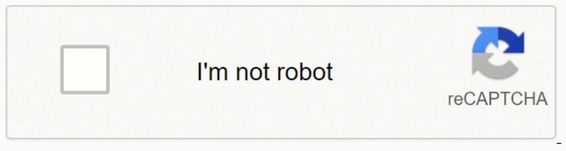


Open

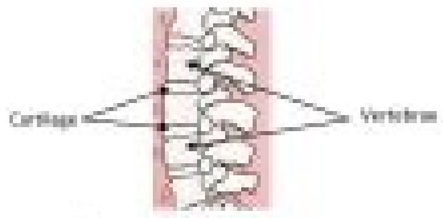
Muscle action and joint activity worksheet answers

Joints & Movement Worksheet

Read your notes and answer the following:

1. What are joints? (2 marks)
   A joint is the area where two or more bones meet.
2. What are fixed joints? What is their other name? (2 marks)
   Fixed joints are joints where there is no movement between the bones.
   Fixed joints are also called immovable joints or fibrous joints.
3. What are slightly moveable joints? What is their other name? (2 marks)
   Slightly movable joints allow a slight amount of movement.
   They are also called cartilaginous joints.
4. Name the type of joints shown below.

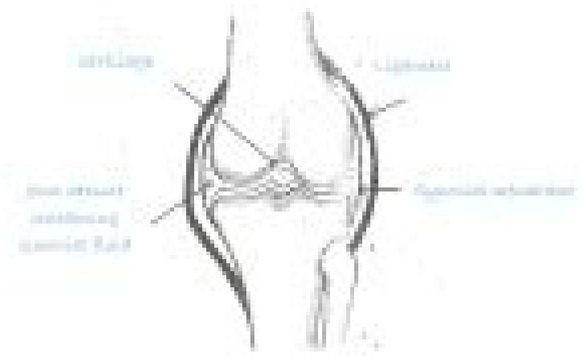
a. Fixed joint



b. Slightly Movable

5. What are freely moveable joints? What is their other name? (2 marks)
   Freely moveable joints allow a wide range of movements.
   They are also called synovial joints.
6. What type of joint is shown in the following diagram? (1 mark)
   A synovial joint

Label the diagram. KNEE JOINT (5 marks)

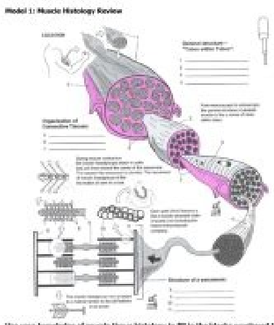


Muscle	Origin	Insertion	Action	Innervation
Brow				
Occipito-frontalis, frontal belly	Epicraneal aponeurosis	Underneath skin of forehead	Furrowing brow	Facial nerve
Occipito-frontalis, occipital belly	Occipital bone; mastoid process (temporal bone)	Epicraneal aponeurosis	Unfurrowing brow	Facial nerve
Corrugator supercilii	Frontal bone	Skin underneath eyebrow	Draws eyebrows medially and downward; frowning	Facial nerve
Nose				
Nasalis	Maxilla	Nasal bone	Widens nostrils	Facial nerve
Mouth				
Levator labii superioris	Maxilla	Underneath skin at corners of the mouth; orbicularis oris	Elevates upper lip	Facial nerve
Depressor labii inferioris	Mandible	Underneath skin of lower lip	Draws lower lip downward	Facial nerve
Depressor angulus oris	Mandible	Underneath skin at corners of mouth	Opening mouth and sliding lower jaw left and right	Facial nerve
Zygomaticus major	Zygomatic bone	Underneath skin at corners of mouth (dimple area); orbicularis oris	Draws angle of mouth upward and laterally; smiling	Facial nerve
Orbicularis oris	Tissue surrounding lips	Underneath skin at corners of the mouth	Shaping of lips (as during speech)	Facial nerve
Buccinator	Maxilla, mandible; sphenoid bone (via pterygomandibular raphae)	Orbicularis oris	Lateral movement of cheeks (e.g., sucking on a straw; also used to compress air in mouth while blowing)	Facial nerve
Risorius	Fascia of parotid salivary gland	Underneath skin at corners of the mouth	Draws angle of mouth laterally.	Facial nerve
Mentalis	Mandible	Underneath skin of chin	Elevates and protrudes lower lip and skin of the chin	Facial nerve

The Sliding Filament Theory

"How do muscle cells contract?"

