scale real estate development following a comprehensive, long-term plan. Such communities often blend the price ranges of residential neighborhoods with a couple of commercial properties that are designed to serve the needs of the residents. (Source: Delaware Complete Communities) Commercial development may include retail strip centers, shopping malls, entertainment centers, restaurants, and office buildings. Multiple home builders are also included when constructing these various neighborhoods. Meanwhile amenities like neighborhood schools, extensive landscaping, as well as public recreation centres and parks are usually offered by master-planned communities. 71. Mortgage: A mortgage refers to a contract that provides security for a loan repayment. Before deciding on the mortgage loan, the lender (called a mortgagee) considers the property (known as the security) and the financial ability of the borrower (also known as the mortgagor; in this case, it is the covenant). In a mortgage, the property is used as collateral and the lender will have a lien on the said property. A mortgage can also mean the amount of money borrowed with interest (the interest rate is also known as the mortgage rate) for the purpose of purchasing a property. 72. Mortgage Broker: An individual or company that stays connected to financial institutions or individuals who are interested in investing in mortgages. A mortgage broker connects borrowers to lenders in order to originate a loan and is responsible for taking loan applications, processing loans, and even closing the loan. A commercial real estate mortgage broker or commercial mortgage broker is a trained financial specialist with the knowledge, expertise, and connections needed to provide businesses and investors with options and services for securing a commercial mortgage. 73. Negative Amortization: In this type of amortization, payment made is not sufficient to fund the full repayment of the loan after its due date. Usually, it occurs when unpaid interest is added to the loan balance and payments do not cover the interest due. In such a case, the amount that should be paid will be added to the remaining balance that the defaulter owes. This remaining balance may increase instead of decrease over the duration of the loan. A negative amortization typically happens when a ceiling limits the increase in the monthly payment. 74. Net Lease: A commercial real estate lease in which a tenant pays the stipulated rent and also pays a portion of the operating expenses including real estate taxes, maintenance costs, and insurance premiums. It is expected that all expenses that the tenant should pay directly should be disclosed. (Source: Outsourcing Hub India) If the landlord passes on three operating costs namely, taxes, insurance, and maintenance, to the tenant, the arrangement will be referred to as a "triple net lease." A net lease is always in the landlord's favor because the operating costs are variable and rarely decrease. However, a tenant may bargain for a net lease that has caps or ceilings, as this can limit the rent the tenant is supposed to pay. An example of such protection is when a net lease with caps specifies that if taxes increase beyond a certain point or if new taxes come up, the landlord will have to pay it. 75. Net Listing: Net listing is an expressly agreed-upon price, below which an owner will not agree to sell the property. If the property is sold at exactly the exact net listing price, the broker will not get a commission because a broker's commission is the excess amount on the net listing price. In this type of listing, the broker's interests are somewhat at odds with the seller's interests, hence, the broker may not be able to fully maintain fiduciary responsibilities to the seller. 76. Net Operating Income (NOI): A potential rental income in addition to other income, credit losses, operating expenses, and less vacancy. NOI is generated before deducting financing expenses and taxes, and after deducting operating expenses. Net operating income in commercial real estate is a measure of the income stream of an investment property. It helps to assess the potential returns as well as cash flow of a property. Also, it does not include any financing and tax costs incurred by the investor or owner, but remains unique to the real property. To measure NOI, deduct the operating expenses from the property's gross income. 77. Office Property: A type of commercial property, typically housing management and staff operations, used for maintaining or occupying professional or business offices. The word 'office' may refer to whole buildings, office parks, floors, and parts of floors. An office space is referred to as a generic office space it is used for a wide variety of purposes. Usually, office properties fall under three classes – A, B, and C. Class A office properties are very modern in their functionalities, while Classes B and C properties are older, require modernization, and often attract lower rents. Properties classed B and C are not always as desirable or as efficient as properties in Class A because their condition or design are prone to functional problems. 78. Oversupply: Oversupply, in commercial real estate, is the stock of supply of a particular type of commercial property that exceeds the quantity that can be cleared under prevailing market conditions and prices levels. It could also refer to a real estate market cycle phase or period when commercial real estate markets are saturated with units as a result of overbuilding. Simply put, oversupply means that the property on the market is too much compared to the demand. For commercial property buyers, it means there are too many properties for sale relative to the demand from purchasers. 79. Planned Unit Development (PUD): Referred to as Planned Commercial Development (PCD) in commercial real estate, it is a situation where the planned unit development association owns and maintains any real property in a real property development project for its members who belong to the association by reason of the ownership and own individual parcels of property in the development. Each owner has a title to a particular parcel of land, hence lenders can decide to treat units as non-condominiums if the fees and level of services are similar to those of a condominium complex. A PUD allows higher LTV loans while eliminating requirements for owner occupancy percentage. 80. Power Center: A retail center that is dominated by many large anchors, such as discount department stores, warehouse clubs, or off-price stores that offer a wide range of selections in a specific merchandise category at reduced prices. Power centers are outdoor shopping centers often located in suburban areas because of cost and space restrictions, but they are sometimes located in urban areas too. Usually, a power center comprises several free-standing or unconnected multiple smaller anchor tenants like pharmacies and grocery stores, and just a few small specialty tenants. 81. Principal: A principal can refer to someone who authorizes a real estate agent to act or create legal relationships with an interested third party. (Source: Lard Bucket) A principal can also mean a portion of a loan payment usually used to reduce the original amount of the loan. This amount of money has not been repaid to the lender yet and does not include interest the borrower needs to pay before borrowing the money. The principal balance (also referred to as unpaid principal balance or the outstanding principal balance) is obtained by subtracting the amount of money repaid from the amount owed on the loan. 82. Qualify: To meet the requirements for approval set by a mortgage lender. It is usually the first out of a four-stage process of transaction management involving the gathering of information, and then evaluating the information to measure the willingness, readiness, and ability of a client to consummate the transaction. Before qualifying a prospect, it is important to look out for certain attributes. First, the prospect must need commercial real estate services. Secondly, he knows that he needs the services. Thirdly, the prospect should have the authority to act on this need as well as the budget to back up the authority. Lastly, he should also trust you enough to willingly follow your guidance. 83. Quality Control: A system put in place to safeguard whoever is giving out a loan and makes sure the loan goes through the right process of being originated, underwritten, and then serviced in accordance to the standards of the lender, investor, mortgage insurer, or government insurer. This system safeguards the person 84. Real Estate: Land and permanent improvements attached to it (either natural or man-made), as well as the right to own them and also use them. It is also referred to as realty or real property. It is a form of real property that differs from personal property. Categories of real estate include residential, commercial, raw land, industrial, and special use real estate. (Source: Real Estate Skills) Investing in real estate can be done directly (by purchasing a real property) or indirectly (through a real estate investment trust). 85. Real Estate Cycles/Phases: The sequence of economic upturns and downturns that repeat regularly, as well as related changes in real estate market transactions linked to changing macroeconomic conditions and market dynamics, with phases comprising recovery, expansion, oversupply/hyper supply, and recession – in this order. (Source: Guggenheim Investments) Understanding the real estate cycle is important for predicting upcoming trends, which will help to make informed investment decisions. Demographics, interest rates, government policies, and general economy are some of the factors that can affect real estate market cycles. (Source: Medium) 86. Rentable Area: It comprises a building's computed area, in accordance with the Building Owners and Managers Association (BOMA) guidelines, and includes both the structure or core of a building and its usable area. It is this actual square foot area that the tenant will pay rent for. The rentable area includes common areas like lobbies, hallways, restrooms, architectural projections, and measurement of structural columns. Generally, a rentable area is bigger than a usable area and commercial property landlords base their rents and expenses charges on the size of this area. 87. Right of First Refusal: In an agreement, this provision requires that the owner of the property gives someone the first opportunity to lease or purchase the said property before offering it for lease or sale to other interested parties. The person is under no obligation to take the property. Also known as the first right of refusal, the right of first refusal is a tenant's negotiated right in a commercial lease meant to match any offer by a landlord to lease premises. However, it could limit the amount an owner may receive from other parties competing for the real property. Usually, individuals or companies who are eager to see how a business, opportunity, or property turns out will request rights of first refusal. 