



FITMOTIVATION ACADEMY: Aquatic Arms & Legs CEC Handout

Steps for successfully completing this Online CEC Program

1. You must be a registered subscriber of www.fitmotivation.com to complete the online quiz
2. View **BOTH** suggested videos: Aquatic Arms with Lori Templeman and Aquatic Legs with Mark Grevelding
3. Read the CEC Handout. **Important:** ALL quiz questions relate to this CEC handout.
4. Take the online quiz – 20 questions (separate payment required)
5. Print out your CEC form.

Aquatic Arms & Legs has been approved for 2.0 AEA CECs.

Note: At this time, there is no approval from any other fitness organizations

If you have any questions or issues regarding the online quiz, handout or CEC form – please contact Fitmotivation at: support@fitmotivation.com

Objectives:

1. Understand concepts important to anatomical movement and muscles actions
2. Review anatomical movement of the upper body muscle groups.
3. Learn five ways to use arms in an aquatic fitness class.
4. Review anatomical movement of the lower body muscle groups.
5. Discover how to target one side of the muscle pair with applied force.

Introduction:

The Aquatic Exercise Association (AEA) suggests five different ways that you can use arms in an aquatic fitness class. Aquatic Arms with Lori Templeman is a 20-minute video that brings this concept to life by demonstrating samples of the five different ways. This handout includes important concepts for understanding anatomical movement, as well as a review of aquatic base moves for the main muscle groups in the upper body. Aquatic Legs with Mark Grevelding is a 20-minute video that provides a leg workout, along with an educational tutorial that reviews aquatic base moves for the main muscle groups in the lower body. Explore bilateral and unilateral leg exercises and the concept of applied directional force to emphasize one side of the muscle pair. Understanding concepts of anatomical movement which muscle groups are being targeted with base moves will help instructors lead smarter and more efficient aquatic fitness classes.

ANATOMICAL MOVEMENT CONCEPTS

MUSCLE ACTIONS

There are three types of muscle actions, isotonic, isometric and isokinetic.

Isometric muscle actions occur when tension is created in the muscle - in the presence of a force - without movement at the joint. Isokinetic muscle actions typically require specialized equipment/machinery. Isotonic muscle actions are the ones most frequently performed in exercise.

Isotonic muscle actions occur as muscles shorten and lengthen with movement at a joint. These actions consist of two parts or phases

Concentric: this is the shortening, contracting phase of the muscle action when tension is created by resisting a force. Concentric muscle actions are resisted movement.

Eccentric: this is the lengthening phase of the muscle action when tension is created by controlling the assisted phase against a force. Eccentric muscle actions are assisted movement. In submerged movement with no additional equipment, all movement in all directions is resisted by the water's viscosity and therefore all muscle actions are concentric. Equipment would need to be incorporated to achieve eccentric muscle actions. In the absence of equipment, both Aquatic Arms and Aquatic Legs feature only concentric muscle actions.

JOINT ACTIONS

The term joint action identifies movements that the joints are capable of performing.

The following joint actions are featured in the Aquatic Arms and Aquatic Legs videos.

Flexion: Decreases the angle between two bones. In the videos, the arms and legs would be moving OUT of anatomical position with flexion.

Extension: Increases the angle in two bones. In the videos, the arms and legs perform extension when they RETURN to anatomical position.

Hyperextension: Features movement the CONTINUES PAST anatomical position. In the videos, examples of shoulder hyperextension would be to swing the arms behind the line of the body. An example of hip hyperextension would be performing rear leg lifts and kicks. The phase of the swing kick as it continues past anatomical position is also an example of hip hyperextension

Abduction: Moves the limbs AWAY from the midline of the body. An example of shoulder abduction would be side arm lifts. An example of hip abduction would be side leg lifts.

Adduction: Moves the limbs TOWARD the midline of the body. An example shoulder adduction would be side arm pull downs, or the inward face of "jumping jack arms." An example of hip adduction would be ankle sweeps, soccer kicks and anything that moves the leg(s) towards the midline of the body.

