Pd h pe preliminary course

PD/H/PE PRELIMINARY COURSE Assessment Task 4 Discus 1. Discus is a complex sport that requires skill and a lot of training. The discus is held in the dominant hand putting the first knuckles of your fingers around the edge. Your hand must be spread wide but not strained. You must orient your wrist so your index finger is directly in line with your forearm. You must then align yourself with the target area, either at your left shoulder or behind you. Most professionals face away from the target, which requires another 90 degrees of spin and can be a more difficult manoeuvre but optimizes throwing speed on a properly executed throw. Just before your right leg is planted, your left leg should rise off the ground with the momentum of your spin. As your right leg plants, your left leg should move low and fast around your body to plant in line with the right leg at the front of the circle. The left leg plants firmly and the entire momentum of the body is directed into the extended right arm. The hips drive through the rotation to face the target while the shoulders and arm trail behind and then snap through. The discus is released off the front of the fingers, rolling off the index finger, which imparts clockwise spin. The skeletal system has a major contribution as it provides the movement during the discus throw. The phalanges and metatarsals are used to allow the movement in the feet when spinning and swivelling. The feet play a very significant role throughout the entire preparation and throw. The tarsals in the ankles are gliding joints which allow for the ankles to create the joint action of dorsiflexion and plantar flexion when the individual turns their body in preparation for the throw. During the discus throw, the athlete lifts one foot in a plantar flexion whilst the other foot stays in the dorsiflexion position. During the whole throw, the legs are constantly flexed and extension is not made until the discus has been

released and the athlete is not longer in motion. The vertebral column, consisting of the cervical vertebrae, thoracic curvature and the lumbar curvature, allows movement in the trunk. When the individual spins, the vertebral allows the trunk to rotate from side to side. Included in the trunk is the sternum and the rib cage. The patella is a condyloid joint is in a bent while the tibia, fibula and femur are all flexing as rotation is taking place. The pelvis which is a ball and socket joint allows flexion in the legs. The phalanges and the metacarpals flex as the discus is gripped. The carpals in the wrist are gliding joints, which rotate and flex as the arm swings back and forth across the body in order to keep a solid grip on the discus. The fingers extend when releasing the discus in order to get distance. The elbow, which is a hinge joint, allows bending when coming back across the body after hyperextension behind the body. It is then in a pronation position when extended forward. The muscular system also plays a major role in throwing a discus. The entire muscular system is required to enable to discus throw. The tibialis anterior, located near the tibia, allows the feet to produce the action of dorsiflexion, inversion and eversion. For the knee to be able to flex, the gastrocnemius and the hamstrings perform a concentric movement whilst the quadriceps and tibialis anterior create the eccentric movement because they lengthen. The erector spinae allows for the back to extend when the individual swings their arms back and forth around their body in preparation of releasing the discus. This allows for the muscle length to increase so that muscle is completing an eccentric contraction. Because the body is moving from side to side, the external obliques flex as the trunk rotates. Whilst the athlete is moving to the left, the left hand side obliques shorten, performing the concentric muscle contraction. At the same time the right external

oblique is lengthening. This is constantly swapping as the athlete swings their arms from side to side. The trapezius elevates the shoulders and extends while the pectorals flex when the arms moves. The pectorals are performing concentric contractions and the trapezius is performing eccentric contractions. In the upper body the deltoids are extending as the arms hyperextend behind the body, which is an eccentric contraction, although it is becoming a concentric contraction as the arms move towards the front of the body. As the arm flexes, the bicep is performing a concentric contraction whilst the triceps perform eccentric contractions. The rectus abdominals are an isometric muscle contraction as they do not play a major role in performing discus. 2. In performing discus there are six main physical fitness and movement components. Three being health-related components and three being skill-related components. Muscular strength is highly necessary in discus. The more muscular strength an individual has, the further distance the discus will go. Flexibility is also a component of fitness involved in discus. It is one of the most neglected but most vital elements to an athlete. There are many different stretching techniques a discus athlete should perform in preparation. These include straddle stretch, upper groin stretch, butterfly groin stretch, trunk twist, open arm stretch, triceps stretch, cuff stretch. The skill related components that discus thrower posses are power, coordination and balance. There are many different training techniques that all professional discus throwers need to be able to perform. The first is weight lifting. Discus throwers should incorporate upper body and lower body exercises. For the upper body, perform workouts that train the essential muscles for discus throwing. These include bench press, shoulder press, triceps extensions, and shoulder lifts, exercises that improve the strength of

