## FOUNDATIONS OF GROUP EXERCISE

Produced in Cooperation with the American Council on Exercise

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C16-004


The YMCA and the American Council on Exercise (ACE) have teamed up to enhance community health. ACE is fueled by the passion of more than 58,000 health and wellness professionals worldwide, and the YMCA reaches more than 22 million members in 10,000 communities nationwide.

The partnership created by our two organizations is a natural fit, and one that will allow us to more effectively address the health of our nation from multiple angles.

ACE, a nonprofit that has helped to provide science-based education to professionals since 1985, will now offer YMCA Foundations of Group Exercise and YMCA Foundations of Strength and Conditioning courses for the YMCA certifications.

Our goal with each of these courses is to provide the foundational education you need to enrich your classes and better help the members who come to you for guidance on their health and wellness journeys.
They are designed to give YMCA instructors, like you, the foundational knowledge of exercise and movement science to better serve the people participating in healthy living programs at the YMCA. Although the education is not meant to replace National Commission for Certifying Agencies (NCCA)-accredited certification programs, it will help you more effectively engage participants to better understand how to exercise safely and efficiently.
Combined with your passion for health and wellness, the education you pursue through the $Y$ will also help you position members to achieve sustainable, healthy change.
We are excited to welcome you to the ACE family in the same way that you are part of the Y's. Professionals like you are the reason why our organization continues to succeed in helping people worldwide achieve their health and wellness goals.

We encourage you to continue to pursue science-based health and wellness information, and to stay abreast of the latest fitness trends and research. Arming yourself with reliable, trusted education is the best way to help your members achieve the long-term, healthy change they deserve.
Let's get moving,


Scott Goudeseune<br>President and CEO, American Council on Exercise (ACE)

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## YMCA Foundations of Group Exercise WELCOME!

ON BEHALF OF THE AMERICAN COUNCIL ON EXERCISE, WE THANK YOU FOR PARTICIPATING IN THE YMCA FOUNDATIONS OF GROUP EXERCISE COURSE.

## Purpose

The purpose of this course is to provide the group exercise instructor of cardiorespiratory, strength, and/or flexibility classes with a comprehensive knowledge base of general information and guidelines relevant to single-modality and/or pre-choreographed class formats. The population addressed in this course is made up of apparently healthy group exercise participants, without special considerations or medical concerns.

Upon successful completion of this course, participants will be able to:

- Apply a basic understanding of anatomy (muscles and bones), joint actions, and planes of motion to any modality of group exercise
- Explain the FITT principle for cardiorespiratory, resistance, and flexibility training
- Understand the three group exercise applications for balance, and how to integrate each into class design
- Describe the purpose of each section of class (warm-up, conditioning phase, and final phase)
- Identify the two options for using music in group exercise (as the foreground or background)

This workbook is designed to be used concurrently with the online course components. The fill-in-the-blank and other written activities presented in this workbook correspond to specific videos in the online course.

## THEME

The overall theme of this course is to promote the safety, alignment, and success of all participants in each group exercise class format. That said, the ultimate question for any exercise movement pattern is "Do the overall benefits of this movement outweigh any potential risks?"

# Chapter 1 <br> Professional Conduct 



ACE CODE OF ETHICS

## GROUP EXERCISE INSTRUCTORS MUST BE FAMILIAR WITH THEIR SCOPE OF PRACTICE

as well as the expected professional code of conduct. Knowing this helps instructors understand their responsibilities, while also identifying when they may need to refer a participant to a more qualified health or medical professional.

For example, when a participant asks an instructor to play his or her favorite music in an indoor cycling class, the instructor is responsible for complying with federal copyright laws and should know to utilize only approved music, such as licensed music made specifically for group exercise classes.

As another example, when a participant asks an instructor for specific recommendations on diet to lose weight, the instructor is responsible for knowing that this goes beyond his or her scope of practice and that he or she must refer the individual to a registered dietitian or medical doctor for more information.

## ACE Code of Ethics

A
n example of a code of conduct for health, fitness, and wellness professionals is the ACE Code of Ethics. This code includes a promise by the professionals to:

- Provide safe and effective instruction

Provide equal and fair treatment to all clients

- Stay up-to-date on the latest health and fitness research and understand its practical application
- Maintain current CPR and AED certificates and knowledge of first-aid services
- Comply with all applicable business, employment, and intellectual property laws
- Uphold and enhance public appreciation and trust for the health and fitness industry
- Maintain the confidentiality of all client information
- Refer clients to more qualified health or medical professionals when appropriate
- Establish and maintain clear professional boundaries

NOTES

## Chapter 2 The Priority of Teaching <br>  <br> TEACHING MULTILEVEL CLASSES <br> THE BASICS OF HUMAN MOVEMENT

## WHEN GROUP EXERCISE INSTRUCTORS TEACH, THEY ARE IMPARTING KNOWLEDGE ONTO

their participants. By definition, teaching means to bring about an independent change in behavior or thought. With that being said, the goal and priority of an educator should be to teach in such a way as to empower one's participants to independently execute moves with proper form. Keeping this in mind will help instructors become the best communicators they can be in order to encourage their participants to understand how to take responsibility for their own form and body mechanics, and transfer those skills to activities outside of class.

Ultimately, when participants squat at home to pick up something heavy, go out dancing at a club, or stretch after a solo run, they should demonstrate the same quality and integrity of movement that they do in class in the presence of the instructor. Great teachers strive to make their participants as independent as possible by imparting upon them the knowledge and skills that they need in order to be successful, both inside and outside of the group exercise class.

## Example:

If a participant in class demonstrates good alignment in the hip-hinge, the client is not only moving safely, but he or she will also move more effectively when transitioning into exercises such as squats or lunges.

Correct form


However, if at home this participant hinges with incorrect form, such as with a rounded spine when bending over the bathroom sink to brush his or her teeth, then the participant is not reaping the benefits of the quality of movement discussed and demonstrated in class due to the fact that he or she has not changed his or her behavior and body mechanics in everyday life.

Instructors should remember that the best way to teach is to educate participants about the purpose of movements not just for class, but for enjoyment and success in activities of daily living.

Incorrect form


## Teaching Multilevel Classes

While it would be easier to instruct participants who all possess the same fitness aptitude, the reality is that almost every group exercise class includes someone with a special consideration and/or a skill level other than that which is ideally suited for the particular class. While some class names and descriptions have suggested class participant levels, for example "Yoga for Beginners" or "Advanced Kettlebell Conditioning," the truth is that class names do not always draw only the ideal participants to that class.

Instructors, therefore, must always be prepared to make changes to movement patterns to guarantee success for all class participants.

- An increase in the difficulty, complexity, or intensity of a movement is called a progression.
- A decrease in the difficulty, complexity, or intensity of a movement is called a regression.

Effective group exercise instructors are able to teach progressions and regressions so that all participants can continue any basic movement pattern and experience success.

## MODIFYING MOVEMENTS THROUGH PROGRESSIONS AND REGRESSIONS

Throughout this workbook, you will see reference to both progressions (to make exercises harder) and regressions (to make exercises easier). These terms were chosen because they label the specific skill or relative intensity of the movement being taught or performed, not the individual participant. Progressions and regressions are two types of modifications, which are used to cue to the difficulty of movement and allow participants of all skill levels to have positive, compelling physical-activity experiences.

Among the ways to create progressions and regressions are the following considerations, which form the acronym DRILLS:

- Direction
- Rhythm, range of motion, resistance, repetitions
- Intensity, impact
- Lever Length
- Stability

Learning how to manipulate each of these considerations when individuals struggle or seek greater challenges will help all participants master the movements that are appropriate for them.

- For example, if a participant is having difficulty performing a body-weight squat, the instructor can regress the exercise by modifying it to a quarter squat with hands on the thighs. This modification reduces the intensity because it decreases the range of motion of the hips and knees, and it increases the stability of the upper body and core. If participants in the same class are ready for an increased challenge during the body-weight squat,
the instructor can progress the exercise by having them hold their arms overhead or straight out in front of them. This modification produces an increase in the intensity by increasing the lever length of the arms, resulting in a greater stability challenge.


## EYES, EARS, HEART

Instructors must be aware of all class participants at all times. Though there are often exceptions for a variety of reasons, it is typically true that the most experienced, intense, and comfortable participants tend to congregate toward the front of the room. Such participants are usually able to do all skills that instructors request with progressions of movements, and sometimes even more. Instructors sometimes refer to the skills this group can perform as "level 3."

Participants with average skill and intensity needs often congregate toward the center of the room and are able to do most skills the instructor shows before offering progressions or regressions. Instructors sometimes refer to the skills this group can perform as "level 2."

Participants who are new to class or less fit often congregate toward the rear of the classroom and sometimes possess a less-developed skill set for movements and therefore need more regression options from instructors. Instructors sometimes refer to the skills this group can perform as "level 1."

When instructors teach such multilevel classes, they should be aware of the need to offer various options for movements, which they could call "progressions and regressions" or name by their level number, such as "this is a level 2 option." Ultimately, when teaching group exercise, instructors need to teach so that ALL class participants can achieve success. To do this, teach with the following saying in mind:

Have an ear for the front row, an eye for the middle row, and a heart for the back row.

When making suggestions to participants, try to layer the feedback, offering something positive first, mentioning the suggested correction second, and then finishing with something positive or motivational.

