

Grade 11 PE: Active Living
Forms of Movement

Name: _____

Date: _____

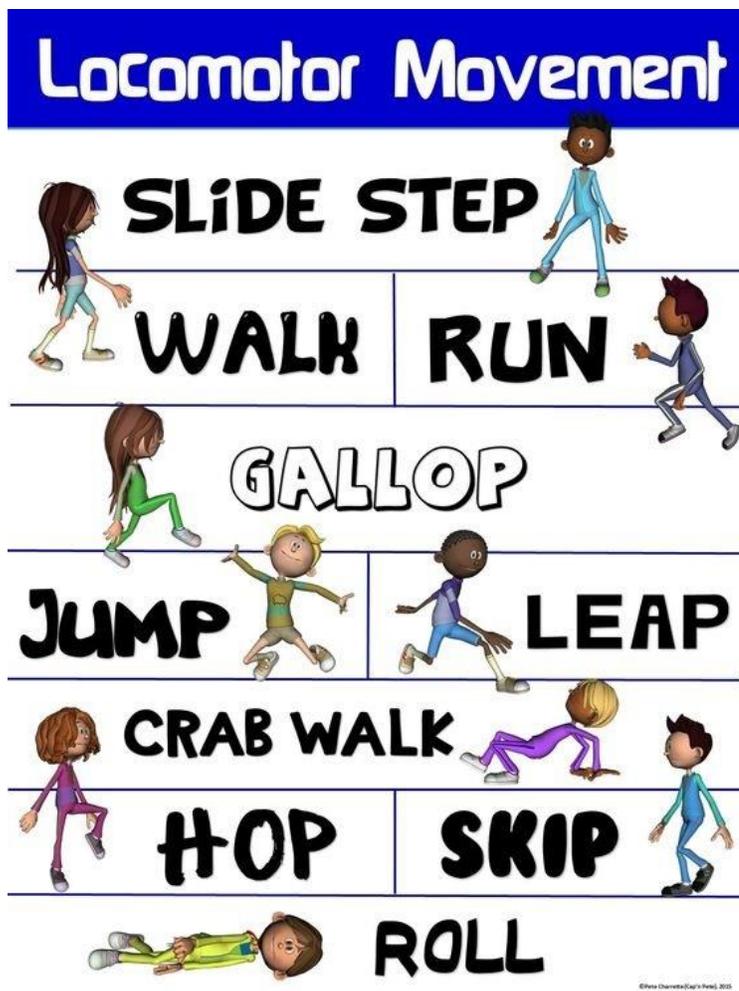
There are two forms of movement:

1. Locomotor movement
2. Non-locomotor movement

Locomotor Movement: These are movements where the body travels through space from one location to another. Locomotor movements primarily use the feet for support however, the body can travel on other parts such as the hands and feet.

Even Rhythm

- Walk - The walk is a transfer of weight from one foot to the other. Usually the heel touches first.
- Run - The run is a transfer of weight from one foot to the other however, the body is propelled into the air and suspended between run steps.
- Jump - The jump required the body to push off from one or both feet. Most common is a two foot take off and two foot landing. A jump can take off on one foot and land on two or take off from two feet and land one foot.
- Hop - The hop requires a push-off from one foot and landing on the same foot.
- Leap - A leap is performed by pushing off from one foot and landing on the other foot. The body is suspended in the and between the push off and the landing. Can be combined with a run or walk.

