Electronics projects for school students pdf

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Nevonprojects brings you the top 10 DIY Electronics projects list for students in 2021. We have collected best, easy and latest simple low-cost electronics projects list topics and ideas of 2021 and listed them below. The electronics projects listed below are a compilation of creative and out of the box electronics based concepts for students, researchers & engineers. You may get best ideas by reading all of these following project ideas. 10. Generate Electricity by Walking Power Generator Floor Tiles Project Nowadays due to population rise, demand for electricity is on rise. As electricity is generated from non-renewable sources, its depletion fear is high. This system is proposed to generate electricity using tiles. Generating off-grid electricity just by walking around or powering streetlights with your footsteps. This system consists of spring, gears, two rack and pinion and three generators. These tiles are intended to somewhat uproot vertically when somebody strolls on them. This vertical development results in a rotatory movement that produces electrical vitality. 9. Rotating Solar Panel Using Arduino Project This project is an Arduino based project which uses Rotating Solar Panel. This rotating solar panel scans from one horizon to other to know the current position of sun and hence the position from the solar energy can be harnessed. Solar panel is powered by Arduino which aims to charge 12VDC battery, it has motor to rotate solar panel which is controlled by Atmega 328 microcontroller. Along these lines we can outfit the greater part from the Solar board by changing it to be specifically towards the Sun reliably. Therefore, this project makes this procedure of saddling sun-based energy more efficient and thus more brilliant. 8. Arduino Ultrasonic Sonar/Radar Monitor Project This military spying sonar system is used to monitor the local area and it scans suspicious object. The sonar radar helps to prevent the enemies from reaching near a target and can thus save lives of many. This system is powered by Arduino, it consists of LCD display, Ultrasonic to stimulate sonar and motor to rotate sensor. This helps the system to track the exact position and the path followed by the object. 7. Motion Controlled Pick & Place Obstacle Avoider Robotic Vehicle Project This project is based on Motion Controlled Robotic vehicle. Motion Controlled Robotic vehicle can be moved using tilting motion which does not need a single button press. This robotic vehicle also allows has pick and place motion, this system propose a completely hand motion controlled robotic vehicle. Robots are usually controlled by remotes but this remote are not always comfortable to use. This system make use of Atmega microcontroller to transmit the motion commands sent by accelerometer sensor through RF to the receiver unit. 8051 family microcontrollers are also used to convert the receiver into motion commands. This vehicle can be used to transport military applications. 6. Regenerative Braking with Power Monitor Project The serious issue behind the mass utilization of electric vehicles is the battery charging time and absence of charging stations. Hence, we have proposed this system which allows vehicles to generate energy, each time brakes are applied as well as track the amount of power generated. This system uses friction lining arrangement in a brake drum. Circuitry is also being used to track the voltage generated on the brake press. This system helps to charge the car battery each time when the brake is being applied. It is also a pollution free transportation system 5. Third Eye for Blind Ultrasonic Vibrating Glove Project This system can be used to help blinds to overcome their visual deficiency. To notify about the hurdle present in front, it uses audio and vibration signals. System uses Atmega 328 microcontroller, Ultrasonic range finder distance sensor module. This ultrasonic wave is used to sense and measure the distance of a hurdle. This system also has a buzzer which generates vibration signals. As the distance between glove and object decreases, the frequency increases both the audio and vibration, which helps to conquer the visual deficiency. 4. Smart Dustbin with IOT Notifications Project With the rise in the population we have an expansion in the garbage around urban territories. Here we propose a brilliant dustbin that works automatically to tackle this issue utilizing IOT and sensor-based hardware. This dustbin will open automatically when receives the signal of clap of foot tap. This smart dustbin consists of sensor to detect the clap signal, it also has level sensing ultrasonic sensor that constantly measures the level of garbage in the bin and detects if it's about to fill. This dustbin is a fully automated dustbin which allows cleaning garbage 3. Smart Stand-up wheelchair using Raspberry Pi and RF Controller Project This Advanced system is used by disabled people to move around easily. People with paralysis problem, often faces issues for reaching one place to another. This system is powered by raspberry Pi, it consists of graphical LCD and RF module, a GSM and GPS module, servo motor and wheel chair. User can command to operate a wheel chair. It also has emergency feature, user can use emergency button in case of emergency or else they can use mic to speak during an emergency. To move forward, backward and also to stand user can use buttons. 