## The Basics of Human Movement

When instructors understand that all human movement, from sitting to performing acrobatics, fits into one of three planes of motion, they can better understand proper alignment and body mechanics as it applies to effective exercise program design. While most movements are multiplanar, understanding each of the three planes of motion individually first is important to both teaching and recognizing safe and effective movement patterns.

Since exercise is designed to enhance the movements and activities that we perform on a daily basis, the best way to functionally prepare the body is to train the way we move, favoring integration over isolation (training movements, not solely muscles).

There are $\qquad$ planes of motion.

1. The $\qquad$ plane separates the body into right and left halves. Think of standing in a $\qquad$ and moving away from the frame forward and backward.

Possible joint actions are:

- Flexion (knees, hips, back, shoulders, and elbows)
- Extension (knees, hips, back, shoulders, and elbows)
- Ankle plantar flexion and dorsiflexion


## Practical Application:

Joint movements during indoor cycling classes occur primarily in the sagittal plane. Many supine Pilates exercises and traditional abdominal crunches also occur in the sagittal plane, as well as many resistance-training exercises, such as squats and lunges.

## FIVE PRIMARY MOVEMENT PATTERNS

In addition to understanding movements in terms of the planes of motion, it is also beneficial to think of exercises in terms of their application to activities of daily living. Specifically, movements of everyday life can be broken down into five primary movements:

- Bending/raising and lifting/lowering movements (e.g., squatting down to pick an object off of the floor, or standing up from a chair)
- Single-leg movements (e.g.,lunging, climbing stairs, or walking)
- Upper-body pushing movements (e.g., pushing open a door, putting something away on a tall shelf, or propping oneself up from a side-lying position)
- Upper-body pulling movements (e.g., opening a car door)
- Rotational movements (e.g., turning to throw something away behind you or reaching across the body to pick up an object on the left side of a desk and placing it on the right side)
Incorporating a variety of exercises in your classes that help individuals to effectively train these important movement patterns will enable your participants to achieve success both in class and in their activities of everyday living.

a. Bend-and-lift movement

d. Pulling movement

b. Single-leg movement

e. Rotational movement

c. Pushing movement

NOTES

## Chapter 3

## Balance in Group Exercise



TYPES OF CLASSES

## A WELL-ROUNDED FITNESS ROUTINE SHOULD INCLUDE ACCUMULATED

cardiorespiratory, strength, and flexibility exercise, as well as balance and agility training. The goal of a class can be to increase muscular strength/endurance or cardiorespiratory fitness. If both of these disciplines will occur in the same class format, then either can occur first, or they may alternate in a circuit-style format. If the goal of a class is to increase flexibility, this should either become a class in itself (such as dedicated stretching or yoga class) or the specific flexibility exercise should be performed at the end of a strength, cardiorespiratory, or fusion class, as it is most effective to stretch muscles that are properly warmed and therefore more pliable. This allows for increased length in muscles and connective tissue, improved range of motion about joints, and more effective performance of activities of daily life.

As an instructor, it is important to understand that all participants should engage in cardiorespiratory, strength, and flexibility training. Even if you do not personally teach all three disciplines, you should recommend to your participants that they develop a well-rounded fitness program that incorporates these three elements so that their training program reflects the concept of balance. The most balanced individuals cross-train to some extent each week in order to ensure that their fitness program encompasses these three key elements.

Overall, the principle of balance applies to group exercise in three ways:

1. "Balance" has a neuromuscular meaning:

- Being able to stand on one leg
- Being able to perform a single-leg stance equally well on either foot
- Raising one arm or leg (or both) from the quadruped position
- Having neutral static tension in the core in all positions for a neutral spine
- Balance to maintain neutral pelvic position and neutral spinal posture
- Executing exercises with good movement patterns on an unstable surface, as appropriate
- Raising one knee or foot off of the floor in plank position

2. "Balance" has a training meaning:

- Both sides of the body (if split into right and left halves) need to be trained equally because together they connect and create a whole. This type of approach is called bilateral training. Instructors who train with a unilateral approach during both cardiorespiratory moves (such as only doing mambos with the left leg, leaping only to the right, and stepping with only the right lead leg) and strength moves (such as only doing lunges with the right foot stepping forward) fail to integrate this principle of balance in their classes.
$\checkmark$ When instructors teach movement patterns that utilize both sides of a given movement pattern (such as both sides of the body during lunges, or doing grapevines to the right and left), these strength-training and cardiorespiratory patterns are called "transitional" and "reversible" because they are repeated on both sides and/ or in both directions to ensure this type of balance.
- Balance in training also means that an individual should strive to be equally balanced among the three key components of training - cardiorespiratory, strength, and flexibility training. For example, if a participant or instructor only takes or teaches indoor cycling classes, he or she should seek out additional modes of exercise that focus on strength/endurance training, such as by taking a group strength class that includes resistance-training exercises for the upper body. Similarly, a yoga enthusiast should seek out modes of cardiorespiratory training to complement his or her yoga practice, such as taking cardio-dance classes.

3. "Balance" has a programming meaning:

- Instructors should consider opposing muscles and varying planes of movement when choosing exercises and movements for their participants.
$\checkmark$ As a cardiorespiratory example, always doing movement in the frontal plane with exercises like grapevines instead of sometimes incorporating marching front and back (sagittal plane) or twisting (transverse plane) would not only be boring, but it would also limit the participants from experiencing exercises in all three planes of movement.
$\checkmark$ As a muscular strength/endurance example, performing biceps curls in a group strength class without an exercise for the triceps (the opposing muscle group) would not be a balanced class from a resistancetraining perspective.


## Types of Classes

Many participants ask instructors what the best class is for muscular strength, cardiorespiratory fitness, or flexibility training. The answer to this question lies in identifying what it is they are able to do:

- Safely
- At appropriate levels of intensity
- For the longest duration
- With the most enjoyment

These factors help to indicate that it is an appropriate class option for the individual. Keep in mind, however, that it is also beneficial to seek out new modes of exercise every so often to balance the fitness routines and to challenge the muscles and cardiorespiratory system in a new way.

All single-discipline and fusion classes can be broken down into these three class categories based on their purpose. A class called "Strength Secrets," for example, will likely focus on improving muscular strength and endurance. A fusion class called "Cardio Sculpt," on the other hand, will likely focus on improving both cardiorespiratory endurance and muscular strength/endurance, and will likely conclude with some sort of flexibility training as well.

## COMMON GROUP EXERCISE MODALITIES FOR CARDIORESPIRATORY TRAINING

Zumba; cardio dance; hi-lo; dance styles like hip-hop, funk, and country; kickboxing; fusions like cardio sculpt and
aqua fitness; equipment-based classes like step, BOSU, rebounding, indoor cycling, and Gliding; and others

## COMMON GROUP EXERCISE MODALITIES FOR STRENGTH TRAINING

Body-weight classes, bootcamp, barre-influenced classes, yoga, Pilates, aqua fitness, and equipment-based classes like dumbbells, BOSU, kettlebells, suspension training, elastic resistance, stability balls, some aquatic fitness, and others

## COMMON GROUP EXERCISE MODALITIES FOR FLEXIBILITY TRAINING

Stretch classes, yoga, Pilates, some forms of qigong and tai chi, and equipment-based classes like foam rollers, stretching with bands and straps, and others


NOTES

# Chapter 4 "Meet Your Body" The Basics of Applied Anatomy \& Kinesiology 



BONES
MUSCLES
FLEXIBILITY
POSTURE AND POSITIONS OF THE BODY
APPLYING KNOWLEDGE TO MOVEMENT
CARDIOVASCULAR SYSTEM

Two Helpful Principles:

1. Two yoga postures that all fitness professionals should be able to recognize from their anatomical design are:

- "Tall Mountain"
- "Reaching Child"

These two postures help demonstrate flexion and extension. In Tall Mountain pose, also referred to as the anatomical position, almost all joints are in extension, while in Reaching Child pose almost all joints are in flexion.

2. Wherever it $\qquad$ that's what it .

The general area where a muscle runs will often tell you what the muscle will do when it shortens or contracts (called the concentric phase-discussed more in the M3 section of this course, which begins on page 35). This movement is called the joint action of the muscle. You should know generally where a muscle is located and what joint or joints it crosses.

- Many muscles in the front of the body are primarily used for pushing movements, such as in the muscles of the chest, while many muscles in the back of the body are primarily used for pulling movements, such as the muscles of the back.

When the angle between any two bones decreases, this is called joint flexion. Conversely, when the angle between joints increases, this is joint extension.

The prefix 'hyper' is commonly defined as excessive, so hyperflexion occurs when a limb or part of the body is flexed beyond its normal range of motion. Similarly, hyperextension
occurs when there is movement at a joint into a position beyond the joint's normal full extension.

- An example of this concept is seen in indoor cycling, where some participants hyperextend their elbows as they prop themselves up on the handlebars, placing stress on the elbows and producing tension and instability throughout the core.


## Keep in mind that muscles contract and joints flex.

- For example, it's more correct to say "contract your biceps and flex your elbow" than to say "flex your biceps."

All of the joints in the body are important. A joint in the superior part of the body that is often quite unstable is the shoulder joint. Think of this joint as a golf ball sitting on a golf tee; as the tee is much smaller
 than the golf ball, the ball is quite unstable, much like the shoulder joint.

