DOWNLOAD PDF THE SUPERCHARGED LEARNER

Chapter 1 : Supercharge | Definition of Supercharge by Merriam-Webster

Learning Supercharged looks at emerging approaches and tools, and incorporates professional educators' stories of how and why they have implemented each trend, including information on challenges faced and overcome, how to get started and other resources to explore.

While it is true that higher intake temperatures for internal combustion engines will ingest air of lower density, this only holds correct for a static, unchanging air pressure. However, the heating of the air, while in the supercharger compressor, does not reduce the density of the air due to its rise in temperature. The rise in temperature is due to its rise in pressure. Energy is being added to the air and this is seen in both its energy, internal to the molecules temperature and of the air in static pressure, as well as the velocity of the gas. Inter-cooling makes no change in the density of the air after it has been compressed. It is only removing the thermal energy of the air from the compression process. Two-stroke engines[edit] In two-stroke engines , scavenging is required to purge exhaust gasses, as well as charge the cylinders for the next power stroke. In small engines this requirement is commonly met by using the crankcase as a blower; the descending piston during the power stroke compresses air in the crankcase used to purge the cylinder. Scavenging blowing should not be confused with supercharging, as no charge compression takes place. As the volume change produced by the lower side of the piston is the same as the upper face, this is limited to scavenging and cannot provide any supercharging. Larger engines usually use a separate blower for scavenging and it was for this type of operation that the Roots blower has been utilized. Turbocharging two-stroke engines is difficult, but not impossible, as a turbocharger does not provide any boost until it has had time to spin up to speed. Purely turbocharged two stroke engines may thus have difficulty when starting, with poor combustion and dirty exhausts, possibly even four-stroking. Some two-stroke turbochargers, notably those used on Electro-Motive Diesel locomotive engines, are mechanically driven at lower engine speeds through an overrunning clutch to provide adequate scavenging air. As engine speed and exhaust gas volume increase, the turbocharger no longer is dependent on mechanical drive and the overrunning clutch disengages. Simple two-stroke engines with ported inlet and exhaust cannot be supercharged since the inlet port always closes first. For this reason, two-stroke Diesel engines usually have mechanical exhaust valves with separate timing to allow supercharging. Regardless of this, two-stroke engines require scavenging at all engine speeds and so turbocharged two-stroke engines must still employ a blower, usually Roots type. This blower may be mechanically or electrically driven, in either case the blower may be disengaged once the turbocharger starts to deliver air. Automobiles[edit] "Blower" Bentley. The large "blower" supercharger , located in front of the radiator, gave the car its name. In , Gottlieb Daimler , of Daimler-Benz Daimler AG , was the first to patent a forced-induction system for internal combustion engines, superchargers based on the twin-rotor air-pump design, first patented by the American Francis Marion Roots in , the basic design for the modern Roots type supercharger. The first supercharged cars were introduced at the Berlin Motor Show: Keeping the air that enters the engine cool is an important part of the design of both superchargers and turbochargers. Compressing air increases its temperature, so it is common to use a small radiator called an intercooler between the pump and the engine to reduce the temperature of the air. There are three main categories of superchargers for automotive use: Centrifugal turbochargers â€” driven from exhaust gases. Centrifugal superchargers â€” driven directly by the engine via a belt-drive. Mechanically driven superchargers may absorb as much as a third of the total crankshaft power of the engine and are less efficient than turbochargers. However, in applications for which engine response and power are more important than other considerations, such as top-fuel dragsters and vehicles used in tractor pulling competitions, mechanically driven superchargers are very common. For this reason, both economy and the power of a turbocharged engine are usually better than with superchargers. Turbochargers suffer to a greater or lesser extent from so-called turbo-spool turbo lag; more correctly, boost lag , in which initial acceleration from low RPM is limited by the lack of sufficient exhaust gas mass flow pressure. Once engine RPM is sufficient to raise the turbine RPM into its designed operating range, there is a rapid increase in power, as higher turbo boost causes more exhaust gas production,