88. Servicer: A firm specialized in performing special servicing functions, such as collecting and remitting mortgage payments, paying the taxes of a borrower, administering escrow, sending notices and statements to the borrower and lender, and managing delinquency. A loan servicer helps to collect and handle the daily tasks involved in collecting a mortgage loan. These servicers may work with borrowers, who have defaulted on a loan agreement or fallen behind on payments to determine the most favorable outcome for the borrower and lender, as well as look for alternatives to foreclosure. 89. Settlement: In a commercial property settlement, ownership of the commercial property is transferred from the seller to the buyer. It is a process whereby a loan transaction is completed, mortgage documents are signed, checked, and recorded, and the balance of the real property's purchase price is paid, and both parties' agents inform them that the settlement is complete. After these processes, the property is then transferred to the buyer. Some jurisdictions refer to this as closing, while others refer to it as an escrow. 90. Sublease: A type of lease whereby an original tenant (also called the lessee) sublets a part or all of the leasehold interest to a different tenant (called a subtenant or sublessee) without losing a leasehold interest in the property. A sublease is also referred to as a sandwich lease because the original lessee is sandwiched between the lessor and subtenant. In this kind of rental agreement, the rent is paid to the tenant who is fully responsible to the landlord for rent and any damage, including those caused by the sublessee. (Source: AHPM) Most landlords will only allow subleases when they have already given prior written consent. 91. Trade Area: An area that has been delineated about a dominant or central location. It is made up of a zone that depends on the production output from the location to meet internal demand. The outermost boundaries of the zone are defined by the presence or absence of interactions involving the central or dominant location. Trade areas are often based on retail areas, which provide convenience and synergy for future customers. To maximize the value position, it is important for an investor to find optimal trade area characteristics that are specific to his business model. 92. Timeshare: Primarily used when selling vacation properties, timeshare is an arrangement whereby a purchaser gets an interest in real property along with the right to use the accommodation and/or its amenities on a recurring basis and for an agreed period of time. This shared ownership model allows multiple purchasers to own allotments of usage in the same property. Vacation properties that allow the timeshare model are vacation resorts, campgrounds, apartments, and condominiums. Use of the vacation property is limited to a season or period of time – sometimes a fixed week or a floating week. 93. Title: The right to a property and its ownership. A title, which is sometimes referred to as a deed, can be used in some cases as proof of ownership of land. Deeds may convey title between a buyer and a seller, but not all deeds can convey full ownership of a commercial real estate property. A commercial real estate investment may be worthless if a prospective owner does not acquire a good title. More so, a single document does not determine the title to real estate; rather, an entire collection of documents affecting a certain property will determine the title to real estate. 94. Underwriting: A process that helps to determine the approval of a loan. It mainly involves an evaluation of the property, the borrower's credit, and the ability of the borrower to pay the mortgage. Lenders use underwriting to determine a potential customer's creditworthiness. An underwriter makes sure applicants are representing themselves truthfully, no one else is on the title and there are no dangers to the property caused by natural disasters. It is also the work of an underwriter to determine if the sale price of the property meets its appraised value. (Source: SKP Global) 95. Usable Area: A usable area is an actual space a tenant occupies from wall to wall. In other words, it is the area a tenant would get if the offices or warehouses are paced out. It is generally not as big as a rentable area. The usable area of an office building is the area available for the tenant to use exclusively. It may include corridors, bathrooms, and storage facilities. If a tenant leases several floors, the usable area will include hallways but exclude linked areas such as changing rooms. The formula for calculating usable area is given as: Usable area = Rentable area x Building efficiency percentage. 96. Vacancy: The number of vacant units or space in a particular commercial type of building that is available for occupancy within a given market at a certain time. (Source: Performance Data) A vacancy rate, defined as the percentage of the total units in a single, uninhabited rental property during a specified period of time, serves as a pointer to assess the overall performance of a property relative to the average vacancy rate of other commercial properties in the area. A property with a high vacancy rate is considered undesirable, while a low vacancy rate is a positive indication that people are interested in investing in that property. 97. Walk-Through: A clause used in a sales contract that allows a buyer to examine a property within 24 hours before it is purchased or before closing. In other words, it is a buyer's on-site inspection of a property that is being purchased, prior to closing. A walk-through could also mean a detailed inspection of a brand new construction home, allowing a punch list and cosmetic items to be addressed before final acceptance. 98. Weighted Average Cost of Capital (WACC): It is the average cost of capital for either equity or debt used to finance a commercial real estate investment, giving consideration to the relative proportions of each capital source. It is also defined as the return on the total capital that is required to meet an investor's goals. (Source: Cleverism) WACC helps to determine an investment's hurdle rate as well as the discount rate for a company's valuation. Hence, it is important for every listed property company to identify its specific WACC. 99. Yield: Sometimes referred to as the rate of return, yield is a measure of how an investment (for example, commercial building) is performing. It weighs the percentage return on the money invested. (Source: Housing.com) Also, yield is the annual income obtained from an investment and expressed as a percentage of the total cost of the investment (in some cases, its estimated current value). Yield is mainly a measure of income produced by a commercial property without factoring in appreciation or increases in its value. 100. Zoning: A designation of some particular areas by the local planning authority with a jurisdiction meant to legally define the land use or categories of land use. It ensures that municipalities achieve a layout they feel is best suited for their area. Zoning laws are crucial to the utilization of land and buildings in cities or towns. Types of zoning include residential, commercial, agricultural, industrial, historical, recreational, aesthetic, etc. Each type of zoning helps to accomplish different results and has varying rules affecting how each parcel of land can be used. (Source: Transport Geography) We hope you found our commercial real estate glossary helpful. We believe it is one of the best commercial real estate resources on the market and use it plenty ourselves! If you need more information about any of the commercial real estate terms provided in this guide and their implication in practice, do not hesitate to contact us. At Commercial Consult, we can help you sell your commercial property with less stress while ensuring that you get all you want out of your deal. Our trusted advisors are waiting to hear from you. Discover the 18 most important commercial real estate terms you must know if you want to become a successful commercial investor. The first 7 terms help you determine cash flow and the next 11 terms help you analyze potential investments and make decisions. Armed with a clear understanding of these 18 fundamental terms, you can intelligently invest in commercial real estate. 7 Basic Commercial Real Estate Terms Using a 5 unit multi family apartment building as our example, you'll learn the 7 basic commercial real estate terms which are used to determine the Net Operating Income (NOI) and Cash Flow (CF). Those basic terms are: 11 Decision Making Commercial Real Estate Terms Once the NOI and Cash Flow have been determined, the next set of commercial real estate terms are used to make intelligent investment decisions. Those terms are: 7 Basic Commercial Real Estate Terms 1. Gross Rental Income (GRI) The gross rental income is the total income generated by a rental property before deducting expenses. To calculate the monthly gross rental income, multiply the monthly rent by the number of units and then multiply by 12. If each unit of our 5-unit apartment example rents for $1,200/month, the calculation is: Gross Rental Income Calculation $1,200/unit/month x 5 units = $6,000/month x 12 months = $72,000 per year gross rental income. 2. Vacancy Factor Commercial real estate rarely remains 100% rented 100% of the time. Vacancy factor accounts for this reality and therefore you must subtract a vacancy factor from the gross rental income. A vacancy factor provides safety into your calculations and the industry standard for multifamily apartments is a 5% vacancy factor. At a minimum, calculate a vacancy factor of at least 5%, and depending on the deal, it could be more. Understanding what the vacancy factor should be is where a mentor is so crucial. Vacancy Factor Calculation Example 5% of $72,000 = $3,600/year vacancy factor 3. Effective Gross Rental Income (EGI) The subtraction of the vacancy factor from the gross rental income is your effective gross income. Effective Gross Rental Income (EGI) Calculation $72,000 Gross Rental Income – $3,600 Vacancy Factor = $68,400 Effective Gross Income (EGI) 4. Total Operating Expenses (OpEx) Operating expenses are the recurring costs that support the day-to-day operations of the property, including taxes, insurance, management, utilities, repairs, maintenance, supplies, bookkeeping, legal and contractors. Obtaining truthful, real-world operating expenses from a commercial property seller can be extremely difficult because in commercial real estate, it's Caveat EmptorCaveat Emptor whereby the Buyer is responsible for verifying the validity of all information provided by the Seller. Sellers often lie or don't tell the whole truth. Here is how to get the REAL expenses on any commercial deal. While the most accurate way to calculate operating expenses is to add up all of the yearly operating expenses one line item at a time, a very helpful rule of thumb for multifamily apartments is to multiply the EGI by 35% to get the operating expenses. Total Operating Expenses Calculation 35% of $68,400 EGI = $23,940 in Total Operating Expenses What are NOT Operating Expenses Beginners oftentimes mistakenly include costs that are NOT operating expenses. The following are NOT operating expenses: Occupancy: This was already accounted for in the Vacancy Factor Loan Payments: This will be accounted for in the Annual Debt Service (ADS) below. Depreciation: This is an income tax deduction, not an actual expense. Improvements: Upgrading the property to increase gross rental income (such as adding washers & dryers to each of the 5 units) are not considered operating expenses because they are not day to day repair or maintenance costs, they are capital improvements. 