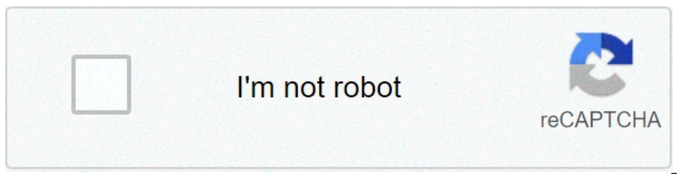

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New building material

Around 10,000 years ago, man started to make fundamental changes in the way he lived. Slowly moving away from a nomadic lifestyle, he started staying in one place for longer periods. This was probably due to the ending of the last ice age creating more abundant resources. Man didn't have to travel as far to find food, so he stayed where food was plentiful. Over time, a more settled lifestyle brought some challenges with it. Instead of having to find caves or create makesift shelters from animal skins for protection from the weather, man started to look for more durable materials with which to build long-lasting dwellings [source: Castleden].Over time, man has used a variety of materials, and they help to paint a picture of our ongoing quest to make long-lasting structures to meet our changing needs. The evolution of architecture meets those challenges and handles the cultural perception of what those buildings should look like and how they should be used.In the next few pages, we'll take a look at five materials that man has relied on to build homes, halls, temples and many other types of structures. All five are still used today, and knowing something about them will help us make the historic leap from mud huts and tents to skyscrapers that can shelter thousands.First up, lets take a look at the ever-versatile building material of man and termites alike: wood.As a construction material, wood has a lot going for it. It can be used as a primary material, as seen in log cabin construction or blended with other building materials and used as either a decorative element or support structure. Wood is lightweight compared to stone, and it's strong once it's been seasoned to remove moisture. It can also be cut to length easily.Wood does have some disadvantages, though. It decays eventually, and it's vulnerable to moisture damage like dry rot and predation by insects like termites. Fire is a big problem, too.Even with these vulnerabilities, wood buildings can survive a long time. Just how long may surprise you. The oldest wood building in existence is the Horyu-ji temple in Japan, which dates to the 8th century [source: CWC].In the next section, let's see how playing with mud can be a smart thing to do when you're trying to make bricks.Usually made of clay, brick has been used in many ancient structures, like the Roman aqueducts, the Pantheon and the Great Wall of China. The Sumerians made the earliest recorded bricks, and we can deduce that those early bricks used in construction were crude, uneven, sun-dried blocks probably made of silt that was deposited when high waters receded after storms [source: Britannica].The silt dried naturally to a very hard consistency, and then it was dug up, broken into chunks and used to make the walls of huts and other structures. Some experimentation led to the development of forms and molds to create uniform bricks that could be stacked easily for smooth walls with clean corners.This style of brickmaking is still being used today and is very stable in dry climates. But too much rain and the walls of your painstakingly built hut turn to mud. That's solved with the application of high heat. These bricks are durable, weather resistant, fire resistant, easy to make and convenient to work with.In the next section, let's take a look at a building material for the ages, stone.Stone is durable and impressive stuff, but it's also challenging to quarry, and heavy to move, and it has tension and stress limitations. Where there are resources available to excavate and cut it precisely, stone can be an extremely strong and useful natural material. Unlike brick, it can be stacked without mortar and support heavy vertical loads. Stone resists deforming, weathers the elements well, withstands fire and helps maintain stable interior environments. There are so many extraordinary stone structures that it seems a shame that modern construction uses stone more as decoration than anything else.Today, there are cheaper and more efficient building materials that have usurped the position of stone in modern building construction, not the least of which are decorative stone veneers. It seems humbling, but steel, wood and concrete construction with a thin layer of decorative stone on the outside is more in keeping with modern budgets and standards of construction than the impressive, towering stone edifices of historical buildings. Newer synthetic materials are even mimicking the look of stone in much lighter weight, inexpensive incarnations, eliminating the need even for veneers.Stone is still popular for its esthetic value, and it's unlikely that it will ever be completely eliminated. Stone has probably been around since the first Stone Age settlers reached for a few rocks to hold down their tent flaps, and as a decorative element