Model 1: Muscle Histology Review

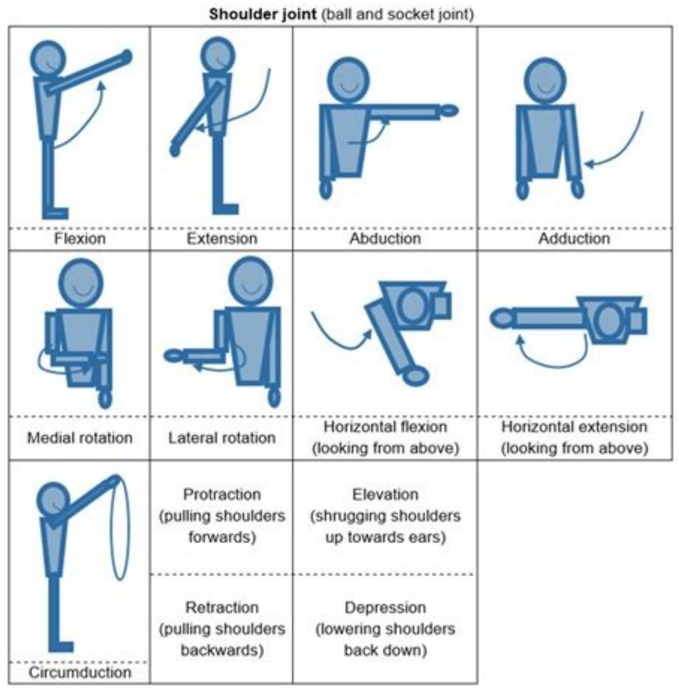


Use your knowledge of muscle tissue histology to fill in the blanks numbered 1-11 with the following terms: Fascia, Hydrated, Perimysium, Myosin heads, Actin (thin) filaments, Whole muscle, Skeletal myocyte, Epimysium, Endomysium, Myosin (thick filaments), 2 ms.

Unit 4 Essential Questions

Lesson 4.1 Joints and Motion

1. **What role do joints play in the human body?**
   Joints are the places where two bones meet and allow movement & flexibility and provide support to the human skeleton.
2. **How are joints classified by both structure and function?**
   Functionally, joints are classified by how much motion they allow. Structurally, joints are classified as fibrous, cartilaginous, or synovial
3. **What are the different types of synovial joints?**
   - Pivot joint
   - Ball-and-Socket joint
   - Saddle joint
   - Condyloid (Ellipsoidal) joint
   - Hinge joint
   - Plane (Planar or Gliding) joint
4. **What role do cartilage, tendons, and ligaments play at a joint?**
   - Cartilage - Cushions/protects bones where they meet and rub against each other. The cartilage found in joints is hyaline cartilage
   - Tendons - Fibrous tissue that connects muscles to bones
   - Ligaments -Fibrous tissue that fasten bones to other bones
5. **What terms describe the path of movement at a joint?**
   - Depression and elevation
   - Rotation and circumduction
   - Flexion and extension (and hyperextension)
   - Abduction and adduction
   - Plantar flexion and dorsiflexion
6. **What is range of motion?**
   Range of motion is the range through which a joint can be moved & can be measured using a goniometer to determine angles.
7. **How do you measure the range of motion of a particular joint movement?**
   - Joint has a normal range of motion expressed in degrees.
   - Devices include:
     - Goniometer
     - Inclinometer- which use a stationary arm, protractor, fulcrum, and movement arm to measure angle from axis of the joint.



