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Welcome to a way to make a small water wheel generator out of things around your house. Please Note that there are many better ways of doing this, and many parts you may skip in certain cases, but this is how to make a simple one from scratch (sadly doesn't provide much power).You will need: A pen Bare copper wire a flat magnetic metal a round magnet (two in diameter) or series of rectangular magnets. Binder clips plywood 1" pvc pipe A nail about 2 1/2 in. wire/string box (preferably cardboard) cardboard Aluminum can 12x24 in board (wood)As Well As: voltmeter sand paper a drill wood glue duct tape hot glue Epoxy pencil ruler clamps First build the main body of the generator based on these pictures Notes: Drill the holes into the pen carefully The last two in of the pen was the naile epoxied on as well as duct taped in order to make longer Please find a different way of attaching the metal sticks together, this is NOT the best way Make sure the metal is towards the bottom of the pen Remove ink cartridge before drilling. FOR ALL GENERATOR STEPS TO COME I RECOMMEND LOOKING AT THIS LINK FOR THIS IS WHAT I BASED MY DESIGNS OFF OF. Coil the copper wire make sure to leave some at the beginning and the end, and use one giant peace not individuals Note: the copper wire MUST be bare and have limited Coating if not none. (I made this mistake) cut an aluminum can into strips that can barely wrap around the pen once. Then cut in half Note: Sand off all sides, make sure to scrape off as much paint as possible Do what it looks like in the following pictures Note: Make sure the aluminum and the copper wire ARE touching, i suggest sandpaper to rough up the wire. Make sure that the two Aluminum strips are NOT touching. Assemble the magnets in this arrangement with hot glue. (if applicable) Drill small hole into middle of magnet/group of magnets sorry no pictures came out with you able to see the whole cut two circles of cardboard about an inch in diameter, then stab a hole through them both with a similar pen, Make sure the pen can spin fairly easily. Place everything in a box, hot glue the magnet to the bottom, and create supports like so Put some copper wire just like the last one, but in the opposite direction, make sure wire does not cross and to sand the wire first, as well as have it touch the aluminum on both sides. twist the two ends of the SAME wire together on the same side of the box. As well as place cardboard circles underneath the pen/generator. Use binder clips to bring the copper wire tighter to the aluminum, then put box on its side and hook up the bare copper wire to a voltmeter and while spinning measure the current and see if electricity is being produced. Measure and mark two 8.5"x8.5" squares measure and mark four 6"x3" panels cut out the two 8.5" squares in the center of both squares drill a hole the size of your pvc tube Cut out the four 6"x3" rectangles apply glue to three of the edges of the rectangles and position along the pvc and the walls of the wheel clamp the walls together and let the glue dry overnight when the glue has dried apply a second coat to fill holes glue the pvc tubing on the outside and inside of the waterwheel Put Epoxy in tube and duct tape it to motor Rig a support system, Originally we had the thing below, then someone broke it, so we improvised and came up with this with the broken wood and left over duct tape. Since This was for, of all things, a Math project we are going to talk about some of the area and volume stuff. The volume of the pvc pipe is approximately 14.13716694115406957308189522 4758 cubic in. I got to this conclusion through finding the base of the pvc pipe through .5(radius) squared times pi, then I multiplied it by the height which is approximately 18 in to get14.13716694115406957308189522 4758. I also found the volume of the water wheel which is the following equation: (8.5*3*8.5)- (6*3*0.25*4)-(0.5*0.5*pi*3)=196.39380551 cubic in meaning at any point in time the water is touching approximately 98.1969027549cubic in. To find the total surface area of the water wheel do (8.5*8.5*.25)*2+ (6*3)*8-(6*.25*8)+(1*pi*3)=177.549777961 in squared.HOPE YOU ENJOYED AND ADAPTED OUR DESIGN TO MAKE IT BETTER, I know several ways to make this better next time, but PLEASE COMMENT ANY IDEAS FOR NEXT TIME.Share on FacebookShare on PinterestThe increasing demand for energy coupled with concerns over environmental sustainability has prompted the exploration of alternative power generation methods. One such method involves the use of a water wheel powered by flowing water from a stream or creek. This project details the construction of a homemade off-grid power generation system using this technique. The initial step in harnessing power from the water source involves constructing a small dam to collect and regulate the flow of water. This ensures maximum efficiency of the water wheel and optimal power output. The system is designed to be sustainable, cost-effective, and reliable, providing an alternative power source for homes and small businesses located near a flowing water source. Through the use of readily available materials and easy-to-follow instructions, this project provides an opportunity for individuals to contribute to a more sustainable future while reducing their dependence on traditional power sources. With proper maintenance, this off-grid power generation system can provide a reliable and sustainable energy source for years to come.STEP 1 : BUILDING THE DAMTo begin with, it is crucial to divert the water using a 4 inch pipe before commencing the construction of the dam. This ensures that the work area is dry and enables a better construction process. The construction of the dam itself involves creating a solid concrete foundation, which will serve as the base for the structure. The dam should be 42 inches in length with a 30 inch head to ensure maximum water flow for the water wheel. On the high water side of the dam, a six inch, 36 inches long PVC drain pipe is installed. This drain pipe helps to regulate the water flow and prevent overflows, which can lead to damage and reduce the efficiency of the water wheel. To construct the dam, four layers of hollow blocks are used along with quickrete blended mason mix to provide stability and durability. It is essential to test the dams strength by gradually increasing the water level to determine the maximum height it can hold before overflowing.After constructing the dam structure, the next step involves installing the dam board gates, which are made of sturdy deck boards. These gates are placed in the middle of the dam and act as barriers to regulate the water flow. To install the dam board gates, the back and front boards are spaced apart with a distance of one and three-quarters inches. This allows the dam stop gate, which is made of plywood and measures one and a half inches, to fit snugly between the boards. To ensure a tight seal and prevent any water from seeping through, a half-inch rubber tube is stuffed between the boards. This rubber tubing acts as a gasket, providing a watertight seal when the dam stop gate is inserted.STEP 2 : BUILDING THE FLUMETo construct the flume, a 13 and a half inch treated plywood is used as the base, along with a couple of 26 plywood side boards. The plywood base and side boards are secured together using a strong adhesive sealant and exterior grade screws. It is important to ensure that the boards are tightly fastened together to prevent any water leakage. The flume is designed to channel the water from the dam to the water wheel. It is important to take into consideration the length and angle of the flume, as well as any obstacles that may affect the flow of water. The flume should be sloped at a consistent angle to ensure a steady flow of water to the water wheel.To ensure stability and prevent warping of the plywood, four cross spacers are strategically placed along the flume board. These spacers also help maintain a consistent width for the flume, which is essential for optimal water flow. In order to divert the water without the need to completely drain the dam, a small trap door is constructed in the flume near the opening. The trap door is positioned approximately seven inches from the face of the dam and is supported by a sturdy flange on the back and a durable stainless steel hinge. This design ensures that the trap door remains securely in place, effectively diverting water as needed.Once the flume is constructed, it is time to install it on the creek or stream. This requires attaching rebars to supporting deck boards using u-bolts and a drill bit. The rebars provide stability to the flume and ensure that it remains securely in place. In order to extend the length of the flume, three subsequent flumes are attached to each other. To seal the gaps between the flumes, poly foam caulk rope is applied. This ensures that there are no leaks or water loss between the different sections of the flume.Proper installation of the flume is crucial for the efficient operation of the water wheel. It is important to ensure that the flume is level and properly supported. STEP 3 : MAKING THE WATER WHEELTo construct the waterwheel, a section of 55-gallon HDPE drum is utilized as the main body. For the blades, 4-inch PVC drain pipe is cut into suitable lengths and curved in a manner that allows it to retain a majority of the water passing through, thus increasing its energy efficiency. A total of 24 blades are attached to the drum using 16th by half aluminum angle pieces, ensuring a strong and stable connection.The next step in building this homemade off-grid power generation system is to install the drive shaft and complete the waterwheel assembly. To do this, a 3/4 inch jack shaft salvaged from an old go-kart is used as the drive shaft. This jack shaft is then supported at both ends of the wheel using pillow block bearings to ensure smooth rotation. To complete the waterwheel assembly, two 28 inch circular end pieces made of plywood are bolted along both sides of the HDPE drum barrel. This is achieved using six 10 inch long 1/2 inch by 13 carriage bolts. These end pieces serve as reinforcement for the waterwheel, providing stability and preventing any wobbling or misalignment during operation.To ensure proper alignment and reduce any runout in the center shaft of the waterwheel, two square collar blocks are mounted onto the shaft. The holes in these collar blocks are slightly larger than the diameter of the shaft to allow for adjustments. In order to further adjust and center the waterwheel, four additional blocks are placed around the center block, similar to a four jaw chuck. These adjustment blocks are equipped with bolts that allow for precise alignment of the wheel. STEP 4 : INSTALLING THE WATER