

**COMPETENCY 1.0 UNDERSTAND TECHNIQUES AND PROCEDURES
FOR DEVELOPING AND ASSESSING HEALTH-
RELATED FITNESS.**

SKILL 1.1 Demonstrate knowledge of expected development progressions, ranges of individual variation, and levels of readiness for health-related fitness.

A normal three-year-old should be able to walk up and down the stairs, jump from the lowest step, and land on both the feet without falling. They should also be capable of standing on one foot and balancing and kicking a large ball (though not with a lot of force). A three-year-old can jump on the same spot, ride on a small tricycle, and throw a ball (although not very straight and with limited distance). The large motor skills are more or less developed, but fine motor skills and hand-eye coordination need refining. For example, a three-year-old may not be able to dodge a ball or play games like badminton, which require greater hand-eye coordination, speed, and balance, but a three-year-old can catch a big ball thrown to him/her from a short distance.

A four-year-old is capable of walking on a straight line, hopping using one foot, and pedaling a tricycle with confidence. A four-year-old can climb ladders and trees with relative ease. A four-year-old child can run around obstacles, maneuver, and stop when necessary. A four-year-old can throw a ball a greater distance and is capable of running around in circles.

A five-year-old is capable of walking backwards, using the heel and then the toe, and is able to easily climb up and down steps by alternating feet without any outside help. Five-year-olds can touch their toes without bending at the knee and balance on a beam. They may be able to do somersaults provided it is taught in a proper and safe manner. A five-year-old can ride a tricycle with speed and dexterity, make almost ten jumps or hops without losing balance and falling, and stand on one foot for about ten seconds.

Early elementary school children have already acquired many large motor and fine motor skills. Their movement is more accurate and with purpose, though some clumsiness may persist. An elementary student is always on the run and restless. A child older than five finds pleasure in more energetic and vigorous activities. He/she can jump, hop, and throw with relative accuracy and concentrate on an activity which sustains his/her interest. However, concentration on a single activity usually does not last long. Early elementary students enjoy challenges and can benefit greatly from them.

When proper and appropriate physical education is available, by the time a child finishes the fourth grade he is able to demonstrate well-developed locomotor movements. He is also capable of manipulative and nonlocomotor movement skills like kicking and catching. He is capable of living up to challenges like balancing a number of objects or controlling a variety of things simultaneously. Children at this developmental age begin to acquire specialized movement skills like dribbling. When a child has finished eighth grade, he is able to exhibit expertise in a variety of fine and modified movements (e.g. dance steps). Children begin to develop the necessary skills for competitive and strategic games. Despite a lack of competency in a game, they learn to enjoy the pleasure of physical activity. By the time the children finish the twelfth grade they can demonstrate competency in a number of complex and modified movements with relative ease (e.g. gymnastics, dual sports, dance). Students at this age display their interest in gaining a greater degree of competency at their favorite game or activity.

SKILL 1.2 Identify and apply developmentally appropriate strategies, instruments, and technologies to assess and monitor individual fitness levels, to measure learner progress in fitness development, and to provide feedback to students.

Data from physical fitness assessments can diagnose an individual's level of fitness and identify the components of fitness in need of improvement. We compare data to fitness standards and norms.

Cardio-respiratory data identifies an individual's functional aerobic capacity by the predicted maximum oxygen consumption. This can partially explain natural leanness, running ability, and motivation.

Muscle strength data identifies an individual's ability to execute some basic skills, an individual's potential for injury, an individual's potential to develop musculoskeletal problems, and an individual's potential to cope with life threatening situations.

Muscle strength data identifies an individual's ability to exercise continually for an extended period of time and an individual's potential to develop musculoskeletal problems.

Flexibility data identifies an individual's potential for motor skill performance, an individual's potential for developing musculoskeletal problems (including poor posture), and an individual's potential for performing activities of daily living.

Body composition is an indicator of an individual's health status and potential to participate in physical activities.

The following is a list of tests that instructors can use to assess the physical fitness of students.

Cardio-respiratory fitness tests – maximal stress test, sub maximal stress test, Bruce Protocol, Balke Protocol, Astrand and Rhyming Test, PWC Test, Bench Step Test, Rockport Walking Fitness Test, and Cooper 1.5 Mile Run/Walk Fitness Test.

Muscle strength tests – dynamometers (hand, back, and leg), cable tensiometer, the 1-RM Test (repetition maximum: bench press, standing press, arm curl, and leg press), bench-squat, sit-ups (one sit up holding a weight plate behind the neck), and lateral pull-down.

Muscle endurance tests – squat-thrust, pull-ups, sit-ups, lateral pull-down, bench-press, arm curl, push-ups, and dips.

Flexibility tests – sit and reach, Kraus-Webber Floor Touch Test, trunk extension, forward bend of trunk, Leighton Flexometer, shoulder rotation/flexion, and goniometer.

Body Composition determination – Hydrostatic weighing, skin fold measurements, limb/girth circumference, and body mass index.