5. Net Operating Income (NOI) The Net Operating Income (NOI) is one of the most important commercial real estate terms you'll ever need to know. It is the value driver in commercial property because as your NOI increases, the property value increases. Therefore, unlike residential real estate, with commercial, you can increase the value of the property by improving the property's financial performance (which is defined by the NOI). NOI describes how much money the property earns if you owned it free and clear without any loans against it. To determine the NOI, subtract your operating expenses (OpEx) from the effective gross income (EGI). Net Operating Income (NOI) Calculation $68,400 (EGI)- $23,940 (OpEx) = $44,460 Net Operating Income (NOI) 6. Annual Debt Service (ADS) It is financially astute to maintain a loan against commercial real estate rather than own it free and clear of any financing. Therefore, there will be debt payments, or what homeowners refer to as mortgage payments. The total yearly loan payments is called "Annual Debt Service" in the world of commercial real estate. The purchase price of our example property was $600,000 and the down payment was 25% (or $150,000) and the other 75% was financed at 6.5% interest amortized over 30 years, making the monthly loan payment $2,844/month. Annual Debt Service Calculation $2,844/month loan payment x 12 months = $34,128 Annual Debt Service (ADS). 7. Cash Flow (CF) The first 6 commercial real estate terms above help us determine this incredibly important calculation, the property's Cash Flow (CF). The Cash Flow is how much money the property puts in your pocket as the owner. This is your net profit. The purpose of owning commercial real estate is to make a profit and the Cash Flow is a critical component of that purpose. There are other ways to profit from commercial property, as you'll discover below, but Cash Flow is arguably the most important one. It is calculated by subtracting the Annual Debt Service (ADS) from the Net Operating Income (NOI). Cash Flow Calculation $44,460 NOI – $34,128 ADS = $10,332 Cash Flow per year, or $861 per month 11 Decision Making Commercial Real Estate Terms Once you have calculated the NOI and Cash Flow accurately and responsibly, your focus can turn to decision making commercial real estate terms. Bad investments come from investors making bad decisions. Bad decisions come from lack of knowledge and wisdom. By understanding the following 11 commercial terms, you'll avoid making bad decision. 8. Cash on Cash Return Cash on Cash return makes up part of your overall return on investment (ROI). This benchmark begins to help you compare a commercial real estate investment to other investment options that exist in the marketplace. For example, traditionally the "safest" investments include Certificate of Deposits from a Bank or Government Treasury Bonds. Since commercial real estate requires more of your time, has less liquidity and may have more risk, you certainly want a higher Cash on Cash Return (or ROI) than a Bank CD or a Treasury bill. However, other investments like a stock market no load mutual fund historically deliver a much higher return than a CD with much more volatility and risk. Since commercial real estate is much safer than the stock market, having a Cash on Cash Return somewhere between the two makes financial sense. Moreover, there are several other ways in which you can obtain a return on your investment from commercial real estate, including Tax Benefits of Commercial Real Estatetax benefits as well as being able to do a When to Refinance Commercial Real Estate?cash out refinance so you don't want to compare this one factor alone in deciding on a deal. Cash on cash return is important but not the whole story. Cash on Cash Return is calculated by dividing the Cash Flow by the money invested in the deal, or in this case, the down payment. Cash on Cash Return Calculation $10,332 Cash Flow divided by $150,000 down payment = 6.9% Cash on Cash Return 9. Capitalization (Cap) Rate Capitalization Rate, or what commercial investors shorten to Cap Rate, is defined as your return on investment if you paid all cash for the property and did not get a loan. There are actually two types of Cap Rate; the

first is the Deal Cap Rate, which is defined as the NOI divided by the Purchase Price and the second is a metric commonly used by commercial real estate brokers called the Market Cap Rate, which is also the NOI divided by the Sales Price but it is calculated on every single commercial property sale and is used to gauge what investors are willing to pay for properties in a given area. From a Deal Cap Rate perspective, the higher the cap rate, the higher the return on investment, which is a good thing! From a Market Cap Rate perspective, the higher the cap rate, the worse an area is because the most desirable areas have the most competition and therefore the lowest cap rates. Confused? That's why all commercial real estate investors need a mentor! Calculating Capitalization (Cap) Rate $44,470 NOI divided by $600,000 Purchase Price = 7.4% Cap Rate Determining if You Overpaid While in residential real estate, you can easily compare similar property sales to determine if you overpaid or got a great deal on the home you bought, with commercial, it's not quite that simple. The fastest and easiest way to figure out if you are overpaying (or getting a great deal) is to compare the property's Deal Cap Rate with the Market Cap Rate. Ideally, your Deal Cap Rate is higher than the Market Cap Rate, since the Market Cap Rate is what other properties in the neighborhood have sold for in terms of a cap rate. For example if there are four or five transactions in the immediate area of your property that closed at a cap rate of 6.5%, then the market cap rate is 6.5% and if your deal cap rate is 7.4%, then you got a good deal! However, what if the market cap rate is 8%? Then $600,000 is paying too much for the property. That's because: $44,460 NOI divided by 8% market cap rate = $555,000 Price Capitalization Rate (Cap Rate) is therefore crucial to deciding if your purchase price is too high or if you are getting a great deal. 10. Debt Coverage Ratio (DCR) The Debt Coverage Ratio (DCR) determines the property's ability to pay (or cover) the property's loan payments out its Net Operating Income (NOI). You want the NOI to cover the debt by at least 1.2 times because most lenders require the DCR to be at least 1.2. If the DCR is 1.0, your annual debt service and your NOI are the same and therefore you are just breaking even. Even worse, if your debt coverage ratio is less than 1.0, then you have negative cash flow and are losing money each month! The DCR is calculated by dividing the NOI by the Annual Debt Service: Debt Coverage Ratio Calculation $44,460 (NOI) divided by $34,128 (ADS) = 1.3 11. Actual vs Pro Forma Financials When you're actively looking at commercial deals listed with a broker, you will most likely be presented with two sets financials, the current or actual income and expenses as well as the Pro Forma, or future potential financials. Actual is what has been happening with the property whereas Pro Forma is what is possible given the right improvements and adjustments. Actual Financials tell the real story and Pro Forma Financials describe what could happen if everything goes right. Sellers prefer to illustrate the Pro Forma Financials because it makes their property look better than it really is. Buyers like to negotiate based on Actual Financials because the future is not always as good as we hope it to be. To illustate this, we have already determined the Actuals for the 5 Unit example: Actual Income & Expenses Financials GRI: $72,000/yr Vacancy: 5% EGI: $68,4000/yr OpEx: $23,940 NOI: $44,460 ADS: $34,128 CF: $10,332 What if each of the 5 units could be upgraded and the rents could be raised? What if there were other income producing improvements that could be made like covered parking? Let's assume you did your own research, rather than relying on the Seller or the Broker, and you determined that with certain improvements, the Pro Forma Financials would be: Pro Forma Income & Expenses Financials GRI: $93,600 Vacancy: 5% EGI: $88,920 OPEX: $31,122 NOI: $57,798 ADS: $34,128 CF: $23,670 How does an increase in the NOI from $44,460 to $57,798 impact the value of the property? It increases the value by $190,543. And here's how that was determined: Pro Forma Property Value: $57,798 / 7% Market Cap = $825,686 Actual Property Value: $44,460 / 7% Market Cap = $635,143 $825,686 – $635,143 = $190,543 Value Increase This is how commercial real estate investors become so incredibly rich. They increase the NOI of the properties they acquire, which drastically increases the value of those properties and then they either refinance to pull out their cash or they sell. 12. Building and Location Class Knowing the "Class" of the building (A, B, C, or even D) is important when analyzing a potential commercial deal because it is key to implementing value add strategies that increase your NOI and increase the value. However, determining building class can be quite subjective. There are 3 key factors used to distinguish between A, B and C Class properties: the price, the quality of the property (including location) and the amenities on the property. Multifamily Apartment Real Estate Classification Class A: These are newer buildings of the highest quality. They have great curb appeal with immaculate landscaping, are less than ten years old, and are located in the best market with high income earners. A-class apartment buildings have the highest rents and tenants get access to great amenities like a clubhouse, a media room, exercise room, swimming pool and even a tennis court. They are in high price markets with the lowest cap rates. Because the price is so high and there's really no work to do, A-Class properties are for the investor with a lot of money who wants to preserve their capital. Their goal is to purchase commercial real estate and let it cash flow. Investing in A-Class multifamily apartments has less risk but there isn't lot of upside to look forward to. Class B: A step down from A-Class is B-Class. These properties are well maintained and are about ten to twenty years old, which means they may need slight renovations or updating but nothing major. They are situated in good neighborhoods where the middle class live. So, B-Class is an average looking property and the price is lower than A-Class. For an investor, B-class is in between A and C. And although there may be some upside opportunity with renovations, overall these properties are stable with limited investment risk. Class C: In the U.S. we have a lot of C-Class properties because there are a lot of old buildings. C-Class buildings are twenty to thirty years old (or older) and often in need of major renovations. They are in a less desirable location, mostly lower to middle class neighborhoods. C-Class properties have the lowest rents, but for investors C-class properties can be an attractive value-add opportunity. After renovating an older C-Class property, the rents can be raised over a couple of years, increasing the NOI and forcing the appreciation. These properties have the most risk but also the most potential for investors to grow their investment. 