in human design, it's bound to be a part of our structures for a long time.Concrete is an aggregate made up of a number of materials like stones and sand that are mixed with a binder like cement and water. The mixture is then left to dry and harden. It's a flexible material that can be formed on the spot or poured into molds, hardened and then transported.Even though it had been around for hundreds of years, it wasn't until 1860, when someone realized that concrete could be reinforced to increase its tensile strength (the amount of force or stress it could withstand), that concrete started gaining wide acceptance.Reinforced concrete can be formed into many shapes with a supporting structure of narrow steel rods embedded right in the concrete when it's poured. Rebar reinforcement makes concrete an ideal material for walls, beams, slabs, foundations, frames and many other applications. The use of metal rods and mesh, together with a relatively inexpensive concrete medium, make reinforced concrete a flexible, reliable and economical building choice.Twentieth century refinements have made reinforced concrete an even bigger player in modern building design and construction. Pre-cast concrete is made under controlled manufacturing conditions that increase its water repelling characteristics and limit its capacity to expand and contract. Pre-stressed concrete, made by placing stretched steel strands in the hardening concrete, increase reinforced concrete's tensile strength and resistance to downward pressure.Let's proceed to the next section, where we'll take a look at how steel is being used to do more than just reinforce concrete in building construction.Once man started building up instead of out, stronger building materials became necessary to support taller structures. And tall buildings place a lot of weight on load-bearing walls; some sort of support framework was needed to carry the load.We can see here that steel has a dual role in our builder's toolkit. It can be embedded in concrete to provide support or become a foundation in itself. Steel can easily be prefabricated to make for a fast and easy installation. It can be welded, bolted or riveted in place. It can be up to 100 percent recyclable, too, which is important with newer green building practices. Steel is a relatively economical commercial building choice which is making inroads in residential construction, as well.The advent of steel technology that allows man to design and build taller structures has changed the face of architecture and expanded the way we find creative solutions to our building challenges.On the next page, you'll find lots more information about building and architecture.Balogh, Anne. "What Makes Concrete a Sustainable Building Material." Undated. 3/4/09. Mary. " The History of Concrete and Cement." Undated. 3/4/09. Rodney. "Inventions That Changed the World." Chartwell Books, Inc. 2007Castleden, Rodney. "Events That Changed the World. Time Warner Books. 2005Craven, Jackie. "Viking Log Homes." Undated. 3/4/09. . "Wood's Heritage." 6/08. 3/2/09. 20Heritage/?Language=ENCWC. 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Image: shutterstock Do you know the difference between vinyl and aluminum siding, or what ducts are designed to carry? Know why you need special electrical outlets in your bathroom, and what these special outlets are called? Any idea what a board foot is? If you think you know all the steps and materials involved in building a house, take our quiz to prove it!Home building has come a long way in the past couple of centuries. As early Americans established homesteads, they had limited options to choose from when it came to building a house. Most took advantage of plentiful free lumber, joining forces to build simple structures with just a single room or two, using mud to fill the gaps and keep out the cold.Of course, things have changed a lot since then. Modern homes come equipped with conveniences our forefathers could only dream of. This is pretty nice when it comes to taking a hot shower or flipping on a light switch when the sun goes down, but it makes the building process infinitely more complex. Today's builders are also subject to countless building codes and safety regulations to protect occupants against everything from radon gas to fires to structural failure.Still think you're a home building expert despite the complexities of the modern construction industry? Take our quiz to find out! TRIVIA Do You Know These Home-Building Fundamentals? 7 Minute Quiz 7 Min TRIVIA The Home & Garden Quiz 7 Minute Quiz 7 Min TRIVIA 88% of People Can't Name All of These Home Building Materials. Can You? 6 Minute Quiz 6 Min TRIVIA Do You Know More About Home Improvement Than Bob Vila? 7 Minute Quiz 7 Min PERSONALITY Which Home Architectural Style Fits Your Personality? 6 Minute Quiz 6 Min TRIVIA Can You Identify These Everyday Home Items? 