Agility tests – Illinois Agility Run.

Balance tests – Bass Test of Dynamic Balance (lengthwise and crosswise), Johnson Modification of the Bass Test of Dynamic Balance, modified sideward leap, and balance beam walk.

Coordination tests – Stick test of Coordination.

Power tests – vertical jump.

Speed tests – 50-yard dash.

After assessing an individual's fitness level, a personal fitness trainer or instructor can prescribe a training program. Prescription of a fitness program begins with:

1. Identifying the components of fitness that need changing (via assessment)
2. Establishing short-term goals
3. Developing a plan to meet the established goals
4. Keeping records to record progress
5. Evaluating progress of goals and making changes based on success or failure

For successful programs, the instructor and student should formulate new goals and change the personal fitness program to accomplish the new goals.

For unsuccessful programs, changing the goals, particularly if the goals were too unrealistic, is an appropriate response. Adjusting goals allows individuals to make progress and succeed. In addition, analyzing positive and negative results may identify barriers preventing an individual's success in her personal fitness program. Incorporating periodic, positive rewards for advancing can provide positive reinforcement and encouragement.

SKILL 1.3 Apply principles and techniques for designing and implementing individualized fitness programs.

BASIC TRAINING PRINCIPLES

The **Overload Principle** is exercising at an above normal level to improve physical or physiological capacity (a higher than normal workload).

The **Specificity Principle** is overloading a particular fitness component. In order to improve a component of fitness, you must isolate and specifically work on a single component. Metabolic and physiological adaptations depend on the type of overload; hence, specific exercise produces specific adaptations, creating specific training effects.

The **Progression Principle** states that once the body adapts to the original load/stress, no further improvement of a component of fitness will occur without the addition of an additional load.

There is also a **Reversibility-of-Training Principle** in which all gains in fitness are lost with the discontinuance of a training program.

MODIFICATIONS OF OVERLOAD

We can modify overload by varying **frequency, intensity, and time**. Frequency is the number of times we implement a training program in a given period (e.g. three days per week). Intensity is the amount of effort put forth or the amount of stress placed on the body. Time is the duration of each training session.

PRINCIPLES OF OVERLOAD, PROGRESSION, AND SPECIFICITY APPLIED TO IMPROVEMENT OF HEALTH-RELATED COMPONENTS OF FITNESS

1. Cardio-respiratory Fitness:

Overloading for cardio-respiratory fitness:

- **Frequency** = minimum of 3 days/week
- **Intensity** = exercising in target heart-rate zone

- **Time** = minimum of 15 minutes rate

Progression for cardiovascular fitness:

- begin at a frequency of 3 days/week and work up to no more than 6 days/week
- begin at an intensity near THR threshold and work up to 80% of THR
- begin at 15 minutes and work up to 60 minutes

Specificity for cardiovascular fitness:

- To develop cardiovascular fitness, you must perform aerobic (with oxygen) activities for at least fifteen minutes without developing an oxygen debt. Aerobic activities include, but are not limited to brisk walking, jogging, bicycling, and swimming.

2. Muscle Strength:

Overloading for muscle strength:

- **Frequency** = every other day
- **Intensity** = 60% to 90% of assessed muscle strength
- **Time** = 3 sets of 3 - 8 reps (high resistance with a low number of repetitions)

Progression for muscle strength:

- begin 3 days/week and work up to every other day
- begin near 60% of determined muscle strength and work up to no more than 90% of muscle strength
- begin with 1 set with 3 reps and work up to 3 sets with 8 reps

Specificity for muscle strength:

- to increase muscle strength for a specific part(s) of the body, you must target that/those part(s) of the body

3. Muscle endurance:

Overloading for muscle endurance:

- **Frequency** = every other day
- **Intensity** = 30% to 60% of assessed muscle strength
- **Time** = 3 sets of 12 - 20 reps (low resistance with a high number of repetitions)

Progression for muscle endurance:

- begin 3 days/week and work up to every other day
- begin at 20% to 30% of muscle strength and work up to no more than 60% of muscle strength
- begin with 1 set with 12 reps and work up to 3 sets with 20 reps

Specificity for muscle endurance:

- same as muscle strength

4. Flexibility:

Overloading for flexibility:

- **Frequency:** 3 to 7 days/week
- **Intensity:** stretch muscle beyond its normal length
- **Time:** 3 sets of 3 reps holding stretch 15 to 60 seconds

Progression for flexibility:

- begin 3 days/week and work up to every day
- begin stretching with slow movement as far as possible without pain, holding at the end of the range of motion (ROM) and work up to stretching no more than 10% beyond the normal ROM
- begin with 1 set with 1 rep, holding stretches 15 seconds, and work up to 3 sets with 3 reps, holding stretches for 60 seconds

Specificity for flexibility:

- ROM is joint specific

5. Body composition:

Overloading to improve body composition:

- **Frequency:** daily aerobic exercise
- **Intensity:** low
- **Time:** approximately one hour

Progression to improve body composition:

- begin daily
- begin a low aerobic intensity and work up to a longer duration (see cardio-respiratory progression)
- begin low-intensity aerobic exercise for 30 minutes and work up to 60 minutes

Specificity to improve body composition:

increase aerobic exercise and decrease caloric intake

SKILL 1.4 Demonstrate an understanding of factors and techniques that motivate students to enhance health-related fitness levels for overall personal well-being.