2. IOT Color Based Product Sorting Machine Project This Product sorting advanced system puts forward a mechanism to detect colour and sorts items through image processing. This system is powered by raspberry pi, it consists of camera using electronic circuitry and motor. Motor is used to feed an object to the camera chamber. As soon as the the colour is detected, it sends signal and sort mechanism is used by the motor to position the sorting tube towards the respective section. This system can be used by candy sorting industries. 1. Arduino Based Autonomous Fire Fighting Robot Project Firefighting robot system is a self-travelling vehicle. This robot can sense the fire flame and travel to the place and extinguish the fire. This system consists of HC-SR04 ultra sonic sensor and servo motor to detect the obstacles. This robot has water tank and uses spraying mechanism for extinguishing the fire. This can help to extinguish fire without losing any life. This article is a collection of simple electronics circuits we have published over a span of 3 years, which can be used as simple electronics projects for students, beginners, engineering students and other hobbyists. The following circuits listed below can also be used for your mini project needs. But we won't recommend any of these circuits for your final year or main project requirements. While selecting the circuits for this article, we have taken care to serve you with popular circuits on our website which are easy to implement. We suggest you go through all the comments before practically testing any of these circuits which will save you a lot of troubleshooting time. All of these circuits fall into the basic or small or hobby category and that's why we used simple electronics projects as the title. And all these circuits are free of any patents and any other legal stuff; you can experiment with them at your own free will and creativity. So here begins the list:- 1. Simple Water Level Indicator Objective:- To measure the level of any conductive non-corrosive liquid. We selected this circuit first because of its simple nature. This water level indicator circuit is easy to implement and is composed of the least components. You only need 5 transistors, 5 resistors and 5 LEDs to implement this circuit; which makes it an ideal simple electronics project for beginners and students. 2. Automatic LED Emergency Light Objective:- Implement a Lighting system/device using LED's This is another popular circuit that can be used for simple project development. There are 3 versions available. One is developed by the CircuitsToday team and the other by Seetharaman Subrahmanian (a great contributor of CircuitsToday). Links are given to other similar circuit applications like LED ramp circuit, street light circuit, flashing led circuit etc. 3. Infrared Motion detector Objective:- Detect Infrared rays. This circuit idea can be modified to design simple projects like Intruder alarm, Anti-theft systems etc. A circuit application that everyone must try out. This circuit will teach you how to deal with infrared detection (transmitting and receiving), usage of 555 IC as a monostable multivibrator inside an application, usage of ICs like LM 1458 etc. 4. 7 segment counter project Objective:- Learn the application of 7 segment display. (This circuit will teach you how to use 7 segment display for your future applications) A simple electronic circuit that uses two ICs – NE 555 (as an astable multivibrator to trigger CD 4033 IC) and CD 4033 for counting purposes. Apart from two ICs and a 7 segment display (LT 543), the circuit uses a minimal set of components, 4 resistors, 1 capacitor and a diode. 5. Fire Alarm Project Objective:- Detect fire in a given area and warn using an alarm system. Though simple in nature this circuit will help you to understand how real-world electronics systems are built. This circuit is a basic one that senses smoke to detect fire and hence produce an alarm to warn people around. It uses an LDR to detect smoke (By default LDR is kept active by a light fall; smoke will mask the light and hence LDR resistance will increase), IC UM 66 as a tone generator, IC 7805 to drive tone generator IC and TDA 2003 IC as an amplifier to drive the speakers (alarm system). 6. Lead-acid battery charger Objective:- To charge a battery. So why not try your hands at charging a lead-acid battery? Here is a simple electronics project that will let you charge your battery. This circuit is very simple in nature which consists of an LM317 IC (which provides correct charging voltage), a couple of resistors, capacitors and a potentiometer. 