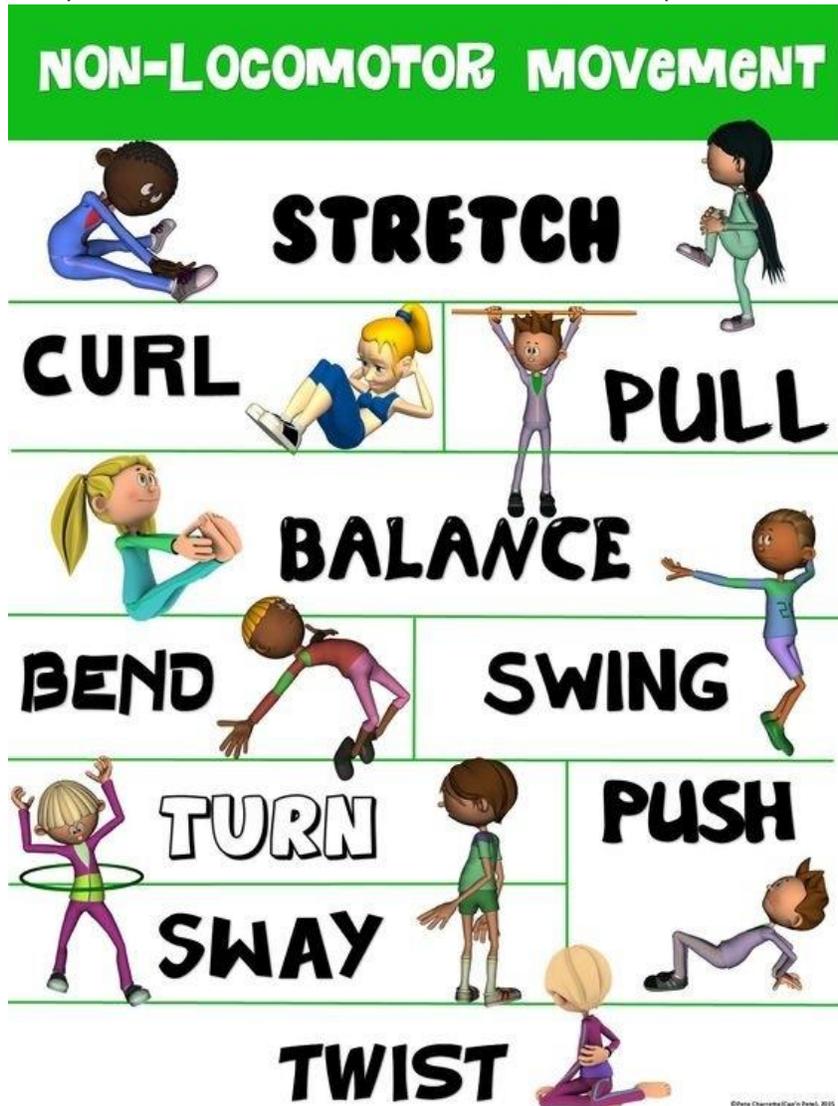


Uneven Rhythm

- Skip - A combination of a step and a hop on the same foot followed by a step and hop on the other foot. The rhythm is uneven long -short. Long (the step) and short (the hop).
- Gallop - A forward movement where one foot leads the gallop while the other foot follows. The lead footsteps with a bent knee and pushes off into the air and landing on the trailing foot. The rhythm is uneven, long -short. Long (the step) and short (the landing).
- Slide - Is similar to a gallop performed with the right or left foot leading. The rhythm is uneven, long -short. Long (the step) and short (the landing).

Non-Locomotor Movement: These are movements that occur in the body parts or the whole body and do not cause the body to travel to another space. However, non-locomotor movements can be combined with locomotor movements such as a walk and arm swing.

- Swing - a pendular motion of a body part that can move forward and backward or side to side.
- Twist - a partial rotation of body parts around an axis
- Turn - a full rotation of the body around a vertical or horizontal axis. Full, half or quarter turns
- Shake - a short quick vibrating movement in a body part or the whole body.
- Bend - a flex of a body part at a joint
- Stretch - extending a body part or the whole body
- Wiggle - a small or big, fast or slow curvy movement of a body part or the whole body.
- Rock or sway - shift of the body weight forward, backward, side to side or in a circular pathway.



Sources:

- <http://users.rowan.edu/~conet/rhythms/Resources/Loco.nonloco.definitions.html>
- <https://www.quora.com/What-are-locomotor-and-non-locomotor-activities>

Heart-Rate Monitoring

Why is it important to monitor your heart rate?

- Heart rate provides feedback about how hard you are working so that you can adjust the intensity to get the desired results
- Resting heart rate can be an indicator of health and fitness
- Heart rate tells us if there is anything wrong (ex. when we are sick our hear rate is faster).
- Irregular heart rate (too fast or too slow) may indicate a cardiac problem
- Helps to verify improvement in aerobic fitness
- Lets you exercise safely

How do you check your heart rate?

You can check your heart rate by either:

- Carotid pulse (on neck)
- Radial pulse (on wrist)
- Heart-rate monitor

Carotid Pulse (on neck)

Using your index finger and your middle finger find your carotid pulse by gently pushing under the angle of your jaw. When feeling for the carotid pulse under the angle of the jaw, use very light pressure. If you use your right hand count your neck pulse on the right side, and if you use your left hand count your pulse on the left side of the neck.

Radial Pulse (on wrist)

Using your index finger and your middle finger find your radial pulse by gently pushing on your wrist, just under your thumb.



Try taking your pulse using a 15 second count. First, count the heart rate for 15 seconds; then multiply the number you get by 4. This method is considered to be especially good because you can do it quickly and because counting your heart rate for longer periods after exercise is less accurate.