7 Minute Quiz 7 Min PERSONALITY Design a Dream Home and We'll Guess Which HGTV Star You Are 5 Minute Quiz 5 Min PERSONALITY Design Your Retro Home and We'll Guess Which Brady Bunch Character You Are 5 Minute Quiz 5 Min TRIVIA The Home Ownership Quiz 7 Minute Quiz 7 Min PERSONALITY It's Time to Find Out What Your Dream Home Looks Like 5 Minute Quiz 5 Min How much do you know about dinosaurs? What is an octane rating? And how do you use a proper noun? Lucky for you, HowStuffWorks Play is here to help. Our award-winning website offers reliable, easy-to-understand explanations about how the world works. From fun quizzes that bring joy to your day, to compelling photography and fascinating lists, HowStuffWorks Play offers something for everyone. Sometimes we explain how stuff works, other times, we ask you, but we're always exploring in the name of fun! Because learning is fun, so stick with us! Playing quizzes is free! We send trivia questions and personality tests every week to your inbox. By clicking "Sign Up" you are agreeing to our privacy policy and confirming that you are 13 years old or over. If your designer has specified all the fixtures, appliances, and building materials needed for the job, you may not have to do any of the buying. If you have a general contractor on the job, he or she may handle the ordering and delivery of goods. Yet in most jobs, the homeowner, by choice or force of circumstance, ends up going shopping. Perhaps the goal is to save money; maybe it's to make sure one or another product is to your taste. On the other hand, if you are acting as your own general contractor, you'll need to arrange for buying and paying for a wide range of materials.Whether you're buying one light fixture or truckloads of lumber, you should keep in mind these considerations:Discounts When you begin shopping, ask each supplier—the lumberyard, the electrical supply store, the plumbing supply house—whether they give a builder's discount. As a remodeler, you are a de facto builder, so you should act like one and get the benefits. Your suppliers probably won't complain (after all, you are not asking for anything more than many of their other customers get), though if your project is a relatively small renovation, don't be surprised if the answer is no.Some suppliers have monthly minimums to qualify for builder's discounts (typically, a thousand dollars or more at the lumberyard). Some suppliers have a scale, with deeper discounts for the contractors that do a big volume of business. If the supplier tells you that the preferred builders' terms are not available to you, ask why not and what the required qualifications are. Discounts vary greatly, but a 10 percent discount on lumber and millwork is common, while with lighting fixtures the savings are often much higher. Ask the question.Delivery Many suppliers will deliver at no charge. Make sure to establish that they do, and if not what the charges will be. If there is a delivery fee, shop around a bit to see whether other suppliers charge one.Beware of "sidewalk delivery." A familiar concept to apartment dwellers, it means that your giant new refrigerator will be delivered only as far as the sidewalk—even if your kitchen is on the third floor. That may (or may not) be acceptable to you, but if it is, you'll need to know when the truck is coming and arrange for the manpower to bring the goods inside.Schedule When ordering materials, consult often with your GC or subs about the schedule. There's little point in having materials piled at the work site waiting to be used, since the sooner you get them, the sooner you have to pay for them. Stacks of goods can also be very inviting to thieves—in the jargon of the business, they have a tendency to "walk away." On the other hand, you need to be sure that supplies are available when they're needed in order to keep the job on schedule. If the materials aren't on site when required, work will quickly come to a halt.When researching options, ask suppliers about availability. Find out when you have to order that special tile and odd-size window in order to have them available. Cabinets and heating equipment are most likely to require the longest order time, and their absence can, again, slow down the job.Payment Terms You can pay for goods at the time of purchase. Most suppliers will take a local check or a credit card. However, you may want to open an account. If so, the supplier will check your credit (it'll probably ask which bank loaned you money and for other credit references). Having established you are a worthy credit risk, most suppliers will then offer at least a thirty-day term in which to pay, meaning that goods that arrive this month at your house won't have to be paid for until next. That can be helpful in managing the flow of cash during a renovation. Find out exactly what each supplier's terms are as some suppliers also offer a 1V2 or 2 percent discount for speedy payments.