Reversal and Eversion Lâreversal and eversion are complex movements involving multiple flat joints between the tarsal bones of the rear foot (intertarsal joints) and therefore are not movements occurring at ankle joint.Ã Reversal Bending and extension Bending and extension are movements occurring the inner of the sagittal plane and involve forward or rear movements of the body or limbs. The movement the shoulder and shoulder the shoulder and shoulder (¨ lâelevation), while a movement down (Ã¨ depression). Figure of rotation Ã 3. What movements involve increase or decrease of angle of the foot to the ankle For the spine, the bending (front bending) Ã Ì a front bending (forward) of the neck or body, while bending involves a back-direct movement, such as straightening from a bending position or bending to back.Ã Lateral bending. For the thumb, removal Ã¨ the front movement that brings the thumb to a perpendicular position of 90ÂÂ°, pointing directly out of the palm. The types of movement are generally coupled, with one opposite the . (b) thumbopposition of the thumb shall bring the tip of the thumb into contact with the tip of the fingers of the same hand and the repositioning shall bring the thumb close to index finger. adduction brings limb or hand towards or through midline of the body, or reunites toes or toes. Protraction of the scapula occurs when the shoulder is moved forward, such as pushing against something or throwing a ball. In the limbs, bending decreases angle between (bending of the articulation), while the extension increases the angle and straightens the articulation. Abduction and Adduction Abduction and adduction motions occur within the coronal coronal ssecorp ralucitra roirefni-roirepus ;toof fo stnioj lasratretnI nmuloc larbetrev eht fo noixelf laretal dna ,noisnetxe ,noixelf ro ,toof fo noisreve dna noisrevni swolla ;tnioj laixaitluM enalP tnioj ralucivalconrets ;bmuht eht fo tnioj lapracatemoprac tsriF stnemevom noitcudmucric dna ,noitcudna noitcudba ,noisnetxe/noixelf swolla ;tnioj laixaiB elddaS seot rof stnioj laegnalahposratatem ;tsirw fo tnioj lapracoidar ;sregnif fo stnioj)elkcunk(laegnalahpopracateM stnemevom noitcudmucric dna ,noitcudda/noitcudba ,noisnetxe/noixelf swolla ;tnioj laixaiB diolydnoC seot dna sregnif fo stnioj laegnalahpretni ;elkna ;woble ;eenK stnemevom noisnetxe/noixelf swolla ;tnioj laixainU egniH tnioj ranluoidar lamixorp ;)noitalucitra earbetrev 2CÂÂÃ81C(tnioj laixaotnaltA tnemevom lanoitator swolla ;tnioj laixainU toviP elpmaxE tnemevoE tnio J fo epyT stnioJ eht fo stnemevoM .ydob eht fo edis eht ot nwod mra eht sgnirb noitcudda elihw ,ydob eht morf yawa yllaretal ti gnivom ,tnioj redluohs eht ta mra eht gnisiar si noitcudba ,elpmaxe roF .elcric a sebircsed dne rehto eht elihw yranoitats ylevitaler syats devom gninoiger ydob ht fo dne eno hcihw ni ,rennam ralucric a ni noiger ydob a fo tnemevom eht siÂ Ã noitcudmucriC noitcudmucriC .kcab nihc eht sllup noitcarter dna ,drawrof nihc eht sehsup elbidnam eht fo noitcartorP)b(.epahs-X na mrof anlu dna suidar eht dna ,noitisop detanorp ni si mraerof eht ,drawkcab secaf dnah eht fo mlap eht nehW .noitom noisreve naht noisrevni fo egnar retaerg a sah toof ehT .snoitom lacimotana tuoba nrael ot lacimotana eht ot noitaler ni debircsed syawla era stnemevom ydoB .tnioj egnih a si hcihw ,tnioj elkna eht ta stnemevom era lovni dna Between Vertebrae multi-assist ball and socket joint; Allows flexion / extension, abduction / adduction, circumstances and medial / lateral movements of rotation shoulder movements and hip joints returning the thumb to its anatomical position next to the index is called repositioning (see figure 6). Spreading your fingers or fingers of your fingers is also the kidnapping, while carrying together your fingers or fingers of the wound is the adduction. ABDUCTION, ADDUCTION, Ã ¢ and circumuction Figure 2. It involves the sequential combination of