



**FAIRFAX COUNTY FIRE AND RESCUE DEPARTMENT
STANDARD OPERATING PROCEDURE**

	SUBJECT: FITNESS MEASUREMENT ASSESSMENT PROGRAM	SOP 02.04.01	
		ORIGINATOR BUREAU: Office of the Fire Chief	
		DIVISION/SECTION: Health & Wellness	
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	CATEGORY: Personnel	SUBCATEGORY: Medical and Fitness Standards	
	APPROVED BY:  Fire Chief John S. Butler FIRE AND RESCUE DEPARTMENT		EFFECTIVE DATE: November 15, 2018 REVISION DATE: July 14, 2021 CFAI PI: 7G.1
FORMS REQUIRED: None			

PURPOSE:

The Fitness Measurement Assessment Program (FMAP) assesses uniformed employees' fitness level, through body weight exercises and body composition analysis.

I. POLICY

The Fitness Measurement Assessments (FMA) are administered to uniformed employees and operational volunteer firefighters during the annual physical. Additionally, FMA may be administered as part of a fitness for duty, return to work, or at the recommendation of an immediate supervisor through chain of command.

Full participation is mandatory by all uniformed personnel. Employees who decline to participate in any of the four components shall be referred to Public Safety Occupational Health Center (PSOHC) staff for further medical evaluation.

II. PROCEDURES

A. Overview

The FMA is comprised of four individual components: pull-ups, curl-ups, push-ups, and step-ups. Participation in each component is mandatory. Performance in each component is scored and summed to an overall fitness score. The overall fitness score places the employee in one of three fitness tiers:

1. **Tier 1:** Exceeds Standard.
2. **Tier 2:** Meets Standard.
3. **Tier 3:** Does Not Meet Standard.

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Employees who score in Tier 3: Does Not Meet Standard, who do not finish the step-up component, or who fail the step-up component shall be referred to PSOHC staff for further medical evaluation, to include but not limited to, a treadmill test, doctor consult, and behavioral health consult.

B. Administration

FMA components shall be administered in the following order:

1. **Pull-ups** – As many as possible, no time limit.
 - a. Up to two-minute rest interval.
2. **Curl-ups** – As many as possible within one minute.
 - a. Up to two-minute rest interval.
3. **Push-ups** – As many as possible within one minute.
 - a. Up to three-minute rest interval.
4. **Step-ups** – Three minutes.

C. Pull-up

1. Participant begins from a hanging position with arms fully extended.
2. Participants may use overhand or underhand grip.
3. Pull elbows down and through the body to bring chin above the bar. Once chin is above the bar, participant lowers, under control, back to the starting position with arms locked out. This is one repetition.
 - a. The following behaviors will result in an invalid repetition and will not be included in the participant's final score:
 - i. Kipping.
 - ii. Swinging.
 - iii. Butterflywing.
 - iv. Not fully extending arms at starting/ending position.
 - v. Not getting chin above bar.

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4. The evaluation ends when participant releases grip on the pull-up bar.
5. If the participant is unable to complete a pull-up, a maximum hang timed event shall be attempted to establish a benchmark for improvement. A chin hang or dead hang is not equivalent to pull-ups, but it does establish a baseline to evaluate and trend progress.
 - a. Duration – n/a.

D. Curl-ups

1. Participant lies down so that the lower back is supported by the AbMat. Place arms across chest, grabbing the opposite shoulder's shirt. Knees are bent with feet supported and braced by weight.
2. Participant raises upper body off the AbMat, touching elbows to knees.
3. Participant returns, controlled, to the AbMat, back touching counting pad. This is one repetition.
 - a. Duration – One minute.
 - b. The following behaviors will result in an invalid repetition and will not be included in the participant's final score:
 - i. Letting go of shirt at any point during exercise.
 - ii. Glute muscles do not stay in contact with floor throughout exercise.

E. Push-ups

1. Participant places hands slightly wider than shoulder width apart, with fingers pointing forward. Feet may be together or slightly apart.
2. Starting from a high plank position, lower body until upper arms are parallel to the ground in the down position, chest touching counting pad, return to high plank position. In the high plank position elbows must be extended and locked out. This is one repetition.
 - a. Duration – One minute.

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b. Evaluation ends if participant does the following:

- i. Knees touching the floor.
- ii. Unable to push off floor or counting pad.