A joint in the middle of the body that is quite stable is the hip joint. Think of this joint as a baseball inside a baseball mitt; as the mitt is much larger than the ball, the baseball is much
 more stable.

Finally, in addition to thinking of the arms, legs, hips, and shoulders as joints, also remember that the spine is one long series of bones connected by joints that can flex, extend, and twist.


## Bones

nstructors should become familiar with the names of the major bones of the body, as they can reference them when providing verbal anatomical and alignment cues. Using the correct names of bones not only makes instructors more credible, but also helps to truly educate participants about their bodies.

The following is not an exhaustive list, but rather a series of practical examples of what types of cues instructors from various disciplines can use when referencing bones:

| DISCIPLINE | SAMPLE CUE |
| :--- | :--- |
| Cycle | "When placing your toes on the pedal to size your bike, ensure that your patella remains <br> aligned with your second toe as your knee flexes slightly." |
| Stretching | "When lying supine in the dead bug position, make sure your tibia and fibula are parallel with <br> the floor." |
| Latin-based dance | "Concentrate on moving your pelvic girdle up and down from side to side as we do the <br> merengue dance." |
| Yoga or Pilates | "Try to sit on your ischial tuberosities instead of the gluteus maximus muscle." |
| Core conditioning | "When setting up the side-plank position, be sure the radius and ulna are perpendicular to <br> the spine." |
| Aqua | "Try to keep the humerus stable in the water while you flex and extend the elbow for these <br> biceps curls." |



## Muscles

This section includes illustrations of the major muscles involved in common group exercise movements. Following along with the video, Muscles, fill in the blanks for joint actions, stretches, and common classes. Additional and related information can be found on pages 35-39.

Muscle: Pelvic Floor

Joint Action:

Stretch(es):


Notes:

## Muscle: Transverse Abdominis

Joint Action:

Stretch(es):

Common Classes:

Notes:


## Muscle: Anterior Tibialis

Joint Action:

Stretch(es):

Common Classes:


Notes:

## Muscle: Gastrocnemius/Soleus

Joint Action:

Stretch(es):

## Muscle: Quadriceps

Joint Action:

Stretch(es):

Common Classes:

## Notes:



Muscle: Hamstrings

Joint Action:

Stretch(es):

Common Classes:

Notes:



Muscle: Gluteus Maximus

## Common Classes:

Notes:


```
Common Classes:
```


## Notes:

## Muscle: Hip Adductors

## JJoint Action:

## Stretch(es):

## Common Classes:

## Notes:



Joint Action:

Stretch(es):

## Common Classes:

Notes:

Muscle: Erector Spinae

Joint Action:

Stretch(es):

Common Classes:

## Notes:



## Notes:



Muscle: Quadratus lumborum

Joint Action:

Stretch(es):

Common Classes:

Notes:


Joint Action:

Stretch(es):

Common Classes:

Notes:

Muscle: Trapezius \& Rhomboids



## Muscle: Deltoids

Joint Action:

Stretch(es):

Common Classes:

Notes:

Muscle: Latissimus Dorsi

Joint Action:

> See above
> figure

Common Classes:

Notes:

Joint Action:

Stretch(es):

Common Classes:

Notes:


Muscle: Triceps

Joint Action:

Stretch(es):

Common Classes:


## Flexibility

lexibility refers to the ability to move the joints through their normal full ranges of motion. When muscles and connective tissue are flexible, it can help to reduce the risk of injury as well as enhance quality of life by allowing full joint movement during exercise and activities of daily living.

During the warm-up portion of group exercise classes, the primary goal is to increase the overall temperature of muscles and functionally prepare them for the activity to come. Performing dynamic movements, such as arm circles and leg swings, during the warm-up increases joint mobility and muscular tissue pliability in preparation for the rest of class.

Flexibility exercises during the final phases of group exercise classes (or for the duration of stretching-specific classes following the warm-up), are focused on increasing the length of muscles and tendons to create or maintain long-term improvements in joint range of motion, generally through static stretching. Static stretching refers to holding a stretch in one position without movement, while simultaneously
focusing on appropriate breathing techniques and body alignment and stretching the muscle by moving the joint in the opposite direction from which the targeted muscle creates movement when it contracts. Since the pectoralis major acts on bringing the shoulders closer together, opening the arms behind the body and taking the shoulders away from each other stretches the chest.

To improve range of motion, instructors should guide participants to hold static stretches to the point of slight discomfort (but not pain) for up to 30 seconds, and incorporate stretches for all major muscle groups used within any specific group exercise class.

| COMMON FULL-BODY FLEXIBILITY MOVEMENTS |  |
| :--- | :--- |
| Movements | Standing plantarflexed lunge with overhead side stretch |
| Muscles | Anterior tibialis, hip flexors, latissimus dorsi, quadratus lumborum, obliques, and rectus <br> abdominis |


| Movements | Standing calf stretch with open arms |
| :--- | :--- |
|  |  |
| Muscles | Gastrocnemius/soleus and pectoralis major |


| Movements | Cross-legged hip and overhead stretch |
| :--- | :--- |
|  |  |
| Muscles |  |


| Movements | Standing unilateral hamstring stretch with unilateral shoulder stretch |
| :--- | :--- |
|  |  |
| Muscles |  |

## INSTRUCTOR SELF-CARE: MYOFASCIAL RELEASE

Myofascial release involves using soft-to-hard surfaces like foam rollers, tennis balls, and other pieces of equipment to help stretch muscles and promote general muscle health. Because active instructors who teach multiple classes per day use their muscles more than the average participant who works out once per day, instructors may wish to incorporate myofascial release at least once weekly as part of their muscle self-care.


## Posture and Positions of the Body

The principle of balance discussed earlier also applies to general posture, as it helps one understand that neutral means that all of the muscles work on the body's center equally. When any muscle or muscle group pulls too strongly or becomes too tight, this can create an imbalance. Similarly, when a muscle or muscle group is too weak, it may not pull strongly enough or efficiently execute the movement(s) it is intended to perform.

The unique aspect of the trunk of the body is how it functions as the "tunnel" through which all systems connect. The center of the core is the pelvic floor, and core training involves a general isometric tightening of these muscles in addition to activating the transverse abdominis, which compresses and protects the core, helping to stabilize the spine.

One way to describe the fitness-related function of the transverse abdominis is to think about cinching a belt around your waist, drawing in your core muscles almost as if to appear slimmer through the midsection. The technique of bracing (which involves co-contracting the core and abdominal muscles) in conjunction with pelvic floor maneuvers (such as Kegels) protects the spine, activates the core, and can enhance overall core function during classes, whether they focus on cardiorespiratory, strength, or flexibility training.
Neutral posture involves an equal amount of tension produced by the anterior and posterior muscles of the core. The balance of neutral posture creates a natural relationship between the ribs and the hips where there is little to no exaggeration in either direction. Deviations from neutral spine indicate muscle imbalances that can impact posture, movement, and musculoskeletal health.

The spine has seven cervical vertebrae, 12 thoracic vertebrae, five lumbar vertebrae, and four fused vertebrae at the bottom, called the coccyx.
Since the natural, aligned spine is neither straight nor flat, instructors should opt to use the words "natural," "neutral,"
"aligned," "lengthened," "tall," "proud," and other similar words instead of terms that do not adequately describe the way the vertebrae should align.

While some spinal curvature is natural, deviations in the spine are common and occur when someone has an exaggeration of these curves.


## LORDOSIS

When standing in Tall Mountain, all joints are in extension. When someone's pelvis tilts forward, this is called an anterior pelvic tilt and usually denotes an exaggerated lordotic curve. Often, the spinal erectors are pulling too strongly in the back. This individual most likely will need to focus on strengthening his or her abdominal muscles and hip extensors (gluteus maximus and hamstrings), in addition to
 stretching the spinal erectors and hip flexors (iliopsoas).

## KYPHOSIS

This postural deviation involves an exaggerated posterior curve of the thoracic spine. A forward-head position and rounded shoulders often accompany this posture. To address this excessive posterior curvature of the spine, which is typically seen in the thoracic region, this individual will most likely need to strengthen the middle/lower trapezius fibers and rhomboids that pull the shoulder blades back, as well as strengthen the
 erector spinae group to increase the space between the ribs and hips. Often, this hunched position is a result of the pectoralis major pulling too strongly; thus, it is important that this individual also stretch the chest.

## SCOLIOSIS

When someone's spine has a lateral deviation that creates an " S " shape where the pelvis and shoulders appear uneven, this is scoliosis. If this individual has pain and cannot assume a neutral spine position, he or she should be referred to a medical practitioner.


## 10 POSITIONS OF THE BODY

In fitness classes, the various exercises and movements of the body can be categorized into 10 positions. Alignment in each of these positions is important for an overall understanding of how the joints should align and be stacked under each other where appropriate. Notice the phrase "finger space between the ribs and hips" below, which means that the space between the lowest rib and the top of the pelvis should not decrease while getting into or out of any of the positions.

First, instructors must have an understanding of what neutral position of the spine both looks and feels like in each of the following positions. Second, instructors must understand what the extremities/distal body parts both look and feel like in each position.