WHEELTo ensure a stable and secure installation of the water wheel, a sturdy support structure is constructed using 24 boards. This structure is positioned at the end of the flume, where the waterwheel will be installed. Two swivel block bearings are then mounted onto the support structure, providing a strong and durable foundation for the waterwheel. The swivel block bearings allow for smooth rotation of the waterwheel, reducing the amount of friction and wear on the system. The bearings are carefully selected to match the specifications of the jack shaft and other components of the waterwheel system, ensuring a precise and reliable fit. STEP 5: CONNECTING THE MOTOR AND THE WATERWHEELTo ensure the proper functioning of the water wheel and power generation system, it is essential to have a sturdy and adjustable mounting structure for the bearings, sprockets, and motor. In this step, an adjustable Unistrut is used to mount these components, allowing for easy chain tension adjustments. The Unistrut is mounted vertically on top of the cross support that is under the flume.To secure the Unistrut onto the wheel, bearings and T-nuts are used on both sides. A Number 35 sprocket with 72 teeth is then mounted onto the center wheel shaft. This sprocket will help in transferring the power from the water wheel to the generator or other mechanical devices. By using an adjustable Unistrut, the positioning of the sprockets and motor can be fine-tuned to optimize the power output of the system.This sprocket is then connected to a half shaft with an 11 tooth sprocket using a size 35 go-kart roller chain. Finally, a Permanent Magnet Brushed DC motor mounted on a 24 board is connected to this shaft via another sprocket. The gear system has a ratio of 30.86:1, providing optimal power generation from the water wheels rotation.To ensure the water wheel operates efficiently, it is important to position it correctly. This is achieved by mounting the wheel onto the support board near the flume using unistruct angled brackets. The brackets allow for adjustment of the wheels position to ensure the point where the water meets the wheel is exactly at the top. STEP 6: CONNECTING THE CHARGING SYSTEMThe charging system of the water wheel project is a crucial aspect that helps generate electrical energy. It involves the use of a few components such as a 12V DC standby battery, a Maximum Power Point Tracking (MPPT) charge controller, and a 300W sine wave inverter.The DC motor of the water wheel is connected to the charge controller, which regulates the power generated by the motor to optimize its efficiency. The charge controller is responsible for ensuring that the battery is charged properly and is not overcharged, which could damage the battery. It is also connected to the 12V DC standby battery, which acts as a backup power source in case of power outages or during periods of low water flow.Furthermore, the MPPT charge controller maximizes the energy harvested from the water wheel by adjusting the electrical load to match the motors output, thus increasing the overall efficiency of the system. Finally, the 300W sine wave inverter is used to convert the DC voltage from the battery to AC voltage.Once the battery is charged, the inverter is used to convert the 12V DC power from the battery into 120V AC power, which can be used to power a load. To ensure the safety of the system, a fuse connection is installed between the components, which protects against overloading and short circuits. All of these components are mounted onto a temporary wooden board for easy portability and maintenance. Image Credits : Joe Malovich1Use scissors to cut 10 plastic spoons in half at an angle. The spoons will serve as the paddles that actually turn the wheel when water passes over them. Cut 10 spoons in half of the handle length and try to get them to be as even as possible. Make your cut at a slight angle so the spoons can be inserted into the styrofoam easier.[1]Plastic spoons can be hard to cut, so ask for help if you need it. Be careful cutting the plastic spoons as the pieces can fly off when you cut them. 2Cut a circle with a diameter equal to the length of a spoon. Lay one of the spoons you cut down on the styrofoam and draw a circle around it so the diameter of the circle is about as wide as your spoons. Use a utility knife to cut the circle out of the styrofoam taking care not to let the knife slip and cut yourself.[2]Check the diameter around the circle to make sure its even.The sheet of styrofoam should be at least 2 inches (5.1cm) thick.Place the styrofoam on a surface that you dont mind cutting, like cardboard or a cutting block, in case the utility knife cuts through the styrofoam. Advertisement 3Insert the spoons into the outside edge of the styrofoam. Push the cut edge of the spoons you cut into the styrofoam until about 1 inch (2.5cm) of the handle and the bowl of the spoon are exposed. The bowl of the spoon should face the side of the styrofoam, not the front or back. Make sure the spoons are all facing the same direction and are evenly spaced out so they can catch the water that will turn the wheel.[3]Tip: If your spoons keep slipping out of the styrofoam, place a little bit of glue into the slot created by the spoon and then insert the spoon to secure it in place. 4Use a pencil to mark the center of 2 paper plates and your foam circle. Its important that your skewer goes through the center of your wheel to ensure that it turns properly. Take a ruler and draw a vertical line through the center of the plate, then draw a horizontal line through the center of your plates and the foam circle. Mark the center of the plate and foam disc with a dot.[4]Use standard 9in (23cm) paper plates.5Make a hole in the center with a wooden skewer. Once youve found your center points, use a skewer to make a hole by pushing it through the center of the plates and the foam. Push the skewer through them one at a time so it penetrates them easier. This will make the perfect size hole.[5]It may take some effort to push the skewer through the styrofoam and plates. But be careful not to place your hand over the center of the plates and styrofoam to avoid poking yourself with the skewer.6Glue the plates to the sides of the foam disk. The 2 paper plates will serve to stabilize the foam disk and the spoons. Apply glue to the sides of the foam disk, around the area of the hole in the center, and attach the plates to the disk one at a time, lining up the holes in the center so the skewer will be able to slide through the entire piece.[6]Allow the glue to dry for at least 1 hour before you move on so the glue is completely set.7Push the skewer through the center of the wheel. After the glue has dried, you can insert the wooden skewer. The skewer will serve as your dowel rod and will allow the wheel to turn when water passes over the spoons. Make sure the skewer is secure in the wheel because if its too loose, the wheel wont turn.You can place a dab of glue at the hole where the skewer goes through to anchor it into the plate and styrofoam.[7]8Set your wheel on a bucket and fill a glass with water. With your wheel complete, place it on a bucket by resting the skewer on the mouth of the bucket. Place the wheel so it rests securely and wont fall off or into the bucket when you pour water over it by having about 1 inch (2.5cm) of the skewer hanging over the mouth of the bucket on each side. Fill a glass of water to use to test your wheel.[8]9Slowly pour the water onto the spoons to turn the wheel. Take your glass and bring it to the side of the wheel where the bowl of the spoons are facing up and slowly start to pour the water so that the spoons catch it. This will cause the wheel to turn and it should continue to spin as long as you keep pour water over it.[9]Play around with making the wheel spin faster or slower by pouring more or less water over the spoons to alter the speed. Advertisement 1Use a ruler to make a straight line 2 inches (5.1cm) from the edge of the foam board. Youll need a straight and narrow strip of foam board to form the paddles of your water wheel. Use a ruler to measure and to make a straight line down the length of the board to form a 2in (5.1cm) wide strip.[10]The foam board should be a minimum of 24 inches (61cm) long and 316 inch (0.48cm) thick.2Cut the strip off of the board using a utility knife. After youve traced the straight line down the board, take a utility knife and use your ruler as a guide to cut the foam board where you measured your line. It may take more than one pass to cut all the way through the board. Run the blade of the knife through the line you cut until it penetrates the other side of the board.[11]You may want to place cardboard beneath the foam board or cut on a surface that you dont mind cutting in case the knife cuts through the board.3Divide the strip into 10 sections measuring 1.5 inches (3.8cm) to make your paddles. Take the strip you cut off and measure 1.5in (3.8cm) sections with your ruler, marking the sections clearly with a pencil. You may not use the entire strip, but you will need 10 even and uniform sections. Cut the sections out of the strip with a utility knife.[12]4Use a compass to measure 2 circles that are 6 inches (15cm) in diameter. Place a protractor on your foam board and measure a circle that is 6 inches (15cm) in diameter, then measure another circle of the same size in the foam board. Keep the point of the protractor in place as you swivel it around to form an even circle.[13]5Use your utility knife to cut out the circles. Take your time and make light cuts into the circle pattern. The light cuts will guide the blade of your knife to help you punch through the foam board. Follow the edge of the circular pieces carefully to keep the rounded shape of the circles and so that circles are of the same size and shape.[14]6Glue the paddles to one of the wheels at an angle. Take the 1.5in (3.8cm) by 2in (5.1cm) paddles that you cut out and glue them to the wheel with the shorter side down. Apply fast-drying super glue to the edge of the 1.5in (3.8cm) side of the paddles and press the glue side down to the wheel. Arrange the paddles slightly at an angle toward the center of the wheel.[15]Make sure all of the paddles are facing the same direction!7Attach the other wheel to the paddles and allow the glue to dry. Once youve glued all of the paddles to one of the wheels, apply glue to the edge of the paddles that is face up, making sure you cover the edge evenly with glue. Then take the other foam board wheel and gently press it to the glue to attach it. Allow the glue to dry for at least 1 hour.