the shoulders and arms to generate a longer throw. For the lower body, perform squats, lunges, and box jumps to improve leg power. Discus throwing includes a high level of intensity and a sudden burst of speed for a short interval of time. Another way discus throwers can train is by using medicine balls. Use a medicine ball to perform exercises that mimic throwing the disc. To increase oblique strength, throw a medicine ball from your hip against a wall and catch on the opposite side of your body. Repeat to strengthen both sides of the body. This strengthens the upper body by simulating similar movements to discus throwing. As with strength training, medicine ball exercises should be performed at maximum intensity. Another training technique is the tire flip. The tire flip improves explosiveness, endurance and full body muscle strength. Flip the tire as many times as you can at full intensity. The tire flip works the muscles necessary for the discus throw and greatly improves conditioning. There are also other training techniques for discus throwers such as stretching and the sandbag carrying. Athletes should perform a complete stretching routine before and after each training session. Since discus throwing incorporates all muscles of the body, take the time to stretch each muscle group thoroughly. Throwing a discus is an extremely intense movement, forcing your body to twist and jerk at high speed. Competitors can easily injure a number of muscle groups if they fail to prepare the muscles for the movements by stretching and warming up. The sandbag carry will develop your core and strengthen your abdominal muscles. As you throw the disc, your body is twisted at a high speed to generate power. Your abdominal muscles generate this twist as your arm swings around. The sandbag carry develops strength and endurance for this muscle group. This exercise also strengthens the shoulders and the arms. 3.

Biomechanical principles deal with the scientific basis of human movement. Analysis of the way the body moves during the sport has led to improved and advances performance using newly developed techniques and modified or changed sports equipment. The first aspect of biomechanics that has an influence on discus is motion. Angular motion and momentum are the most influential in discus. Angular motion is motion in a curved or circular path. Discus is the best example of angular motion, as the thrower is moving in a circular path in preparation for the release of the discus. Linear and angular motion are combined in most movement activities. Momentum is the amount of motion possessed by a moving object. A moving object has a certain mass and velocity and the two of these together equals the momentum. The greater the momentum of the body, the greater the tendency to resist changes in motion. External forces can have an influence on momentum, as can internal forces. The greater the mass, the greater the momentum. When professional athletes spin in circles will preparing to throw the discus, they are aiming to gain momentum in order for the disk to go a further distance. Balance and stability also occur in discus. Dynamic balance is balance in motion. While the discus thrower is beginning their throw, they must keep dynamic balance in order for their throw to go as preferred. There are many factors that influence stability. These include mass, base of support, centre of gravity, stability and mobility. The greater the mass of the discus thrower, the more stable the body is likely to be. The larger the bass of support, the greater the stability. This is why taking larger steps while circling will benefit the thrower and give them more stability. The lower a person’s centre of gravity, the greater the stability. The line of gravity must be located within the supporting base to increase stability, therefore the closer to the ground

the discus thrower is the more stable they will be and will get more distance in their throw. The momentum of an object directly affects stability in motion. The faster the discus throw is going, the more stable they are with their throw. The larger the mass, the greater its stability. Taller discus throwers will be less stable in motion than shorter discus throwers because of the height of their centre of gravity. Force is something that causes movement. A force may be a push or pull, that causes a change in the shape of an object or body. Forces can be internal or external. The body can apply force using the summation of forces. This is a combination of a number of forces working in sequence. For example in discus, forces produced by the feet, legs, arms, wrists and fingers produce the large forced used to throw the discus as far as possible. The body also applies force by Newton’s Third Law: for every applied force there is an equal and opposite force. For example in discus the thrower exerts a force against the ground and an equal and opposite force pushes the thrower off the ground. Applying force to objects depends on a number of factors. These include magnitude which is the amount of force that has been applied to the discus, direction which is the way the force is applied to the discus, the point of application which is the spot where the force is applied to the discus and the line of action which is the point of application plus the direction of the force. Sarah McAneney