which spins the turbo yet faster, leading to a belated "surge" of acceleration. This makes the maintenance of smoothly increasing RPM far harder with turbochargers than with engine-driven superchargers, which apply boost in direct proportion to the engine RPM. The main advantage of an engine with a mechanically driven supercharger is better throttle response, as well as the ability to reach full-boost pressure instantaneously. With the latest turbocharging technology and direct gasoline injection, throttle response on turbocharged cars is nearly as good as with mechanically powered superchargers, but the existing lag time is still considered a major drawback, especially considering that the vast majority of mechanically driven superchargers are now driven off clutched pulleys, much like an air compressor. Turbocharging has been more popular than superchargers among auto manufacturers owing to better power and efficiency. However, Audi did introduce its 3. Twincharging[edit] In the and World Rally Championships, Lancia ran the Delta S4 , which incorporated both a belt-driven supercharger and exhaust-driven turbocharger. The design used a complex series of bypass valves in the induction and exhaust systems as well as an electromagnetic clutch so that, at low engine speeds, boost was derived from the supercharger. In the middle of the rev range, boost was derived from both systems, while at the highest revs the system disconnected drive from the supercharger and isolated the associated ducting. The supercharger is at the rear of the engine at right A Centrifugal supercharger of a Bristol Centaurus radial aircraft engine. Superchargers are a natural addition to aircraft piston engines that are intended for operation at high altitudes. As an aircraft climbs to higher altitude, air pressure and air density decreases. The output of a piston engine drops because of the reduction in the mass of air that can be drawn into the engine. In addition, there is decreased back pressure on the exhaust gases. A supercharger can be thought of either as artificially increasing the density of the air by compressing it or as forcing more air than normal into the cylinder every time the piston moves down. With the reduced aerodynamic drag at high altitude and the engine still producing rated power, a supercharged airplane can fly much faster at altitude than a naturally aspirated one. The pilot controls the output of the supercharger with the throttle and indirectly via the propeller governor control. Since the size of the supercharger is chosen to produce a given amount of pressure at high altitude, the supercharger is oversized for low altitude. The pilot must be careful with the throttle and watch the manifold pressure gauge to avoid overboosting at low altitude. As the aircraft climbs and the air density drops, the pilot must continuously open the throttle in small increments to maintain full power. The altitude at which the throttle reaches full open and the engine is still producing full rated power is known as the critical altitude. Above the critical altitude, engine power output will start to drop as the aircraft continues to climb. Effects of temperature[edit] Supercharger CDT vs. Graph shows the CDT differences between a constant-boost supercharger and a variable-boost supercharger when utilized on an aircraft. As discussed above, supercharging can cause a spike in temperature, and extreme temperatures will cause detonation of the fuel-air mixture and damage to the engine. In the case of aircraft, this causes a problem at low altitudes, where the air is both denser and warmer than at high altitudes. With high ambient air temperatures, detonation could start to occur with the manifold pressure gauge reading far below the red line. A supercharger optimized for high altitudes causes the opposite problem on the intake side of the system. With the throttle retarded to avoid overboosting, air temperature in the carburetor can drop low enough to cause ice to form at the throttle plate. In this manner, enough ice could accumulate to cause engine failure, even with the engine operating at full rated power. For this reason, many supercharged aircraft featured a carburetor air temperature gauge or warning light to alert the pilot of possible icing conditions. Several solutions to these problems were developed: Two-speed and two-stage superchargers[edit] In the s, two-speed drives were developed for superchargers for aero engines providing more flexibility aircraft operation. The arrangement also entailed more complexity of manufacturing and maintenance. The gears connected the supercharger to the engine using a system of hydraulic clutches, which were initially manually engaged or disengaged by the pilot with a control in the cockpit. At low altitudes, the low-speed gear would be used in order to keep the manifold temperatures low. Later installations automated the gear change according to atmospheric pressure. In the Battle of Britain the Spitfire and Hurricane planes powered by the Rolls-Royce Merlin engine were equipped largely with single stage and single speed superchargers. Horsepower was increased and performance at all aircraft heights. After the air was compressed in the low-pressure stage, the air flowed through an intercooler