MAJOR JOINTS

There are several joints in the human body. An anatomical joint or articulation is formed where two bones meet. Each joint is responsible for different movement or joint actions. Aquatic Arms and Aquatic Legs pertain to the limbs of the body and for that reason we will confine our review to the major joints of the arms and legs. The major joints of the arms would be the shoulder and elbow. The major joints of the legs would be the hip and knee. There are other minor joints in the limbs that are not covered.

Shoulder Joint

The shoulder joint is a ball & socket joint and is capable of multi-planar movement in almost all directions, including the arm movements in Aquatic Arms, which include flexion, extension, hyperextension, abduction, adduction, transverse abduction, transverse adduction. Movement at the shoulder joint as featured in the video targets several upper body muscle groups, including pectoralis, latissimus, shoulder (anterior, medial & posterior), biceps and triceps.

Elbow Joint

The elbow is a hinge joint and is limited to flexion and extension, which isolates the targeted muscles to just biceps and triceps.

Hip Joint

Similar to the shoulder, the hip is a ball and socket joint and capable of multi-planar movement, including the leg movements in Aquatic Legs, which include flexion, extension, hyperextension, abduction and adduction. Movement at the hip joint as featured in the video targets several lower body muscle groups, including glutes, hip flexors, quadriceps and hamstrings.

Knee Joint

The knee is a hinge joint and similar to the elbow joint it can only flex and extended. The only muscles targeted with movement at the knee joint are the quadriceps and hamstrings. The hinge is reversed in the elbow and knee joints and therefore flexion and extension move in different directions. Elbow flexion moves forward out of anatomical position and knee flexion moves backwards.

MUSCLE BALANCE

One of the most important skillsets a fitness instructor can develop is the ability to design classes that include muscular balance. Muscles occur in pairs and it is important to work both sides of the muscle pair for optimal strength, range of motion (ROM) and joint health. Creating classes that have muscular balance involves paying attention to balancing anterior and posterior movement and making sure that the shoulder and hip joint move in all directions.

MOVEMENT PLANES

The quickest way to determine if there is muscle balance in a routine is to make sure you have selected exercises representing movement in all three planes. Every time you change movement from one plan to the next you change the targeted muscles. Understanding which plane a movement is performed in is helpful for identifying anatomical movement and joint actions, thus the muscles being targeted. Each movement plane features different joint actions, therefore different targeted muscles. When designing a fitness program, including exercises that occur in all three movement planes is the easiest way to ensure muscle balance and a total body workout.

Sagittal Plane – is vertical and extends from front to back, dividing the body into right and left parts. Movements in the sagittal plan move front to back and include flexion, extension and hyperextension. Examples include cross country ski, knee high jogs, front kicks and leg curls.

Frontal Plane – is vertical and extends from side to side, dividing the body into anterior and posterior (front and back). Movements in the frontal plane move side to side and include abduction and adduction. Examples include jumping jacks, pendulums and side arm lifts.

Transverse Plane – is horizontal and divides the body into upper and lower portions. Movements in the transverse plane move horizontally and include transverse abduction and adduction. Examples include breast strokes and horizontal arm sweeps.

MULTI-PLANAR MOVEMENT

Combining movement planes and moving a joint in all possible directions is referred to as multi-planar movement. Take your programming to the next level by adding functionality, which can promote supple joints and assist people with activities of daily living (ADLs). Below are some ways to add more multi-planar movement in your classes.

Combine movement planes: The movements described above can all be mixed and matched so that the lower body is performed in one movement plane and the arms are performed a different movement plane. For example, a jumping jack with ski arms. Combining arms and legs in different movement planes promotes agility and coordination.

Full range of movement at the joint: Transform movement of the arms and legs with multidirectional, full range of motion (ROM) at the joint. Circular, diagonal and spiral movements are examples of moving a joint in its full range of movement. These moves are essentially a combination of all planes.

RANGE OF MOTION (ROM)

Multi-planar movement helps improve joint ROM by ensuring that the joint is moved in all possible directions to effectively distribute synovial fluid throughout the joint cavity. If you never perform shoulder circles, eventually you will not be able to do so without pain or discomfort because your shoulder will no longer possess the ROM to do so. Concepts of ROM also include levers. The arms and legs can be used to increase or reduce intensity depending on the length of the lever.