13. Occupancy Rate Determining occupancy rate is important because it helps investors accurately predict cash flow and evaluate risk. This calculation determines the percentage of units occupied by tenants. So, if you have a 10-unit building and nine are occupied, that is a 90% occupancy rate. This is the same, but defined a different way, as the Vacancy Rate. Occupancy Rate Calculation The formula for calculating the occupancy rate is the number of units occupied divided by the total number of units of the apartment building. So, in the case of our example, we have five units. If 4 units are occupied, our formula is: 4 divided by 5 = 0.8 or 80% Our 5-unit apartment has an 80% occupancy rate. Why is calculating the occupancy rate important? Well, let's say you own a 10-unit building and 9 units are occupied. That gives you 90% occupancy rate. On the other hand, if you own a duplex and one tenant moves out, you have a 50% occupancy rate, and your cash flow is cut in half. Do you see how occupancy rate impacts cash flow? With more units you get stable cash flow and a less risky investment. 14. Occupancy Breakeven Point Occupancy breakeven point is a practical tool for commercial real estate investors when evaluating the cash flow of a potential deal. It measures the amount of occupancy needed to reach the cash flow breakeven point. In other words, how many tenants do you need to cover your expenses and break even in terms of cash flow. Occupancy Breakeven Point Calculation The formula for calculating OBEP is: Annual Operating Expenses + Annual Mortgage Payment divided by Gross Potential Rental Income (Gross Potential Rental Income is the amount of income the property will generate if it is 100% occupied) Again, using our 5-unit apartment as the example: (Operating Expenses) $23,940 + (Mortgage) $34,128 divided by (Gross Potential Income) $72,000 = 80% That means once I achieve 80% occupancy, I am breaking even. Anything over that 80% and my asset is cash flow positive. When occupancy dips below 80%, I have negative cash flow and am operating in a deficit. So, if this was a 100-unit property, and the breakeven point was 80%, then once the 81st person moves in, that's positive cash flow. One situation where calculating the occupancy breakeven point is especially helpful is when you are renovating an apartment and the property is distressed with a lot of vacancy. Knowing the OBEP will give you the benchmark you need to reach in your renovation timeline to cover expenses and debt. 15. Ratio Utility Building System (RUBS) Ratio Utility Building System (RUBS) is a powerful value-add strategy that helps to manage expenses and increase cash flow. It is a system that investors implement to bill back to the tenant monthly utility costs such as electrical, gas, water, trash, and sewer. Calculating RUBS Investors and property managers determine the bill back ratio themselves. For this example, I will divide utility costs equally among the tenants of my 5-unit apartment building. The utility costs for water, sewer, and trash are $375/month which means each tenant will be charged $75.00/month in addition to the rent. I now have that $375 back from the tenants which seems like a small number, but when multiplied by 12 it increases my bottom line by $4,500. But it gets better. This $4,500 increase also impacts value. Let's say the market cap rate is 6%. Divide $4,500 by 6%, and that equals $75,000. So at a 6% market cap rate, we have forced the appreciation on the property $75,000. See how powerful that is? Imagine the value-add potential for a 100-unit multifamily property. And all we did was implement a billing system where the tenant covers the cost of utilities. 16. Capital Reserves Capital reserves are a necessary practical requirement for all commercial investments. But how much do you set aside? Here are 3 different ways you can calculate the amount to set aside so you have cash on hand for future capital expenses or to offset any short-term losses. Why You Need a Capital Reserve Fund But first, let's answer the questions, "Why do I need capital reserves and how are they used?" Let's say you have a property, and you know that it will need a new roof in the next four or five years. Between now and then, your capital reserve fund needs to be built up so that when the time comes to replace your roof you have the cash on hand for it. Or let's say the parking lot has a lot of potholes and you know that next summer you will need to repave the parking lot. This is what the capital reserves fund is for. It's also to offset any short-term losses. For example, during COVID some tenants were unable to pay their rent. Those of us who had reserves were able to cover the expenses and the mortgage. Having a capital reserve fund is just a smart thing to do. How Much Should Capital Reserves Be? Now the question remains, how much should capital reserves be? Here are 3 ways to determine how much to set aside. Option #1: 5% of the Gross Rental Income One way to calculate how much to put in a capital reserve fund is to set aside 5% of the annual gross rental income before taking any cash flow. So, before you take any cash flow, put 5% of the gross rental income into a property savings account to be built up. Option #2: 3-6 Months of Operating Expenses Another way to determine how much capital expenses should be is to set aside 3-6 months of operating expenses: taxes, insurance, property management, utilities, etc. Simply calculate your annual operating expenses and divide it in half and put it in your rainy-day fund. Option #3: 6 Months of Mortgage Payments The final option is to save up 6 to 12 months of mortgage payments. With that amount of money set aside, investors can sleep well at night because they are prepared for any unexpected expenses or short-term losses. 17. Price per Unit Price per unit for multifamily real estate is a helpful metric for determining if you are over or under paying for a potential multifamily investment. When an apartment building is appraised, price per unit is how the appraiser determines the value. Also, when evaluating a multifamily deal, price per unit (or price per door) is used as a sales comparable. You need to know how much a multifamily property is worth so that it can be compared to similar properties in the area. This helps to determine if the property is priced below, above or at market value. Price per Unit Calculation Purchase Price divided by Number of Units = Price per Unit $500,000 divided by 5 Units = $100,000 per unit 18. Price per Square Foot Price per foot is what appraisers, lenders, and real estate professionals use to determine and compare the value of industrial, office and retail commercial real estate. Price per Square Foot Calculation Calculating price per square foot on a commercial property is done by dividing the purchase price by the total square footage. Using a 20,000 square foot office building with a purchase price of $1 million as an example, the formula is: $1,000,000 divided by 20,000 = $50 per square foot (PSF) This 20,000 square foot office building is selling for $50 PSF. Understanding Commercial Real Estate Terms Through evaluating actual deals, you'll better understand the significance of these commercial real estate terms. This hopefully gives you a foundational understanding of what they mean and how to calculate them but until you are analyzing actual deals, all of this knowledge will be useless. Furthermore, understanding how to calculate these commercial real estate terms doesn't tell you the whole story. Knowing what the numbers mean in relation to other deals is the real magic. And that comes from having a mentor. Every successful commercial real estate investor has a mentor. Get your mentor here: Protege Program. Commercial real estate lenders offer financing to businesses to purchase, develop, or refinance properties based on the property's value and borrower's financial strength. Commercial real estate lending refers specifically to credit that is created to finance or refinance commercial property. With very few exceptions, commercial real estate (CRE) is property built on land designated with commercial zoning, like a light industrial warehouse, an office, or a retail property. The most notable exception is multifamily properties (like a rental apartment building); these may be built on residential or mixed-use zoning but are underwritten as commercial financing. The common thread among all forms of CRE lending is that physical property serves as collateral to secure the credit exposure. Key Highlights Commercial real estate lending is credit that is secured by property where commercial activity occurs. Commercial real estate is an asset class that has historically used a high proportion of debt as a funding source. The most common type of commercial real estate credit is a commercial mortgage, but construction financing and bridge lending are also included. Commercial real estate lenders can be separated into two broad categories: cash flow lenders and equity lenders. Commercial Real Estate – Context & Financing The commercial real estate market in the United States is a major contributor to domestic GDP. According to IBISWorld Industry Research estimates, the commercial real estate market (measured by