In each of these positions, think of the joints of the body as lasers projecting outward from the body in the dark, and focus on keeping all lasers pointed in the same direction for optimal alignment. Exceptions occur when splitting the body into right and left halves in the sagittal plane, such as during a plié. In this case, the lasers of each side of the body would still point in the same direction with the head facing forward between the two sides.

1. Bilateral Standing (e.g., squats, pliés, and hinging)

- Many movements performed throughout the day, from picking things up to sitting down at a desk, are twolegged movements.

2. Unilateral Standing (e.g., single-leg squats, tree pose, and lunges)

- Many movements performed throughout the day, such as climbing up stairs and getting in and out of the car, are one-legged movements.

3. Kneeling (hi, low)
4. Quadruped (hands and knees position)
5. Plank
6. Prone (lying on stomach)
7. Side-plank, Side-lying
8. Supine (lying on back)
9. Reverse Plank
10. Seated (flexed, extended knees)

The following is a list of common cues for each of the major positions of the body. Pictured are three common movements from a plethora of group fitness disciplines to illustrate some common exercises that fall within each of these categories.

| POSIIION | ALIGNMENT TIPS |
| :--- | :--- |
| 1. Bilateral Standing | Ankles under soft knees, under neutral hips; navel in; shoulders back and down <br> and eyes forward with chin down; finger space between the ribs and hips |
| 2. Unilateral Standing | Ankles under soft knees, under neutral hips; navel in; shoulders back and down <br> and eyes forward with chin down; finger space between the ribs and hips |
| 3. Kneeeling hips; finger space between the ribs and hips and down; neutral spine, head, |  |
| POSIIION |  |
| Q. Quadruped |  |


| 5. Plank | Palms under gently flexed elbows under shoulders with fingers pointing forward <br> (for plank or triceps push-ups) or toward each other (for triangle pushh-ups); <br> neutral spine, head, and hiss; feet pointing in the same direction; finger space <br> between the ribs and hips |
| :--- | :--- | :--- |
| 6. Prone | Neutral spine and head usually looking to one direction; <br> feet pointing in the same direction; finger space between the ribs and hips |
| Space between the ribs and hips on elbow or cradled head in arm; finger |  |

Instructors should be conscious of their scope of practice and avoid making exercise recommendations for participants who have medical conditions (e.g., pregnant, arthritis, or diabetes) and have not yet received clearance from their physician for exercise participation. These individuals should be referred to an appropriate medical practitioner for evaluation and recommendations for exercise participation.

# Applying Knowledge to Movement 

> - elcome to the M3 section-Movements, Muscles, and Maintenance (Flexibility). The following is a generalization of some of the most basic, yet important movements common to group exercise. While many multijoint and multiplanar movements involve many different kinds of muscular activation, the following list serves as a starting point for a general understanding of common exercises.

The Movements section addresses just a few of the common movements, known as joint actions, usually performed in classes from that particular discipline. It is neither meant to be an exhaustive list nor a recommendation for what you should be doing in your classes.

The Muscles section addresses some of the main muscles involved in the movements discussed as agonists/prime movers. This course does not cover the muscles acting as isometric stabilizers in each movement, but instructors should be aware of them as well.

Here are some examples:

- When executing punches, there are more muscles of the upper body involved than just the triceps and deltoids. For the purposes of this introductory group exercise course, this is the baseline level of information that you need to know.
- When moving into a side plank position, the shoulders work to stabilize isometrically, but the prime mover is the quadratus lumborum.


The Maintenance section refers to the static stretching and myofascial release that instructors and participants should include for each specific muscle group in the final phases of class for general health and improved flexibility.

Since group exercise instructors often have expanded roles that involve teaching many different types of classes, this section consists of a few basic, practical pieces of information that prove helpful to instructors, as they are need-to-know items for your participants' success in a given modality.

## MUSCULAR STRENGTH <br> AND ENDURANCE

Once instructors understand the basics of how muscles work, how to train them, and how to stretch them, they can learn basic ways to strengthen the muscular system using body-weight exercises. Adding equipment later makes sense once you have a firm grasp on what training entails with no equipment, first focusing on improving quality of movement (effectively performing the five primary movement patterns) before adding external load/weight.

Strength and endurance are related components of musculoskeletal fitness. The development of muscular strength results from using heavier weight and completing fewer repetitions of movement, while muscular endurance results from using less weight but completing a greater number of repetitions. When participants take classes to assist them in weight loss and weight maintenance, remind them that resistance training plays a key role in that process. Lean body mass developed through resistance-training exercises is a critical component of finding and maintaining a healthy body weight.

For the purposes of this course, concentrate on training muscles both isometrically and isotonically to emphasize both stability and mobility.

## TIPS FOR BODY-WEIGHT TRAINING (FOR ALL MAJOR MUSCLE GROUPS):

- Understand what the particular muscle group does
- Place the body in a position that places the pull of the targeted muscle group(s) against gravity
- For isometric stability training, choose the appropriate progressions and regressions and hold as appropriate, usually for 10 to 30 seconds, maintaining a consistent breathing pattern
- For isotonic mobility training, utilize these five steps:
$\checkmark$ Choose the appropriate progressions and regressions for the given exercise
$\checkmark$ Understand safe range of motion for that part of the body
$\checkmark$ In general, exhale on the concentric (pushing or pulling) phase of the movement
$\checkmark$ Display constant body control during movement
$\checkmark$ Manipulating as appropriate the direction, rhythm, impact, lever length, and stability (D.R.I.L.L.S.), typically following the guidelines for general muscular fitness using three sets of 8 to 15 repetitions for all major muscle groups

As mentioned previously, when muscles contract/shorten, this is the concentric phase. When muscles elongate/ lengthen, this is the eccentric phase. The prime mover, or the muscle creating the desired motion, is the agonist, while the muscle that has the potential to oppose the action is the antagonist. When movement occurs, this is isotonic; when muscle tension is created but no movement is observed, this is isometric. One limb or side of the body completing the movement/exercise is unilateral, whereas two limbs or sides acting together create bilateral movement.

- The exception to what is listed above pertains to the
aquatic environment when no equipment is used. Due to the fact that the body is surrounded with water, which provides more resistance than air, most movement in the aquatic environment is concentric (for eccentric contractions, specialized equipment is used, though this topic is beyond the scope of this course). The body's response to moving in the aquatic environment is very different from the way it reacts to gravity on land.
$\checkmark$ For example, when standing on land and abducting the shoulder to the side in the frontal plane, you move the arm up against gravity, so this is the concentric phase for the medial deltoid. When you lower the arm, the movement occurs with the assistance of gravity, and it is the eccentric phase for the same medial deltoid muscles (as you slow the arm as it moves back toward the side of the body).
$\checkmark$ When standing in the pool or ocean in shoulder-deep water, however, the water provides resistance during both abduction and adduction, so the medial deltoid performs the shoulder abduction concentrically (with resistance) and the latissimus dorsi performs the shoulder adduction (with resistance), since the water surrounds the shoulder moving in both directions.


## SPOT REDUCTION

Instructors should note that training any specific area of the body targets the muscles as joint movers in that particular region. Muscular strength and endurance exercises do not burn fat from a specific part of the body by selectively exercising that area of the body, a flawed concept known as spot reduction. In order to eliminate excess body fat and keep it off long-term, participants should engage in regular exercise that includes both cardiorespiratory and strength training in conjunction with following a sensible diet.


## COMMON BODY-WEIGHT STRENGTH-TRAINING OPTIONS

This list is not exhaustive, does not constitute an exercise program or class design, and does not suggest any particular order of importance.

The following exercises can be executed isotonically or held as positions isometrically, depending on both the class purpose and participant level. As an additional note, moving against gravity is the concentric phase of the exercises in this section, unless otherwise specified.

## SQUATS \& LUNGES

| Movements | Ankle, knee, and hip flexion |
| :--- | :--- |
| Muscles | Quadriceps (for knee extension) and hamstrings and gluteus maximus (for hip extension) |
| Maintenance | Quadriceps and hamstrings static stretching, and occasional myofascial release |


| QUADRUPED RECIPROCAL REACHES |  |
| :--- | :--- |
| Movements | Unilateral shoulder flexion and unilateral hip and knee extension |
| Muscles | Anterior and middle deltoid (for the shoulder) and gluteus maximus and hamstrings (for the <br> hip/leg) |
| Maintenance | Shoulder, hip, gluteus maximus, and hamstrings stretching |


| PUSH-UPS | Shoulder flexion and horizontal adduction |
| :--- | :--- |
| Movements | Pectoralis major, triceps, and anterior deltoid |
| Muscles | Pectoralis major, triceps, and anterior deltoid static stretching |
| Maintenance |  |

## PRONE SPINAL EXTENSION

| Movements | Spinal extension |
| :--- | :--- |
| Muscles | Spinal extensors |
| Maintenance | Spinal extensor static stretching |


| SIDE PLANKS |  |
| :--- | :--- |
| Movements | Lateral spinal flexion |
| Muscles | Quadratus lumborum and obliques |
| Maintenance | Static stretching (seated, standing) |

## SUPINE ABDOMINAL FLEXION AND ROTATION

| Movements | Spinal flexion and rotation |
| :--- | :--- |
| Muscles | Rectus abdominis (for the spinal flexion) and external and internal obliques (for the spinal <br> rotation) |
| Maintenance | Rectus abdominis (usually prone position) and oblique static stretching (seated, standing, <br> or kneeling position) |

## SUPINE BRIDGES

| Movements | Hip extension |
| :--- | :--- |
| Muscles | Gluteus maximus and hamstrings |
| Maintenance | Gluteus maximus and hamstring static stretching, and occasional myofascial release |

## Cardiovascular System

T
0 better understanding what is happening in the body during cardiorespiratory training, it is important to have a general understanding of the heart and how it works during this type of exercise. Think of the heart in four general sections: upper right (right atrium), lower right (right ventricle), upper left (left atrium), and lower left (left ventricle). Fresh, oxygenated blood comes into the upper left atrium, passes down to the lower left ventricle, and goes out through the aorta to the body to fortify the muscles for work, making up the systemic circuit. At the muscles, the blood becomes depleted of oxygen and returns to the heart to enter the right atrium through the superior and inferior vena cava, passes through to the right ventricle, and then out through the pulmonary arteries to the lungs to get refreshed with oxygen, making up the pulmonary circuit.


