

# Push and free-throws your knee, hip, ankle

[Nutrition](#)



PSK 4U1 Culminating Performance Task- 2018 Exercise Physiology:

Energy Systems Used: For basketball you use all energy systems, for example: ATP-PC system provides short bursts of immediate energy, this usually lasts only 10 to 30 seconds and happens during quicksprints up and down the court, jump-shots, rebounding, and intense defense.

This system requires at least 3 minutes of rest to recover due to the absence of oxygen during this energy system. To train your ATP-PC system you would need to do very intense but short actions such as lifting heavy weights or sprinting 50-80 meters with a 3-minute break in between sets. The next energy system used is Glycolysis, this is used primarily between plays that last anywhere from 30 seconds up to a minute.

Examples where this is used is in full defensive sets that start at full court, multiple quick changes of possession, and full offensive sets that use inbound plays and lots of screens. The recovery of this system takes 60 seconds to 4 minutes for a full recovery. To train your Glycolysis system you should do moderate intensity exercises that would last from 30 seconds to a minute with a 2-minute break between sets, for example you can do standard strength and conditioning training for this system. The last energy system used but probably the most important for basketball is the Aerobic energy system. This system is essential for the continuous play that is required for an entire basketball game. This system is used for long endurance activities such as a long grueling basketball game, the Aerobic system also assists the other systems in recovering sooner. This system can last anywhere from a couple minutes to hours depending on the fitness level of the athlete, the rest time for this system is around 10 minutes long.

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To train your Aerobic energy system you should do long moderate to low intensity workouts such as cross country, 800m, or long interval training.

**Muscle Contractions Required for Sport:** Certain actions in basketball require the use of concentric and eccentric muscle contractions to perform the given task, some of these tasks can include: chest passes, free-throws, rebounding/dunking, and 3-point shots. In chest passes, 3-point shots, and free-throws your knee, hip, ankle and elbow extensors as well as shoulder and wrist flexors shorten to perform the action which results in a concentric contraction. On the other hand, during a fast-break dunk or while going up for a rebound your quadriceps lengthen as you get ready to explode up with full force putting them in an eccentric contraction, your hamstrings however are doing the opposite. But as you jump and are in the air your hamstrings lengthen making them do an eccentric contraction.

**VO<sub>2</sub> Demands in Basketball:** VO<sub>2</sub> max is the measurement of the maximum amount of oxygen a person can use during intense, or maximal exercise. In basketball you have many short plays that require short moments of intense physical demands and your VO<sub>2</sub> max dictates how much oxygen you can use during that event. Since this is an important factor in basketball and can also show how efficient you are at utilizing the oxygen in your body it makes sense that you would want to try and improve your VO<sub>2</sub> max.

Average VO<sub>2</sub> max values for female and male basketball players have been reported in the range of 44.0–54.0 and 50–60 mL/kg/min, respectively.

(Taylor, J. (2004). A tactical metabolic training model for collegiate basketball. *Strength Cond. J.*

26: 22-29.) Having your VO2 max in these levels will optimize your playing ability and be the difference in split-second 50/50 plays that can win or lose a game. Anatomy in Basketball: Main Muscles Used in Basketball: Basketball is a dynamic sport that simultaneously activates muscles throughout your body to coordinate complex, multi-joint movements with precision (Miguel Cavazos, Muscles Used During Basketball). In basketball your hamstrings are used in every play, they form at the back of your thighs and help your knee bend every time you lift your leg to run across the court or bend down to get ready to take a shot. To strengthen your quadriceps, I would recommend doing heavy weights with 5 sets but low reps (around 3-6) as this will start of training the size and power of your quads. Some exercises that will improve the strength and endurance of your quadriceps are: squats, leg press, and leg extensions. Your core muscles are vital in basketball as they can help with your stability, shock absorption, and adjusting your body in mid-air during layups. Your core is made up of many muscles such as the rectus abdominis, external obliques, and erector spinae just to name a few.