Heart-Rate Monitors

A heart-rate monitor is a simple device that looks like a wrist watch, or is incorporated into your wrist watch, that can sense your heart rate. A heart-rate monitor will sense any changes in heart rate and update the information approximately every five seconds. This makes the heart-rate monitor invaluable as a training tool as it allows the wearer to continue the pace of their activity while they monitor their heart rate.

To improve your cardiovascular fitness you must engage in aerobic activities or sports that are of sufficient intensity to get your heart rate into your target heart-rate (THR) zone and keep it there.

What are Heart-Rate Zones and How Can You Find Yours?

- Your heart-rate zones are calculated ranges of heart rate that provide benefits specific to that zone.
- Calculating your heart-rate zone requires you to know your maximum heart rate (MHR). The maximum heart rate is the fastest your heart can beat.
- Your target heart rate (THR) zone for aerobic exercise (moderate to vigorous intensity) is generally between 60% and 85% of your maximum heart rate depending on your level of fitness.
- It tells you how hard to work during your exercise session to get the most benefits.

You can calculate your own target heart rate using the following formula:

1. First determine your maximum heart rate:
 $208 - (\text{age in years} \times 0.7) = \text{maximum heart rate (MHR)}$
2. Then calculate your target heart-rate zone lower limit:
 $\text{MHR} \times 0.7 = \text{Lower Limit}$
3. Next calculate your target heart-rate zone upper limit:
 $\text{MHR} \times 0.85 = \text{Upper Limit}$
4. Your target heart rate zone (THR) is therefore:
Lower limit to Upper limit beats per minute

The following chart will help give you an idea of how you may feel when exercising within each of the different zones.

Heart-Rate Zone	Heart-Rate Range* (Age Based)	Descriptive Exertion	Fitness Benefits
Zone 1 Sedentary Activity	50% - 60% of maximum heart rate (MHR)	<ul style="list-style-type: none"> • No exertion to extremely light • Very easy to have a conversation 	<ul style="list-style-type: none"> • Health zone: you will see health benefits but few if any fitness benefits
Zone 2 Mild Activity	60% - 70% of MHR	<ul style="list-style-type: none"> • Moderately light exertion • Breathing becomes somewhat noticeable 	<ul style="list-style-type: none"> • Energy Efficient Zone: exercising within this zone develops basic endurance and aerobic capacity
Zone 3 Moderate Activity	70% - 80% of MHR	<ul style="list-style-type: none"> • Somewhat hard to strong exertion • Still able to converse 	<ul style="list-style-type: none"> • Aerobic Zone: exercising in this zone will develop your cardiovascular system
Zone 4 Vigorous Activity	80% - 90% of MHR	<ul style="list-style-type: none"> • Hard to very strong exertion • Heavier breathing is evident 	<ul style="list-style-type: none"> • Anaerobic Zone: training in this zone will develop your lactic acid system
Zone 5 Maximum Activity	90% - 100% of MHR	<ul style="list-style-type: none"> • Very hard to maximum exertion (extremely strong maximum pain) 	<ul style="list-style-type: none"> • Red Line Zone: training in this zone will only be possible for short periods of time

* The heart-rate range may vary, depending on the source of exercise, age, physical abilities, individual fitness levels, and so on. It is important to note that different aerobic exercises have different maximum heart rates.

ASSIGNMENT: Calculating and Predicting Heart Rate

Name: _____

Date: _____

Part A: Calculate Heart Rate in Various Zones

Using the same formula that you used to find your upper and lower limit heart rates, fill in the following chart to make it personalized for you.

First determine your maximum heart rate.

$$208 - (\text{age in years} \times 0.7) = \text{Maximum Heart Rate (MHR)}$$

$$208 - (\text{_____} \times 0.7) = \text{_____}$$

Heart-Rate Zone	Calculating Heart-Rate Range	Heart-Rate Range
Zone 1 Sedentary Activity	_____ x 0.50 = _____ lower limit _____ x 0.60 = _____ upper limit	_____ to _____
Zone 2 Mild Activity	_____ x 0.60 = _____ lower limit _____ x 0.70 = _____ upper limit	_____ to _____
Zone 3 Moderate Activity	_____ x 0.70 = _____ lower limit _____ x 0.80 = _____ upper limit	_____ to _____
Zone 4 Vigorous Activity	_____ x 0.80 = _____ lower limit _____ x 0.90 = _____ upper limit	_____ to _____
Zone 5 Maximum Activity	_____ x 0.90 = _____ lower limit _____ x 1.00 = _____ upper limit	_____ to _____