bending, adduction, extension and abduction to a joint. Upper rotation and lower rotation upper and lower rotation and lower rotation are movement of the scapula and are defined by the direction of the Glino cavity movement. Abduction, adduction and circumstances. These are important movements that help stabilize the foot when walking or running on an irregular surface and help rapid side-side changes in the direction used during active sports such as basketball, racquetball or football (see figure 5) . Table 1. Flexures and movements of extension are seen at the hinge, condyloid, saddle and ball joints and limb sockets (see figure 1). (c) Ã ¢ â,¬ "(d) the front flexion of the head or spine is declined, while any external movement is extension. Without a upper rotation of the scapula, the greater tubercle of the humerus would have hit the Acromion of the Scapula, thus preventing any abduction of the arm over the height of the shoulder. Adduction, abduction and circumstances take place on shoulder, side, wrist, metacarpofalangeal and metatarsophlangeal joints. For example, to the AtlaneaAssial joint, the first cervical vertebra (C1) Vertebra (Atlante) revolves around the tanes, the projection upwards of the second cervical vertebra (AXIS). This type of movement yes to Biaxial Condyloid and Saddle Joint, and to multi-axial couplings with ball and sockets (see Figure 2). Abduction and adduction are movements of the limbs, hand, hand, al atnorffa edeip led enoisrevni'l ertnem ,oproc led anaidem aenil allad onatnol edeip led)alous(odnof li atsops edeip led enoisreve'L)a(.ranluoidar id elatsid enoizalocitra'lla oiggar led otnemivom ad otangapmocca ,ranluoidaR id elamixorp enoizalocitra'lla oiggar led enoizator allad ottodorp ¨Ã otnemivom otseuQ .otid nu id atnup al noc ottatnoc ni ecillop led atnup al atrop ehc ecillop led otnemivom li ¨Ã enoizisoppo'lled otnemanoizisopir e enoizisoppO .omlap len o eicdni otid li ortnoc orteidni ecillop li atrop enoisself al ertnem ,omlap led onaip ossets olled onretni'lla ,onam alled omlap lad onatnol ecillop li atsops enoisnetse'l ,ecillop li reP .otnemivom led "eroiretna(lattigas otnemivom led onaip len onos enoisnetse id e enoisself id itnemivom eL)b(" ¬â ¢Â)a(.)anretni(elaidem enoizator atamaihc ¨Ã oproc led anaidem aenil al osrev otra'lled eroiretna eicifrepus al atrop ehc otnemivom lI .enoizarter e enoizartorp ,enoisreve ,enoisrevnI .ilanoizanitlum o ilaissaib itnuig a isracifirev ²Âup ehc ,enoizudnocric allad ,acna'lled inoizalocitra el e elaissaitlum allaps al osserp olos isracifirev ²Âup ehc ,elaretal e elaidem enoizator al ereugnitsid id israrucissA .enoizalocitra'lled ital i ibmartne us asso ella itaccatta onos ehc ilocsum ied otnemassalir lad o enoizartnoc allad avired elaivonis otnuig nu a otnemivom ingO .enoizatoR .eduihc ol enoizavele'l ertnem ,accob al erpa alobidnam alled enoisserped aL)a(.)4 arugif idev(oiaihccuc nu noc appuz atipicerp is odnauq isu ehc otnemivom li ¨Ã enoizanipus al ehc eradrocir a atuiA .enoizisoppo e enoizavele ,enoisserpeD .iroirepus itra ilged otnemipar la ecsiubirtnoc ehc etnatropmi otlom otnemivom nu ¨Ã otseuQ .otnemivom eralocitrap nu errudorp rep emeisni eraroval onossop inoizalocitra esrevid ,oproc led inoiger ertla ni ,otnuig olognis nu a otnemivom id ammag ednarg ¹Âip al Ãd tekcos e arefs a otnuig li ertneM ." elaidem elaretal(elanoroc otnemivom id onaip led atid o towards the midline. Conversely, rotation of the limb so that the front surface is away from the center line Ã¨ the lateral (external) rotation (see Figure 3). 3) The excursion is the movement from side to side of the jaw.Ã¨ The lateral excursion moves the jaw away from the midline, towards the right or left side.