When you train the cardiorespiratory system in such a way that you are working at a specific intensity consistently for a certain period of time, this is referred to as steady-state training. When you train the cardiorespiratory system in a way that alternates between working at high and low intensities, this is called interval training.

Most group exercise classes include starting, stopping, and slower- and faster-paced movements. Cycling, boot camp, and Latin dance are essentially forms of interval training because at different times, participants work at different intensities. Group exercise classes that maintain consistency in intensity at a steady tempo (beats per minute) are examples of steady-state training, and include some versions of traditional dance-based and step-training classes.

To add intensity to movements performed in cardiorespiratoryfocused group exercise classes, instructors may opt to increase lever length by adding the arms, which in turn can increase the number of calories burned due to the fact that more muscles are involved in the sustained, rhythmic movements.

Tips for using the arms during cardiorespiratory conditioning such as during dance-based classes include:

- Using arm variety between songs or combinations to avoid using the same muscles in the same patterns, thereby reducing the risk of overuse. For example, if one song includes reaching the arms overhead (using the anterior deltoid muscles), choreography for the next song should include side reaches (using the medial deltoid muscles).
- Raising the arms overhead requires more effort for the heart than keeping the arms below shoulder height, so using a healthy combination of raising arms overhead and keeping them below the level of the heart allows for variations in exercise intensity.
- Avoiding heavy hand-weights (greater than 3 lb ) for dance-based conditioning where large arm movements are part of the choreography
- Being aware of constant, repetitive movements and instead offering variety in hand and arm patterns to avoid overuse


## COMMON MOVEMENTS IN CARDIORESPIRATORY CLASSES

| DANCE-BASED CARDIO CONDIIIONING |  |  |
| :--- | :--- | :---: |
| Movements | Isotonic ankle plantar flexion with body weight (walking in place, running, mambos,and high-knee runs) |  |
| Muscles | Gastrocnemius and soleus for endurance |  |
| Maintenance | Static calf stretching and occasional myofascial release (see Flexibility section, page 22) |  |
| Movements | Isotonic lateral hip movements in the frontal plane during Latin dance such as merengue, mambos, etc. |  |
| Muscles | Quadratus lumborum for endurance |  |
| Maintenance | Static quadratus lumborum stretching |  |
| Movement | Step-touches, grapevines, jumping jacks |  |
| Muscles | Isotonic abduction: Gluteus medius and tensor fasciae latae for endurance <br> Isotonic adduction: Adductor group for endurance |  |
| Maintenance | Static abductor and adductor stretches, and occasional myofascial release for these two opposing <br> muscular groups |  |
| CYCLE |  |  |
| Movements | Isotonic knee and hip extension on the pushing phase |  |
| Muscles | Quadriceps (for the knee extension) and gluteus maximus (for the hip extension) |  |
| Maintenance | Static quadriceps and gluteus maximus stretching and occasional myofascial release |  |
| Movements | Isotonic knee flexion on the drag and pull-up phase and hip flexion on the drag and pull-up phase |  |
| Muscles | Hamstrings (for knee flexion) and hip flexors for hip flexion) |  |
| Maintenance | Static hamstring and hip flexor stretching and occasional myofascial release |  |
| Movements | Isometric ankle dorsiflexion for proper technique |  |
| Muscles | Anterior tibialis |  |
| Maintenance | Static anterior tibialis stretching |  |
| Movements | Isometric spinal extension for safe body mechanics |  |
| Muscles | Erector spinae muscle group for isometric stabilization |  |
| Maintenance | Dynamic and static erector spinae stretching and occasional myofascial release |  |

*Cycle instructors should recommend that participants complete strength-training exercises for their upper body outside of class, as discussed in the earlier section on balance.

| AQUA |  |
| :--- | :--- |
| Movements | Jumping jacks with reciprocal shoulder abduction and adduction under water surface |
| Muscles | Abduction phase legs: Gluteus medius and tensor fasciae latae <br> Abduction phase shoulders: Middle deltoids <br> Adduction phase legs: Hip/leg adductors <br> Adduction phase shoulders: Latissimus dorsi |
| Maintenance | Static deltoid, latissimus dorsi, and hip abductor and adductor stretching |
| KICKBOXING |  |
| Movements | Isotonic knee extensions in kicking with hip flexion |
| Muscles | Quadriceps for knee extensions and hip flexors for hip flexion |
| Maintenance | Static quadriceps and hip flexor stretching |
| Movements | Isotonic elbow extensions in punching with shoulder flexion |
| Muscles | Triceps (for elbow extension) and deltoids (for shoulder flexion) |
| Maintenance | Static triceps and deltoid stretching |

NOTES

## Chapter 5 FITT Principle <br>  <br> COMPONENTS OF THE FITT PRINCIPLE <br> SMART GOAL SETTING <br> EXERCISE EVALUATION CRITERIA (EEC)



## MANY PARTICIPANTS ASK COMMON QUESTIONS THAT CAN BE ANSWERED WITH AN

understanding of the FITT principle. Common questions that this acronym will answer are:
— How often should I work out?

- What do I need to do for strength training?
- How intensely should I exercise?
_ Is that class too short or too long for me?
— Should I monitor my heart rate?
— What's the best class for me to lose weight?
Many health, fitness, and wellness professionals refer to the FITT principle to ensure that their classes are safe and effective. When teaching strength, cardiorespiratory, and flexibility disciplines, it is important to be aware of what kind of atmosphere you should be creating for your participants to:
- Feel successful
- Stay safe
_ Improve their fitness level


## Components of the FITT Principle

## F = FREQUENCY

Participants: Individuals should engage in physical activity on most, if not all, days of the week. Participants should allow for a 24 -hour period between similar class types if possible, and incorporate rest days as needed. When choosing classes, participants should seek out modalities that they enjoy, but also classes that will challenge them in new ways every few weeks in order to avoid muscles becoming accustomed to any one specific mode of exercise. This is also known as adaptation.

Instructors: If possible, avoid teaching the same type of class more than two to three times per day, and incorporate appropriate rest into your schedule according to the mode of class you are teaching.

- For example, if you teach two group strength-training classes on Monday, on Tuesday you may opt to teach either a flexibility or cardiorespiratory class instead.


## I = INTENSITY

## Intensity for Cardiorespiratory Exercise

Many ways exist for monitoring intensity during cardiorespiratory training. Some involve equipment (like heart-rate monitors) and some involve complex calculations (such as percentage of maximal heart rate or percentage of heart-rate reserve). This course focuses on simplicity, with two easy-to-use, widely accepted methods of monitoring exercise intensity-the talk test and ratings of perceived exertion (RPE).
Participants: Utilizing the talk test and RPE requires no complex calculations by participants outside of class, and also does not require any specific equipment. Participants using the talk test will monitor their intensity based on their ability to converse. Participants using RPE charts should choose the numbers that correspond with how intensely they feel they are working (on a scale of either 6 to 20 or 0 to 10 ), and should align their intensity levels with both their current fitness level and their specific health, fitness, and wellness goals.
Instructors: Keep in mind that your goal is to demonstrate exercises appropriately, coach, correct, motivate, and properly cue movements so that participants learn how to become independently efficient movers. Your own intensity when you are teaching should be lower than it would be if you were working out alone. Making any class you teach a part of your own workout misses the purpose of your role as an instructor, which is to effectively lead your participants on their health and wellness journeys. Choosing additional resistance or higherintensity moves to advance the workout is not appropriate for an instructor teaching multiple classes in one day.
Instructors guiding participants to monitor intensity by using the the talk test may cue them by saying, "Be sure you aren't
working so hard you couldn't sing Happy Bithday," whereas instructors guiding participants using RPE may cue them by saying, "Let's turn up the resistance on our bikes so that we're working at an intensity of about 7 out of 10 for this next 2-minute hill climb."
This table presents the original and modified RPE scales. The advantage of the original scale is that it corresponds well to heart-rate when you add a 0 to the number. The advantage of the modified scale is that it's easier to understand, since most people are familiar with using a 0 to 10 scale.