These muscles help you stay upright against gravity, rotate and bend your torso, and help with overall stability. To strengthen your core, I would use exercises such as side crunches, Russian twists, and bicycle crunches to target your obliques, sit-ups, exercise ball knee tucks, and planks for your rectus abdominis, and Roman chair hyperextensions, superman back extensions, and deadlifts for your erector spinae. For your obliques and abs do as many reps as possible for a minute with a 1-minute rest in between sets, for the erector spinae do 20 reps with 1-minute rest for your Roman chair and superman exercises and 12 reps of a moderate weight with a 1-

minute rest between sets for deadlifts. Biomechanics: Scientific Advances in Equipment: Basketball is a simple sport with a court and two hoops however, this is what brought its attention to the masses. Even though basketball is simple there has been many advancements in its technology throughout the years since its conception. In basketball's infancy players only wore canvas sneakers with rubber soles called "Chuck Taylor All-Stars", these shoes offered poor shock absorption, and ankle support. Since players didn't change their shoes as often as today's NBA players their shoes got worn out and deformed putting added stress on the bones and joints of the athletes, basketball shoes stayed like this until the 80's.

Now in the present-day NBA there is a plethora of different shoes an athlete can choose from, researchers figured out how to give players small advantages over others solely based on the type of shoe they could be wearing. If you look at athletes such as Kyrie Irving or Stephen Curry you notice that their shoes have a greater surface area on the bottom of the shoe for added grip, and better ankle support. This is due to the nature of their play-style and the fact they are guards and must shift directions much quicker than bigs, just wearing certain shoes will make a difference in your performance whether it being an increase in speed, ankle support, or shock absorption. Shoes are constantly being biomechanically improved and put out into the market to keep the game of basketball interesting and ever-changing. Technique of a Skill: In basketball one of the most vital skills is the ability to shoot the ball, many players have different ways of doing this but the best all follow a general pattern to improve the efficiency and transfer of force to maximize their chances of sinking the shot. When you get ready to

take your shot you want to keep your eyes on the target and not the path of the ball, you should have your feet shoulder width apart with a slight bend in your knees and holding the ball in your shot pocket. Line up your body so the ball and your shooting eye form a straight line, make sure you are holding the ball with your fingertips parallel to the long seams on the ball. Start by bringing the ball upwards with your elbow under the ball, the ball needs to stay in front of you and should never go behind your head, uncoil your body by springing up with your legs, core, and arms all synchronized, your elbow and wrist should extend in a straight line towards the hoop.

Release the ball just before the apex of your jump, your wrist should be relaxed and your fingers pointing at the basket, then hold your follow through until the ball hits the rim. The best shooters all follow these rules but the most important one is consistency, if you look at all the best shooters and their form they always repeat the same motion and generate the same amount of force in their shot, this is the difference between a good shooter and a great one.

3 Principles of Biomechanics in Basketball: In biomechanics there are seven principles one of them is stability, it is the ability to maintain balance, it states: the lower the center of mass the larger the base of support, and the closer the center of mass to the base of support. In basketball when shooting a free-throw, players will get into a slightly bent down position to lower their center of mass and increase their stability. For bigger players such as centers they use all their mass by increasing their base of support and lowering their center of mass when getting ready to box out an opponent for a rebound. Maximum force requires the use of all possible joint movements that contribute to the objective, in basketball this can be any

action that requires maximum effort to be applied to perform the action such as jumping or going up for a dunk. Torque is angular motion that is produced by the application of force acting at some distance from an axis, in basketball this can occur during a windmill dunk as the force is away from the axis being the shoulder and allows rotation to occur. 360 dunks and layups are rotations of the entire body and require a great deal of force to be produced to turn the player's whole body 360 degrees.

Motor Development in Basketball: Movement Intelligence in Basketball:

Movement intelligence is the ability for us to identify and utilize the sweet spots of ideal coordination, in basketball this is where efficiency and using the quickest way to get around the floor to score points comes in. If you look back at early shooting forms in basketball players used to shoot with both hands which generated more force but skewed the ball left or right, modern players shoot only with one hand while the other is used to guide the ball. This is more efficient and requires less energy to be used, along with the sweet spot of making a basket which is at a 52-degree release, 3 revolutions per second of backspin and aiming for a spot 7 centimeters back from the center of the basket these are all movements that players are slowly understanding and changing their forms to optimize their chances of achieving better movement intelligence.

Skill Breakdown of a Skill: In the 3-point shot a player will pre-load his muscles by coiling up and getting ready to release all that energy into his shot, this stage is the pre-stretch and the athlete looks like he is slightly bent over and looks like he is about to jump. When the player finally jumps all his muscles must activate together as this moment is known as the critical instant where

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all the task become ready to execute at the same time. The follow through happens right after the ball is released from the player's hands, it helps the athlete remember how he performed the action so the next time he does it he doesn't need to think about what his last shot was like.