Finding intrinsic motivation for study is the main factor promoting the development of self-motivated learners. Helping learners become self-motivated is a process that revolves around connecting them personally with the material that they are studying, and instilling a belief in their ability to control the outcome of their studies (if they believe they are not capable of mastering the material, they cannot become self-motivated learners).

This process begins with the cultivation of a positive attitude about the study of the subject matter in question. Instructors should emphasize to students that they are capable of mastering the material. Instructors can reinforce this belief by setting small, incremental milestones in the educational plan that show the students the progress they are making.

Having convinced the students of their ability to learn the subject matter and master their goals, instructors should teach the students to become increasingly goal-oriented. This begins with students setting their own short-term goals and, after they begin developing a pattern of meeting their goals, longer-term goals. As students set goals, instructors should teach students to accept and assume responsibility for their decisions, actions, and outcomes.

ROLE OF EXERCISE IN HEALTH MAINTENANCE

Possibly the best way to motivate students to engage in regular physical activity is to educate students on the many health benefits of exercise. The health risk factors improved by physical activity include cholesterol levels, blood pressure, stress related disorders, heart diseases, weight and obesity disorders, early death, certain types of cancer, musculoskeletal problems, mental health, and susceptibility to infectious diseases.

BENEFITS OF PHYSICAL ACTIVITY

Physiological benefits of physical activity include:

- improved cardio-respiratory fitness
- improved muscle strength
- improved muscle endurance
- improved flexibility
- more lean muscle mass and less body fat
- quicker rate of recovery
- improved ability of the body to utilize oxygen
- lower resting heart rate
- increased cardiac output
- improved venous return and peripheral circulation
- reduced risk of musculoskeletal injuries
- lower cholesterol levels
- increased bone mass
- cardiac hypertrophy and size and strength of blood vessels
- increased number of red cells
- improved blood-sugar regulation
- improved efficiency of thyroid gland
- improved energy regulation

- increased life expectancy

Psychological benefits of physical activity include:

- relief of stress
- improved mental health via better physical health
- reduced mental tension (relieves depression, improves sleeping patterns)
- better resistance to fatigue
- better quality of life
- more enjoyment of leisure
- better capability to handle some stressors
- opportunity for successful experiences
- better self-concept
- better ability to recognize and accept limitations
- improved appearance and sense of well-being
- better ability to meet challenges
- better sense of accomplishments

Sociological benefits of physical activity include:

- the opportunity to spend time with family and friends and make new friends
- the opportunity to be part of a team
- the opportunity to participate in competitive experiences
- the opportunity to experience the thrill of victory

SKILL 1.5 *Analyze health-related fitness goal setting, activity selection, and personal health-related fitness programs for individual students.*

SEE ALSO Domain 1, Skill 1.3

The following is a list of physical activities that may reduce specific health risks, improve overall health, and develop skill-related components of physical activity.

1. Aerobic Dance:

Health-related components of fitness = *cardio-respiratory, body composition.*

Skill-related components of fitness = *agility, coordination.*

2. Bicycling:

Health-related components of fitness = *cardio-respiratory, muscle strength, muscle endurance, body composition.*

Skill-related components of fitness = *balance.*

3. Calisthenics:

Health-related components of fitness = *cardio-respiratory, muscle strength, muscle endurance, flexibility, body composition.*

Skill-related components of fitness = *agility.*

4. Circuit Training:

Health-related components of fitness = *cardio-respiratory, muscle strength, muscle endurance, body composition.*

Skill-related components of fitness = *power.*

5. Cross Country Skiing:

Health-related component of fitness = *cardio-respiratory, muscle strength, muscle endurance, body composition.*

Skill-related components of fitness = *agility, coordination, power.*

6. Jogging/Running:

Health-related components of fitness = *cardio-respiratory, body composition.*

7. Rope Jumping:

Health-related components of fitness = *cardio-respiratory, body composition.*

Skill-related components of fitness = *agility, coordination, reaction time, speed.*

8. Rowing:

Health-related components of fitness = *cardio-respiratory, muscle strength, muscle endurance, body composition.*

Skill-related components of fitness = *agility, coordination, power.*

9. Skating:

Health-related components of fitness = *cardio-respiratory, body composition.*

Skill-related components of fitness = *agility, balance, coordination, speed.*

10. Swimming/Water Exercises:

Health-related components of fitness = *cardio-respiratory, muscle strength, muscle endurance, flexibility, body composition.*