

Joint and Muscular Action for Specific Yoga Postures

When teaching a yoga class or doing your own practice, it can be helpful to think about the joints actions involved in each postures, as well as the main muscles that are contracting and those that are lengthening or stretching. This will help you develop a well-balanced practice that incorporates all the major synovial joints in the body moving in many different ways, along with stretching and strengthening all the major muscles groups. It can also be helpful in knowing which postures would be most effective in dealing with a specific issue, such as tight hamstrings or low back pain due to weakness in the supporting muscles.

The following posture examples explain the main joint actions, along with the muscles that are contracting or lengthening in each posture.

Standing Forward Fold

Joint Action

Spinal Flexion (mild)

Hip Flexion

Knee Extension – against gravity

Muscles Contracting

Quadriceps (vastus lateralis, intermedius, medialis, and rectus femoris)

Abdominals

Tibialis Anterior (eccentrically)



Muscles Passively Lengthening

Hamstrings

Gluteus Maximus, medius, minimus, Piriformis

Gastrocnemius, Soleus

Notes:

If hamstrings are tight, then pulling down with straight knees will result in tightness in the front of the hip joint. It's best to come down with bent knees and place the hands on the floor first, then begin to straighten the knees to the point where a stretch is felt in the hamstrings.

Chair Pose

Joint Action

Spinal Extension (mild)

Upward rotation, retraction, and elevation of the scapula (shoulder blades)

Shoulder flexion

Elbow extension (against gravity)

Hip flexion

Knee flexion

Ankle Dorsiflexion

Muscles Contracting

Erector spinae (to maintain alignment of spine)

Psoas minor and abdominal muscles (to prevent over extension of lumbar spine)

Upper trapezius and serratus anterior (to upwardly rotate, elevate scapula)

Rotator cuff (to stabilize and flex shoulder joint)

Triceps (to extend elbow against gravity)

Adductors (to keep knees close together)

Muscles in Eccentric Contraction (lengthening while contracting)

Gluteus maximus (stabilizing in knee flexion)

Hamstrings (knee flexion against gravity)

Quads (knee flexion against gravity)



Down Dog

Joint Action

Spine stays neutral
Scapula upward rotation and elevation
Shoulder flexion
Elbow Extension
Forearm Pronation
Hip Flexion
Knee Extension
Ankle Dorsiflexion



Muscles Contracting

Erector Spinae (eccentric contraction to maintain neutral alignment)
Deltoid, Bicep (to flex shoulder)
Rotator Cuff (to stabilize shoulder)
Serratus Anterior (to upwardly rotate scapula)
Triceps (elbow extension against gravity)
Pronators (pronate forearm)
Extensor Carpi Radialis, Extensor carpi ulnaris (wrist extension)
Adductors (internal rotation of hip)
Quads (extend knees against gravity)
Tibialis Anterior (dorsiflexion)

Muscles Lengthening

Hamstrings
Gastrocnemius (stretched due to ankle dorsiflexion)
Soleus

Notes:

If pronation is limited, it can lead to overuse of the elbows and wrists, as well as internal rotation at the shoulder joint which can lead to impingement. This can be helped by maintaining a slight arch in each hand to activate the pronators in the forearms.

Warrior 2

Joint Action

Front leg:

hip flexion, external rotation,
abduction
knee flexion,
ankle dorsiflexion.

Back leg:

Hip extension, abduction
Knee extension,
Ankle dorsiflexion.

Shoulder abduction

Retraction of the shoulder blades



Muscles Contracting

Back leg:

gluteus medius, minimus and maximus (internal rotation and abduction),
hamstrings.

Front leg:

Quadriceps (hip flexion, and keeping the knee stable against gravity)
adductors (eccentric).

Muscles Lengthening

Back leg: iliopsoas (front inner hip)

Front leg: hamstrings, adductors (eccentric contraction)

Note

There is a tendency for the front knee to collapse in, due to tightness in the hips and restricted external rotation of the hips. To maintain good alignment between the front foot, ankle, knee and thigh, have students shift their back hip slightly in and turn their belly slightly forward. Having less external rotation in the back hip will allow the front hip to more fully externally rotate.