Principles of Training

Watch YouTube video: Principles of Exercise [https://youtu.be/KrAB_2Uyjyc]

Watch YouTube video: FITT Principle Exam [https://youtu.be/t-p74_GqTd0]

The Principles of Training

The creation of any long-term physical activity or fitness development plan should be based on a number of key principles to be effective and bring about its desired goals. The principles of training are:

1. Specificity
2. Progressive overload
3. Individual variability
4. Diminishing return
5. Reversibility

1. Specificity

In order for the training that you are doing to be effective it should be specific to the sport or task for which you are training. Different energy systems are used for endurance as opposed to strength. Different muscle fibres are used for running as compared to cycling. Different changes take place in the body in response to the type of training you do. Specific training brings specific results.

2. Progressive Overload

Training must place continuous increasing demands or stresses on the body systems (muscular, nervous, and circulatory) if continued changes are to take place. For the beginner, this means that the stresses of training must exceed the everyday demands of the body. As the body gets used to the new stress it must be activated again to a greater extent. Gradually increasing the demands on the body is what progressive overload is all about. The rate of improvement is related to four factors that can be remembered with the letters FITT – Frequency, Intensity, Time (duration), and Type. See the following page for more information on FITT Principle Guidelines.

3. Individual Variability

People respond differently to the same training. Care must be taken to consider this when training with a partner or in groups. Some of the reasons for this difference in training response are discussed below.

- Heredity: many characteristics are genetically inherited (ex. body type, heart and lung size, muscle fibre composition).
- Maturity: more mature individuals are able to deal with, and respond to more training. Less mature individuals need the energy for growth and development and consequently do not respond as well to training.
- Nutrition: training places new demands on the body, which must be addressed with proper nutrition. As the tissues and organs change they require more protein.
- Rest and sleep: the body makes its necessary changes during sleep. Increased training often demands more rest, and too little rest may lead to fatigue. Exercising too frequently and too intensely hinders the body's ability to recover and adapt. Generally, the harder you train, the more recovery you should allow for.

- Illness or injury: the popular phrase “no pain, no gain” has led to the demise of many training programs. Pain is a signal that your body must pay attention to. It is a signal that something is wrong. Ignoring the signals and working through the pain can often lead to serious injury.
- Motivation: the individual must see the relationship between hard work and results that lead to achieving personal goals. Training is easier when you are doing it for personal reasons (intrinsic) rather than for extrinsic reasons (ex. awards, approval of others).

4. Diminishing Return

This principle suggests that the rate of fitness improvement slows down over time as the level of fitness gets nearer to the person’s genetic potential. It is much easier to see results from a fitness development program when the starting point is relatively low. Extremely fit individuals make only small advances towards a higher fitness level over a significant amount of time. Alternating the form of exercise is sometimes helpful for people with a high fitness level to reactivate change.

The duration of an activity many also fall under this principle. Doing aerobic exercise for longer than one hour, for example, does little enhance the cardiovascular training effect.

5. Reversibility

The adaptations and changes that take place after months of training are reversible. If the body ceases to be stressed, then the adaptations that have been gained will be lost. With complete bed rest, fitness can decline at the rate of 10% per week according to Brian J. Sharkey the author of *Fitness and Health*. In other words, the principle of reversibility means that “if you don’t use it, you’ll lose it”.

FITT Principle Guidelines				
Fitness and/or Health Benefit	Variables			
	F Frequency	I Intensity	T Time	T Type
Cardiovascular endurance (aerobic)	<ul style="list-style-type: none"> 3 to 5 times per week 	<ul style="list-style-type: none"> Moderate to vigorous intensity (60% to 85% of maximum heart rate) 	<ul style="list-style-type: none"> Minimum of 20 minutes 	<ul style="list-style-type: none"> Running Cycling Cross-country skiing (continuous motion f large muscle group[s])
Muscular Strength	<ul style="list-style-type: none"> Alternate days 3 times per week 	<ul style="list-style-type: none"> High resistance (sets to maximum capability) 	<ul style="list-style-type: none"> 1 to 3 sets of 8 to 12 repetitions 	<ul style="list-style-type: none"> Free weights Universal gym Tubing Body weight
Muscular Endurance	<ul style="list-style-type: none"> Alternate days 3 times per week 	<ul style="list-style-type: none"> Low to moderate resistance 	<ul style="list-style-type: none"> 3 sets of 10 to 20 repetitions 	<ul style="list-style-type: none"> Free weights Universal gym Tubing Body weight
Flexibility	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Slow and controlled movement 	<ul style="list-style-type: none"> 20 to 30 seconds 	<ul style="list-style-type: none"> Static
Body Composition	<ul style="list-style-type: none"> 5 to 7 times per week 	<ul style="list-style-type: none"> Combination of intensities 	<ul style="list-style-type: none"> Dependent on intensity 	<ul style="list-style-type: none"> Aerobic Anaerobic Resistance
Anaerobic	<ul style="list-style-type: none"> Alternate days 2 or 3 times per week 	<ul style="list-style-type: none"> 90% of maximum heart rate 	<ul style="list-style-type: none"> 2 to 3 minutes per "bout" 	<ul style="list-style-type: none"> Sprinting Jumping
Active Daily Living/Health	<ul style="list-style-type: none"> daily 	<ul style="list-style-type: none"> low to moderate intensity 	<ul style="list-style-type: none"> 30 to 60 minutes 	<ul style="list-style-type: none"> Gardening Walking Bowling