7. Simple 10 Watt Audio Amplifier Objective:- To design a 10-watt audio amplifier. How can we avoid audio electronics projects? So let's start our audio electronics journey with a simple audio amplifier project. As written in the objective, our aim is to design and implement a simple audio amplifier using IC TL081 (as a preamplifier). A much advanced audio amplifier project is given below. 8. 150 Watt Amplifier circuit Objective:- To design an amplifier circuit and deliver 150 watt RMS to a 4-ohm speaker. The first thing to mention is; above given project is the most popular circuit on CircuitsToday with live discussions going on (so far 563+ comments). We recommend you to g through all comments section to understand various problems faced by our readers while implementing this circuit. This will help you in your troubleshooting phase. So let us talk a little about this circuit. This is the cheapest 150-watt amplifier you can make using a pair of Darlington transistors TIP 142 and 147. You have to go through the circuit design and description carefully as it will take a little bit of effort to get the desired output. 9. Simple Inverter Project Objective:- To design a simple 100-watt Inverter. This is a simple low-cost inverter circuit that comprises IC CD 4047 and two MOSFET's IR540 as its main components. This circuit will teach you the basics of the common application we always use in building electronics devices. 10. FM Transmitter project Objective:- To design an FM transmitter circuit that can transmit signals up to 2 kilometres. How about designing a local FM station for your college? A station where students can air their programs (songs, speeches, solos) and all your college mates can receive them? Here is such an interesting project. This is a low-cost project which can be assembled using basic components. So far we have covered 10 simple electronics projects for beginners, students and hobbyists. We will keep on expanding this article in the future with other interesting small and basic projects. Latest Projects 1. Water Level Controller using 8051 Microcontroller Well, this is a fully functional water level controller made using an AT89S51 (8051 compliant IC from Atmel) microcontroller from Atmel. This water level controller monitors the level of the overhead tank and automatically switches on the water pump whenever the level goes below a preset limit. 2. Voltmeter using 8051 Microcontroller This is another simple project using 8051 microcontrollers, made using the same AT89S51 IC from Atmel. With this circuit, you can measure voltages in the range of 0 to 5 volts. 3. 250W PWM inverter circuit The objective of this project is to build a 250W inverter circuit using the IC SG3524. You have already seen above our project for creating a 100W inverter but this one is more difficult. 4. Simple function generator A function generator is used to generate electrical waveforms of different frequencies. The most common waves this generated are sine waves, square waves and triangular waves. 5. Digital Thermometer You know the function of a digital thermometer, it measures the temperature of a body and displays the output in a human-readable form. This circuit uses a 3 digit display to show the output. The temperature is sensed via contact using the LM35 temperature sensor. 6. DC Motor Speed Control Using Arduino & PWM This project is about how you can control the speed of a DC motor using an Arduino UNO board. You will also learn, what is Pulse Width Modulation(PWM) and how you can use PWM on the Arduino UNO board. 7. Water Level Indicator Using Arduino & Ultrasonic Sensor This is another project based on Arduino. In this project, you will learn, how you can make a simple water level indicator using an ultrasonic sensor, LCD and Arduino UNO boards. 8. Interface common anode and common cathode RGB LEDs with Arduino You all must have seen RGB LEDs at some point in your life. Have you ever wondered how these RGB LEDs works and how you can generate different colours using a single RGB LED? In this project, you will be learning all this. You will create a circuit using an Arduino UNO board that will control the RGB LED. 9. Arduino and BMP180 Pressure Sensor Interfacing This is a very simple project. This project is all about how to interface a BMP180 pressure sensor with Arduino. You will also learn its working and find out the atmospheric pressure around you. Based on that atmospheric pressure you will be able to find your altitude. 10. How to make a Digital Watch using an 0.96 inch OLED Display An OLED is a display that can be used to display anything. You can use this display in any kind of project. Not only your projects will look cool by using this display but also you will be able to display a lot more information on it as compared to 16×2 LCD. In this project, you will be building a simple digital clock that will display the date, day and time.

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