total revenue) represented USD $1.2tn[1]. Commercial real estate is the largest asset class after stocks and bonds (government and investment grade) and is valued at $8.8tn in 2021[2], ahead of cryptocurrencies, art, and others. What's somewhat unique about CRE as an asset class is that debt tends to represent a large proportion of its funding. This requires that both real estate and financial services professionals have a strong understanding of how CRE lending is analyzed and underwritten. The most common type of commercial real estate lending is a commercial mortgage. Types of Commercial Real Estate Loans Real estate lending can take on many forms. The loan structure and terms may look quite different if funded by a senior lender (like a commercial bank or credit union) vs. a private equity lender or the public debt markets (for example, commercial mortgage backed security). But in general, there are four categories of commercial real estate loans: Owner–Occupied Commercial Mortgages This is where the property serving as collateral is occupied by an operating company that has common ownership and/or control as that of the physical property (and the borrower). The mortgage is serviced using the operating company's cash flow, so credit is underwritten based on its indicators of overall business and financial health (think 5 Cs of Credit). These loans are reducing and typically amortize over 20-25 years. The debt service coverage (DSC) ratio is usually calculated holistically (operating company and building expenses) to not inadvertently double count occupancy costs in financial metrics. For example, rent paid by the operating company is rental revenue for the building company, but not always set at arms' length. Income-Producing Commercial Mortgages Borrowers are investors; they own property that is occupied by third-party, arms' length tenants. Cash flow to service loan obligations comes from the tenants' rental payments, so it's key that lenders know how to make sense of lease terms and rent rolls. The credit is underwritten based on a variety of factors, including tenant quality and lease maturity profile, among others. This type of commercial mortgage is reducing, and it will typically amortize over the course of 15-25 years, depending on the property class. A versatile property like a warehouse or a generic office will get a longer amortization, while a specialized property (like self storage or a golf course) are higher risk and tend to see shorter amortizations. Construction Loans Construction finance is a very specialized type of commercial real estate lending. Borrowing is extended to support the development and redevelopment of physical buildings, in advance of realizing potential cash flow. This makes it inherently higher risk than an amortizing commercial mortgage supported by predictable monthly payments. Credit is advanced in stages (sometimes called "progress draws") based on project milestones. These loans are interest only, generally with no cash interest payments throughout the term. The entire principal amount, including accrued interest, is repaid at one time upon project completion. Repayment typically comes from either the proceeds of property sale or it is "taken out" by one of the two commercial mortgages we covered earlier (depending on whether the property will be owner occupied or if it will be "leased up" with tenants). Bridge Loans These tend to be a higher risk type of CRE loan; they serve as a "bridge" between more traditional forms of credit. For example, a development project is completed, and the construction loan comes due. But maybe there's a 6-month delay in getting the building tenanted so that the commercial mortgage lender won't advance funds. This developer would need bridge financing to "take out" the construction loan while he or she waits for tenancy (and occupancy) so the commercial mortgage can advance. These credit facilities are interest only and tend to come with higher rates and fees. This is higher risk lending; thus, most "A Lenders" (meaning cash flow lenders like commercial banks, credit unions, etc.) don't do bridge financing. Private or otherwise non-bank equity lenders play in this space due to their higher risk tolerance for return on funds deployed. Types of Commercial Real Estate Lenders The best way to understand CRE lending is to put them into one of two big categories. The first is cash flow lending; the second is equity lending. Cash Flow Lenders Cash flow lenders, as the title suggests, care about cash flow. They employ what's often called a bottom-up approach to underwriting; this means they start with net operating income (for investment properties) or net income/EBITDA (for owner-occupied properties). The property will serve as collateral; however, the property's value is somewhat secondary to the borrower's ability to clearly service debt obligations (including interest rate buffers and other sensitization techniques). Cash flow lenders are often called "A" or "prime" lenders, not because they're better at lending, but because their sources of capital tend to be less expensive, so they get to pick through the best deals (i.e. strong cash flow and prime locations). Most commercial banks, credit unions, and other large financial services firms (like insurance companies, pension funds, etc.) tend to play in the "A" space. Equity Lenders Equity lenders, often called "B" or "sub-prime" lenders, also like cash flow; however, they tend to do deals with less certainty around future cash generation. Many equity lenders are non-bank firms, so they have to pay a return to investors in exchange for the funds they lend out. Since their cost of funds is higher than a bank (which has deposits), they have to charge more in order to make a solid spread. Equity lenders, as a result, tend to take on riskier deals (since they can charge a premium for it). "Risk" manifests as higher LTVs, second charges, properties outside of "prime" urban cores, more bridge loans, etc. Equity lenders are very reliant on the property's highest and best use value in the event they need to take enforcement action against the borrower and the collateral. Important Commercial Real Estate Terminology The following terms are critical to know when seeking to understand commercial real estate lending. Loan-to-Value (LTV) – what the loan amount will be, expressed as a percentage of the total asset value. LTV may represent the loan amount relative to the purchase price, the appraised value, or some other calculated and verifiable indicator of "value." Net Operating Income (NOI) – simply put, this is gross rental income, less operating expenses and adjustments. It's a normalized profit metric that is used to quantify the economic value of an investment property. Capitalization Rate (Cap Rate) – can be thought of as a "return" metric. It's calculated by dividing NOI by the market value of the property, expressed as a percentage. A property's Cap Rate is used as a benchmark to compare it to other similar properties for the purpose of valuation. Vacancy Allowance – when looking at an investment property, it might be fully tenanted at the time of underwriting. But tenant turnover and downtime without rental income for vacant units is the cost of doing business. The vacancy allowance is a sensitization technique to simulate this cost by testing debt service capacity under the assumption that, in the long run, the vacancy rate is not zero for most properties. Amortization Period – is the number of months (or years) over which the principal repayments of a loan are spread. Put a different way, how many months before the mortgage loan is paid down to zero balance? Term – is the length of time that the interest rate is agreed to between the borrower and the lender. When the interest term is approaching maturity, new terms must be agreed upon, or the commercial mortgage is said to have "expired." CFI offers the Commercial Banking & Credit Analyst™ certification program for those looking to take their careers to the next level. To keep learning and advancing your career, the following resources will be helpful: Article Sources The following role based learning paths have been curated to help you pursue a career in this field. The Appraisal Institute is a global professional association of real estate appraisers, with over 16,000 professionals in almost 50 countries throughout the world. Its mission is to empower valuation professionals through community, credentialing, education, body of knowledge, and ethical standards. Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution — You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. , the free encyclopedia that anyone can edit. 110,331 active editors 7,023,308 articles in English Game Boy, platform of Donkey Kong Land Donkey Kong Land is a platform game developed by Rare and published by Nintendo for the Game Boy (pictured). Released on June 26, 1995, it condenses the side-scrolling gameplay of Donkey Kong Country with a different level design and boss fights. The player controls Donkey Kong and Diddy Kong as they recover their stolen banana hoard from King K. Rool. Development began in 1994: Rare's Game Boy programmer, Paul Machacek, developed Land as an original game rather than a port of Country, believing that it would be a better use of resources. Land features pre-rendered graphics converted to sprites through a compression technique. Rare retooled Country's gameplay to account for the lower-quality display, and David Wise and Graeme Norgate converted the soundtrack to the Game Boy's sound chip. Critics praised it as successfully translating Country's gameplay, visuals, and music to the Game Boy. Land was rereleased for the Nintendo 3DS and the Nintendo Switch. (Full article...) Recently featured: History of education in Wales (1701–1870) White dwarf Battle of Groix Archive By email More featured articles About Erena So ... that a Hong Kong porn actress (pictured) once invited her cyberbullies to talk? ... that the manga Doing Time is based on the author's experiences while incarcerated for three years in a Japanese prison? ... that Minnesota Pioneer editor James M. 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In basketball, the Oklahoma City Thunder defeat the Indiana Pacers to win the NBA Finals. An attack on a Greek Orthodox church in Damascus, Syria, kills at least 25 people. The United States conducts military strikes on three nuclear facilities in Iran. In rugby union, the Crusaders defeat the Chiefs to win the Super Rugby Pacific final. Ongoing: Gaza war Iran–Israel war Russian invasion of Ukraine timeline Sudanese civil war timeline Recent deaths: Maria Voce Wes Hildreth Lucien Nedzi Anne Burrell Frederick W. Smith Ron Taylor Nominate an article June 26 Douglas Skymaster plane "Amana" 1740 – War of Jenkins' Ear: Spanish troops stormed the British-held strategically crucial position of Fort Mose in Spanish Florida. 