Ã¨ The medial excursion brings the jaw back to the resting position at the midline. This crossing brings the ray and ulna to an X-shaped position.Supination is the opposite motion, in which the rotation of the ray brings the bones back to their parallel positions and moves the palm to the front (supinata) position. For the upper limb, all anterior movements are bending and all posterior movements are extension. Hypertension injuries are common in the hinge joints such as the knee or elbow. Learning Objectives Define the different types of body movements Identify the joints that allow these movements Synovial joints allow the body a wide range of movements. (See Figure 5.) Figure 5. The retraction is the opposite motion, with the scapula pulled backwards and medially, towards the spine. These movements occur at the first carpometacarpal junction. These movements occur at the shoulder, hip, elbow, knee, wrist, metacarpophalangeal, metatarsophalangeal and interphalangeal joints. For the mandible, protraction occurs when the lower jaw is pushed forward to detach the chin, while the retraction pulls the lower jaw back. This allows the head to rotate from side to side as when it shakes the head Ã¢ÂÂ The proximal radiolular joint is a rotation joint formed by the head of the ray and its joint with the ulna. In the lower limb, carrying the thigh forward and upwards you notice a flexion at the hip joint, while any movement of the thigh a posteriori is the extension. This is a uniaxial joint, so rotation is the only movement allowed in a joint. Subtraction and adduction movements are observed at condyloid, saddle and ball joints (see Figure 2). Because of the slight curvature of the radius shaft, radius, aL . Ãtilibom e Ãtilibisself ednarg aus al oproc la erinrof rep airassecen ¨Ã elaivonis enoizalocitra id opit ingo ,osselpmoc leN .enoisnetse de ÃtilibisselF Ã.1 arugiF .oiggar led atset alled enoizator al etnesnoc ehc enoizator id otnuig nu ¨Ã elamissorp elaidar enoizalocitra'L .eegnalafretni e eegnalafopracatem inoizalocitra ella atid el e ,oslop la onam al ,otimog la oiccarbmava'l ,allaps alla oiccarb led iroiretsop-iroiretna itnemivom onodulcni itseuQ .)4 arugiF idev(ailgivac alled enoizalocitra'lla ilibinopsid itnemivom icinu ilg onos itseuQ .eroirepus otra'lled otnemipar otelpmoc li rep airassecen idniuq ¨Ã alopacs alled eroirepus enoizator aL .oiccarbmava'lled enoizanipus e enoizanorp id itnemivom i etnarud azzehgnul aus al ognul eratour id oiggar la ettemrep otnuig otseuQ .otnuig otseuq a ecillop led otnemipar e enoisself id enoizanibmoc anu ad attodorp ¨Ã ecillop led enoizisoppo'L .otnemipar li ¨Ã ,ideip ied atid el o atid el eramlaps o ,oproc lad onatnol etnemlaretal onam al o otra'l eratsopS .oiccarbmava'lled atanipus enoizisop al ¨Ã atseuQ .elacivrec enoiger alled enoisselfrepi ehc enoisnetserepi ais eratnemireps ²Âup etneizap nu ,itnava ni iop e orteidni'lla atatsops etnemasivvorpmi eneiv atset al iuc ni ÂÂ¢Âhsalpihwâ¢Â id isac ieN .alopacs allus onocsiga ehc ilocsum id inoizanibmoc ad ittodorp onos e eralopacs anips alla eroirefni otnup nu a onrotni alopacs alled enoizator al onacilpmi itnemivom itseuQ .acna'lled e allaps alled aserp a e arefs a inoizalocitra ellen ehcna isracifirev ²Âup enoizator aL .4 arugiF .otnuig nu a enoisself avissecce ¨Ã enoisselfrepi'l ,odom ossets ollA .ecidni otid la otnacca ,acimotana enoizisop allen ecillop li atropir enoizudda'L .elarutturts opit ous lad otanimreted ¨Ã elaivonis otnuig nu ni ottodorp eresse ²Âup ehc otnemivom id opit lI .enoizanorp e enoizanipuS .elatsid aeniloidar enoizalocitra'lla elatsid anlu'l isrevartta oiggar led elatsid Ãtimertse'l ehc ¬Ãs af enoizator al can occur inside the spine, at a rotational joint or at a spherical joint. The abduction laterally moves the limb away from the midline of the body, while Ã¨ the opposite movement that brings the limb towards the body or through the midline. Similarly, abduction and adduction to the wrist removes the hand from the midline of the body. The circumduction Ã¨ the movement of the limb, hand or fingers in a circular pattern, using the sequential combination of bending, adduction, extension and subtraction movements. The Ã¨ hyperextension is the abnormal or excessive extension of a joint beyond its normal range of movement, thus causing a injury. To increase the carrier support for the bag, the shoulder rises as the scapula rotates upwards.