[16]Check that the glue is dry by pressing against the sides to make sure they dont wobble.8Push a skewer through the center of the wheel. Once the wheel has completely dried, carefully press the sharp end of a skewer through the center of the wheel on one side and push it until it penetrates through the other side of the wheel. Be careful not to crush the wheel as you push the skewer.[17]It can help to rotate the skewer as you press to push it through the board.Tip: If youre having trouble getting the skewer to fit through, you can make a small cut with your utility knife to help the skewer pierce the foam board. 9Secure 3floz (89mL) drinking cups to the paddles with glue. Once the glue around the paddles has completely dried, take your small drinking cups and apply glue to the bottom of them. Then attach them to the acute angle of the paddles so they can catch the water when its poured over the wheel. Allow the glue to dry for 1 hour before moving on.[18]10Trace and cut out 2 A shaped frames 12 inches (30cm) tall. To create the stand for your wheel, cut a 12in (30cm) tall frame in the shape of an A out of your foam board. Trace the shape first using a ruler and pencil for even and straight lines, then use your utility knife to cut out the shape.[19]Take the first A frame and use it to trace your second frame so they are the same size.11Carve out a V shaped knock out of the top of the A frames. At the top of the A, trace a 12 inch (1.3cm) V shape, then use your utility knife to cut out the shape. This will serve as a nock for you to rest the skewer on and allow your wheel to turn when water is poured over the cups.[20]12Cut out 4 rectangular 4in (10cm) by 6in (15cm) pieces. To support the frame so the wheel can stand upright, you need to cut out rectangular pieces to serve as a stand for the frame. Measure 4in (10cm) by 6in (15cm) rectangles using your ruler and pencil to make sure the lines are straight and even.[21]13Attach the legs to the A frames with glue to form a stand. Apply glue to the bottom legs of the frames and press each of them into the center of one of the rectangles. Hold them there for a moment to let the super glue adhere the 2 pieces before you do the next one.[22]Let the glue dry for another hour before you do anything else so the stand is sturdy and secure.14Place your water wheel in a sink and turn on the faucet. Once all of the glue has dried, place the wheel on the stand by resting the skewer into the nocks you cut out of the top of the frame. Then place your water wheel into a sink, beneath the faucet. Slowly turn on the faucet and let the water land in the cups to turn the wheel.[23]Adjust the flow of the faucet to speed up or slow down the spinning wheel. Advertisement Add New Question Question What are the materials needed for creating the water wheel? 15 x 20 inch (38.1 x 50.8 cm) waxed corrugated cardboard or foam board, box cutters, protractor, pen or pencil, ruler, pins or a hot glue gun, wooden skewer, miniature bucket and string. Question What is a water wheel used for? It's used for getting the energy of free-falling water and using that energy to power different things. Question Can primary kids use this? Yes, but make sure they have adult supervision and help. See more answers Ask a Question Advertisement Plastic spoonsUtility knifeScissorsStyrofoamStandard 9in (23cm) paper platesFast-drying super glueWooden skewersRulerPencilBucketProtractorFoam boardUtility knifeFast-drying super glue3floz (89mL) drinking cupsRulerPencil This article was co-authored by wikiHow Staff. Our trained team of editors and researchers validate articles for accuracy and comprehensiveness. wikiHow's Content Management Team carefully monitors the work from our editorial staff to ensure that each article is backed by trusted research and meets our high quality standards. This article has been viewed 241,438 times. Co-authors: 35 Updated: February 24, 2025 Views:241,438 Categories: Featured Articles | Outdoor Water Features | Water PrintSend fan mail to authors Thanks to all authors for creating a page that has been read 241,438 times. How to make a DIY water wheel at home for kidsThanks for joining in on another of our exciting episodes on Teaching kids science. If you're a fan of anything STEM: Makersgeneration is the place to be!!Now, get ready for an exciting DIY STEM for kids projectthat will spark creativity. For today's exercise, we will be learning about Water wheels and what they're used for, then proceed to make a simple DIY version using household materials such as plastic bottles, straws, and some glue. This project will help us learn about how energy can be converted from one form to another for various applications.Before we get into making our DIY water wheel, let's take a look at what a water wheel is and how it works.A water wheel is a large wheel driven by flowing water, used to work machinery or to raise water to a higher level. It converts the energy of flowing or falling water into useful power, typically in the form of rotational motion. A typical water wheel consists of three main components:Blade or bucket: This is the part of the system that directly takes the kinetic energy from the falling water.Wheel: The wheel is the part of the system that the bucket is attached to. This is the part that rotates.Axle: The axle acts at the fulcrum which holds the wheel in place during rotation.Workings: When the force of the moving or falling water is exerted against the blades, it pushes it in the opposite direction creating a rotation of the wheel which is then transmitted to machinery via the shaft of the wheel to be used for various purposes.Water wheels have been used for centuries as a means of harnessing water's energy for various purposes, such as grinding grain, powering machinery, or generating electricity. In the past, water wheels were commonly used for activities such as milling grains, sawing wood, and powering various industrial processes. While they have largely been replaced by more modern forms of power generation such as in modern hydroelectric power plants, water wheels are still used in some places for specific applications.Now that we know the workings of a conventional water wheel, let's try to replicate a simple version with DIY tools - starting from the materials needed:2 plastic bottles with covers6 plastic spoons1 Straw2 ToothpicksHot glue gun and glue sticksTapeScissorsNow, follow the steps below to make your DIY version of a water wheel:Using scissors, cut off half of the 6 spoon handles. (This will form the bucket section of our water wheel)Cut off the spoon handles.Remove the cover from the two bottles, stack them together by the rim then secure with glue. (This will form the wheelsection of the water wheel)Glue the two bottle covers together.Attach the spoons around the bottle cover with glue leaving equal spacing between them.Attach spoons to bottle cover.Make a small hole at the center of the two bottle covers, insert the two toothpicks (one on each side) then secure them with glue.Make a hole in the bottle cover and attach a toothpick.Take one of the plastic bottles: with your scissors, cut off a portion of the bottleneck. Next, cut off two identical portions vertically from the bottle. (This will form the axlesection of our water wheel)Cut out vertical portions from the bottle.Make two little holes in the two remaining vertical portions of the bottle. Pass the two ends of the toothpick through the holes in the bottle leaving the wheel in the middle. Finally, tape the ends of the toothpick to keep the wheel from falling out when spinning.Fix the wheel to the axle.For the falling water reservoir: take the second plastic bottle, make a little hole by the side (closer to the base), insert a straw then secure it in place with glue.Insert straw into the second bottle and secure with glue.For the final setup, place the water wheel inside a tray to avoid water spilling all over the place. Elevate the second bottle (water reservoir) to give the falling water some momentum.DIY Water wheel final setup.Workings - When the water hits the inside of the spoon, it pushes it in the opposite direction putting the wheel in perpetual rotational motion.Thanks for sticking around to this point!! Hope we learned something new about the water wheel.If this was an exciting project, then you'll love other projects we have in store below: You are looking for a nice 2024 summer campfor this year for your children focusing on STEM (Learn how to code, make robots, use 3D printing, droning and more) in the Washington DC, Maryland and Northern Virginia area. Come join us in Takoma Park Marylandwhere your children can learn and have fun.Check the following link for more details and the dates:STEM Summer Camps 2024 - Silver Spring MarylandYou and your children are looking for nice activities to have fun and learn new things and skills. Come join us for online classessuch as:Python coding for kids and teensCoding for elementary school studentsMake video gamesElectronicsDigital modeling (Create cars, rockets, rings, etc) for 3D printing and much morewith the following link: Online after-schoolsIf you are looking for morecool Arduino and STEM project ideasto do with your kids, take a look at these other activities:If you like online STEM activities, consider subscribing to the newsletter and social media for updates, and don't miss any STEM events. Don't forget to subscribe to the newsletter at the bottom of our website ''www.makersgeneration.net'' for more events, tutorials,and freebies.We can be reached at: contact@makersgeneration.netif any questions.In this concise guide, you will discover a step-by-step approach to constructing a functional water wheel. Whether you are an enthusiast eager to learn new DIY projects or a student researching for a science fair, this article provides a comprehensive breakdown of the process. From gathering the necessary materials to assembling the wheel, this guide offers clear instructions and helpful tips to ensure a successful endeavor. Embrace your inner engineer and join us on this exciting journey of crafting a working water wheel.Before building a water wheel, it is crucial to assess the availability of a water source in your desired location. Look for a nearby river, stream, or any other water body that can provide a consistent flow of water to power the wheel. Adequate water source availability is essential for the wheel to function efficiently and generate the desired amount of power.It is vital to check for any regulations or permits required before constructing a water wheel. Some areas may have specific laws regarding the use of water bodies for energy generation or restrictions on modifying natural habitats. You may need to consult with local authorities or obtain permits to ensure compliance with legal requirements.Another important factor to consider when choosing a location for your water wheel is the sites accessibility. Assess the ease of transportation of materials and tools to the