It is easy to tell when the follow through occurs in basketball as players will have one arm in the air with the wrist down. Operant Conditioning in Basketball: Operant conditioning is a type of learning where behavior is controlled by consequences. In basketball when you play good during games or always show up to practice your coach will reward you with praise and more playing time, this reinforces your positive image linked with working hard and getting playing time because of it.

This method turns those who are already hard workers into gym rats who will do anything to get better whereas those who have off games or don't show up to practice will have consequences and result in them linking negative things with playing bad and going to practice. Coaches will use this to try and shape and mold athletes into their ideal player even if it doesn't line up with the athlete's own. Classic Conditioning in Basketball: Classic conditioning is a type of learning that takes two unconnected external stimuli and links them to one natural occurring stimulus. In basketball when a player hears a whistle that tells them to stop or go but by itself a whistle doesn't mean much and won't garner a response but if you take a whistle and the stop or start of a game and put these two unrelated things together they will be associated together and cause a certain response to occur which is players starting or stopping when they hear the whistle. Sports Psychology in Basketball: Wheel of Excellence in Basketball: The wheel of excellence is <https://assignbuster.com/psk-and-free-throws-your-knee-hip-ankle/>



made up of seven parts and all of them are connected to one central theme of believing you can do it and committing to it.

To succeed in anything, you must make sure you accomplish all the seven steps, if you ever failed at something it was due to one of the steps not being completed. In basketball these steps play major roles in becoming an all-star athlete in the sport. When I try to improve in basketball I will take certain steps to try and improve my game, when I start to practice it has my full attention and I block out all possible distractions that might disrupt my practice.

I mentally prepare myself for everything that comes with practicing basketball while believing that I can accomplish my goals and listen to constructive evaluation to improve my game based on feedback from coaches or players. Things I could improve on would be my commitment to basketball as I only practice when I feel like it and don't dedicate enough time to the game, another zone that needs improvement is positive imagery as I don't think of my body as a basketball player's body due to my lack of height which affects how I play the game and what I focus on when practicing.

Self-Talk in Basketball: Self-talk is important in everyday life, whether you are lying in bed trying to talk yourself to get up or preparing yourself for a presentation self-talk plays a vital role, and sports are no different when it comes to self-talk. When players go to take a free-throw, or go up for a shot majority of them are giving a positive self-talk, it could be along the lines of "relax", "it's going to go in", or "he can't guard me".

All these things said are positive reinforcement to improve the athlete's game and give them a mental edge against their opposition, if you think that you can't do something or that your shot won't go in it won't cause you don't think you can do it. If I were giving myself a self-talk I would always tell myself what I would want to hear such as "I'm making that shot", or "I'll make this free-throw" as this tells my body that I can do it and will make me perform at my best.

**Imagery in Basketball:** Imagery in basketball would be visualizing yourself making a shot, layup, block, or getting a rebound, while playing a sport, before you do an action you visualize what could happen and more so what you want to happen. This is imagery, and it helps athletes prepare themselves mentally for whatever action they are about to take. When you go to take a shot, you don't visualize yourself missing because that would be a negative outcome, I would use imagery to picture my shots going in, doing a nice crossover, or layup, there are many studies showing that positive imagery or thinking of a good outcome leads to that given outcome rather than negative imagery which leads to negative outcomes.

**Success Cycle/Failure Cycle in Basketball:** The success cycle starts with believing in your potential and the amount of potential leads to the amount of action you take and that leads to results based on the action you took; the cycle then repeats and this is what gives someone success. I have seen the success cycle in basketball with players like Isaiah Thomas who are undersized and taken late in the draft and are called busts.

Because Isaiah believed in his potential he worked on his craft as much as possible which made him take action, that led to great results such as him now being in a starting role and being talked about as one of the best point-

guards as of right now. The failure cycle is the opposite of the success cycle as players who get trapped in the failure cycle never seem to get out of it. An example of it shown would be any NBA bust. They had bad seasons or injuries and that led them to not believe in themselves which hurt their potential so when they acted they didn't get the results they wanted. This threw them into a vicious cycle where the only way out was to not try anymore and this led to short careers and being known as busts.