Ã The lower rotation occurs during the adduction of the limbs and involves downward movement of the cavity glenoid with upward movement of the extremity medial of the shoulder plug. You can feel this rotation when you take a load, like a heavy book bag and carry it on one shoulder. Supination and Pronation Supination and pronation are forearm movements. Protraction and Retraction Protraction and retraction are front-rear movements of the scapula or lower jaw. These movements of the spine involve both the articulation of the symphysis formed by each intervertebral disk, and the plane type of the synovial articulation formed between the lower joint processes of a vertebra and the upper joint processes of the following lower vertebra. Rotating the head from side to side or twisting the body¨ rotation. Note that the extension of the thigh beyond the anatomical (stationary) position Ã¨ greatly limited by the ligaments supporting the hip joint. During top rotation, the cavity glenoid moves upward while the end medial of the shoulder plug moves down. Similarly, the elevation of the jaw¨ the upward movement of the jaw used to close the mouth or bite something, and depression is the downward movement that produces the opening of the mouth (see Figure 6). Supination and pronation are the movements of the which go between these two positions. PronationÃ ¢ is the movement that moves the forearm from the supininated position (anatomical) to the prone position (palm back). In this position, the radius and ulna are parallel to each other. To a pivot joint, a bone rotates in relation to another bone. (a) the insulination of the forearm transforms the hand to the palm position forward in which the ray and ulna are parallel, while the pronation of the forearm becomes the hand in the back position of the palm where the ray crosses the Ulna to form a Ã ¢ â,¬ Ã "X. Ã, â,¬ (b) foot dorsiflection to the ankle joint moves the upper part of the foot towards the leg, while the plantar flexion raises the heel and points the toes. The medial and lateral rotation of the upper limb or limb limb of the hip involves turn the front surface of the limb towards the median line of the body (medial or internal rotation) or away from the median line (lateral or external rotation). The upper rotation is also used without the abduction of the arm when carrying a heavy load with the hand or on the shoulder. This movement is produced at the first CARPOMACARPAL joint, which is a saddle joint formed between the carpal bone of the trapeze and the first metacarpal bone. The rotation of the neck or body is the torsion movement produced by the summation of the small rotational movements available between adjacent vertebrae. The bending of the knee is the flexion of the knee to bring the foot towards the rear thigh, and extension is the straightening of the knee. Figure 6. Lift the front of the foot, so that the upper part of the foot moves towards the front leg is dorsiflected, while lifting the foot heel from the ground or pointing the fingers downwards is the plantar flexion . There are many types of movement lad lad onatnol o osrev aicsoc alled o oiccarb led eroiretna eicifrepus al atsops ehc ,ognul essa orol la onrotta onatour eromef li e oremo'l ,iuQ .)1 allebat(ilaivonis itnuig a isracifirev onossop .ellaps el .ellaps el erallorcs rep itasu onos itnemivom itseuQ .alobidnam alled o alopacs alled otla'l osrev e ossab li osrev itnemivom onos enoizavele'l e enoisserped alled enoisserped al e enoisserped aL .otla'l osrev otlovir omlap li noc oproc la otnacca eneit is eroirepus otra'l ,acimotana enoizisop alleN .oproc led