site, as well as the convenience of maintenance and troubleshooting activities in the future. An easily accessible site will facilitate construction and upkeep, saving time and effort down the line.To build a water wheel, you will need several materials, including but not limited to:Wood planks for the wheel frame and support structureSturdy metal axle for the wheelSteel buckets or containers for collecting and transferring waterNails or screws for joining the componentsWaterproof sealant or paint for protecting the woodReinforcing materials such as brackets or braces for added stabilityMake a comprehensive list of all the materials required before starting the construction process. This will ensure that you have everything you need and minimize any delays or interruptions.In addition to the materials, you will need certain tools to construct the water wheel. Some of the essential tools include:Measuring tape or ruler for accurate measurementsSaw for cutting the wood planks to the desired sizeDrill for making holes and attaching componentsHammer or screwdriver for joining the parts togetherLevel for ensuring the wheel and support structure are properly alignedShovel for excavation, if necessaryMake sure you have all the necessary tools readily available to avoid any unnecessary delays during the construction process.The size of the water wheel depends on various factors, including the available water flow, desired power output, and available space. Consider the amount of power you intend to generate and the space constraints of your location. A larger wheel will generally produce more power but may require a higher water flow rate.The number of buckets attached to the water wheel should be determined based on the desired water flow and the wheels size. Typically, a greater number of buckets will allow for more efficient water collection and transfer. However, too many buckets may increase the overall weight and drag on the wheel, reducing its effectiveness.Calculating the water flow is crucial to determine whether the available water source will provide sufficient power for your needs. Measure the volume of water flowing through the source over a specific time period. This information will help you assess whether the water flow is adequate for your desired power output and whether adjustments are needed.Start by preparing the base for the wheel frame. Clear the area of any debris or obstacles that may hinder the construction process. Level the ground to ensure a stable and balanced foundation for the wheel frame.Constructing the wheel frame involves assembling the wooden planks to form the desired shape and size of the wheel. Use the appropriate measurements and ensure that the frame is sturdy and well-aligned. Consider reinforcing the joints with brackets or braces for added stability.Once the wheel frame is complete, attach the metal axle to the frame. The axle should run through the center of the wheel and allow it to rotate smoothly. Ensure that the axle is securely fastened to the frame and centered, as any misalignment can cause the wheel to wobble or function improperly.Selecting the right materials for the buckets is essential to ensure their durability and efficiency. Consider using sturdy and waterproof materials such as steel or durable plastic. Avoid materials that may deteriorate or rust over time, as this can affect the buckets performance.Cut the chosen material into appropriately sized pieces for the buckets. The size should allow for efficient water collection and transfer while maintaining a balance with the wheels design. Shape the pieces into bucket-like structures that can hold and transport water effectively.Attach the buckets to the wheel at equal intervals. Use nails, screws, or other appropriate fasteners to secure the buckets firmly to the wheel. Ensure that the buckets are evenly spaced and properly aligned to facilitate smooth water collection and transfer.Design the water channel route based on the desired flow and the location of the water wheel. The channel should have a gentle slope and lead the water directly into the buckets attached to the wheel. Proper channel design will maximize water flow efficiency and prevent water loss.Excavate the channel according to the designed route. Ensure that the channel is wide and deep enough to accommodate the desired water flow. Remove any obstructions, rocks, or debris that may hinder the smooth flow of water.To prevent erosion and maintain the integrity of the water channel, secure the channel walls with appropriate materials such as rocks, bricks, or concrete. Reinforce the sides of the channel to prevent water leakage and maintain a consistent flow into the wheel buckets.Carefully place the constructed wheel onto the axle, ensuring a proper fit. The wheel should rotate smoothly and without any obstructions. Make any necessary adjustments to ensure the wheel is balanced and centered on the axle.Connect each bucket to the wheel securely. Use nails, screws, or other suitable fasteners to attach the buckets to the wheel at their designated positions. Double-check the alignment and stability of each bucket to ensure efficient water collection and transfer.Once the buckets are attached to the wheel, secure the entire wheel assembly to the support structure. Ensure that the wheel is aligned properly and rotates freely. Use appropriate fasteners to secure the wheel, taking into account any adjustments needed for optimal performance.Construct the support structure frame using the prepared wooden planks. The frame should be sturdy and able to support the weight of the wheel assembly and any additional components. Follow the appropriate measurements and ensure the frame is well-aligned and evenly balanced.To enhance stability and prevent any potential swaying or wobbling, add crossbars to the support structure frame. These crossbars will provide additional support and reinforce the overall stability of the water wheel system.Once the support structure frame is completed, attach the wheel assembly to the frame firmly. Ensure that the wheel is centered within the frame and rotates smoothly. Use appropriate fasteners to secure the wheel assembly, taking into consideration any adjustments needed to achieve optimal performance.Designing the Water Entry PointDesign the water entry point based on the location of the water source and the desired water flow into the wheel. Create a path for the water to enter the water channel, taking into account any necessary redirection or reinforcement to optimize the flow.Attach the water inlet to the water channel at the designated entry point. The inlet should be securely fastened to prevent water leakage and ensure a smooth and consistent flow into the channel. Use appropriate seals or waterproofing materials to ensure a tight connection.Once the water inlet is attached, adjust the water flow to the desired level. Modify the channel or the inlet if necessary to achieve the optimal balance between water flow and the wheels design. Regularly monitor and adjust the water flow to maintain efficient performance.Maintaining and TroubleshootingRegularly inspect the water wheel system for any signs of damage, wear, or malfunction. Check the wheel, buckets, support structure, and water channel for any cracks, loose components, or leaks. Promptly repair or replace any damaged parts to avoid further issues and maintain optimal performance.Periodically clean the wheel, buckets, support structure, and water channel to remove any debris or blockages. Lubricate the axle and moving parts to ensure smooth rotation and minimize friction. Regular maintenance will prolong the lifespan of the water wheel and maximize its efficiency.In case of any problems or issues with the water wheel, troubleshoot the specific area affected. Check for misaligned buckets, loose connections, or insufficient water flow. Refer to the construction guidelines and make any necessary adjustments or repairs to resolve the issue and restore the functionality of the water wheel.,the free encyclopedia that anyone can edit.116,704 active editors 7,002,279 articles in EnglishThe English-language Wikipedia thanks its contributors for creating more than seven million articles! Learn how you can take part in the encyclopedia's continued improvement.Logo of Namco LimitedNamco Limited was a Japanese multinational video game and entertainment company founded in 1955 by Masaya Nakamura which operated video arcades, amusement parks, produced video games, films, toys, and arcade cabinets. In the 1960s, it manufactured electro-mechanical arcade games such as the 1965 game Periscope. It entered the video game industry after acquiring the Japanese division of Atari in 1974, distributing games such as Breakout and Gee Bee. Among Namco's first major hits was the fixed shooter Galaxian in 1979 and Pac-Man in 1980. During the golden age of arcade video games in the early 1980s, Namco released titles such as Galaga, Xevious, and Pole Position. Namco entered the home market in 1984 with conversions of its arcade games. Namco produced several multi-million-selling game franchises, such as Pac-Man, Galaxian, Tekken, Tales, Ridge Racer, Ace Combat, and Taiko no Tatsujin. In 2006, Namco merged with Bandai to form Bandai Namco Holdings. (Fullarticle...)Recently featured: The Boat Race 2018Radar, Gun Laying, Mk.I and Mk.IIAndrea NavageroArchiveBy emailMore featured articlesAboutSylvilagus aquaticus... that the swamp rabbit (pictured) is both territorial and a great swimmer?... that no other month in a calendar year starts with the same day of the week as June?... that Samantha Kane led an unsuccessful takeover bid for Sheffield United F.C. and, after a gender transition, was interviewed to become its chief executive?... that the first version of the Amtrak Susquehanna River Bridge was heavily damaged by a tornado during construction?... that medicine dean Sjahriar Rasad was accused of being involved in a conspiracy to assassinate Indonesian president Sukarno?... that the U.S. Supreme Court is currently deciding whether the family who lived in a house wrongly raided by the FBI may sue the government?... that Romanian sports shooter Petre Cimigiu demanded the elimination of a pension gap between Olympic and non-Olympic champions, such as himself?... that the novel Looking Glass Girl was launched at Coventry Central Library to highlight the threat of 17 libraries in the city closing?... that John P. Morris won a strike by hiding pigeons in fur coats?ArchiveStart a new articleNominate an articleNgg wa Thiong'oKenyan writer and activist Ngg wa Thiong'o (pictured) dies at the age of 87.In sumo, nosato Daiki is promoted to yokozuna.In association football, Liverpool win the Premier League title.In the Surinamese general election, the National Democratic Party