F. Step-ups

1. The participant begins with both feet on the ground in front of the 16.25” box. The assessment starts when the participant places one foot at a time onto the box stepping up with the second foot, then returning to the starting position one foot at a time.
 - a. All steps taken must be to cadence, including steps onto the box and steps off box.
 - b. Time starts when the participant places their foot on the box.
2. The metronome cadence count is 88 beats per minute (bpm) for females and 96 bpm for males.
3. If the participant cannot keep up with the cadence, they will be provided up to three warnings. If the participant cannot maintain the prescribed cadence after three warnings, the assessment will be stopped, and time recorded. *This is an automatic failure of the FMA.*
4. At the end of three minutes, the participant’s heart rate will be assessed at 15 seconds and entered into the equation for [estimated VO₂ max](#).
 - a. Men: $VO_2 \text{ max} = 111.33 - (0.42 \times \text{Heart Rate [HR]})$.
 - b. Women: $VO_2 \text{ max} = 65.81 - (0.1847 \times \text{HR})$.
 - c. Duration – Three minutes.
 - d. The following behaviors will result in a failure:
 - i. Inability to maintain cadence after three warnings: 88 bpm for women, 96 bpm for men.
 - ii. Stumbling/kicking the box attempting to step-up more than three times.
 - iii. Stopping before end of three minutes.

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G. Components and Scoring

Each of the four FMA components (pull-ups, curl-ups, push-ups, step-ups) scores (excellent, good, above average, average, fair, below average, poor, and very poor) are given a numeric value from zero to six. The numeric value for each component is weighted.

1. Pull-up: 15%

2. Curl-up: 10%

3. Push-up: 35%

4. Step-up: 40%

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COMPONENT CATEGORY	COMPONENT NUMERIC VALUE
Excellent	6
Good	5
Above Average	4
Average/Fair	3
Below Average	2
Poor	1
Very Poor	0

5. Component weighted scores are summed to achieve an overall fitness score between zero and six.

a. Pull-up score + Curl-up score + Push-up score + Step-up score = Overall Fitness score.

6. The overall fitness score is banded into three fitness tiers:

a. **Tier 1 (> 4.0-6.0) – Exceeds Standard**

b. **Tier 2 (> 2.0-4.0) – Meets Standard**

c. **Tier 3 (0.0-2.0) – Does Not Meet Standard**

Example 1

Component	Category	Numeric Value	Weighted Score Calculation	Overall Fitness Tier
Pull-Up	Poor	1	1 x 15% = 0.15	Exceeds Standard
Curl-Up	Excellent	6	6 x 10% = 0.6	
Push-Up	Good	5	5 x 35% = 1.75	
Step-Up	Good	5	5 x 40% = 2.00	
Overall Fitness Score			4.5	

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Example 2

Component	Category	Numeric Value	Weighted Score Calculation	Overall Fitness Tier
Pull-Up	Very Poor	0	0 x 15% = 0.00	Meets Standard
Curl-Up	Poor	1	1 x 10% = 0.1	
Push-Up	Fair	3	3 x 35% = 1.05	
Step-Up	Good	5	5 x 40% = 2.00	
Overall Fitness Score			3.15	

Example 3

Component	Category	Numeric Value	Weighted Score Calculation	Overall Fitness Tier
Pull-Up	Very Poor	0	0 x 15% = 0.00	Does Not Meet Standard
Curl-Up	Good	5	5 x 10% = 0.5	
Push-Up	Fair	3	3 x 35% = 0.35	
Step-Up	Average	2	2 x 40% = 0.80	
Overall Fitness Score			1.65	

Example 4

Component	Category	Numeric Value	Weighted Score Calculation	Overall Fitness Tier
Pull-Up	Fair	3	3 x 15% = 0.45	Does Not Meet Standard: Fail Step-Up
Curl-Up	Good	5	5 x 10% = 0.5	
Push-Up	Fair	3	3 x 35% = 1.05	
Step-Up	Below Average	2	2 x 40% = 0.80	
Overall Fitness Score			2.8	

H. [FMA Results](#)

Employees meeting any of the following criteria will be referred to a treadmill test, PSOHC doctor consult, and behavioral health consult:

1. **Tier 3** – Does Not Meet Standard.
2. Does not finish the step-up assessment.
3. Fails the step-up assessment.

Performance on the treadmill test is the determining factor for whether the employee will be placed in an In-station Fitness Improvement Plan (FIP), or a light duty FIP.

1. ≥ 10 METs: [In-station FIP](#).
2. < 10 METs: [Light Duty FIP](#).