radiator where it was cooled before being compressed again by the high-pressure stage and then possibly also aftercooled in another heat exchanger. In some two-stage systems, damper doors would be opened or closed by the pilot in order to bypass one stage as needed. Rolls-Royce Merlin engines had fully automated boost control with all the pilot having to do was advance the throttle with the control system limiting boost as necessary until maximum altitude was reached. Turbocharger A mechanically driven supercharger has to take its drive power from the engine. This is where the principal disadvantage of a supercharger becomes apparent. The engine has to burn extra fuel to provide power to drive the supercharger. The increased air density during the input cycle increases the specific power of the engine and its power-to-weight ratio , but at the cost of an increase in the specific fuel consumption of the engine. In addition to increasing the cost of running the aircraft a supercharger has the potential to reduce its overall range for a specific fuel load. As opposed to a supercharger driven by the engine itself, a turbocharger is driven using the otherwise wasted exhaust gas from the engine. The amount of power in the gas is proportional to the difference between the exhaust pressure and air pressure, and this difference increases with altitude, helping a turbocharged engine to compensate for changing altitude. This increases the height at which maximum power output of the engine is attained compared to supercharger boosting, and allows better fuel consumption at high altitude compared to an equivalent supercharged engine. This facilitates increased true airspeed at high altitude and gives a greater operational range than an equivalently boosted engine using a supercharger. The majority of aircraft engines used during World War II used mechanically driven superchargers, because they had some significant manufacturing advantages over turbochargers. However, the benefit to operational range was given a much higher priority to American aircraft because of a less predictable requirement on operational range, and having to travel far from their home bases. The size of the ducting alone was a serious design consideration. For example, both the F4U Corsair and the P Thunderbolt used the same radial engine , but the large barrel-shaped fuselage of the turbocharged P was needed because of the amount of ducting to and from the turbocharger in the rear of the aircraft. The F4U used a two-stage intercooled supercharger with more compact layout. Nonetheless, turbochargers were useful in high-altitude bombers and some fighter aircraft due to the increased high altitude performance and range. Turbocharged piston engines are also subject to many of the same operating restrictions as those of gas turbine engines. Turbocharged engines also require frequent inspections of their turbochargers and exhaust systems to search for possible damage caused by the extreme heat and pressure of the turbochargers. Such damage was a prominent problem in the early models of the American Boeing B Superfortress high-altitude bombers used in the Pacific Theater of Operations during â€” In more recent times most aircraft engines for general aviation light airplanes are naturally aspirated , but the smaller number of modern aviation piston engines designed to run at high altitudes use turbocharger or turbo-normalizer systems, instead of a supercharger driven from the crank shafts. The change in thinking is largely due to economics. Aviation gasoline was once plentiful and cheap, favoring the simple but fuel-hungry supercharger. As the cost of fuel has increased, the ordinary supercharger has fallen out of favor. Also, depending on what monetary inflation factor one uses, fuel costs have not decreased as fast as production and maintenance costs have. Effects of fuel octane rating[edit] Until the late s all automobile and aviation fuel was generally rated at 87 octane or less. This is the rating that was achieved by the simple distillation of "light crude" oil.

Chapter 2 : Seadoo GTX Supercharged | Sea-Doo Forum

Meaning of "supercharged" in the English Dictionary. (Definition of "supercharged" from the Cambridge Advanced Learner's Dictionary & Thesaurus.