wins the most seats in the National Assembly.In motor racing, lex Palou wins the Indianapolis 500.Ongoing: Gaza warM23 campaignRussian invasion of UkrainetimelineSudanese civil wartimelineRecent deaths: Harrison Ruffin TylerPhil RobertsonMary K. GaillardPeter DavidAlan YentobGerry ConnollyNominate an articleJune 1Wreckage of American Airlines Flight 14201676 Scanian War: The Swedish warship Kronan, one of the largest ships in the world at the time, sank at the Battle of land with the loss of around 800 men.1857 The Revolution of the Ganhadores, the first general strike in Brazil, began in Salvador, Bahia.1974 In an informal article in a medical journal, Henry Heimlich introduced the concept of abdominal thrusts, commonly known as the Heimlich maneuver, to treat victims of choking.1988 Group representation constituencies were introduced to the parliament of Singapore.1999 On landing at Little Rock National Airport in the U.S. state of Arkansas, American Airlines Flight 1420 overran the runway and crashed (wreckage pictured), resulting in 11 deaths.Kitabatake Chikafusa (d.1354)Louisa Caroline Tuthill (d.1879)Tom Holland (b.1996)Faizul Waheed (d.2021)More anniversaries: May 31June 1June 2ArchiveBy emailList of days of the yearAboutDrosera capensis, commonly known as the Cape sundew, is a perennial rosette-forming carnivorous plant in the family Droseraceae. It is endemic to the Western Cape and Eastern Cape provinces of South Africa. As in all sundews, the leaves are covered in stalked, mucilage-secreting glands (or 'tentacles') that attract, trap, and digest arthropod prey. When prey is captured, the tentacles bend inward and the leaves curl around it, preventing escape and enhancing digestion by increasing the surface area of the leaf in contact with the prey. This time-lapse video shows a D.capensis leaf curling up around a Mediterranean fruit fly over a period of approximately six hours.Video credit: Scott SchillerRecently featured: Cucumis metuliferusIgnace TonenAustralian white ibisArchiveMore featured picturesCommunity portal The central hub for editors, with resources, links, tasks, and announcements.Village pump Forum for discussions about Wikipedia itself, including policies and technical issues.Site news Sources of news about Wikipedia and the broader Wikimedia movement.Teahouse Ask basic questions about using or editing Wikipedia.Help desk Ask questions about using or editing Wikipedia.Reference desk Ask research questions about encyclopedic topics.Content portals A unique way to navigate the encyclopedia.Wikipedia is written by volunteer editors and hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other volunteer projects: CommonsFree media repository MediaWikiWiki software development Meta-WikiWikimedia project coordination WikibooksFree textbooks and manuals WikidataFree knowledge base WikinewsFree-content news WikiquoteCollection of quotations WikisourceFree-content library WikispeciesDirectory of species WikiversityFree learning tools WikivoyageFree travel guide WiktionaryDictionary and thesaurusThis Wikipedia is written in English. Many other Wikipedias are available; some of the largest are listed below. 1,000,000+ articles DeutschEspaolFranaisItalianoNederlandsPolskiPortugusSvenskaTing Vit 250,000+ articles Bahasa IndonesiaBahasa MelayuBn-lm-gCataletinaDanskEestiEsperantoEuskaraMagyarNorsk bokmlRomnSimple EnglishSloveninaSrpskiSrpskohrvatskiSuomiTrkeOzbekcha 50,000+ articles AsturianuAzrbaycancaBosanskiFryskGaeilgeGalegoHrvatskiKurdLatvieuLietuviNorsk nynorskShqipSlovenina Retrieved from " 2This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources:"1676"news newspapers books scholar JSTOR (September 2017) (Learn how and when to remove this message)Calendar yearYearsMillennium2ndmillenniumCenturies16thcentury17thcentury 18thcenturyDecades1650s1660s1670s 1680s1690sYears1673167416751676 167716781679vteSeptember 19: Virginian rebels commanded by Nathaniel Bacon burn down Jamestown, Virginia during war against British governor.1676 by topicArts and scienceArchitectureArtLiteratureMusicScienceLeadersState leadersColonial governorsReligious leadersBirth and death categoriesBirths DeathsEstablish

1606)January 13 Isaac Commelin, Dutch historian (b. 1598)January 14 Francesco Cavalli, Italian composer (b. 1602)January 16 Georg Arnold, Austrian musician (b. 1621)January 29 Tsar Alexis of Russia (b. 1629)February 3 Franois Chauveau, French painter (b. 1613)February 14 Abraham Bosse, French engraver and artist (b. c. 1604)February 20 Hugh Forth, English politician (b. 1610)March 2 Juan de Almoguera, Roman Catholic prelate who served as Archbishop of Lima (16731676) and Bishop of Arequipa (16591673) (b. 1605)March 21 Henri Sauval, French historian (b. 1623)March 22 Lady Anne Clifford, 14th Baroness de Clifford (b. 1590)March 23 Paul Wrtz, Swedish general (b. 1612)March 27 Bernardino de Rebolledo, Spanish poet, soldier and diplomat (b. 1597)April 5 John Winthrop the Younger, Governor of Connecticut (b. 1606)April 8 Claudia Felicitas of Austria, Holy Roman Empress (b. 1653)April 20 John Clarke, English physician (b. 1609)April 29 Michiel de Ruyter, Dutch admiral (b. 1607)May 5 Sir Richard Lloyd, English politician (b. 1606)May 7 Henri Valois, French historian (b. 1603)May 25 Johann Rahn, Swiss mathematician (b. 1622)May 26 Thomas Rouse, English politician (b. 1608)June 1 Karl Kaspar von der Leyen, German Catholic archbishop (b. 1618)June 7 Paul Gerhardt, German hymnist (b. 1606)June 13 Princess Henriette Adelaide of Savoy, wife of Ferdinand Maria (b. 1636)June 16 Nathaniel Dickinson, American settler (b. 1601)June 29 Hendrik van der Borcht II, German painter (b. 1614)July Jesse Wharton colonial governor of MarylandJuly 5 Carl Gustaf Wrangel, Swedish soldier (b. 1613)July 8 Francis I Rkczi, Hungarian prince of Transylvania (b. 1645)July 12 Duchess Elisabeth Sophie of Mecklenburg, German poet composer and (by marriage) Duchess of Brunswick-Lneburg (b. 1613)July 22 Pope Clement X (b. 1590)July 25 Franois Hdelin, abb d'Aubignac, French writer (b. 1604)July 17 Madame de Brinvilliers, French murderer (b. 1630)August 11 Hans Jakob Christoffel von Grimmelshausen, German writer (b. 1621)August 14 Nicol Sagredo, 105th Doge of Venice (b. 1606)August 28 Margravine Louise Charlotte of Brandenburg, Duchess of Courland by marriage (16451676) (b. 1617)August 31 Lars Stigzelius, Swedish Lutheran archbishop (b. 1598)September 4 John Ogilby, Scottish-born impresario and cartographer active in Dublin and London (b. 1600)September 9 Paul de Chomedey, Sieur de Maisonneuve, French military officer, founder of Montreal in New France (b. 1612)September 10 Gerrard Winstanley, English religious reformer (b. 1609)September 11 Anna de' Medici, Archduchess of Austria (b. 1616)September 17 Sabbatai Zevi, Montenegrin rabbi, kabbalist and founder of the Jewish Sabbatean movement (b. 1626)September 28 Anna Maria Antig, Spanish Catholic nun (b. 1602)October 6 Claudia Rusca, Italian composer, singer, and organist (b. 1593)October 7 Richard Neville, English soldier and MP (b. 1615)October 10 Sebastian Knpfer, German composer (b. 1633)October 13 Juan de Arellano, Spanish artist (b. 1614)October 15 Simon de Vos, Flemish painter (b. 1603)October 26 Nathaniel Bacon, Virginian colonist and instigator of Bacon's Rebellion (b. circa 1640s)October 28 Jean Desmarets, French writer (b. 1595)November 1 Gisbertus Voetius, Dutch theologian (b. 1589)November 9 Allart Pieter van Jongestall, Dutch jurist, politician, and diplomat (b. 1612)November 12 Shang Kexi, Chinese general (b. 1604)December 11 Roland Frart de Chambray, French writer (b. 1606)December 12 William Morice, English politician (b. 1602)December 18 Edward Benlowes, English poet (b. 1603)December 19 Adolph, Prince of Nassau-Schaumburg and Count of Nassau-Schaumburg (16531676) (b. 1629)December 25Matthew Hale, Lord Chief Justice of England (b. 1609)William Cavendish, 1st Duke of Newcastle-upon-Tyne, English soldier, politician, writer (b. 1592)^ Procedure 373 of the Guatemalan Real Audiencia in the General Archive of Indias.^ Walford, Cornelius, ed. (1876). "Fires, Great". The Insurance Cyclopeadia: Being an Historical Treasury of Events and Circumstances Connected with the Origin and Progress of Insurance. C. & E. Layton. p.43.^ Hubbard, William (1848). A General History of New England, from the discovery to MDCLXXX. Boston: Little, Brown.^ "Leigh Rayment's list of baronets". Archived from the original on October 21, 2019.^ "America's First Coffeehouse". Massachusetts Travel Journal. Archived from the original on September 27, 2010. Retrieved September 21, 2010.^ "Robert Walpole, 1st earl of Orford | prime minister of Great Britain". Encyclopedia Britannica. Retrieved September 1, 2021.Retrieved from " 3One hundred years, from 1501 to 1600This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources:"16th century"news newspapers books scholar JSTOR (September 2022) (Learn how and when to remove this message)Millennia2ndmillenniumCenturies15thcentury16thcentury17thcenturyTimelines15thcentury16thcentury17thcenturyState leaders15thcentury16thcentury17thcenturyDecades1500s1510s1520s1530s1540s1550s1560s1570s1580s1590sCategories:Births Deaths Establishments DisestablishmentsvteThe world map by the Italian Amerigo Vespucci (from whose name the word America is derived) and Belgian Gerardus Mercator shows (besides the classical continents Europe, Africa, and Asia) the Americas as America sive India Nova', New Guinea, and other islands of Southeast Asia, as well as a hypothetical Arctic continent and a yet undetermined Terra Australis.[1]The 16th century began with the Julian year 1501 (represented by the Roman numerals MDI) and ended with either the Julian or the Gregorian year 1600 (MDC), depending on the reckoning used (the Gregorian calendar introduced a lapse of 10 days in October 1582).