1945 – At a conference in San Francisco, delegates from 50 nations signed a charter establishing the United Nations. 1950 – A Douglas DC-4 Skymaster aircraft (pictured) crashed after departing from Perth, becoming the worst aviation accident in Australia's peacetime history. 2010 – A G20 summit, the largest and most expensive security operation in Canadian history, began in downtown Toronto. 2015 – The U.S. Supreme Court ruled in Obergefell v. Hodges that the right of same-sex couples to marry is guaranteed by the Fourteenth Amendment. Robert the Lotharingian (d. 1095)George IV of the United Kingdom (d. 1830)Walter C. Root (d. 1925)Pavel Belyayev (b. 1925) More anniversaries: June 25 June 26 June 27 Archive By email List of days of the year About Atacamite is a copper halide mineral: a copper(II) chloride hydroxide with the chemical formula $Cu_2Cl(OH)_3$. It was first described in 1802 by Dmitri Alekseyevich Golitsyn from deposits in Chile's Atacama Desert, after which it is named. Atacamite is a comparatively rare mineral, formed from primary copper minerals in the oxidation or weathering zone of arid climates. It has also been reported as a volcanic sublimate from fumarole deposits, as sulfide alteration products in black smokers. This photograph shows a specimen of atacamite, on a malachite matrix, from the Mount Gunson Mines in South Australia. The picture was focus-stacked from 42 separate images. 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As of the start of 1740, the Gregorian calendar was 11 days ahead of the Julian calendar, which remained in localized use until 1923. Calendar year January 8 – All 237 crewmen on the Dutch East India Company ship Rooswijk are drowned when the vessel strikes the shoals of Goodwin Sands, off of the coast of England, as it is beginning its second voyage to the Indies. The wreckage is discovered more than 250 years later, in 2004.[1] February 20 – The North Carolina General Assembly incorporates the town of Newton as Wilmington, North Carolina, named for Spencer Compton, 1st Earl of Wilmington and patron of Royal Governor Gabriel Johnston. March 16 – King Edward of the Miskito Indians signs a treaty making his kingdom, located on the coast of modern-day Nicaragua, a protectorate of Great Britain.[2] March 25 – Construction begins on Bethesda Orphanage for boys near Savannah, Georgia, founded by George Whitefield. April 8 – War of the Austrian Succession: The Royal Navy captures the Spanish ship of the line Princesa off Cape Finisterre and takes her into British service. May 31 – Frederick II becomes King in Prussia upon the death of his father, Frederick William I. June 1 – Plantation Act 1740 or Naturalization Act 1740 of the Parliament of Great Britain comes into effect providing for Protestant alien immigrants (including Huguenots, and also Jews) residing in the American colonies for 7 years to receive British nationality. June 16 – Pour le Mérite first awarded in Prussia as a military honour. June 26 – War of Jenkins' Ear: Siege of Fort Mose – A Spanish column of 300 regular troops, free Black militia and Indian auxiliaries storms Britain's strategically crucial position of Fort Mose, Florida. July 7 – Adam Smith sets out from Scotland to take up a scholarship at Balliol College, Oxford.[3] July 11 – Pogrom: Jews are expelled from Little Russia. August 1 – The song Rule, Britannia! is first performed at Cliveden, the country home of Frederick, Prince of Wales, in England.[4] August 17 – Pope Benedict XIV succeeds Pope Clement XII, as the 247th pope. September 8 – Hertford College, Oxford, England, is founded for the first time.[5] October 9–22 – Batavia Massacre: Troops of the Dutch East India Company massacre 5,000–10,000 Chinese Indonesians in Batavia.[6] October 20 – Maria Theresa inherits the hereditary dominions of the Habsburg monarchy (Austria, Bohemia, Hungary and modern-day Belgium) under the terms of the Pragmatic Sanction of 1713 on the death of her father, Charles VI. Her succession to the Holy Roman Empire is contested widely because she is a woman, but she will reign for 40 years. November 6 – Samuel Richardson's popular and influential epistolary novel, Pamela; or, Virtue Rewarded, is published anonymously in London. November 14 – The University of Pennsylvania is officially established. December 16 – Frederick II of Prussia invades the Habsburg possession of Silesia, starting the War of the Austrian Succession. Enfield, North Carolina, is founded. Spain begins construction on Fort Matanzas in the Matanzas Inlet, approximately 15 miles (24 km) south of St. Augustine, Florida. The fairy-tale Beauty and the Beast by French novelist Gabrielle-Suzanne Barbot de Villeneuve was published. February 4 – Carl Michael Bellman, Swedish poet, composer (d. 1795) February 15 – Juan Andrés, Spanish Jesuit (d. 1817) February 16 – Giambattista Bodoni, Italian publisher and engraver (d. 1813) February 17 – John Sullivan, American General in the American Revolutionary War, delegate in the Continental Congress (d. 1795) March – Johann van Beethoven, German musician, father of Ludwig van Beethoven (d. 1792) March 16 – Johann Jacob Schweppe, German-born inventor, founder of the Schweppes Company (d. 1821) April 7 – Haym Salomon, Polish-Jewish American financier of the American Revolution (d. 1785) April 14 – Anna Strong, Patriot spy during the American Revolutionary War (d. 1812) May 7 – Nikolai Arkharov, Russian police chief (d. 1814) Marquis de Sade June 2 – Marquis de Sade, French author, for whom sadism is named (d. 1814) June 24 – Juan Ignacio Molina, Spanish-Chilean Jesuit priest, naturalist, historian, translator, geographer, botanist, ornithologist and linguist (d. 1829) June 27 – James Woodforde, English clergyman and diarist (d. 1803) July 27 – Jeanne Baré, French explorer (d. 1803) August 23 – Emperor Ivan VI of Russia (d. 1764) August 26 – Joseph-Michel Montgolfier, French inventor (d. 1810) September 12 – Johann Heinrich Jung, German writer (d. 1817) September 23 – Empress Go-Sakuramachi of Japan (d. 1813) September 25 – Hercules Mulligan, tailor and spy during the American Revolutionary War (d. 1825) October 29 – James Boswell, Scottish author (d. 1795) October 31 – Philip James de Loutherbourg, English artist (d. 1812) December – Elisabeth Olin, Swedish opera singer (d. 1828) Ali Pasha of Ioannina, Albanian ruler (d. 1822) Margaret Bingham, Countess of Lucan, born Margaret Smith, English portrait miniature painter and writer (d. 1814)[7] John Milton, American politician and officer of the Continental Army (d. 1817) (earliest estimated date of birth) Septimanie d'Egmont, French salonist (d. 1773) Pope Clement XII Frederick William I, King in Prussia Saint Theophilus of Corte Charles VI, Holy Roman Emperor Anna, Empress of Russia January – Louise Élisabeth de Joybert, politically active Canadian governors' wife (b. 1673) January 5 – Antonio Lotti, Italian composer (b. 1667) January 17 – Matthias Buchinger, German artist (b. 1674) January 20 – Niccolò Comneno Papadopoli, Italian jurist of religious law and historian (b. 1655) January 21 – Nicholas Trott, colonial magistrate, South Carolina Chief Justice (b. 1663) January 27 – Louis Henri, Duke of Bourbon, Prime Minister of France (b. 1692) January 29 – Richard Lumley, 2nd Earl of Scarbrough (b. 1686) February 6 – Pope Clement XII (b. 1652)[8] February 23 – Massimiliano Soldani Benzi, Italian artist (b. 1656) February 29 – Pietro Ottoboni, Italian cardinal (b. 1667) March 23 – Olof Rudbeck the Younger, Swedish scientist and explorer (b. 1660) April 28 – Bajirao I, Great Maratha warrior and Prime Minister of Marartha Empire (b.1700) April 23 – Thomas Tickell, English writer (b. 1685) May 17 – Jean Cavalier, French Protestant rebel leader (b. 1681) May 31 – Frederick William I, King in Prussia (b. 1688) June 1 – Samuel Werenfels, Swiss theologian (b. 1657) June 6 – Alexander Spotswood, British governor of Virginia Colony (b. 1676) June 17 Theophilus of Corte, Italian Roman Catholic priest, preacher and missionary, canonized (b. 1676) William Wyndham, English politician (b. 1687) June 18 – Piers Butler, 3rd Viscount Galmoye, Anglo-Irish nobleman (b. 1652) July 2 – Thomas Baker, English antiquarian (b. 1656) October 5 – Johann Philipp Baratier, German scholar (b. 1721) October 11 – Princess Magdalena Augusta of Anhalt-Zerbst, Duchess of Saxe-Gotha-Altenburg (b. 1679) October 20 – Charles VI, Holy Roman Emperor (b. 1685) October 28 – Anna, Empress of Russia (b. 1693) December 1 – John Abernethy, Irish Protestant minister (b. 1680) December 20 – Richard Boyle, 2nd Viscount Shannon, British military officer and statesman (b. 1675) December 30 – John Senex, English geographer (b. ca. 1678)[9] ^ Wendy van Duivenvoorde, Dutch East India Company Shipbuilding: The Archaeological Study of Batavia and Other Seventeenth-Century VOC Ships (Texas A&M University Press, 2015) p145 ^ "Mosquito Coast", in Historical Dictionary of the British Empire, ed. by Kenneth J. Panton (Rowman & Littlefield, 2015) p384 ^ "On this day in 1740..." Adam Smith Institute. July 7, 2010. Retrieved November 19, 2019. ^ Williams, Hywel (2005). Cassell's Chronology of World History. London: Weidenfeld & Nicolson. p. 308. ISBN 0-304-35730-8. ^ Hamilton, Sidney Graves (1903). Hertford College. University of Oxford college histories. London: Robinson. ^ "Image: Bird's eye view of Batavia showing the massacre of the Chinese". Archived from the original on September 21, 2009. Retrieved November 12, 2006. ^ This article incorporates text from a publication now in the public domain: Stephen, Leslie, ed. (1886). "Bingham, Margaret". Dictionary of National Biography. Vol. 5. London: Smith, Elder & Co. ^ "Clement XII | pope". Encyclopedia Britannica. Retrieved April 22, 2021. ^ "The Historical Theater in the Year 400 AD, in Which Both Romans and Barbarians Resided Side by Side in the Eastern Part of the Roman Empire". World Digital Library. 