**Nutrition for Basketball: Pre-game Guidelines for Basketball:** When getting ready to play a long basketball game it is important that you properly fuel your body with the food needed for the match. It is best to eat a meal rich in complex carbohydrates an hour or two before the basketball game starts. This will give the player a steady boost of energy during the entire game. Foods rich in complex carbohydrates include pasta, cereal, vegetables, peanut butter and bread.

It is also important to stay hydrated by drinking plenty of liquids throughout the day as well as during the game itself. **Items to Improve On:** I could improve on the type of carbohydrates that I eat as most of them are simple carbs and have empty calories, I also don't drink enough water before or during the game which leads to me being dehydrated and performing poorly. **Strengths of My Diet:** When I eat, I always try to eat balanced meals even when the meals are not the healthiest so I can make sure I am getting all the nutrients that I need. I space out my meals throughout the day and try to always eat something rather than missing out on it due to time constraints. **Sports Injuries in Basketball: Common Injuries in Basketball:**

Basketball has many injuries that come with playing the sport, the most common injury is a sprain whether it be to the wrist, finger, knee, or ankle.

A sprain is a stretching or tearing of one or more ligaments, they can occur in basketball when you try to change directions too fast or land awkwardly on a limb. Treatment for ankle sprains should follow the R. I. C. E method of rest, ice for the first 48-72 hours, compression for the first 24-36 hours, and elevating the injury above your heart for 2-3 hours a day. Head trauma such as lacerations or concussions are also common in basketball and be caused by colliding with a defender or getting hit in the head.

Treatment for mild concussions is rest and over-the-counter painkillers but if it is more severe you should seek medical attention right away. The next common injury in jumper's knee or patellar tendonitis, it is the inflammation of the patellar tendon. It is caused by repetitive stress placed on the patellar tendon or quadriceps tendon due to jumping which happens all the time in basketball. Treatment for this injury should follow R. I. C. E, rest for the injury however should take 2-4 weeks.

Sociology of Basketball: History of Basketball: Basketball was created in 1891 in a YMCA training school in Springfield, Massachusetts by the Canadian James Naismith, the sport originally only had 13 rules and was played with a soccer like ball being shot at peach baskets 10-feet of the ground.

Since then the sport of basketball has changed tremendously and is one of the most popular sports today. Equipment Required for Basketball: The equipment needed to play basketball is few and is not necessarily needed to play a simple pickup game. To play the sport of basketball you must have

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basketball shoes, a court, uniform, shot clock, hoop, and a whistle. Barriers in Basketball: Barriers in basketball can range from disability to socio-economic standings. Players with disabilities cannot play in the NBA but have disability leagues for them to still enjoy the sport and play it competitively, racial barriers are not that prevalent in basketball as other sports due to the wide demographics of ethnicities in the sport. Athletes that are from low socio-economic classes will find it hard to enlist in rep leagues as they require a good amount of money to participate in however, this does not stop them from participating in the sport as a whole and from even going pro. Club Organization in Basketball: When starting basketball, you can start in recreation leagues that are usually offered through the city and have different leagues based on age and skill, the next level would be high school.

When playing for your high school team you will be facing many players with different skill levels and be required to consistently improve your game.

College basketball such as the NCAA governs all collegiate basketball and teams, players in this league will be looking to go pro and will not back down from the increase of fierce competition as they all are looking to make a living from the sport. The NBA is the highest level that one can play basketball at, players in this league are the best of the best and some might even get the chance to go down in the basketball hall of fame. This level requires you to focus all your time on the sport as this is now treated as your job. Basketball's Long-Term Athlete Development Model: Basketball fits the L. T. A.

D model, active start is for ages 0-6 years old and basketball offers leagues for this age group that helps them stay active and works on their fitness and <https://assignbuster.com/psk-and-free-throws-your-knee-hip-ankle/>

movement skills development. FUNdamentals is for ages 6-9 years old and youth leagues offer this to promote participation, overall development, and cognitive development of required skills. Learning to train would fall under the youth league while training to train and training to compete would be rep leagues as they offer more competition and better skill development opportunities. Training to win would be provincial and national leagues that offer the best players from all over the world to compete head-to-head and have highly skilled coaches and trainers helping players reach their full potential. Active for life would be senior recreation leagues that focus on being active and friendly competition.