[1]The Renaissance in Italy and Europe saw the emergence of important artists, authors and scientists, and led to the foundation of important subjects which include accounting and political science. Copernicus proposed the heliocentric universe, which was met with strong resistance, and Tycho Brahe refuted the theory of celestial spheres through observational measurement of the 1572 appearance of a Milky Way supernova. These events directly challenged the long-held notion of an immutable universe supported by Ptolemy and Aristotle, and led to major revolutions in astronomy and science. Galileo Galilei became a champion of the new sciences, invented the first thermometer and made substantial contributions in the fields of physics and astronomy, becoming a major figure in the Scientific Revolution in Europe.Spain and Portugal colonized large parts of Central and South America, followed by France and England in Northern America and the Lesser Antilles. The Portuguese became the masters of trade between Brazil, the coasts of Africa, and their possessions in the Indies, whereas the Spanish came to dominate the Greater Antilles, Mexico, Peru, and opened trade across the Pacific Ocean, linking the Americas with the Indies. English and French privateers began to practice persistent theft of Spanish and Portuguese treasures. This era of colonialism established mercantilism as the leading school of economic thought, where the economic system was viewed as a zero-sum game in which any gain by one party required a loss by another. The mercantilist doctrine encouraged the many intra-European wars of the period and arguably fueled European expansion and imperialism throughout the world until the 19th century or early 20th century.The Reformation in central and northern Europe gave a major blow to the authority of the papacy and the Catholic Church. In England, the British-Italian Alberico Gentili wrote the first book on public international law and divided secularism from canon law and Catholic theology. European politics became dominated by religious conflicts, with the groundwork for the epochal Thirty Years' War being laid towards the end of the century.In the Middle East, the Ottoman Empire continued to expand, with the sultan taking the title of caliph, while dealing with a resurgent Persia. Iran and Iraq were caught by a major popularity of the Shia sect of Islam under the rule of the Safavid dynasty of warrior-mystics, providing grounds for a Persia independent of the majority-Sunni Muslim world.[2]In the Indian subcontinent, following the defeat of the Delhi Sultanate and Vijayanagara Empire, new powers emerged, the Sur Empire founded by Sher Shah Suri, Deccan sultanates, Rajput states, and the Mughal Empire[3] by Emperor Babur, a direct descendant of Timur and Genghis Khan.[4] His successors Humayun and Akbar, enlarged the empire to include most of South Asia.Japan suffered a severe civil war at this time, known as the Sengoku period, and emerged from it as a unified nation under Toyotomi Hideyoshi. China was ruled by the Ming dynasty, which was becoming increasingly isolationist, coming into conflict with Japan over the control of Korea as well as Japanese pirates.In Africa, Christianity had begun to spread in Central Africa and Southern Africa. Until the Scramble for Africa in the late 19th century, most of Africa was left uncolonized.For timelines of earlier events, see 15th century and Timeline of the Middle Ages.Mona Lisa, by Leonardo da Vinci, c.15031506, one of the world's best-known paintings1501: Michelangelo returns to his native Florence to begin work on the statue David.1501: Safavid dynasty reunifies Iran and rules over it until 1736. Safavids adopt a Shia branch of Islam.[5]1501: First Battle of Cannanore between the Third Portuguese Armada and Kingdom of Cochin under Joo da Nova and Zamorin of Kozhikode's navy marks the beginning of Portuguese conflicts in the Indian Ocean.1502: First reported African slaves in the New World1502: The Crimean Khanate sacks Sarai in the Golden Horde, ending its existence.1503: Spain defeats France at the Battle of Cerignola. Considered to be the first battle in history won by gunpowder small arms.1503: Leonardo da Vinci begins painting the Mona Lisa and completes it three years later.1503: Nostradamus is born on either December 14 or December 21.1504: A period of drought, with famine in all of Spain.1504: Death of Isabella I of Castile; Joanna of Castile becomes the Queen.1504: Foundation of the Sultanate of Sennar by Amara Dunqas, in what is modern Sudan1505: Zhengde Emperor ascends the throne of Ming dynasty.1505: Martin Luther enters St. Augustine's Monastery at Erfurt, Germany, on 17 July and begins his journey to instigating the Reformation.1505: Sultan Trenggono builds the first Muslim kingdom in Java, called Demak, in Indonesia. Many other small kingdoms were established in other islands to fight against Portuguese. Each kingdom introduced local language as a way of communication and unity.1506: Leonardo da Vinci completes the Mona Lisa.1506: King Afonso I of Kongo wins the battle of Mbanza Kongo, resulting in Catholicism becoming Kongo's state religion.Battle of Cerignola: El Gran Capitan finds the corpse of Louis d'Armagnac, Duke of Nemours1506: At least two thousand converted Jews are massacred in a Lisbon riot, Portugal.1506: Christopher Columbus dies in Valladolid, Spain.1506: Poland is invaded by Tatars from the Crimean Khanate.1507: The first recorded epidemic of smallpox in the New World on the island of Hispaniola. It devastates the native Tano population.[6]1507: Afonso de Albuquerque conquered Hormuz and Muscat, among other bases in the Persian Gulf, taking control of the region at the entrance of the Gulf.1508: The Christian-Islamic power struggle in Europe and West Asia spills over into the Indian Ocean as Battle of Chaul during the Portuguese-Mamluk War15081512: Michelangelo paints the Sistine Chapel ceiling.1509: The defeat of joint fleet of the Sultan of Gujarat, the Mamlk Burji Sultanate of Egypt, and the Zamorin of Calicut with support of the Republic of Venice and the Ottoman Empire in Battle of Diu marks the beginning of Portuguese dominance of the Spice trade and the Indian Ocean.1509: The Portuguese king sends Diogo Lopes de Sequeira to find Malacca, the eastern terminus of Asian trade. After initially receiving Sequeira, Sultan Mahmud Shah captures and/or kills several of his men and attempts an assault on the four Portuguese ships, which escape.[7] The Javanese fleet is also destroyed in Malacca.1509: Krishnadevaraya ascends the throne of Vijayanagara Empire.Afonso de Albuquerque15091510: The 'great plague' in various parts of Tudor England.[8]1510: Afonso de Albuquerque of Portugal conquers Goa in India.1511: Afonso de Albuquerque of Portugal conquers Malacca, the capital of the Sultanate of Malacca in present-day Malaysia.1512: Copernicus writes Commentariolus, and proclaims the Sun the center of the Solar System.1512: The southern part (historical core) of the Kingdom of Navarre is invaded by Castile and Aragon.1512: Qutb Shahi dynasty, founded by Quli Qutb Mulk, rules Golconda Sultanate until 1687.1512: The first Portuguese exploratory expedition was sent eastward from Malacca (in present-day Malaysia) to search for the 'Spice Islands' (Maluku) led by Francisco Serro. Serro is shipwrecked but struggles on to Hitu (northern Ambon) and wins the favour of the local rulers.[9]1513: Machiavelli writes The Prince, a treatise about political philosophy1513: The Portuguese mariner Jorge Ivares lands at Macau, China, during the Ming dynasty.1513: Henry VIII defeats the French at the Battle of the Spurs.1513: The Battle of Flodden Field in which invading Scots are defeated by Henry VIII's forces.1513: Sultan Selim I ("The Grim") orders the massacre of Shia Muslims in Anatolia (present-day Turkey).1513: Vasco Nez de Balboa, in service of Spain arrives at the Pacific Ocean (which he called Mar del Sur) across the Isthmus of Panama. He was the first European to do so.1514: The Battle of Orsha halts Muscovy's expansion into Eastern Europe.1514: Dzsa rebellion (peasant revolt) in Hungary.Martin Luther initiated the Reformation with his Ninety-five Theses in 1517.1514: The Battle of Chaldiran, the Ottoman Empire gains decisive victory against Safavid dynasty.1515: Ascension of Francis I of France as King of France following the death of Louis XII.1515: The Ottoman Empire wrests Eastern Anatolia from the Safavids after the Battle of Chaldiran.1515: The Ottomans conquer the last beyliks of Anatolia, the Dulkadirs and the Ramadanids.15161517: The Ottomans defeat the Mamluks and gain control of Egypt, Arabia, and the Levant.1517: The Sweating sickness epidemic in Tudor England.[10]1517: The Reformation begins when Martin Luther posts his Ninety-five Theses in Saxony.1518: The Treaty of London was a non-aggression pact between the major European nations. The signatories were Burgundy, France, England, the Holy Roman Empire, the Netherlands, the Papal States and Spain, all of whom agreed not to attack one another and to come to the aid of any that were under attack.1518: Mir Chakar Khan Rind leaves Baluchistan and settles in Punjab.1518: Leo Africanus, also known as al-Hasan ibn Muhammad al-Wazzan al-Fasi, an Andalusian Berber diplomat who is best known for his book Descrittione dellAfrica (Description of Africa), is captured by Spanish pirates; he is taken to Rome and presented to Pope Leo X.1518: The dancing plague of 1518 begins in Strasbourg, lasting for about one month.1519: Leonardo da Vinci dies of natural causes on May 2.Europe at the time of the accession of Charles V in 15191519: Wang Yangming, the Chinese philosopher and governor of Jiangxi province, describes his intent to use the firepower of the fo-lang-ji, a breech-loading Portuguese culverin, in order to suppress the rebellion of Prince Zhu Chenhao.1519: Barbary pirates led by Hayreddin Barbarossa, a Turk appointed to ruling position in Algiers by the Ottoman Empire, raid Provence and Toulon in southern France.1519: Death of Emperor Maximilian; Charles I of Austria, Spain, and the Low Countries becomes Emperor of Holy Roman Empire as Charles V, Holy Roman Emperor (ruled until 1556).15191522: Spanish expedition commanded by Magellan and Elcano are the first to Circumnavigate the Earth.15191521: Hernn Corts leads the Spanish conquest of the Aztec Empire.Ferdinand Magellan led the first expedition that circumnavigated the globe in 15191522.15201566: The reign of Suleiman the Magnificent marks the zenith of the Ottoman Empire.1520: The first European diplomatic mission to Ethiopia, sent by the Portuguese, arrives at Massawa 9 April, and reaches the imperial encampment of Emperor Dawit II in Shewa 9 October.1520: Vijayanagara Empire forces under Krishnadevaraya defeat the Adil Shahi under at the Battle of Raichur1520: Sultan Ali Mughayat Shah of Aceh begins an expansionist campaign capturing Daya on the west Sumatran coast (in present-day Indonesia), and the pepper and gold producing lands on the east coast.1520: The Portuguese established a trading post in the village of Lamakera on the eastern side of Solor (in present-day Indonesia) as a transit harbour between Maluku and Malacca.1521: Belgrade (in present-day Serbia) is captured by the Ottoman Empire.1521: After building fortifications at Tuen Mun, the Portuguese attempt to invade Ming dynasty China, but are expelled by Chinese naval forces.1521: Philippines encountered by Ferdinand Magellan. He was later killed in the Battle of Mactan in central Philippines in the same year.1521: Jiajing Emperor ascended the throne of Ming dynasty, China.1521: November, Ferdinand Magellan's expedition reaches Maluku (in present-day Indonesia) and after trade with Ternate returns to Europe with a load of cloves.1521: Pati Unus leads the invasion of Malacca (in present-day Malaysia) against the Portuguese occupation. Pati Unus was killed in this battle, and was succeeded by his brother, sultan Trenggana.1522: Rhodes falls to the Ottomans of Suleiman the Magnificent.