Tree Pose (Vrksasana)

Joint Actions:

Lifted Leg:

Hip flexion, external rotation, abduction
Knee flexion
Ankle dorsiflexion

Elbow flexion

Wrist extension

Muscles Contracting

Lifted Leg:

Psoas major
Gluteus maximus, medius, medius,
piriformis (hip external rotation)

Standing Leg:

Gluteus maximus (maintain hip extension)
Quadriceps (maintain knee extension)

Muscles Lengthening/Stretching

Adductors (inner thigh stretching)

Gluteus medius (eccentric contraction)

Note:

There's a tendency for the hip that is opposite of the standing leg to shift out to the side. This can place strain on the low back. Encourage students to push down through the standing leg, engaging the quadriceps and lower abdominal muscles, while reaching up through the crown of the head. This will help minimize any shifting and create better alignment.



Cobra (Bhujangasana)

Joint Action

Spinal extension
Elbow extension
Forearm pronation
Hip extension, adduction
Knee extension
Ankle plantarflexion



Muscles Contracting

Erector spinae (spinal extension)
Serratus anterior (to stabilize rib cage)
Rotator cuff (to stabilize shoulder joint)
Triceps (maintaining some elbow extension against gravity)
Hamstrings (hip extension)
Adductors (keeping the legs together)
Quadriceps (keeping knees straight)

Muscles Lengthening/Stretching

Abdominal muscles
Psoas (front portion)

Notes:

Weakness in the pronators of the forearms can make the elbows flare out to the sides. This can put strain on the elbow and shoulder joints. Remind students to keep the forearms parallel to each other and elbows in close to the body for best alignment.

Squat (Malasana)

Joint Action

Spinal extension
Slight shoulder flexion
Elbow flexion
Forearm pronation
Wrist extension
Hip Flexion and external rotation
Knee flexion
Ankle dorsiflexion



Muscles Contracting

Tibialis anterior (stabilize ankle in dorsiflexion)

Eccentric/Lengthening while contracting

Gluteus maximus (support external rotation during hip flexion)
Soleus (lengthening while providing support for dorsiflexion)
Quads (knee flexion)
Hamstrings (knee flexion while hip is flexed)

Note:

It's important to make sure that the foot, ankle and knee are all tracking in one line, so there is no additional pressure on the ankle joint.

Bridge (Setu Bandha Sarvangasana)

Joint Actions

Spinal flexion (cervical, thoracic)
Lumbar extension
Scapula Retraction, elevation
external rotation
Shoulder extension, adduction
Elbow flexion
Forearm supination
Hip extension
Knee extension
Ankle dorsiflexion



Muscles Contracting

Erector spinae (to extend the lumbar spine)
Eccentric contraction of psoas, abdominals (to resist lumbar hyper extension)
Rhomboids, levator scapulae (to adduct and rotate scapula)
Rotator cuff (to stabilize shoulder joint)
Hamstrings, Gluteus maximus (to extend hip)
Adductors (to internally rotate hips)
Quadriceps (to extend knees against gravity)

Muscles Lengthening/Stretching

Psoas major
Iliacus (main hip flexor in the anterior part of the pelvis, which is stretched during hip extension)

Note:

If the hamstrings and adductors are not strong enough, the gluteus maximus may do too much and pull the legs into external rotation.

It's also important not to pull the shoulder blades down because, if they are moved down away from the cervical spine, it can leave the flexed neck bearing too much of the weight of the upper body.

Complete the Following Chart

Posture	Joint Actions	Main muscles Working/ Contracting	Main Muscles Lengthening or Stretching
Triangle Pose (Trikonasana)			
Bow Pose (Dhanurasana)			
Child's Pose		N/A	
Boat Pose			
Straight Leg Seated Forward Fold (Paschimottanasna)			