Shorter Lever = less resistance & surface area

Longer Lever = more resistance and surface area

Additionally, the targeted muscle groups can change when lever length changes. In the Aquatic Legs video, the short lever “Sit Kick” only targets the quads and hamstrings with extension and flexion at the knee joint. As the levers are increased with the straight leg front kicks moving from the hip joint, the targeted muscles expand to include quads, hip flexors, glutes and hamstrings. The more muscles that are working, the greater the intensity, muscular AND cardio, because the heart has to pump oxygenated blood to more muscles. Levers can be increased in the arms by extending finger tips and in the legs by pointing toes.

ANTERIOR VS. POSTERIOR MOVEMENT

From infancy we are doomed to a life of flexion - walking forward, reaching forward, bending forward, holding in front, typing in front, driving in front, sitting in front – pretty much everything with shoulders and hips flexed. A life of flexion takes a serious toll on the human body. Traditional exercises, even those in the pool, can actually make matters worse. Learning how to design an aqua fitness workout with an emphasis on extension can help reduce pain and

promote better living. That means focusing more on triceps, latissimus and rhomboids when performing upper body movements and glutes and hamstrings when doing lower body movements. In the Aquatic Legs video, several examples were provided for putting more emphasis on the glutes and hamstrings.

Bilateral & Unilateral Options

Both videos provide examples of bilateral and unilateral movements. In the Aquatic Arms video, each traditional arm movement has three variations.

- 1) Bilateral Symmetrical – both arms are performing the same movement
- 2) Bilateral Reciprocal – both arms are performing opposite movements
- 3) Unilateral – one arm is performing the movement

In the Aquatic Legs video, the moves were essentially demonstrated bilateral reciprocal with one-footed alternating moves, such as kicks, jogs and pendulums. Cross Country Skis are an example of a two-footed bilateral reciprocal leg movement. Jumping jacks are an example of a two-footed bilateral symmetrical leg movement. One-footed moves feature bounding weight transfer. Two-footed moves feature jumping. All of the lower body moves also include a unilateral variation of the leg movement. For example, the unilateral version of an alternating high knee jog is a knee lift performed on the same leg.

APPLIED DIRECTIONAL FORCE

The concept of putting the emphasis on one side of a muscle pair is referred to as applied directional force. The Aquatic Legs video has several examples of this. When doing a unilateral leg lift and pull down, the hamstring can be emphasized by exerting more force on pulling the leg downward with hip extension. There is another way to add applied directional force with upper body movements. Shaping the hand into either full surface area or a sliced hand will determine the emphasis on one side of the muscle pair. For example, if you perform horizontal arm sweeps (shoulder transverse abduction and adduction) and you sweep inward with full surface hands, the emphasis will be on the anterior muscles (pectoralis and anterior deltoid). If you slice inward and then position your hands into full surface area on the sweep backwards, the emphasis will be on the posterior deltoids.

FIVE WAYS TO USE ARMS

The entire Aquatic Arms video is based on AEA's recommendations for adding variety to upper body base moves in five ways.

1. Mix & match arm and leg base moves. Jumping jacks are typically performed with shoulder abduction and adduction. Try completely changing the outcome of the jumping jack by performing shoulder flexion and extension (ski arms) instead. Think outside of the box and create endless variations of arm and leg combinations.
2. Create arm patterns. Instead of doing just one arm movement with a jumping jack, combine 2, 3, 4 or more moves into an arm pattern. Not only does this add creativity to your routine, it challenges coordination.
3. Use arms above the water's surface. AEA recommends keeping the majority of arm patterns below the surface of the water to maximize the water's resistance, but using overhead arms represents functional movement as this is an activity of daily living.

4. Keep the arms in a neutral position. Since the upper body cannot assist with stability, the core muscles must work harder when performing traditional lower body base moves. Examples of neutral arms would be arms in a goal post position or crossed over the chest.
5. Float the arms on the water's surface. Floating arms can help more deconditioned participants perform lower body base moves with better alignment as the water essentially provides support. However, floating arms may provide a disadvantage for fit class members because the core is not actively engaged and challenged. Offering either neutral or floating arms is a great way to provide options to your participants.