[11]Sack of Rome of 1527 by Charles V's forces (painting by Johannes Lingelbach)1522: The Portuguese ally themselves with the rulers of Ternate (in present-day Indonesia) and begin construction of a fort.[9]1522: August, Luso-Sundanese Treaty signed between Portugal and Sunda Kingdom granted Portuguese permit to build fortress in Sunda Kelapa.1523: Sweden gains independence from the Kalmar Union.1523: The Cacao bean is introduced to Spain by Hernn Corts15241525: German Peasants' War in the Holy Roman Empire.1524: Giovanni da Verrazzano is the first European to explore the Atlantic coast of North America between South Carolina and Newfoundland.1524: Ismail I, the founder of Safavid dynasty, dies and Tahmasp I becomes king.Gun-wielding Ottoman Janissaries and defending Knights of Saint John at the siege of Rhodes in 1522, from an Ottoman manuscript1525: Timurid Empire forces under Babur defeat the Lodi dynasty at the First Battle of Panipat, end of the Delhi Sultanate.1525: German and Spanish forces defeat France at the Battle of Pavia, Francis I of France is captured.1526: The Ottomans defeat the Kingdom of Hungary at the Battle of Mohcs.1526: Mughal Empire, founded by Babur.1527: Sack of Rome with Pope Clement VII escaping and the Swiss Guards defending the Vatican being killed. The sack of the city of Rome considered the end of the Italian Renaissance.1527: Protestant Reformation begins in Sweden.1527: The last ruler of Majapahit falls from power. This state (located in present-day Indonesia) was finally extinguished at the hands of the Demak. A large number of courtiers, artisans, priests, and members of the royalty moved east to the island of Bali; however, the power and the seat of government transferred to Demak under the leadership of Pangeran, later Sultan Fatah.1527: June 22, The Javanese Prince Fatahillah of the Cirebon Sultanate successfully defeated the Portuguese armed forces at the site of the Sunda Kelapa Harbor. The city was then renamed Jayakarta, meaning "a glorious victory." This eventful day came to be acknowledged as Jakarta's Founding Anniversary.1527: Mughal Empire forces defeat the Rajput led by Rana Sanga of Mewar at the Battle of Khanwa1529: The Austrians defeat the Ottoman Empire at the siege of Vienna.1529: Treaty of Zaragoza defined the antimeridian of Tordesillas attributing the Moluccas to Portugal and Philippines to Spain.1529: Imam Ahmad Gurey defeats the Ethiopian Emperor Dawit II in the Battle of Shimbra Kure, the opening clash of the EthiopianAdal War.Spanish conquistadors with their Tlaxcallan allies fighting against the Otomies of Metztitlan in present-day Mexico, a 16th-century codex15311532: The Church of England breaks away from the Catholic Church and recognizes King Henry VIII as the head of the Church.1531: The Inca Civil War is fought between the two brothers, Atahualpa and Huscar.1532: Francisco Pizarro leads the Spanish conquest of the Inca Empire.1532: Foundation of So Vicente, the first permanent Portuguese settlement in the Americas.1533: Anne Boleyn becomes Queen of England.1533: Elizabeth Tudor is born.1534: Jacques Cartier claims Canada for France.1534: The Ottomans capture Baghdad from the Safavids.1534: Affair of the Placards, where King Francis I becomes more active in repression of French Protestants.1535: The Mnster Rebellion, an attempt of radical, millennialist, Anabaptists to establish a theocracy, ends in bloodshed.1535: The Portuguese in Ternate depose Sultan Tabariji (or Tabarija) and send him to Portuguese Goa where he converts to Christianity and bequeaths his Portuguese godfather Jordao de Freitas the island of Ambon.[12] Hairun becomes the next sultan.1536: Catherine of Aragon dies in Kimbolton Castle, in England.Territorial expansion of the Ottoman Empire under Suleiman (in red and orange)1536: In England, Anne Boleyn is beheaded for adultery and treason.1536: Establishment of the Inquisition in Portugal.1536: Foundation of Buenos Aires (in present-day Argentina) by Pedro de Mendoza.1537: The Portuguese establish Recife in Pernambuco, north-east of Brazil.1537: William Tyndale's partial translation of the Bible into English is published, which would eventually be incorporated into the King James Bible.1538: Gonzalo Jimnez de Quesada founds Bogot.1538: SpanishVenetian fleet is defeated by the Ottoman Turks at the Battle of Preveza.1539: Hernando de Soto explores inland North America.Nicolaus Copernicus1540: The Society of Jesus, or the Jesuits, is founded by Ignatius of Loyola and six companions with the approval of Pope Paul III.1540: Sher Shah Suri founds the Suri dynasty in South Asia, an ethnic Pashtun (Pathan) of the house of Sur, who supplanted the Mughal dynasty as rulers of North India during the reign of the relatively ineffectual second Mughal emperor Humayun. Sher Shah Suri decisively defeats Humayun in the Battle of Bilgram (May 17, 1540).1541: Pedro de Valdivia founds Santiago in Chile.1541: An Algerian military campaign by Charles V of Spain (Habsburg) is unsuccessful.1541: Amazon River is encountered and explored by Francisco de Orellana.1541: Capture of Buda and the absorption of the major part of Hungary by the Ottoman Empire.1541: Sahib I Giray of Crimea invades Russia.1542: The Italian War of 15421546 War resumes between Francis I of France and Emperor Charles V. This time Henry VIII is allied with the Emperor, while James V of Scotland and Sultan Suleiman I are allied with the French.1542: Akbar The Great is born in the Rajput Umarkot Fort1542: Spanish explorer Ruy Lpez de Villalobos named the island of Samar and Leyte Las Islas Filipinas honoring Philip II of Spain and became the official name of the archipelago.1543: Ethiopian/Portuguese troops defeat the Adal army led by Imam Ahmad Gurey at the Battle of Wayna Daga; Imam Ahmad Gurey is killed at this battle.1543: Copernicus publishes his theory that the Earth and the other planets revolve around the Sun1543: The Nanban trade period begins after Portuguese traders make contact with Japan.1544: The French defeat an ImperialSpanish army at the Battle of Ceresole.Scenes of everyday life in Ming China, by Qiu Ying1544: Battle of the Shirts in Scotland. The Frasers and Macdonalds of Clan Ranald fight over a disputed chiefship; reportedly, 5 Frasers and 8 Macdonalds survive.1545: Songhai forces sack the Malian capital of Niani1545: The Council of Trent meets for the first time in Trent (in northern Italy).1546: Michelangelo Buonarroti is made chief architect of St. Peter's Basilica.1546: Francis Xavier works among the peoples of Ambon, Ternate and Morotai (Moro) laying the foundations for a permanent mission. (to 1547)1547: Henry VIII dies in the Palace of Whitehall on 28 January at the age of 55.1547: Francis I dies in the Chteau de Rambouillet on 31 March at the age of 52.1547: Edward VI becomes King of England and Ireland on 28 January and is crowned on 20 February at the age of 9.1547: Emperor Charles V decisively dismantles the Schmalkaldic League at the Battle of Mhlberg.1547: Grand Prince Ivan the Terrible is crowned tsar of (All) Russia, thenceforth becoming the first Russian tsar.1548: Battle of Uedahara: Firearms are used for the first time on the battlefield in Japan, and Takeda Shingen is defeated by Murakami Yoshikiyo.1548: Askia Daoud, who reigned from 1548 to 1583, establishes public libraries in Timbuktu (in present-day Mali).1548: The Ming dynasty government of China issues a decree banning all foreign trade and closes down all seaports along the coast; these Hai jin laws came during the Wokou wars with Japanese pirates.1549: Tom de Sousa establishes Salvador in Bahia, north-east of Brazil.1549: Arya Penangsang with the support of his teacher, Sunan Kudus, avenges the death of Raden Kikin by sending an envoy named Rangkud to kill Sunan Prawoto by Keris Kyai Satan Kober (in present-day Indonesia).The Islamic gunpowder empires: Mughal Army artillerymen during the reign of Jalaluddin Akbar1550: The architect Mimar Sinan builds the Sleymaniye Mosque in Istanbul.1550: Mongols led by Altan Khan invade China and besiege Beijing.15501551: Valladolid debate concerning the human rights of the Indigenous people of the Americas.1551: Fifth outbreak of sweating sickness in England. John Caius of Shrewsbury writes the first full contemporary account of the symptoms of the disease.1551: North African pirates enslave the entire population of the Maltese island Gozo, between 5,000 and 6,000, sending them to Libya.1552: Russia conquers the Khanate of Kazan in central Asia.1552: Jesuit China Mission, Francis Xavier dies.1553: Mary Tudor becomes the first queen regnant of England and restores the Church of England under Papal authority.1553: The Portuguese found a settlement at Macau.1554: Missionaries Jos de Anchieta and Manuel da Nbrega establishes So Paulo, southeast Brazil.1554: Princess Elizabeth is imprisoned in the Tower of London upon the orders of Mary I for suspicion of being involved in the Wyatt rebellion.1555: The Muscovy Company is the first major English joint stock trading company.1556: Publication in Venice of Delle Navigiationi et Viaggi (terzo volume) by Giovanni Battista Ramusio, secretary of Council of Ten, with plan La Terra de Hochelaga, an illustration of the Hochelaga.