A piston engine is one type of positive displacement pump. Your heater blower motor, on the other hand, does not work that way. Like all fans, it moves more air the faster it spins. Forced induction operates the same way: Though the ultimate goal is to push more air into the engine, you can either do it with a positive- or variable-displacement pump. A generic term for these devices when used on a street machine is supercharger, and they can be driven either by the engine via a mechanical connection or by exhaust gases via a turbine wheel placed in the exhaust system. The exhaust-driven type is referred to as a turbocharger, a shortened version of the term turbosupercharger-literally a turbine [driven] supercharger. All turbochargers are variable displacement-type pumps, but beltdriven superchargers can be either positive or variable displacement. Variable displacement-type superchargers are known as centrifugal superchargers, and on the positive displacement side of things, the industry has latched on to two types-Roots and twin-screw superchargers-to get the job done. We will not be addressing centrifugal superchargers in this article, however, because we feel the trend in the industry is focusing on the positive displacement-type superchargers. Additionally, we believe that a modern, efficient positive-displacement supercharger is currently the most economical way to make more power. Note that by economical, we are considereing the amount of time involved in installing the system as some kits are as easy as swapping an intake manifold. How much is your time worth? In the world of positive-displacement pumps, there are a variety of shapes and styles. As we mentioned before, a piston engine is one example-you will likely find a piston pump pressurizing the compressed air tank in your garage. Rotary pumps are another example: Vane-style pumps, like those in your power steering system and automatic transmission oil pump, are just two more examples of positive-displacement pumps you can find all over your car. However, most of these types of pumps are not good superchargers. They generally cannot move enough air to meet the demands of an automobile engine and still be sized small enough to fit within the confines of an engine compartment. Decades ago, the industry latched on to a different design, the Roots-style pump, because it can move very large quantities of air-enough to feed a hungry V Roots The ubiquitous Roots blower is the oldest and most common supercharger used in automotive applications. Its visual appeal is undeniable: Like a sucker punch to the jaw, nothing says horsepower like an oversized Roots supercharger. Though it was adapted by the transportation industry to help power two-cycle GMC diesel buses, the Roots blower has a history that dates back before the golden age of the automobile. Originally conceived by brothers Philander and Francis Roots, the device was designed as an air pump for blast furnaces. It was quickly adapted for use in a wide variety of applications, from ventilating mine shafts to pumping fluids in plumbing applications. Roots pumps are extremely simple machines. A case houses two rotors that are machined to tight tolerances, though the rotors usually do not touch each other, nor do they touch the case. The rotors are connected by a pair of gears, and a shaft extends out from one of the gears and is driven by the crankshaft. That shaft turns the gears causing the rotors to spin in opposite directions. An opening in the top of the case allows air to fill the empty space in the cavity of the rotors. Then as they turn, the rotors trap that air between themselves and the case of the pump, pushing it around and down through the case and out the other side. The simplicity of the Roots supercharger may be its ultimate shortcoming as well. As a result, the Roots supercharger is one of the most inefficient. More about that later. Twin-Screw The twin-screw supercharger is the other commonly used positive-displacement model. It is similar in appearance to a Roots blower but different on the inside. Decades later, his design would be put to use making cars go faster. The main difference between a Roots supercharger and a twin-screw or Lysholm-style pump is that the twin-screw supercharger is a true compressor becasue it compresses and pressurizes air inside its case. Like a Roots supercharger, the twin-screw design also relies on spinning rotors, but its shape is much different. There is a male and female rotor, and the lobe count is different between the two, usually three lobes on the male rotor and five on the female. Like in the Roots superchargers, the rotors never touch each other or their housing, but unlike in the Roots, the rotors turn