1725. Retrieved July 27, 2013. Retrieved from " 3One hundred years, from 1601 to 1700 Millennia 2nd millennium Centuries 16th century 17th century 18th century Timelines 16th century 17th century 18th century State leaders 16th century 17th century 18th century Decades 1600s 1610s 1620s 1630s 1640s 1650s 1660s 1670s 1680s 1690s Categories: Births – Deaths Establishments – Disestablishments vte The 17th century lasted from January 1, 1601 (represented by the Roman numerals MDCI), to December 31, 1700 (MDCC). It falls into the early modern period of Europe and in that continent (whose impact on the world was increasing) was characterized by the Baroque cultural movement, the latter part of the Spanish Golden Age, the Dutch Golden Age,[1] the French Grand Siècle dominated by Louis XIV, the Scientific Revolution, the world's first public company and megacorporation known as the Dutch East India Company, and according to some historians, the General Crisis. From the mid-17th century, European politics were increasingly dominated by the Kingdom of France of Louis XIV, where royal power was solidified domestically in the civil war of the Fronde. The semi-feudal territorial French nobility was weakened and subjugated to the power of an absolute monarchy through the reinvention of the Palace of Versailles from a hunting lodge to a gilded prison, in which a greatly expanded royal court could be more easily kept under surveillance. With domestic peace assured, Louis XIV caused the borders of France to be expanded. It was during this century that the English monarch became increasingly involved in conflicts with the Parliament - this would culminate in the English civil war and an end to the dominance of the English monarchy.A scene on the ice, Dutch Republic, first half of the 17th centuryBy the end of the century, Europeans were masters of logarithms, electricity, the telescope and microscope, calculus, universal gravitation, Newton's Laws of Motion, air pressure, and calculating machines due to the work of the first scientists of the Scientific Revolution, including Galileo Galilei, Johannes Kepler, René Descartes, Pierre Fermat, Blaise Pascal, Robert Boyle, Christiaan Huygens, Antonie van Leeuwenhoek, Robert Hooke, Isaac Newton, and Gottfried Wilhelm Leibniz. It was also a period of development of culture in general (especially theater, music, visual arts and philosophy). Some of the greatest inventions took place in this century. It was during this period that the European colonization of the Americas began in earnest, including the exploitation of the silver deposits, which resulted in bouts of inflation as wealth was drawn into Europe.[2] Also during this period, there would be a more intense European presence in Southeast Asia and East Asia (such as the colonization of Taiwan). These foreign elements would contribute to a revolution in Ayutthaya. The Mataram Sultanate and the Aceh Sultanate would be the major powers of the region, especially during the first half of the century.[2] In the Islamic world, the gunpowder empires – the Ottoman, Safavid, and Mughal – grew in strength as well. The southern half of India would see the decline of the Deccan Sultanates and extinction of the Vijayanagara Empire. The Dutch would colonize Ceylon and endure hostilities with Kandy. The end of the 17th century saw the first major surrender of Ottoman territory in Europe when the Treaty of Karlowitz ceded most of Hungary to the Habsburgs in 1699. In Japan, Tokugawa Ieyasu established the Tokugawa shogunate at the beginning of the century, beginning the Edo period; the isolationist Sakoku policy began in the 1630s and lasted until the 19th century. In China, the collapsing Ming dynasty was challenged by a series of conquests led by the Manchu warlord Nurhaci, which were consolidated by his son Hong Taiji and finally consummated by his grandson, the Shunzhi Emperor, founder of the Qing dynasty.[3] Qing China spent decades of this century with economic problems (results of civil wars between the Qing and former Ming dynasty loyalists), only recovering well at the end of the century. The greatest military conflicts of the century were the Thirty Years' War,[4] Dutch–Portuguese War,[5] the Great Turkish War, the Nine Years' War, Mughal–Safavid Wars, and the Qing annexation of the Ming. For a chronological guide, see Timeline of the 17th century. Main articles: 1600s, 1610s, 1620s, 1630s, and 1640s Persian Ambassador during his entry into Kraków for the wedding ceremonies of King Sigismund III of Poland in 1605. 1601: 4th Spanish Armada; in the Battle of Kinsale, England defeats Irish and Spanish forces, driving the Gaelic aristocracy out of Ireland and destroying the Gaelic clan system. 1601–1603: The Russian famine of 1601–1603 kills perhaps one-third of Russia.[6] 1602: Matteo Ricci produces the Map of the Myriad Countries of the World (坤輿萬國全圖, Kūnyú Wànguó Quántú), a world map that will be used throughout East Asia for centuries. 1602: The Dutch East India Company (VOC) is established by merging competing Dutch trading companies.[7] Its success contributes to the Dutch Golden Age. 1603: Elizabeth I of England dies and is succeeded by her cousin King James VI of Scotland, uniting the crowns of Scotland and England. 1603: Tokugawa Ieyasu takes the title of shōgun, establishing the Tokugawa shogunate. This begins the Edo period, which will last until 1868. 1603: In Nagasaki, the Portuguese Jesuit missionary João Rodrigues publishes Nippo Jisho, the first dictionary of Japanese to a European (Portuguese) language. 1605: The King of Gowa, a Makassarese kingdom in South Sulawesi, converts to Islam.Tsar Michael I of Russia reigned 1613–1645 1605–1627: The reign of Mughal emperor Jahangir after the death of emperor Akbar. 1606: The Long Turkish War between the Ottoman Empire and Austria is ended with the Peace of Zsitvatorok—Austria abandons Transylvania. 1606: Treaty of Vienna ends an anti-Habsburg uprising in Royal Hungary. 1606: Willem Janszoon captained the first recorded European landing on the Australian continent, sailing from Bantam, Java, in the Duyfken. 1607: Flight of the Earls (the fleeing of most of the native Gaelic aristocracy) occurs from County Donegal in the west of Ulster in Ireland. 1607: Iskandar Muda becomes the Sultan of Aceh for 30 years. He will launch a series of naval conquests that will transform Aceh into a great power in the western Malay Archipelago. 1610: The Polish–Lithuanian Commonwealth army defeats combined Russian–Swedish forces at the Battle of Klushino and conquers Moscow. 1610: King Henry IV of France is assassinated by François Ravaillac. 1611: The Pontifical and Royal University of Santo Tomas, the oldest existing university in Asia, is established by the Dominican Order in Manila[8] 1611: The first publication of the King James Bible. 1612: The first Cotswold Olympic Games, an annual public celebration of games and sports begins in the Cotswolds, England. 1613: The Time of Troubles in Russia ends with the establishment of the House of Romanov, which rules until 1917. 1613–1617: Polish–Lithuanian Commonwealth is invaded by the Tatars dozens of times.[9]James I of England and VI of Scotland ruled in the first quarter of the 17th century 1613: The Dutch East India Company is forced to evacuate Gresik due to the Mataram siege in neighboring Surabaya. The dutch negotiates with Mataram and is allowed to set up a trading post in Jepara. 1614–1615: The Siege of Osaka (last major threat to Tokugawa shogunate) ends. 1616: The last remaining Moriscos (Moors who had nominally converted to Christianity) in Spain are expelled. 1616: English poet and playwright William Shakespeare dies. 1618: The Defenestration of Prague. 1618: The Bohemian Revolt precipitates the Thirty Years' War, which devastates Europe in the years 1618–48. 1618: The Manchus start invading China. Their conquest eventually topples the Ming dynasty. 1619: European slaving reaches America when the first Africans are brought to the present-day United States. 1619: The Dutch East India Company storm Jayakarta and withstand a months-long siege by the combined English, Bantenese and Jayakartan forces. They are relieved by Jan Pieterszoon Coen and a fleet of ships from Ambon. The dutch destroys Jayakarta and builds its new headquarters, Batavia, on top of it. 1620–1621: Polish–Ottoman War over Moldavia. 1620: Bethlen Gabor allies with the Ottomans and an invasion of Moldavia takes place. The Polish suffer a disaster at Cecora on the River Prut. 1620: The Mayflower sets sail from Plymouth, England to what became the Plymouth Colony in New England.The 1622 massacre was instrumental in causing English colonists to view all natives as enemies 1621: The Battle of Chocim: Poles and Cossacks under Jan Karol Chodkiewicz defeat the Ottomans. 1622: Jamestown massacre: Algonquian natives kill 347 English settlers outside Jamestown, Virginia (approximately one-third of the colony's population)[10][11] and burn the Henricus settlement. 1624–1642: As chief minister, Cardinal Richelieu centralises power in France. 1626: St. Peter's Basilica in the Vatican completed. 1627: Aurochs go extinct.[12] 1628–1629: Sultan Agung of Mataram launches a failed campaign to conquer Dutch Batavia. 1629: Abbas I, the Safavids king, died. 1629: Cardinal Richelieu allies with Swedish Protestant forces in the Thirty Years' War to counter Ferdinand II's expansion. 1630: Birth of Shivaji at Shivneri fort, in present day Maharashtra, India, who later founded Maratha Empire in year 1674.[13] 1631: Mount Vesuvius erupts. 1632: Battle of Lützen, death of king of Sweden Gustav II Adolf.Battle of Nördlingen (1634). The Catholic Imperial army, bolstered by professional Habsburg Spanish troops won a great victory in the battle over the combined Protestant armies of Sweden and their German allies 1632: Taj Mahal building work started in Agra, India. 1633: Galileo Galilei arrives in Rome for his trial before the Inquisition. 1633–1639: Japan transforms into "locked country". 1634: Battle of Nördlingen results in Catholic victory. 1636: Harvard University is founded in Cambridge, Massachusetts. 1637: Shimabara Rebellion of Japanese Christians, rōnin and peasants against Edo. 1637: The first opera house, Teatro San Cassiano, opens in Venice. 1637: Qing dynasty attacked the Joseon dynasty. 1639: Naval Battle of the Downs – Republic of the United Provinces fleet decisively defeats a Spanish fleet in English waters. 1639: Disagreements between the Farnese and Barberini Pope Urban VIII escalate into the Wars of Castro and last until 1649. 1639–1651: Wars of the Three Kingdoms, civil wars throughout Scotland, Ireland, and England. 1640–1668: The Portuguese Restoration War led to the end of the Iberian Union.The inauguration of the Royal Academy of Turku in 1640. 1641: The Irish Rebellion, by Irish Catholics who wanted an end to discrimination, greater self-governance, and reverse ownership of the plantations of Ireland. 1641: René Descartes publishes Meditationes de prima philosophia Meditations on First Philosophy. 1642: Beginning of English Civil War, conflict will end in 1649 with the execution of King Charles I, the abolition of the monarchy and the establishment of the supremacy of Parliament over the king. 1643: L'incoronazione di Poppea, Monterverdi 1644: The Manchu conquer China ending the Ming dynasty. The subsequent Qing dynasty rules until 1912. 1644–1674: The Mauritanian Thirty-Year War. 1645–1669: Ottoman war with Venice. The Ottomans invade Crete and capture Canea. 1647–1652: The Great Plague of Seville. 1648: The Peace of Westphalia ends the Thirty Years' War and the Eighty Years' War and marks the ends of Spain and the Holy Roman Empire as major European powers.Map of Europe in 1648 at the end of the Thirty Years' War 1648–1653: Fronde civil war in France. 