RATINGS OF PERCEIVED EXERTION (RPE)

| RPE | Category Ratio Scale |
| :--- | :--- |
| 6 | 0 Nothing at all |
| 7 Very, very light | 0.5 Very, very weak |
| 8 | 1 Very weak |
| 9 Very light | 2 Weak |
| 10 | 3 Moderate |
| 11 Fairly light | 4 Somewhat strong |
| 12 | 5 Strong |
| 13 Somewhat hard | 6 |
| 14 | 7 Very strong |
| 15 Hard | 8 |
| 16 | 9 |
| 17 Very hard | 10 Very, very strong |
| 18 | * Maximal |
| 19 Very, very hard |  |
| 20 |  |

Source: American College of Sports Medicine (2014). ACSM's Guidelines for Exercise Testing and Prescription (9th ed.). Philadelphia: Wolters Kluwer/ Lippincott Williams \& Wilkins.

## Intensity for Resistance Training

Participants: General muscle fatigue (not failure) is an appropriate way to describe how muscular strength/ endurance training should feel in most group exercise classes. Following general muscle-conditioning guidelines, participants should aim to complete up to three sets of 8 to 15 repetitions of each exercise. To gauge if an exercise is being performed at an appropriate intensity, the last few repetitions of each set should be difficult to complete, yet possible to do so with proper form. Instructors should reference strength/ intensity for participants by offering suggestions such as, "You should be able to do $\qquad$ more repetitions of this exercise if you've chosen the right weight today."

Instructors: Remember that when teaching group strength classes, you are teaching for your participants, not for your own workout. This means that as a motivator, educator, and coach, it is important that you strike a comfortable balance between actually performing the movements (visually) in addition to
walking around the room and coaching the movements (verbally and kinesthetically). Since group strength classes typically involve performing three sets of each exercise, instructors should find the right blend of demonstrating and walking around as appropriate for their personal teaching style.

- For example, if you are teaching side squats and backward lunges to the left, the exercise will be repeated on the other leg to the right side. After getting the class started on the right side, it would be an ideal time to leave the front of the room and walk around to cue and motivate participants, as they have already seen you demonstrate one full set of the exercise on the opposite side. Instructors who stay in one place for the complete set of squats and lunges to both sides may be neglecting to remember that this is not their own personal workout.


## Intensity for Flexibility Exercise

Stretches should be held to a point of tension or tightness with slight discomfort, but without pain. Keep in mind that it is most effective to perform flexibility exercises when the muscles are warm.

## $\mathrm{T}=\mathrm{TIME}$

Current industry guidelines recommend that adults should accumulate at least of 150 minutes of moderate-intensity physical activity per week, so instructors should recommend that participants accumulate at least this much time in classes if they are only getting or staying fit through group exercise. Depending on an individual's personal health, fitness, and wellness goals (e.g., general health/well-being or weight loss), exercise recommendations can be met through 30 to 60 minutes of moderate-intensity exercise five days per week, or participants may opt for 20 to 60 minutes of vigorous-intensity exercise three days per week. It is important to note that the recommended amounts of physical activity may be completed in one continuous exercise session, or accumulated through multiple, shorter bouts (of at least 10 minutes in length) of physical activity throughout the day.

In addition to cardiorespiratory exercise, adults should engage in resistance training for all major muscle groups at least two to
three days per week. To allow adequate time for rest and recovery, participants should wait at least 48 hours between resistancetraining sessions before working the same muscle group.

Another important part of a well-rounded exercise program is flexibility training. Guidelines state that adults should perform flexibility exercises for all major muscle groups at least two to three days per week in order to improve range of motion. Each stretch should be held for 10 to 30 seconds and repeated two to three times.

Participants: Participants can choose classes lasting from 30 to 120 minutes based on both their current exercise level and the SMART goals they have set for themselves. On average, the length for most group exercise classes is 55 minutes. An advantage of shorter classes is that they are usually singlediscipline and help combat the commonly cited barrier to exercise, which is that "I don't have time to exercise." An advantage of classes that last longer than 60 minutes is that participants can get a more introspective, specialized workout, something seen commonly in different types of yoga classes. Avoiding back-to-back classes of the same type usually is advisable for most participants to avoid overtraining and to allow for proper rest and recovery. When participants attend too many classes in which they do not allow for sufficient rest and recovery, they may experience both physical and psychological signs of overtraining, such as headaches, loss of appetite, severe muscle soreness, disturbed sleep patterns, difficulty concentrating, reduced self-esteem, and decreased performance.

Instructors: As an instructor, it is important to establish a teaching schedule for yourself that includes leading some shorter- and some longer-duration classes in order to prevent burnout. When appropriate, consider teaching different modalities of group exercise to avoid overuse injuries.

## T = TYPE OF CLASS

This is often referred to as the mode of class, which typically has either a cardiorespiratory, strength, or flexibility focus, though some classes fuse two or more of these components together.

## FITT at a Glance

\left.|  | Frequency | Intensity | Time (duration, set, |
| :--- | :--- | :--- | :--- | :--- |
| or repetition) |  |  |  |$\right)$

## SMART Goal Setting

T0 facilitate positive lasting health behavior and lifestyle changes, it is important that individuals utilize the SMART goal setting approach when establishing their personal objectives for their health and wellness journey. This effective approach to goal setting will allow your participants to take their vague ideas and aspirations about health and wellness and transform them into reality by creating goals that are specific, measurable, attainable, relevant, and time-bound (SMART).


The goal(s) must state specifically what is to be accomplished. To ensure that this is clearly defined, individuals should ask themselves why they are creating this goal, and what are the benefits to accomplishing the goal.
M
In order to accurately
track progress,
goals should be
measured, whether
subjectively (e.g.,
how you look and
feel) or objectively
(e.g., body weight or
body-fat percentage)
or a combination of
the two.

| ATTAINABLE |
| :--- |
| To help determine |
| if the goal is truly |
| within reach, |
| individuals should |
| first assess their own |
| abilities, skills, and |
| attitudes toward the |
| desired outcome. |



RELEVANT
To ensure motivation and continued commitment, it is important that individuals establish goals that are pertinent to their unique interests, needs, and abilities.

> T
> TIME-BOUND
> Establishing a realistic timeline for completion of the overall goal, including identifying incremental steps in the process, will help individuals remain focused and on track.

## Exercise Evaluation Criteria (EEC)

When participants ask questions to which you do not know the answer, consider using www.ACEfitness.org as a trusted resource for quality health and wellness information. While knowing where to go for credible, reliable information is imperative, learning how to answer questions yourself is also an important quality in a group exercise instructor. Utilizing the exercise evaluation criteria (EEC) will assist you in answering frequently asked health and wellness related questions.

## 1. What is the functional objective?

- Is my purpose cardiorespiratory-, strength-, or flexibility-based, or a combination of two or more?
- Am I trying to teach isolation or integration?
- How does this skill contribute to, rather than detract from, the participants' activities of daily living and overall functionality?

2. Which joint actions (and other movements) achieve that objective safely?

- When using body weight as resistance, is the muscle
action opposing gravity?
- When using equipment, are the appropriate muscles being worked safely and effectively?

3. Does the exercise commence from a point of stability and add mobility as appropriate within a safe range of motion?
4. Who are my participants?

- Am I prepared to offer progressions and regressions for the success of all participants?

NOTES

# Chapter 6 Three Class Sections 



UNDERSTANDING ENERGY PATHWAYS
WARM-UP
■ CLASS BODY (CONDITIONING PHASE)
FINAL PHASE (COOL-DOWN)

## Understanding Energy Pathways

The energy to move and think comes from the foods people eat and drink. Carbohydrates are easy for the body to break down and provide quick energy, while fats provide a seemingly endless supply of stored energy. Proteins are the building blocks of human structure and are not a primary source of energy. The body stores carbohydrates and fats in their most basic forms-glucose and triglycerides, respectively. When the body needs energy, it breaks down the chemical bonds in the stored energy, releasing adenosine triphosphate (ATP), the basic unit that the body uses for energy.

Exercise intensity and duration determine the fuel sources used. Generally, there is an inverse relationship between exercise intensity and duration. The more intense the workout, the less time participants are able to maintain the intensity.

When people work at EXTREME intensities for just seconds, they use up the small amount of creatine phosphate they have in the body, called the creatine phosphate system or phosphagen system to produce ATP. An example is sprinting as fast as you can, which people can generally sustain only for a few seconds. When people work at HARD intensities for a few minutes, they use up carbohydrates stored in the muscles, called the glycolytic anaerobic system, which can produce ATP without oxygen. An example is doing high-intensity intervals lasting one to two minutes, and then having to recover while breathing in oxygen to replenish the muscles before continuing.

When people work at MODERATE and LOW intensities for longer than a few minutes, they use a combination of carbohydrates and fats to produce ATP for energy to move. This system is called the aerobic system, as there is sufficient oxygen present for the production of all ATP. Examples of this are swimming, most movements of cardiorespiratory classes, and walking.

When it comes to fueling, participants will often ask about what they should be eating in order to lose weight, and may even ask for a specific meal plan from their instructor. As touched on earlier in the discussion of the ACE Code of Ethics, it is outside of the scope of practice of the group exercise instructor to recommend specific meal plans. Instructors should suggest that the participant seek the guidance of a registered dietitian for specific meal plans.


## INSTRUCTORS SHOULD MAKE UP CLASSES WITH THREE MAIN SECTIONS IN MIND.

The purpose of the warm-up is to prepare. The purpose of the class body is to work. The purpose of the final phase is to recover and promote flexibility.