AQUATIC ARMS – UNDERSTANDING BASE MOVES

Below are the upper body movements that were demonstrated in the Aquatic Arms video, including the movement plane, joint action and the muscles they target.

Joint Action: Shoulder Flexion and Extension

Traditional name/cue: Ski arms

Movement Plane: sagittal

Major Muscle Groups targeted with Shoulder Flexion: anterior deltoids, pectoralis & biceps

Major Muscle Groups targeted with Shoulder Extension: latissimus dorsi (lats), triceps & posterior deltoids

Joint Action: Horizontal Shoulder Flexion and Extension

Traditional name/cue: Pressing Arms

Movement Plane: sagittal

Major Muscle Groups targeted with Shoulder Horizontal Flexion: anterior deltoids, pectoralis & biceps

Major Muscle Groups targeted with Shoulder Horizontal Extension: latissimus dorsi (lats), triceps & posterior deltoids

Joint Action: Elbow Flexion and Extension

Traditional name/cue: Arm Curls

Movement Plane: sagittal

Major Muscle Groups Targeted with Elbow Flexion: biceps

Major Muscle Groups Targeted with Elbow Extension: triceps

Joint Action: Shoulder Abduction & Adduction

Traditional name/cue: Jumping jack arms

Movement Plane: frontal

Major Muscle Groups Targeted with Shoulder Abduction: medial deltoids

Major Muscle Groups Targeted with Shoulder Adduction: latissimus dorsi (lats)

Joint Action: Shoulder Transverse Abduction & Adduction

Traditional name/cue: chest flies or horizontal sweeping arms

Movement Plane: transverse

Major muscle Groups Targeted with Shoulder Transverse Abduction: posterior deltoid
Major muscle Groups Targeted with Shoulder Transverse Adduction: pectoralis & anterior deltoid

AQUATIC ARMS VIDEO NOTES

WARM-UP (Arm Base Moves)

- Jog / Push & pull and shoulder rotation
- Leg Curls / Arm curls and paddlewheel arms forward & reverse
- Jacks / Lateral raise & press down
- Ski / Scoop and press
- Wide Jog / Horizontal arm sweeps

5 WAYS TO ADD UPPER BODY VARIETY

1. DIFFERENT ARMS & LEGS

All moves start with “typical” arms before changing them.

- Ski with wiper arms
- Ski w/ rotation bat swing & punches
- Jack w/ Arm circles (both directions)
- Jack w/ bow and arrow arms (*right arm pull across, Left arm reverse & sweep out*)
- Rocking Horse right w/ row (pull symmetrical, alternating)
- Rocking Horse left w/ horizontal chest sweeps (symmetrical, reciprocal)

2. ARM COMBOS/PATTERNS

- Jog – Scoop, press, curl, extend
- Jog – raise side, sweep in, out, pulldown
- Jog - COMBINE both patterns in 16 ct. combo
- Jacks - side arm raise, curl under, extend, pulldown

3. ARMS ABOVE THE SURFACE

- Jog – Overhead reaches
- Pendulum w/ arms waving overhead
- Rocking Horse (rock 3 & hold), “Flaming Arms”
- Stretching – latissimus and triceps

4. ARMS NEUTRAL

- *Quick Demo of several neutral arm positions. Hands on hips, hands behind back, hands together, goalpost arms, overhead reach, and folded arms.*

- Grounded Lunge/Kick with folded arms right leg & hands on hips with left leg
- Jacks – jack/together, knee lift with “goalpost” arms
- Walk the line – Hands behind back – behind head
- Balance – Side leg raise/crossover w/ hands together right, arms overhead
Left

5. ARMS FLOATING

- March with floating arms
- Leg Swing L/R – arms float/scull for balance
- Moguls Level II – arms abducted at the surface
- Hands at surface – high knees toward hands

AQUATIC LEGS – UNDERSTANDING BASE MOVES

Below are the lower body movements that were demonstrated in the Aquatic Legs video, including the movement plane, joint action and the muscles they target.