toward each other. Air enters the case from the rear, filling up an opening between the rotors. As the rotors turn, their meshing action pushes the air through a cavity that gets smaller toward the end, compressing the air along the way. Boost is Not Always Good We car guys usually equate boost with horsepower: The more boost the better. This is not always true, though. We are going to demonstrate that we should be concerned with the density of the air the supercharger delivers, rather than how much boost it makes. The purpose of a supercharger is to force more air into an engine than it would otherwise be able to ingest naturally aspirated. Instead of operating with vacuum in the intake manifold, this extra air pressurizes the intake; the extra air pressure is referred to as boost. In basic terms, boost represents an increase in air pressure that is above ambient atmospheric pressure. Ambient pressure is around Extra pressure does not always mean there is actually more air in the intake, since air expands at high temperatures and contracts at low temperatures. In a closed system, heating the air in a fixed volume of space will cause an increase in pressure because the air molecules are trying to expand, but the amount of air or oxygen remains the same. To illustrate this point, we performed an easy experiment using the air in our tires. We wanted to see how much the tire pressure changed after a few minutes of hard cornering OK, more like 45 minutes of hard cornering. Before we started driving, we had 34 pounds of air in the tires. After a blast through one of our favorite canyon roads, the tire gauge read about 39 psi. Looking at it another way, you could call the original reading of 34 psi our ambient air pressure. Doing nothing but heating the air in the tires increased the pressure 5 psi. If we were to attach a boost gauge calibrated to be zeroed out at our ambient pressure of 34 psi , it would read 5 pounds of boost in our tires. Within the confines of your intake manifold, degree air takes up more space than air at 80 degrees. But the degree air has less oxygen at a given volume and mixes with less fuel than the degree air does. At the same boost levels, the degree air will make more power than the degree air because there is more air to burn. The best supercharger is the one that can increase pressure with the least amount of temperature rise. They generate boost by feeding more air into the engine than the engine can consume, essentially pressurizing the intake manifold with extra air. They become less efficient at higher boost levels because air begins to leak past the rotors back up through the supercharger, causing turbulence in the case. Turbulence increases the friction between air molecules, and we all know that more friction equals more heat. This is why we stated earlier that Roots superchargers were not very efficient. Traditional GMC-style Roots superchargers, i. They operate best at low pressure levels-wide-open throttle at high engine speeds-but their efficiency can fall to around 30 percent when pressure levels in the intake manifold increase. By design, Lysholm-type superchargers have a clear advantage here. By twisting the rotors and routing the air longitudinally through the case, turbulence and friction are greatly reduced. Plus, because they compress the air within the rotors, they are delivering high-pressure air into the intake manifold, which also helps keep air from blowing backward through the case. They are more efficient at higher boost levels and are ideally suited to street cars operating in part- to medium-throttle at higher boost levels. Over the years, engineers have messed around with the rotor design, adding extra lobes and a degree twist called the High Helix. All these improvements have boosted the efficiency of the pumps. Eaton is an OE-level supplier with an operating budget we can only dream of. The company added even more twist to the old Roots design, making rotors with a degree twist along their length. Like a Lysholm, the TVS superchargers draw in air from the back of the case, pushing it out of an opening on the bottom of the opposite end. Like a traditional Roots design, though, the rotors still turn away from each other, and the air is still pumped between the rotor and the case. But the higher degree of twist prevents leakage past the rotors better than the old Roots design did. Efficiency Efficacy At the end of all this is the issue of efficiency. So which supercharger type is the best? The two efficiency ratings to consider are the volumetric and adiabatic efficiency numbers. Volumetric efficiency measures how much of a substance a pump can flow versus how much it actually does flow. Under perfect conditions, a 5. This rarely happens in the real world, though. Unless you have a big carburetor and exceptionally good-flowing cylinder heads, chances are an engine turning at 6, rpm will not be filling its cylinders as completely as it could. Atmospheric pressure can only push air in the intake, through the ports, and past the valves so quickly. The same principle applies to superchargers. While they are busy forcing air into the engine, superchargers rely on atmospheric pressure to push air into them. Things like rough castings, poorly designed rotors, and inlet and exhaust ports

all affect airflow through the supercharger and can diminish its volumetric efficiency. The adiabatic efficiency rating deals with the issue of heat. The easy explanation is to say adiabatic efficiency is a measure of how much a supercharger heats the air before delivering it to the intake port. Like the volumetric number, adiabatic efficiency measures the actual increase in heat versus the ideal. For any machine to do work, you can expect a certain amount of heat to be generated-usually due to friction. Bearings generate friction as they turn and air molecules generate friction as they tumble around inside the supercharger-friction is unavoidable. One can measure all these parameters to predict how much heat should be generated by this machine as it works.

Chapter 3 : Super News for Supercharged Storytimes!

Definition of supercharged adjective in Oxford Advanced Learner's Dictionary. Meaning, pronunciation, picture, example sentences, grammar, usage notes, synonyms and more. We use cookies to enhance your experience on our website, including to provide targeted advertising and track usage.