## Warm-up

Understanding the purpose of the warm-up means understanding why we do one thing before we do another in group exercise. Everything is cumulative, as the class builds in terms of intensity, complexity, and range of motion. While the warm-up is often five to 10 minutes in length, the exact number of minutes spent on this segment of class will vary slightly depending on the total duration of a given class.

The purpose of a warm-up should be to:

- Functionally prepare the body for the exercises/movements to come, which touches on the principle of specificity
- Create a gradual increase in body temperature, movement complexity, and exercise intensity
In order to achieve the two purposes detailed above, consider the following.

Instructors should use:

- Smooth movements and transitions that allow participants to easily change direction
- A gradual increase in intensity and impact
- Slower movements than what will occur later in the class
- Total body control without flailing arms or legs by using a reserved and controlled range of motion for all movements
- Simple movements that move front to back before side-toside movements and then twisting and pivoting movements are introduced-following a functional movement-pattern progression

Instructors should also consider:

- Starting classes with movements that will be performed later in class, but at half-time
- Starting class with a smaller range of motion than will be used later
- Starting class more basic skills like marching, step-touches,
half squats, and gentle reaching-type movements
- Beginning class without equipment if equipment will be used later and focus on the pattern that will be used once you add the equipment after the warm-up, or consider using lighter weights in the warm-up than will be used in the conditioning segment of the class
- Starting class with core planar sequencing, as outlined next

To achieve a general rise in core temperature, the body should be moving without an emphasis on static stretching, but instead with a focus on multiplanar, dynamic range-of-motion movements. Active, dynamic stretching proves more safe and effective than static stretching for this section of class to achieve the purpose of warming muscles, increasing muscle elasticity through a range of motion, and promoting an overall preparatory training effect.

The warm-up should include general attention to the spinal preparation, which includes core planar sequencing (CPS). This involves warming up the spine in the sagittal, frontal, and transverse planes with the theme of promoting mobility and stability. The focus for CPS is to increase active flexibility and allow for better core control, balance, and spinal stability, while ensuring that the spine receives some attention in the warmup before more complex moves occur. CPS is appropriate for cardiovascular-, strength-, and flexibility-based classes.

## Class Body (Conditioning Phase)

The class body should make up the bulk of the class experience and achieve the purpose of the class, be it cardiorespiratory, strength, flexibility, balance, or a fusion of these components.

## Final Phase (Cool-down)

The final segment of class should prepare the participants to be able to leave class safely by gradually cooling down after the conditioning phase. Specifically, participants should leave class with a lower heart rate and core body temperature than was achieved during the class body.

Where appropriate, static stretching should be incorporated into the cool-down to help increase flexibility, and each stretch should be held for at least 10 to 30 seconds. Both class length and overall purpose will help determine how much of the final portion of class should be dedicated to flexibility training.


NOTES

## Chapter 7

## Types of Teaching, Learning, and Cueing



TYPES OF CUES
MUSIC

## COMMUNICATION IS DEFINED AS THE ACT OR PROCESS OF TRANSMITTING

information, so instructors must be cognizant of the many different ways to engage participants. Neuro-linguistic programming (NLP) says that communication is only about $7 \%$ words, $38 \%$ tone, and the rest is body language. About $65 \%$ of learners worldwide are visual. To target a cueing message to all participants, verbal and kinesthetic cues are also necessary, in addition to visually demonstrating movements.

Cueing is the act of delivering information to group exercise class participants to help them do everything from elicit strength and master choreography, to improve flexibility and succeed in balancing exercises. In the group exercise environment, cueing:

- Maintains class cohesion and control
- Helps ensure participant safety
- Enhances motivation
- Helps participants understand the instructor's personality and unique teaching style
- Educates participants on something that they did not necessarily know before the class
- Promotes success among all participants when instructors offer progressions and regressions when teaching multilevel classes

Since there are generally three types of learning styles among participants-kinesthetic, verbal, and visual-the best cues to utilize to engage all participants are three-
dimensional cues, which involve words (verbal), body language (visual), and sensation (kinesthetic). Opting to use only one type of cueing technique will limit the number of participants you are successfully able to engage as an instructor.

- For example, if as an instructor you are only cueing exercises verbally, the visual learners will not grasp the meaning as quickly as possible, because they will be waiting to watch other participants move to see what they are supposed to do. If an instructor does not cue verbally, only the visual learners and participants in the very front of class will be able to follow as quickly and successfully as possible.

Since there are many types of cues an instructor can give during group exercise classes, keep the acronym BRANDS MASH in mind to remember the various types of cues and explore ways to become more familiar with verbal, visual, and kinesthetic options for communicating each of them.


## Types of Cues

## B reathing:

R hythm:
A natomical:

## $N$ umerical:

D irectional:
S afety:
M otivational:
A lignment:
S patial:

## H umorous:

Because instructors need to communicate a great deal of information in a short amount of time, they often need to condense cues and deliver multiple pieces of information simultaneously.

The best cuers are both efficient and efficacious. Efficient means getting the job done in a very short amount of time, while efficacious refers to getting the job done well. While each of these is possible alone, the goal as instructors must be to accomplish both simultaneously.

It's very possible to be one type of cuer without being the other. Cueing "move your hand here" is an efficient cue, but it is not very efficacious if all participants are in downwardfacing dog and cannot see where "here" is. Cueing "I want you to grapevine left, and then add the mambo-pivot, and do four jumping jacks, increasing the intensity on each jack" may be efficacious at getting participants to move, but is not efficient because it is wordy and takes far too much time to deliver.

## VERBAL

Using verbal cues involves language that most of the participants will understand in order to request movement. These words fall under the categories of BRANDS MASH. Verbal cues should be anticipatory, which means they need to be heard and understood immediately before movement becomes imminent. The best verbal cues are:

- Specific
- Short
- Succinct


Because these are the most popular cues among group exercise instructors, you should practice being the best verbal cuer you can be so that your participants will know how you cue before movement. When cueing to music, you should give cues at least 4 counts before movement is initiated. When not using music, always give a few moments for the brain to process your instructions before expecting the class to follow.

## VISUAL

Using visual cues involves incorporating body language so that visual learners can follow movement. These cues are important because not everyone is a verbal learner, and because not everyone speaks the language of the instructor. When an instructor cues visually, even people who do not speak your language are able to follow your movements.

## KINESTHETIC

Kinesthetic cues involve giving people a sensation, and commonly utilize the words "sense," "imagine," "pretend," and/or "feel." Instructors often use these words to convey where a sensation should be felt ("you should feel this in your biceps in your arms"), how a sensation should feel ("you should notice that the spinal extension creates a tightness in your back when you backbend"), and when a mental component of visualization is appropriate ("when performing lateral raises with your arms and shoulders, imagine that there are sheets of glass in front of you and behind you that you are pinned between").

## Music

A
s stated at the beginning of this course, instructors should know that following a Code of Ethics includes the responsibility of instructors to use licensed music specifically produced for use in the group exercise setting. This can include either: - Music with irregular numbers of beats per minute and bridges, OR - 32-count square music with a fixed beat-per-minute range

When music is in the background, it serves to provide atmosphere and motivation, but instructors do not cue using the music. Instead, it is used primarily to set a mood for the class.

When music is in the foreground, instructors use the beats, phrases, tempo/speed, lyrics, and overall feel of the music in creating the experience of a particular type of class or discipline.

Instructors may choose not to use 32-count square music for disciplines such as dance, Zumba, and more. Choosing music that is not square, with extra counts, bridges, and uneven musical organization, has both advantages and disadvantages. Among the advantages are changes in tempo that provide variety, and for which instructors must be prepared if they are trying to use the music in a 32-count. Among the disadvantages of uneven music are that instructors cannot teach consistent movement patterns for strength and cardiorespiratory conditioning without first memorizing exactly where there are irregular parts of songs and planning for them accordingly.

Instructors wishing to use 32-count music as foreground and incorporate the beat and phrase of music into class should cue new movements at the bottom of musical phrases (counts 29-32) in anticipation of participants' movements, so that everyone can initiate movements on count 1 at the top of each musical phrase.

Regardless of using 32-count square music or irregular music with bridges and chorus sections, when music is being used in the foreground, instructors should always execute movements on the downbeats (accented notes) of music to promote class consistency, uniformity, and safety. Having everyone march, grapevine, or perform other moves on different beats and phrases of music would promote an unsafe environment where people could potentially injure one another. For the purposes of safety and uniformity, leading classes with movements done on downbeats is safer than allowing participants to move on their own musical interpretation.


NOTES

## Chapter 8

## Participant Safety



ELEMENTS OF SAFETY

## Elements of Safety

## FLOORING

For dance-based cardiorespiratory conditioning classes during which the feet move often and change direction quickly, a dance-floor thin layer of wood, nonslip tile floor, or flooring covered with thin padding may be more appropriate than thick carpet such as that found commonly in hotel ballrooms, as carpet can inhibit foot and ankle movement. Instructors teaching on carpet or unstable flooring such as thick mats should limit turns and pivots to help promote stability in the ankles and spine.

## FOOTWEAR

Footwear provides safety, cleanliness, and support. Instructors should encourage participants to wear appropriate footwear specific to the discipline at hand. For most participants, this means a cross-training shoe for disciplines that are not specifically mind-body. If appropriate, participants may choose to wear minimalist footwear, and for indoor mind-body classes such as yoga and Pilates, instructors may also encourage participants to perform movements barefoot.