[13]1556: The Shaanxi earthquake in China is history's deadliest known earthquake during the Ming dynasty.1556: Georgius Agricola, the "Father of Mineralogy", publishes his De re metallica.1556: Akbar defeats Hemu at the Second battle of Panipat.1556: Russia conquers the Astrakhan Khanate.15561605: During his reign, Akbar expands the Mughal Empire in a series of conquests (in the Indian subcontinent).Political map of the world in 15561556: Mir Chakar Khan Rind captures Delhi with Humayun.1556: Pomponio Algerio, radical theologian, is executed by boiling in oil as part of the Roman Inquisition.1557: Habsburg Spain declares bankruptcy. Philip II of Spain had to declare four state bankruptcies in 1557, 1560, 1575 and 1596.1557: The Portuguese settle in Macau (on the western side of the Pearl River Delta across from present-day Hong Kong).1557: The Ottomans capture Massawa, all but isolating Ethiopia from the rest of the world.1558: Elizabeth Tudor becomes Queen Elizabeth I at age 25.15581603: The Elizabethan era is considered the height of the English Renaissance.15581583: Livonian War between Poland, Grand Principality of Lithuania, Sweden, Denmark and Russia.1558: After 200 years, the Kingdom of England loses Calais to France.1559: With the Peace of Cateau Cambrsis, the Italian Wars conclude.1559: Sultan Hairun of Ternate (in present-day Indonesia) protests the Portuguese's Christianisation activities in his lands. Hostilities between Ternate and the Portuguese.The Mughal Emperor Akbar shoots the Rajput warrior Jaimal during the Siege of Chittorgarh in 15671560: Ottoman navy defeats the Spanish fleet at the Battle of Djerba.1560: Elizabeth Bathory is born in Nyirbator, Hungary.1560: By winning the Battle of Okehazama, Oda Nobunaga becomes one of the pre-eminent warlords of Japan.1560: Jeanne d'Albret declares Calvinism the official religion of Navarre.1560: Lazarus Church, Macau1561: Sir Francis Bacon is born in London.1561: The fourth battle of Kawanakajima between the Uesugi and Takeda at Hachimanbara takes place.1561: Guido de Bres draws up the Belgic Confession of Protestant faith.1562: Mughal emperor Akbar reconciles the Muslim and Hindu factions by marrying into the powerful Rajput Hindu caste.15621598: French Wars of Religion between Catholics and Huguenots.1562: Massacre of Wassy and Battle of Dreux in the French Wars of Religion.1562: Portuguese Dominican priests build a palm-trunk fortress which Javanese Muslims burned down the following year. The fort was rebuilt from more durable materials and the Dominicans commenced the Christianisation of the local population.[12]1563: Plague outbreak claimed 80,000 people in Elizabethan England. In London alone, over 20,000 people died of the disease.1564: Galileo Galilei born on February 151564: William Shakespeare baptized 26 April1565: Deccan sultanates defeat the Vijayanagara Empire at the Battle of Talikota.1565: Mir Chakar Khan Rind dies at aged 97.1565: Estcio de S establishes Rio de Janeiro in Brazil.1565: The Hospitallers, a Crusading Order, defeat the Ottoman Empire at the siege of Malta (1565).1565: Miguel Lpez de Legazpi establishes in Cebu the first Spanish settlement in the Philippines starting a period of Spanish colonization that would last over three hundred years.1565: Spanish navigator Andres de Urdaneta discovers the maritime route from Asia to the Americas across the Pacific Ocean, also known as the tornaviaje.1565: Royal Exchange is founded by Thomas Gresham.1566: Suleiman the Magnificent, ruler of the Ottoman Empire, dies on September 7, during the battle of Szigetvar.Siege of Valenciennes during the Dutch War of Independence in 156715661648: Eighty Years' War between Spain and the Netherlands.1566: Da le Balle Contrade d'Oriente, composed by Cipriano de Rore.1567: After 45 years' reign, Jiajing Emperor died in the Forbidden City, Longqing Emperor ascended the throne of Ming dynasty.1567: Mary, Queen of Scots, is imprisoned by Elizabeth I.1568: The Transylvanian Diet, under the patronage of the prince John Sigismund Zpolya, the former king of Hungary, inspired by the teachings of Ferenc Dvid, the founder of the Unitarian Church of Transylvania, promulgates the Edict of Torda, the first law of freedom of religion and of conscience in the World.15681571: Morisco Revolt in Spain.15681600: The Azuchi-Momoyama period in Japan.1568: Hadiwijaya sent his adopted son and son in-law Sutawijaya, who would later become the first ruler of the Mataram dynasty of Indonesia, to kill Arya Penangsang.1569: Rising of the North in England.1569: Mercator 1569 world map published by Gerardus Mercator.1569: The PolishLithuanian Commonwealth is created with the Union of Lublin which lasts until 1795.1569: Peace treaty signed by Sultan Hairun of Ternate and Governor Lopez De Mesquita of Portugal.The Battle of Lepanto1570: Ivan the Terrible, tsar of Russia, orders the massacre of inhabitants of Novgorod.1570: Pope Pius V issues Regnans in Excelsis, a papal bull excommunicating all who obeyed Elizabeth I and calling on all Catholics to rebel against her.1570: Sultan Hairun of Ternate (in present-day Indonesia) is killed by the Portuguese.[12] Babullah becomes the next Sultan.1570: 20,000 inhabitants of Nicosia in Cyprus were massacred and every church, public building, and palace was looted. Cyprus fell to the Ottoman Turks the following year.1571: Pope Pius V completes the Holy League as a united front against the Ottoman Turks, responding to the fall of Cyprus to the Ottomans.1571: The Spanish-led Holy League navy destroys the Ottoman Empire navy at the Battle of Lepanto.1571: Crimean Tatars attack and sack Moscow, burning everything but the Kremlin.1571: American Indians kill Spanish missionaries in what would later be Jamestown, Virginia.1571: Spanish conquistador Miguel Lpez de Legazpi establishes Manila, Philippines as the capital of the Spanish East Indies.1572: Brielle is taken from Habsburg Spain by Protestant Watergeuzen in the Capture of Brielle, in the Eighty Years' War.1572: Spanish conquistadores apprehend the last Inca leader Tupak Amaru at Vilcabamba, Peru, and execute him in Cuzco.1572: Jeanne d'Albret dies aged 43 and is succeeded by Henry of Navarre.1572: Catherine de' Medici instigates the St. Bartholomew's Day massacre which takes the lives of Protestant leader Gaspard de Coligny and thousands of Huguenots. The violence spreads from Paris to other cities and the countryside.1572: First edition of the epic The Lusiads of Lus Vaz de Cames, three years after the author returned from the East.[14]1572: The 9 years old Taizi, Zhu Yijun ascended the throne of Ming dynasty, known as Wanli Emperor.1573: After heavy losses on both sides the siege of Haarlem ends in a Spanish victory.St. Bartholomew's Day massacre of French Protestants1574: in the Eighty Years' War the capital of Zeeland, Middelburg declares for the Protestants.1574: After a siege of 4 months the siege of Leiden ends in a comprehensive Dutch rebel victory.1575: Oda Nobunaga finally captures Nagashima fortress.1575: Following a five-year war, the Ternateans under Sultan Babullah defeated the Portuguese.1576: Tahmasp I, Safavid shah, dies.1576: The Battle of Haldighati is fought between the ruler of Mewar, Maharana Pratap and the Mughal Empire's forces under Emperor Akbar led by Raja Man Singh.1576: Sack of Antwerp by badly paid Spanish soldiers.15771580: Francis Drake circles the world.1577: Ki Ageng Pemanahan built his palace in Pasargede or Kotagede.1578: King Sebastian of Portugal is killed at the Battle of Alcazarquivir.1578: The Portuguese establish a fort on Tidore but the main centre for Portuguese activities in Maluku becomes Ambon.[12]1578: Sonam Gyatso is conferred the title of Dalai Lama by Tumed Mongol ruler, Altan Khan. Recognised as the reincarnation of two previous Lamas, Sonam Gyatso becomes the third Dalai Lama in the lineage.[15]1578: Governor-General Francisco de Sande officially declared war against Brunei in 1578, starting the Castilian War of 1578.1579: The Union of Utrecht unifies the northern Netherlands, a foundation for the later Dutch Republic.1579: The Union of Arras unifies the southern Netherlands, a foundation for the later states of the Spanish Netherlands, the Austrian Netherlands and Belgium.The Irish Gaelic chieftain's feast, from The Image of Ireland1579: The British navigator Sir Francis Drake passes through Maluku and transit in Ternate on his circumnavigation of the world. The Portuguese establish a fort on Tidore but the main centre for Portuguese activities in Maluku becomes Ambon.[16]The fall of Spanish Armada1580: Drake's royal reception after his attacks on Spanish possessions influences Philip II of Spain to build up the Spanish Armada. English ships in Spanish harbours are impounded.1580: Spain unifies with Portugal under Philip II. The struggle for the throne of Portugal ends the Portuguese Empire. The Spanish and Portuguese crowns are united for 60 years, i.e. until 1640.15801587: Nagasaki comes under control of the Jesuits.1581: Dutch Act of Abjuration, declaring abjuring allegiance to Philip II of Spain.1581: Bayinnaung dies at the age of 65.1582: Oda Nobunaga commits seppuku during the Honn-ji Incident coup by his general, Akechi Mitsuhide.1582: Pope Gregory XIII issues the Gregorian calendar. The last day of the Julian calendar was Thursday, 4 October 1582 and this was followed by the first day of the Gregorian calendar, Friday, 15 October 15821582: Yermak Timofeyevich conquers the Siberia Khanate on behalf of the Stroganovs.1583: Denmark builds the world's first theme park, Bakken.1583: Death of Sultan Babullah of Ternate.15841585: After the siege of Antwerp, many of its merchants flee to Amsterdam. According to Luc-Normand Tellier, "At its peak, between 1510 and 1557, Antwerp concentrated about 40% of the world trade...It is estimated that the port of Antwerp was earning the Spanish crown seven times more revenues than the Americas."[17]1584: Ki Ageng Pemanahan died. Sultan Pajang raised Sutawijaya, son of Ki Ageng Pemanahan as the new ruler in Mataram, titled "Loring Ngabehi Market" (because of his home in the north of the market).1585: Akbar annexes Kashmir and adds it to the Kabul SubahPortuguese fusta in India from a book by Jan Huygen van Linschoten1585: Colony at Roanoke founded in North America.15851604: The Anglo-Spanish War is fought on both sides of the Atlantic.1587: Mary, Queen of Scots is executed by Elizabeth I.1587: The reign of Abbas I marks the zenith of the Safavid dynasty.1587: Troops that would invade Pajang Mataram Sultanate storm ravaged the eruption of Mount Merapi. Sutawijaya and his men survived.1588: Mataram into the kingdom with Sutawijaya as Sultan, titled "Senapati Ingalaga Sayidin Panatagama" means the warlord and cleric Manager Religious Life.1588: England repulses the Spanish Armada.1589: Spain repulses the English Armada.1589: Catherine de' Medici dies at aged 69.Abu'l-Fazl ibn Mubarak presenting Akbarnama to Mughal Azam Akbar, Mughal miniature1590: Siege of Odawara: the Go-Hojo clan surrender to Toyotomi Hideyoshi, and Japan is unified.1591: Gazi Giray leads a huge Tatar expedition against Moscow.1591: In Mali, Moroccan forces of the Sultan Ahmad al-Mansur led by Judar Pasha defeat the Songhai Empire at the Battle of Tondibi.15921593: John Stow reports 10,675 plague deaths in London, a city of approximately 200,000 people.15921598: Korea, with the help of Ming dynasty China, repels two Japanese invasions.15931606: The Long War between the Habsburg monarchy and the Ottoman Turks.1594: St. Paul's College, Macau, founded by Alessandro Valignano.1595: First Dutch expedition to Indonesia sets sail for the East Indies with two hundred and forty-nine men and sixty-four cannons led by Cornelis de Houtman.[18]1596: Birth of Ren Descartes.1596: June, de Houtman's expedition reaches Banten the main pepper port of West Java where they clash with both the Portuguese and Indonesians. It then sails east along the north coast of Java losing twelve crew to a Javanese attack at Sidayu and killing a local ruler in Madura.[18]1597: Romeo and Juliet is published.