1648–1657: The Khmelnytsky Uprising – a Cossack rebellion in Ukraine which turned into a Ukrainian war of liberation from Poland. 1648–1667: The Deluge wars leave Polish–Lithuanian Commonwealth in ruins. 1648–1669: The Ottomans capture Crete from the Venetians after the Siege of Candia. 1649: King Charles I is executed for high treason, the first and only English king to be subjected to legal proceedings in a High Court of Justice and put to death. 1649–1653: The Cromwellian conquest of Ireland. Main articles: 1650s, 1660s, 1670s, 1680s, 1690s, and 1700s The Night Watch or The Militia Company of Captain Frans Banning Cocq, 1642. Oil on canvas; on display at the Rijksmuseum, Amsterdam 1651: English Civil War ends with the Parliamentarian victory at the Battle of Worcester. 1656–1661: Mehmed Köprülü is Grand Vizier. 1655–1661: The Northern Wars cement Sweden's rise as a Great Power. 1657 : Sambhaji, the second King of Maratha Empire and eldest son of King Shivaji was born at Purandar Fort on 14 May.[citation needed] 1658: After his father Shah Jahan completes the Taj Mahal, his son Aurangzeb deposes him as ruler of the Mughal Empire. 1659: King Shivaji killed Adil Shahi dynasty's general Afzal Khan at Pratapgad fort on 9 November.[14] 1660: The Commonwealth of England ends and the monarchy is brought back during the English Restoration. 1660: The Royal Society is founded. 1660: The Bruneian Civil War begins 1661: The reign of the Kangxi Emperor of China begins. 1663: Ottoman war against Habsburg Hungary. 1664: The Battle of St. Gotthard: count Raimondo Montecuccoli defeats the Ottomans. The Peace of Vasvar – intended to keep the peace for 20 years. 1665: Maratha King Shivaji signed the Treaty of Purandar with Mughal general Jai Singh I after Battle of Purandar.[citation needed] 1665: Robert Hooke discovers cells using a microscope. 1665: Portugal defeats the Kongo Empire at the Battle of Mbwila.Taj Mahal, completed by 1653 and commissioned by Shah Jahan, one of the Wonders of the World 1665–1667: The Second Anglo-Dutch War fought between England and the United Provinces. 1666: The Great Fire of London. 1666: Shivaji visited Aurangzeb at Agra Fort and forced him into house arrest. Shivaji later escaped and returned to the Maratha kingdom.[citation needed] 1667: The Raid on the Medway during the Second Anglo-Dutch War. 1667–1668: The War of Devolution: France invades the Netherlands. The Peace of Aix-la-Chapelle (1668) brings this to a halt. 1667–1699: The Great Turkish War halts the Ottoman Empire's expansion into Europe. 1672–1673: Ottoman campaign to help the Ukrainian Cossacks. John Sobieski defeats the Ottomans at the second battle of Khotyn (1673). 1672–1674: The Third Anglo-Dutch War fought between England and the United Provinces 1672–1676: Polish–Ottoman War.French invasion of the Netherlands, which Louis XIV initiated in 1672, starting the Franco-Dutch War 1672–1678: Franco-Dutch War. 1673: The Bruneian Civil War ends with Muhiyiddin winning the war. 1674: Shivaji founded the Maratha Empire and crowned himself as first Chatrapati of the empire. 1676–1681: Russia and the Ottoman Empire commence the Russo-Turkish Wars. 1678: The Treaty of Nijmegen ends various interconnected wars among France, the Dutch Republic, Spain, Brandenburg, Sweden, Denmark, the Prince-Bishopric of Münster, and the Holy Roman Empire.Claiming Louisiana for France in 1682 1680: The Pueblo Revolt drives the Spanish out of New Mexico until 1692. 1680: Prince Sambhaji crowned himself as the second Chatrapati of Maratha Empire 20 July.[citation needed] 1682: French explorer Robert La Salle claims all the land east of the Mississippi River.[15] 1683: China conquers the Kingdom of Tungning and annexes Taiwan. 1683: The Ottoman Empire is defeated in the second Siege of Vienna. 1683–1699: The Great Turkish War leads to the conquest of most of Ottoman Hungary by the Habsburgs. 1687: Isaac Newton publishes Philosophiae Naturalis Principia Mathematica. 1688: The Siege of Derry, the first major event in the Williamite War in Ireland. 1688: Siamese revolution of 1688 ousted French influence and virtually severed all ties with the West until the 19th century. 1688–1689: The Glorious Revolution starts with the Dutch Republic invading England, England becomes a constitutional monarchy. 1688–1691: The War of the Two Kings in Ireland. 1688–1697: The Grand Alliance sought to stop French expansion during the Nine Years' War. 1689: The Battle of Killiecrankie is fought between Jacobite and Williamite forces in Highland Perthshire. 1689: The Karposh rebellion is crushed in present-day North Macedonia, Skopje is retaken by the Ottoman Turks. Karposh is killed, and the rebels are defeated.The Battle of Vienna (1683) marked the historic end of the expansion of the Ottoman Empire into Europe 1689: Bill of Rights gains royal consent. 1689: John Locke publishes Two Treatises of Government and A Letter Concerning Toleration. 1690: The Battle of the Boyne in Ireland. 1692: Port Royal in Jamaica is struck by an earthquake and a tsunami. Approximately 2,000 people die and 2,300 are injured. 1692–1694: Famine in France kills two million.[16] 1693: College of William & Mary is founded in Williamsburg, Virginia, by a royal charter. 1694: The Bank of England is established. 1695: The Mughal Empire nearly bans the East India Company in response to pirate Henry Every's capture of the trading ship Ganj-i-Sawai. 1696–1697: Famine in Finland wipes out almost one-third of the population.[17] 1697–1699: Grand Embassy of Peter the Great to Western Europe. 1699: Thomas Savery demonstrates his first steam engine to the Royal Society. Catholic general Albrecht von Wallenstein (1583–1634), supreme commander of the armies of the Imperial Army during the Thirty Years War Jan Pieterszoon Coen (1587–1629), the founder of Batavia, was an officer of the Dutch East India Company (VOC), holding two terms as its Governor-General of the Dutch East Indies René Descartes (1596–1650) with Queen Christina of Sweden (1626–1689) Cardinal Mazarin (1602–1661), who served as the chief minister to the kings of France Louis XIII and Louis XIV Mughal Emperor Aurangzeb (1618–1707), who ruled over almost the entire Indian subcontinent for a period of 49 years Chhatrapati Shivaji (1630–1680) founder of Maratha Empire is widely regarded as one of the greatest Hindu rulers Kangxi Emperor (1661–1722) one of the most influential emperors of the Qing dynasty Shōgun Tokugawa Ieyasu was the founder of Japan's final shogunate, which lasted well into the 19th century See also: Timeline of historic inventions § 17th century Major changes in philosophy and science take place, often characterized as the Scientific Revolution. Banknotes reintroduced in Europe. Ice cream. Tea and coffee become popular in Europe. Central Banking in France and modern Finance by Scottish economist John Law. Minarets, Jamé Mosque of Isfahan, Isfahan, Persia (Iran), are built. 1604: Supernova SN 1604 is observed in the Milky Way. 1605: Johannes Kepler starts investigating elliptical orbits of planets. 1605: Johann Carolus of Germany publishes the 'Relation', the first newspaper. 1608: Refracting telescopes first appear. Dutch spectacle-maker Hans Lippershey tries to obtain a patent on one, spreading word of the invention. 1610: The Orion Nebula is identified by Nicolas-Claude Fabri de Peiresc of France. 1610: Galileo Galilei and Simon Marius observe Jupiter's Galilean moons. 1611: King James Bible or 'Authorized Version' first published. 1612: The first flintlock musket likely created for Louis XIII of France by gunsmith Marin Bourgeois. 1614: John Napier introduces the logarithm to simplify calculations. 1616: Niccolò Zucchi describes experiments with a bronze parabolic mirror trying to make a reflecting telescope. 1620: Cornelis Drebbel, funded by James I of England, builds the first 'submarine' made of wood and greased leather. 1623: The third English dictionary, English Dictionarie, is published by Henry Cockeram, listing difficult words with definitions. 1628: William Harvey publishes and elucidates his earlier discovery of the circulatory system. 1637: Dutch Bible published. 1637: Teatro San Cassiano, the first public opera house, opened in Venice. 1637: Pierre de Fermat formulates his so-called Last Theorem, unsolved until 1995. 1637: Although Chinese naval mines were earlier described in the 14th century Huolongjing, the Tian Gong Kai Wu book of Ming dynasty scholar Song Yingxing describes naval mines wrapped in a lacquer bag and ignited by an ambusher pulling a rip cord on the nearby shore that triggers a steel-wheel flint mechanism. 1642: Blaise Pascal invents the mechanical calculator called Pascal's calculator. 1642: Mezzotint engraving introduces grey tones to printed images. 1643: Evangelista Torricelli of Italy invents the mercury barometer. 1645: Giacomo Torelli of Venice, Italy invents the first rotating stage. 1651: Giovanni Riccioli renames the lunar maria. 1656: Christiaan Huygens describes the true shape of the rings of Saturn. 1657: Christiaan Huygens develops the first functional pendulum clock based on the learnings of Galileo Galilei. 1659: Christiaan Huygens first to observe surface details of Mars. 1662: Christopher Merret presents first paper on the production of sparkling wine. 1663: James Gregory publishes designs for a reflecting telescope. 1669: The first known operational reflecting telescope is built by Isaac Newton. 1676: Antonie van Leeuwenhoek discovers Bacteria. 1676: First measurement of the speed of light. 1679: Binary system developed by Gottfried Wilhelm Leibniz. 1684: Calculus independently developed by both Gottfried Wilhelm Leibniz and Sir Isaac Newton and used to formulate classical mechanics. ^ "Exchange History NL – 400 years: the story". 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ISBN 0-7486-3887-3 Detail of a 17th-century Tekke Turkmen carpet Chang, Chun-shu, and Shelley Hsueh-lun Chang. Crisis and Transformation in Seventeenth-Century China (1998). Langer, William. An Encyclopedia of World History (5th ed. 1973); highly detailed outline of events online free Reid, A. J. S. Trade and State Power in 16th & 17th Century Southeast Asia (1977). Spence, J. D. The Death of Woman Wang: Rural Life in China in the 17th Century (1978). Clark, George. The Seventeenth Century (2nd ed. 1945). Hampshire, Stuart. The Age of Reason the 17th Century Philosophers, Selected, with Introduction and Interpretive Commentary (1961). Hugon, Cécile (1997) [1911]. "Social Conditions in 17th-Century France (1649-1652)". In Halsall, Paul (ed.). Social France in the XVII Century. London: Methuen. pp. 171–172, 189. ISBN 9780548161944. Archived from the original on 23 August 2016. Retrieved 7 August 2021. Lewitter, Lucian Ryszard. "Poland, the Ukraine and Russia in the 17th Century." 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