Joint Action: Hip Abduction & Adduction

Traditional name/cue: Jumping jacks

Movement Plane: Frontal

Major Muscle Groups targeted:

Hip abduction/legs out: Hip Abductors (outer thigh)

Hip adduction/ legs in: Hip Adductors (inner thigh)

Joint Action: Hip flexion & Extension

Traditional name/cue: Cross country skis

Movement Plane: Sagittal

Major Muscle Groups targeted:

Hip flexion/leg forward: Iliopsoas & Quadriceps

Hip extension/leg backwards: Gluteus Maximus & Hamstrings

Joint Action: Hip Flexion & extension

Traditional name/cue: Straight leg front kicks

Movement Plane - Sagittal

Major Muscle Groups targeted:

Hip flexion/leg up: Iliopsoas & Quadriceps

Hip extension/leg down: Gluteus Maximus & Hamstrings

Joint Action: Hip extension

Traditional name/cue: Rear leg lifts or kicks

Movement Plane - Sagittal

Major Muscle Groups targeted:

Hip flexion: minimal

Hip extension: Gluteus Maximus & Hamstrings

Joint Action: Hip flexion & extension (bent knee – short lever)

Traditional name/cue: High knee jogs/knee lifts

Movement Plane - Sagittal

Major Muscle Groups targeted:

Hip flexion/leg up: Iliopsoas & Quadriceps

Hip extension/leg down: Gluteus Maximus & Hamstrings

Joint Action: Knee flexion & extension (bent knee-short lever)

Traditional name/cue: Sit kicks

Movement Plane: Sagittal

Major Muscle Groups targeted:

Knee flexion/heel pulls in: Hamstrings

Knee extension/toes extend out: Quadriceps

Joint Action: Knee flexion & extension (bent knee – short lever)

Traditional name/cue: High heel jogs or leg curls

Movement Plane: Sagittal

Major Muscle Groups targeted:

Knee flexion/heel back: Hamstrings

Knee extension/toe forward: Quadriceps

Joint Action: Hip abduction and adduction

Traditional name/cue: Pendulums

Movement Plane: Frontal

Major Muscle Groups targeted:

Hip abduction/leg out: Hip Abductors (outer thigh)

Hip adduction/ leg in: Hip Adductors (inner thigh)

Joint Action: Hip abduction & adduction

Traditional name/cue: Ankle reaches or inner thigh lifts

Movement Plane: Multi-planar (sagittal & frontal)

Major Muscle Groups targeted:

Ankle in: hip adductors (inner thigh)

Ankle out: hip abductors (outer thigh)

AQUATIC LEGS VIDEO NOTES

Set timing:

Bilateral: 45 seconds

Unilateral R: 30 seconds

Unilateral L: 30 seconds

Rest: 15 seconds

SETS 1-5

High Knee Jogs
Knee lift R
Knee lift L
15 second rest

High Heel Jogs (Leg Curls)
Leg curl R
Leg Curl L
15 second rest

Bent knee kicks (Sit kicks) – short lever
Leg extension R
Leg extension L
15 second rest

Straight leg front kicks – long lever
Straight leg lift R
Straight leg lift L
15 second rest

Rear kicks (Donkey kicks) - shorter lever
Donkey kick R
Donkey kick L
15 second rest

SETS 6-10

Rear leg lifts – long lever
Rear leg lift R
Rear leg lift L
15 second rest

Ankle Reaches
Ankle reach R
Ankle reach L
15 second rest
Pendulums
Side leg lift R
Side leg lift L
15 second rest

Cross Country Ski
Swing kick R
Swing Kick L
15 second rest

Jumping Jacks
Heel clicks (force in)
Plyo jumps (force out)
15 second rest

Bibliography

- Sova, R., Aquatics - The Complete Reference Guide for Aquatic Fitness Professionals. Boston: Jones and Bartlett Publishers; 1992
- Mitchell, T., Ogden, D. Applications of PNF Patterns in the Aquatic Setting. Austin, TX: Aquatic Ms. Fit 2002
- Aquatic Exercise Association, Aquatic Fitness Professional Manual, seventh Edition, Human Kinetics 2018
- Bates A, Hanson, N: Aquatic Exercise Therapy. Philadelphia, PA, WB Saunders. 1996
- Fitmotivation Online Education – Name that Muscle, 2020
- Fitmotivation Online Education – 50 Ways to Change a Move, 2017