## HYDRATION

Instructors should encourage participants to drink room-temperate or cool water before, during, and after exercise. For most group exercise classes under 60 minutes, water is the preferred beverage pre-, during, and post-exercise. If a participant finds it difficult to consume enough water for adequate hydration and prefers the taste of sports drinks, consider encouraging the participant to dilute the sports drink with water to decrease the number of calories consumed, especially during a shorter-duration class (under 60 minutes).

| FLUID-INTAKE RECOMMENDATIONS DURING EXERCISE |
| :--- |
| 2 hours prior to exercise, drink $500-600 \mathrm{~mL}$ (17-20 oz) |
| Every $10-20$ minutes during exercise, drink $200-300 \mathrm{~mL}$ <br> (7-10 oz) or, preferably, drink based on sweat losses |
| Following exercise, drink $450-675 \mathrm{~mL}$ for every 0.5 kg body <br> weight lost (or 16-24 oz for every pound) |

Source: Casa, D.J. et al. (2000). National Athletic Trainers' Association: Position statement: Fluid replacement for athletes. Journal of Athletic Training, 35, 212-224.

## CLOTHING

Instructors should encourage participants to dress in layers with material that wicks away moisture during sweatinducing classes. For mind-body classes, instructors should encourage participants to dress in layers since there is no optimal temperature appropriate for all participants in all disciplines.

## INTENSITY

See "I = Intensity" on pages 43-44.

## EMERGENCY RESPONSE

Instructors must have current CPR training completed at all times. Instructors should be familiar with any special emergencyreporting procedures of a specific center or facility, including where the closest facility telephone is located. When there is a life-threating situation or anything that requires immediate medical attention, it is appropriate to activate an emergency response system, which includes calling 9-1-1 or the facility's direct emergency response number.

## DISCIPLINE: SPECIFIC SAFETY AND TIPS

Success in any format of group exercise is built on a foundation of safety. The following is not an exhaustive list, but rather it is designed to provide an overview of some of the common errors made in each discipline, and to arm instructors with solutions for how to encourage participants to stay safely aligned.

Here are some common issues and suggested fixes you need to know as a group exercise instructor:

| CYCLE |  |
| :--- | :--- |
| Shoulders raised | Cue shoulders down with lower <br> trapezius fibers |
| Knees out to the sides | Cue knees in with adductors |
| Rounded spine | Cue "lengthened spine" with <br> spinal extensors |


| AQUA |  |
| :--- | :--- |
| Shoulders raised | Cue shoulders down with lower <br> trapezius fibers |
| Constant jogs on the <br> balls of the feet | Cue to land with the heels each <br> time |


| STEP |  |
| :--- | :--- |
| Participants stepping too fast, resulting in <br> poor form and range of motion | Reduce step tempo to under 130 beats per minute |
| Overuse of shoulders and back muscles from <br> excessive pulling action | Vary the arm choreography to incorporate different actions |
| Heels not placed on platform | Cue to place the complete shoe bottom on the <br> step surface each time |
| Drooping head posture | Cue constant neutral spine and eyes looking forward |
| Overall muscular imbalance | Teach choreography that is bilateral and reversible so participants are <br> balanced on both sides equally |


| YOGA | Modify unsupported forward fold by encouraging spinal extension when <br> Back discomfort <br> forward flexing/bending from hips, keeping the knees flexed with hands on the <br> quadriceps for support |
| :--- | :--- |
| Shoulders raised in weight-supported positions <br> like upward facing dog | Cue shoulders down with lower fibers of trapezius; lengthen neck |
| Joint discomfort | Cue "soft" elbows and knees whenever appropriate so participants avoid <br> discomfort in these areas |

DANCE-BASED CARDIO CONDITIONING

| Ankle sprains | Avoid ankle sprains by teaching a proper warm-up with a gradual intensity and <br> impact increase to the ankle in all planes of motion; start classes with slower <br> tempo and shorter range of motion (e.g., marching before running); add pivots <br> and turns only after a warm-up with appropriate speed based on the purpose of <br> the class and the abilities of the participants |
| :--- | :--- |
| Body imbalance | Instructors: Teach choregraphy that is bilateral and reversible so participants <br> are balanced on both sides biomechanically <br> Participants: Encourage participants to take strength and flexibility classes, |
|  | since dance classes generally only promote cardiorespiratory conditioning. <br> Discourage participants from leaving before the final stretching is finished to <br> promote overall body flexibility. |
| Exclusively visually cueing | Incorporate verbal cueing for auditory learners and those without clear visual <br> access to you at all times |


| BOOT CAMP | Make sure warm-up is specific in preparing participants for each type of drill <br> they will be doing in class, including wrists and upper-body weightbearing <br> activities |
| :--- | :--- |
| Non-specific warm-up | Make sure the warm-up includes a gradual increase in intensity so the middle <br> of class is considerably more intense than the start |
| Too intense of a warm-up |  |

## SPECIAL POPULATIONS

Instructors should be aware of their scope of practice and avoid making exercise recommendations for special populations, participants who have not received clearance to exercise, with possible recommendations, from their medical practitioner.

## Pregnancy

Pregnant individuals should have clearance from their medical practitioners allowing them to participate in classes for apparently healthy individuals with no special needs. Even if a regular participant tells the instructor that she is now pregnant, instructors should recommend that the individual see her physician for clearance to exercise.

## Arthritis and Obesity

Participants who have obesity or who suffer from arthritis come with a variety of abilities, so instructors should avoid making any general assumptions. Simply ask these
participants if they feel comfortable attending a group exercise class and encourage them to ask for progressions and regressions as appropriate. Participants with arthritis generally need a longer warm-up to increase synovial joint lubrication (especially for early-morning classes). Participants who have obesity need an instructor's sensitivity to know which body positions may not be comfortable or possible for certain exercises.

Below are two general suggestions for working with participants who have obesity:

- For individuals who have severe obesity, sometimes even moderate cardiorespiratory exercise can prove too intense, so regressions should be offered during class, which may include chair exercises if appropriate.
- Simple flexion exercises in all positions may be uncomfortable or difficult for the participant, so an instructor should be able to suggest alternate positions, seated chair work, or even alternate exercises altogether to ensure participant success.


NOTES

## GLOSSARY

Abduction Movement away from the midline of the body.
Adaptation The ability of muscles to become accustomed to a particular form or intensity of exercise.

Adduction Movement toward the midline of the body.
Agonist The muscle directly responsible for observed movement; also called the prime mover.

Alignment Physical balance referring to the preferred position and relationship among various body parts.

Antagonist The muscle that acts in opposition to the contraction produced by an agonist (prime mover) muscle.

Anticipatory A trait of verbal cues, meaning they must be heard and understood immediately before movement becomes imminent..

Balance (1) Neuromuscular balance: balance between various parts of the body, enabling efficient movement. (2) Training balance: balance between the two halves of the body, as well as among the three components of an exercise program—cardiovascular exercise, resistance training, and flexibility training. (3) Programming balance: balance in terms of the planes of movement when designing a workout or class session.

Bracing A co-contraction of the core and the abdominal muscles, as if bracing for impact.

Concentric A type of isotonic muscle contraction in which the muscle develops tension and shortens when stimulated..

Distal Farthest from the midline of the body, or from the point of origin of a muscle.

Eccentric A type of isotonic muscle contraction in which the muscle lengthens against a resistance when it is stimulated; sometimes called "negative work" or "negative reps."

Extension The act of straightening or extending a joint, usually applied to the muscular movement of a limb.

Flexion The act of moving a joint so that the two bones forming it are brought closer together.

Functional Having a purpose that translates to everyday life; training with integration rather than isolation.

Inferior Located below.
Interval training Short, high-intensity exercise periods alternated with periods of rest (e.g., 100-yard run, oneminute rest, repeated eight times).

Isometric A type of muscular contraction in which the
muscle is stimulated to generate tension but little or no joint movement occurs.

Isotonic A type of muscular contraction where the muscle is stimulated to develop tension and joint movement occurs.

Lever length An element that group exercise instructors can use to manipulate exercise intensity. Long-lever movements are more intense, while short-lever movements are less intense.

Mobility The degree to which an articulation is allowed to move before being restricted by surrounding tissues.

Muscular endurance The ability of a muscle or muscle group to exert force against a resistance over a sustained period of time.

Muscular strength The maximal force a muscle or muscle group can exert during contraction.

Myofascial release A manual massage technique used to eliminate general fascial restrictions; typically performed with a device such as a foam roller.

Neutral spine The balance of vertebrae in the three naturally occurring curves: two slight anterior curves at the neck and low back and one slight posterior curve in the thoracic region.

Progression The systematic process of applying overload. For example, in resistance training, more resistance is added to progress the training stimulus.

Regression Offering participants ways or modifications to decrease the intensity or complexity of an exercise or movement.

Rotation Movement in the transverse plane about a longitudinal axis; can be "internal" or "external."

Specificity Exercise training principle explaining that specific exercise demands made on the body produce specific responses by the body; also called exercise specificity.
Stability Characteristic of the body's joints or posture that represents resistance to change of position.

Stabilizers Muscles that stabilize one joint so a desired movement can be performed in another joint.

Steady-state training Constant submaximal exercise below the lactate threshold where the oxygen consumption is meeting the energy requirements of the activity.

Superior Located above.