As a result of this training, participants will be able to: Understand how a cohort functions and the value of a cohort for learning Identify and produce the support and structure to lead a learning cohort in an organization, region, or network Recruit learners to join and convince them of the value of the cohort opportunity Acquire best practices, skills, and strategies for facilitating learning groups on any topic Acquire basic familiarity with the Supercharged Storytimes content to be able to manage cohort time and expectations Apply facilitation practices to guide a group through the self-paced Supercharged Storytimes course Foster and support a sustained peer community around a topic of learning What are the expectations of participants? Attend three, live online sessions November 6, 13, and 27, 2: Participate in online discussions and additional assignments in between sessions. Ask the members of your cohort to complete an evaluation survey about their experience in the course. Participate in evaluation activities such as an end of course survey What is the overall time commitment for the facilitator training? Learners can expect to spend an average of two hours each week outside of the minute sessions for the facilitator training. What is the overall time commitment for facilitating the self-paced course with a cohort? To plan for the time needed to facilitate the self-paced course, note that the course is comprised of six modules. Working through the course involves watching a total of six hours of video recordings approximately 1 hour per module and doing the applied learning on each topic, which can often be combined with storytime preparation and delivery that library staff are already doing. However, it is optimal to allow two weeks in between modules for the applied learning. Please anticipate a span of about 10 weeks for your cohort to complete the course. Who is a good fit for this training? This training targets a range of people. You might be a storytime practitioner who is interested in developing leadership skills by guiding other providers. Perhaps you are a training coordinator who sees this as a great way to provide some excellent professional development and build connections among your staff. Maybe you are looking for professional connections with other storytime providers who may be scattered geographically. Taking this course is a supportive way to challenge yourself and learn new leadership skills. Who would I invite to join my group of learners? Learning groups can be composed in a variety of ways. Think of people in your network who could benefit from the Supercharged Storytimes course and who would enjoy learning together. It might be all the storytime practitioners in your system or at your branch. How do I apply? This facilitator training course is free to all library staff, but space is limited. Registration for Facilitator Training closed on October 19, , 5: Applicants will be informed of their status by October Please contact Brooke Doyle doyleb oclc. Will I be qualified to be a Supercharged Storytimes trainer after completing the Facilitator Training? The Facilitator Training will focus on facilitation skills, and participants will gain a familiarity with the Supercharged Storytimes content but not be trained on it. Instead, the facilitation training will focus on how to maximize group learning, the value of group learning, best practices in facilitating learning in a group, and fostering and supporting a sustained peer community. Can I tell others about this opportunity? Please and thank you! You can direct them to this page or download and print this Facilitator Training Information sheet PDF and share with your channels locally, regionally or throughout your state.

Chapter 4 : Supercharged Readers - Voyager Sopris Learning

Like Power Readers, Supercharged Readers features prereading and postreading activities, with a direct focus on vocabulary. Advancing readers will love the engaging blend of stories, riddles, poems, and informational text.

Posted on by Aurora The left brain works differently from the right brain. The more dominant part of the brain determines the kind of person you are likely to be. It will affect your personality and even the way you learn. Why is this information important to a homeschool teacher? Knowing the way your homeschool student leans will make it much easier to teach them. This involves having a set structure to the day in terms of classes to attend, learning new concepts by repeating them orally and in written form, and in general a predictable work day. Unfortunately a right brain learner would be a terrible fit for this system. Right brain learners are constantly seeking change. They do not like check lists and reminders to do assigned tasks. These children enjoy spontaneous events which can help them learn new things. They like to do projects which involve loads of discussions rather than solving worksheets to gain the same knowledge. Most of them find mathematics boring. Identify Your Homeschool Student If the homeschool parent is having trouble getting the homeschool student to sit down and learn, they may consider the fact that they have a right brain learner on their hands. While these children can adapt to a left brain curriculum fairly easily, they will not enjoy all that it entails. They are far more likely to enjoy doing something that they have been anticipating. Specially if it is somewhat creative in nature and allows them to do something out of the ordinary. Teaching a Right Brain Learner The best thing to do is to give them plenty of space to explore what interests them. Keep a general guideline but be flexible and open to switching plans for the day. Keep things as visual and emotionally charged as possible for the learning to stick in their memories. Leave a Reply Your email address will not be published.

Chapter 5 : Mawi Learning Courses - FLVS

Supercharged Storytimes is a research-based program that helps storytime providers enhance children's early literacy development through intentional emphasis on key early literacy concepts that promote learning. The program's core curriculum, organized in six modules, has been expanded to cover.