Sets, Reps and HIIT

Reps is short for repetitions, which means the number of complete motions of an exercise. For example in weight training 15 reps of bicep curls means you complete 15 bicep curls. Sets on the other hand means the number of groups of consecutive reps. For example in weight training you may do 3 sets of 15 reps, which means you complete 15 bicep curls, rest (or alternate exercises) then complete 15 bicep curls two more times. While sets and reps are typically terms you here in weight training, they can also be used to describe cardio workout routines. For example in your first set you may do 10 jumping jacks, 30 seconds of jogging on the spot and 10 lunges each leg, then you may repeat this set 3 times. Check out this YouTube video for more information on sets and reps.

Watch YouTube video: How many reps and sets? [<https://youtu.be/1bP5AvsRex4>]

HIIT stands for High Intensity Interval Training and it has become a popular way to design cardio workouts for fat burning. Check out BodyBuilding.com 's article on HIIT <https://bbcom.me/2NxrzxA> then watch the following YouTube video.

Watch YouTube video: The BEST CARDIO Workout for FAT LOSS - (HIIT) [<https://youtu.be/UOgDV1I8qsl>]

ASSIGNMENT: Design a Workout

Name: _____

Date: _____

Your task is to design a 30 minute no equipment cardiovascular workout using the locomotor forms of movement. Your workout must include a warm up, cool down and stretches (non-locomotor forms of movement). Watch Breann Michell's 'Drop' workout video on YouTube to get an idea of what your workout should look like [[https://youtu.be/ Cd0eIKXcSs](https://youtu.be/Cd0eIKXcSs)].

Assignment submission can come in the form of a workout video or a workout plan with images. Here is an example of one set in the workout.

Repeat Set 3 times		
Description	Image	Reps
Alternating lateral lunges		10 each side
Skip in place		30 seconds
Forward lunge		10 each leg
Jog in place		30 seconds

Image Sources:

- <https://www.popsugar.com/fitness/Plyometric-Workout-Runners-37101224>
- <https://www.popsugar.com/fitness/photo-gallery/37101224/image/37101923/Skip-Place>
- <https://gethealthyu.com/exercise/alternating-forward-lunge/>
- <https://www.livestrong.com/article/452928-how-to-jog-in-place-to-lose-weight/>

ASSIGNMENT: Complete your Workout

Name: _____

Date: _____

In the previous assignment you designed a cardio workout using locomotor movements. For this assignment you are to complete the workout then reflect. During your workout take a moment to check your heart rate.

1. Heart Rate

- Before workout _____ bmp
- After warm up _____ bmp
- Middle of workout _____ bmp
- End of workout _____ bmp
- After cool down and stretches _____ bmp

2. What was the highest heart rate zone you reached during your workout? _____

a) Was this an optimal heart rate zone for fat burning? Why or why not?

3. What level of exertion would you rate this workout overall?

Level of Exertion		
	Amount of Effort	Description
1	Resting	You are breathing normally. It's very easy to talk.
2	Somewhat Light	You are breathing a little more heavily, but it is still easy to talk
3	Light	You notice your breathing. You can talk with some effort.
4	Medium	You are breathing more heavily, but you do not hear yourself breathe.
5	Somewhat Hard	You can hear yourself breathe, but can still talk.
6	Medium Hard	It is more difficult to talk.
7	Hard	You are breathing heavily. It is hard to talk.
8	Very Hard	You are breathing more heavily and find it difficult to talk.
9	Grueling	It is almost impossible to talk.
10	Maximum	You are breathing very heavily. You cannot talk. You may feel pain.

4. Is there anything that you would change about the workout? Were any of the sets too easy or too hard?

5. How could your workout be modified for someone with a lower level of fitness than you? Provide an example (images may help your answer).