Crushing fatigue would hit him like a storm driving him to bed. As he searched for answers his parents drove him to one clinic after another. But nothing worked until he discovered a way to hack his energy. And he did so by using simple steps that he learned from experts such as those in the SuperCharged Movie. The man I am talking about is meâ€¦ So why am I telling you this very personal story? Because you should know this is not theory. I have used the Energy Hacks shown in the movie to go from zero to abundant energy. And now I am free and energized to create the life I always dreamed of! Dave lost pounds without counting calories or excessive exercise. He also used these techniques to upgrade his brain by more than 20 IQ points You may not want to achieve such feats, but you can use the same energy hacking secrets to transform your life. Almost immediately you can use these secrets to overcome fatigueâ€¦ double your energyâ€¦ think with better clarityâ€¦ sleep more soundly â€¦ and so much more. But first, let me share some of these amazing healing secrets with you. You know you need to drink it â€” and probably more than you do. You know your body is made up of a whole lot of water. You also know that H2O is the chemical formula for water, ice, or steam. So you may think scientists know all about water. And you would be wrong. Leading-edge research has identified a fourth phase of water. And Dr Gerald Pollack - professor of bioengineering at the University of Washington - is at the forefront of fourth phase water research. Besides liquid, ice, and steam, water can also form a gel-like structure of stacked hexagonal layers. And because it stores energy, the gel lining the cells turns your body into a battery. Here are 3 ways to biohack your water for more energy: Chill - Cool water to about 39 degrees before drinking. This brings the water closer to the phase between ice and liquid. Do the twist - Pour water into a glass cylindrical container and stir it with a spoon to create a vortex. The mechanical action increases structure. Infrared light will work, too. For eons, humans did that. They charged their bodies and reset their circadian rhythms by walking on the ground. They also restored energy-depleting imbalances by sleeping on the ground. The earth is like a giant floating battery that carries a net negative charge. And thanks in part to heavy use of electronic devices our bodies often have too much of a positive charge. We can balance ourselves by grounding to the earth. Your feet have some 1, nerve endings per square inch. So spend some time walking barefoot in the grass and see how good you feel. The health benefits are many, and they are significant. This skin-to-ground contact restores a negative charge to the body. This charge seems to stabilize it, bringing it back to its natural electrical state. It also means the body can regulate itself and heal more efficiently. The Earthing Institute cites almost two dozen studies on the health effects of grounding. These effects include improvements in inflammation, stress and cortisol levels. They also include improvements in mood, circulation and wound healing. Here are 3 ways to recharge your battery with earth energy: Ditch the beach chair - To soak up that earth energy, sun your body with your skin in contact with the sand. So push the towel aside! Party on the patio. Concrete is an excellent transmitter of negative earth energies. Be sure you are getting enough water. Wet your face, boost energy - but only at this water temperature Cold thermogenesis CT is a tremendous long-term energy-booster. It can ease chronic pain, reduce stress and stop insomnia. CT also improves skin conditions, boosts immune response, and improves athletic performance. Many have experienced relief from stress and depression. CT also accelerates metabolism and builds the good fat that burns the bad fat. CT is a biological process in which you use cold to produce heat within the body. And it works by activating brown adipose tissue BAT. BAT is a unique kind of fat that generates heat by burning the regular white fat called adipose tissue. Cold temperatures increases BAT energy production and speeds up metabolism and weight loss. When you get cold enough, the brown fat begins to burn calories from either glucose or fat. So you lose weight. During cold exposure, your body releases a hormone called adiponectin. Adiponectin breaks down fat and shuttles glucose into muscles. This in turn can lower blood sugar, repair muscles and enhance recovery. Cold exposure enhances immunity by triggering increased white blood cell

count and activity. This is an evolutionary adaption for the harder life of frozen months. Be sure though your doctor approves of the practice. CT is not for rookies. If it is your first time, face dunking is the ideal introduction to CT. Just follow these steps: Remove anything such as makeup that might be on your skin. Fill a large mixing bowl halfway with ice, then water. Get the temperature to between 50 and 55 degrees Fahrenheit. Dunk your face in the water, and hold it there for as long as you can. You may only last a few seconds. You will be able to build up over time. Take your temperature with a skin thermometer. Rest a minute, then dunk again. Try to increase the time you can hold your face in the cold water. CT is a rejuvenating practice that instantly lifts your mood But before I outline everything - including details on the special discounted price available to you today - I first want to tell you But my seven years with CFS showed me my purpose. When I discovered and followed my true path in life, I became filled with the greatest passion. I have built a worldwide network of more than 4, healthcare practitioners The Living Matrix and 3. And things are moving forward. But I need you help your help to magnify my impact. Below is a package. This is a life changing assembly of cutting edge research for you and your family. With your help, I will be able to put money back into spreading the word about the SuperCharged movement. You may not know but it costs hundreds of thousands to produce movies such as Supercharged. And your help will make all the difference. Limited Time Only SuperCharged A downloadable version of the SuperCharged movie - perfect for travelling so you can play on your computer anywhere without worrying about Internet access! Encoded bio-information provides a one of a kind healing experience. This is the very best at making my body vibrate with the music The sound energizes me while relaxing at the same time. An award winning full feature film starring Sir Richard Branson As information medicine represents the next major evolution in healthcare and self help, this one is not to be missed.

Chapter 6 : Download [PDF] learning supercharged

Supercharged Storytimes is a self-paced course consisting of six modules, which include videos, readings, activities, and reflection questions. The course provides training in how to intentionally apply research-based practices to boost early literacy in young children attending library storytime.

Yammer x A supercharger is an engine-driven air pump or compressor that provides compressed air to the engine to provide additional pressure to the induction air so the engine can produce additional power. With a normally aspirated engine, it is not possible to have manifold pressure higher than the existing atmospheric pressure. For example, at 8, feet a typical engine may be able to produce 75 percent of the power it could produce at mean sea level MSL because the air is less dense at the higher altitude. The supercharger compresses the air to a higher density allowing a supercharged engine to produce the same manifold pressure at higher altitudes as it could produce at sea level. Superchargers are especially valuable at high altitudes such as 18, feet where the air density is 50 percent that of sea level. The use of a supercharger in many cases will supply air to the engine at the same density it did at sea level. The components in a supercharged induction system are similar to those in a normally aspirated system, with the addition of a supercharger between the fuel metering device and intake manifold. A supercharger is driven by the engine through a gear train at one speed, two speeds, or variable speeds. In addition, superchargers can have one or more stages. Each stage also provides an increase in pressure and superchargers may be classified as single stage, two stage, or multistage, depending on the number of times compression occurs. An early version of a single-stage, single-speed supercharger may be referred to as a sea-level supercharger. An engine equipped with this type of supercharger is called a sea-level engine. With this type of supercharger, a single gear-driven impeller is used to increase the power produced by an engine at all altitudes. The drawback with this type of supercharger is a decrease in engine power output with an increase in altitude. Single-stage, single-speed superchargers are found on many high-powered radial engines and use an air intake that faces forward so the induction system can take full advantage of the ram air. Intake air passes through ducts to a carburetor, where fuel is metered in proportion to the airflow. Some of the large radial engines developed during World War II have a single-stage, two-speed supercharger. With this type of supercharger, a single impeller may be operated at two speeds. The low impeller speed is often referred to as the low blower setting, while the high impeller speed is called the high blower setting. On engines equipped with a two-speed supercharger, a lever or switch in the flight deck activates an oil-operated clutch that switches from one speed to the other. Under normal operations, takeoff is made with the supercharger in the low blower position. In this mode, the engine performs as a ground-boosted engine, and the power output decreases as the aircraft gains altitude. However, once the aircraft reaches a specified altitude, a power reduction is made, and the supercharger control is switched to the high blower position. The throttle is then reset to the desired manifold pressure. An engine equipped with this type of supercharger is called an altitude engine. Power output of normally aspirated engine compared to a single-stage, two-speed supercharged engine. Pilot-oriented rather than mechanic-oriented, this guide to aircraft systems is designed specifically to help general aviation pilots understand how aircraft systems work so that they can better use them in flight.

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The new and insightful book by Dr. Richard J. Giordano. Super-Charged Learning. How Wacky Thinking and Sports Psychology Make It Happen. For parents of school-aged children, university students, and anyone wanting to learn more powerfully and remember what you've learned!

Chapter 8 : Supercharger - Wikipedia

Supercharged Storytimes is a research-based program that helps storytime providers enhance children's early literacy

development through intentional emphasis on key early literacy concepts that promote learning.

Chapter 9 : Supercharged Storytimes: Updated Online Self-Paced Course AND Online Facilitator Training

"I just watched the movie SuperCharged. What an excellent production! This is a must see for anybody with low energy or fatigue. It's also a must see for anybody fascinated by biohacking as the movie features an all star cast of experts.".