

Development and Implementation of a Hybrid Pushup / Pullup Test on the Marine Corps Physical Fitness Test

**Symposium on Integration of Women
Into Ground Combat Units
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Agenda

- Purpose / Endstate / BLUF
- Hybrid Pushup / Pullup Test Background, Development and Implementation
- 2017-2018 Data
- Promotion Effects



Purpose / End state / BLUF

- Purpose: TECOM provides Symposium on Integration of Women Into Ground Combat Units attendees an overview on the development and implementation of a hybrid pushup / pullup test on the Marine Corps Physical Fitness Test (PFT)
- End state: Symposium attendees understands test development methodology, trends, and way ahead.
- BLUF: Implementation of a hybrid pushup / pullup test on the Marine Corps PFT has enhanced the testing, training and physical capacity of Marines.



Physical Fitness Test (PFT)

Overview

The PFT is designed to measure general fitness. It is specifically designed to test the capacity of the upper body, midsection, and lower body, as well as efficiency of the cardiovascular and respiratory system. It is not intended to assess mission or occupationally specific fitness demands. Est. 1972.

Events

- Hybrid Pull-up/ Push-up test (Max points for pushups is 70 pts)
- Abdominal Crunch
- 3 Mile Run /5,000 meter (5K) row

PFT Administration:

- Conducted annually for all Marines regardless of age, gender, grade or duty assignment between 1 January and 31 December
- Events conducted while wearing green-on-green T-shirt, shorts, and running shoes. The green-on-green sweat suit/ running suit with watch cap and gloves may be worn.
- Marines aged 46 years of age and older have the option of the 5K Row as an alternative event for the three mile run. Marines 45 and under may row in lieu of running if recommended by a health care provider and approved by their Commanding Officer.
- Gender-neutral events; gender and age-normed scoring
- Reported on personnel evaluations
- PFT performance linked to body composition program decisions



Combat Fitness Test (CFT)

Overview

The CFT, as a complement to the Physical Fitness Test, measures functional elements of fitness through the execution of a series of events that emphasizes our ethos of "Every Marine a rifleman." Est. 2009.

Events

- Movement to Contact (880 yd run)
- Ammo Lift (two minute repetitive lift of 30 lb. ammo can from shoulder to overhead)
- Maneuver Under Fire (MANUF) (300 yd shuttle run that includes crawls, sprints, fireman's carry, simulated grenade throw, and ammo can carry)

CFT Administration:

- Conducted annually for all Marines regardless of age, gender, grade or duty assignment between 1 July and 31 December
- Events conducted while wearing the seasonal utility uniform and boots
- No less than five minutes rest between events
- On MANUF, individuals paired based on their weight (within 10lb.) for fireman's carry portion
- Gender-neutral events; gender and age-normed scoring
- Reported on personnel evaluations
- CFT performance linked to body composition program decisions

History of Marine Corps Physical Fitness Testing

1775-1908	No evidence of Physical Fitness Test policy	
1909-1917	President Roosevelt Executive Order	Line Officers - 50 mi walk / Staff Officers - 90 mi horseback ride Conducted over 3 consecutive days
1918-1955	Walk/Ride suspended due to WWI. No evidence of PFT policy during this period	
1956-1959	LtCol or below or <40 yrs	Chin ups (3 min), Pushups, Situps, 1 min squat thrusts, Broad jump, 50yd Duck Waddle, 880yd run for 30-40yrs (no time limit), 440yd run for <30yrs (<75 sec)
1960-1968	All ranks <40 yrs	Step Test, 20' Rope Climb, Fireman's Carry, Fire/Maneuver, 3mi Forced March
1969-1971	Males <46 yrs: Tested on 5 of 9 events in (1 from each group, no advance notice on test events) Group I- Pullups, Pushups or 20' Rope Climb, Group II-Situps or Leg Lifts, Group III-Squat Thrusts, Group IV-Broad Jump or Vertical Jump, Group V-3mi Run	Boots/ Utes, weapon, light marching pack
1972-1974	Males <46 yrs: Semi-annual PFT: Pullups, Situps, 3mi Run (Shorts, shirt, athletic shoes)	Females <35 yrs: Shorts, shirt athletic shoes 120' shuttle run, Vertical Jump, Knee pushups, 600 yd run/walk, Situps
1975-1995	Males: No change	Females <46 yrs: Semi-annual PFT: Flexed Arm Hang, Situps, 1.5mi Run (Shorts, shirt, athletic shoes)
1996	Males: Deadhang Pull-up (no kipping)	Females: run increased to 3mi
1997-2006	All Marines (regardless of age) take PFT, Situps changed to Crunches, Altitude adjusted run scoring	
2007-2008	MCMAP Tan Belt minimum requirement for all Marines	
2009-2012	PFT changed to annual requirement, Annual Combat Fitness Test introduced: 880yd Movement to contact, Ammo Can Lift, 300yd Maneuver under fire (all in Boots and Utes)	
2013	Males: No change	Females: Phase 1 of PFT Pull-up implementation
2017	Gender Neutral Events, Revised standards for all events, Pull-up/Push-Up Hybrid Test/ Alt Rowing Test (5K row) for Marines ≥ 46 y/o	
2018	Row as alternative event for all age groups if temporarily unable to run and cleared by Physician	



Background

- Pullups implemented for males in 1956
- Flexed Arm Hang implemented for females in 1974
 - Oral history suggests for “optical” reasons (female event on a pullup bar)
 - Several studies show FAH inadequately tests dynamic upper body strength
- 2010 SgtsMaj Symposium recommended study to determine alternative to FAH; CMC approved
- 2011 study: Female pullup average was 1.63 (current avg. for recruits is 3)
 - n=318, TECOM/TRNGCMD permanent personnel
 - A hybrid test was recommended vs. pullup-only test
- Issue dormant until 2012 EOS. At 2012 EOS, CMC directed pullup-only test (3 min, 8 max) to begin in CY14 (females given option to do pullups or FAH in CY 13)
- Implementation delayed to CY15, then again to CY16
- CMC decision in 2016 to implement hybrid test beginning 2017



Rationale for Hybrid Test

- Dynamic upper body strength is important for the Marine Corps
- The FAH is a poor test of this strength and training for it elicits no functional strength benefits
- Transitioning to a pullup-only test for all Marines now would have negative recruiting and retention effects
- The Service Academies currently utilize a hybrid pullup / FAH test to assess prospective female cadets and midshipmen prior to admission
- Implementing a hybrid test would:
 - Incentivize upper body strength training and allow for enhanced assessment of dynamic upper body strength
 - Blunt the negative recruiting and retention effects a pullup-only test would have
 - Offer Marines an option between pushups and pullups
 - Make all events in the USMC PFT and CFT battery gender neutral



Female Pushup / Pullup Hybrid Scoring

Reps	17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Pull-ups								
10			100					
9		100	96	100				
8		95	91	95	100			
7	100	90	87	90	94			
6	94	85	83	85	89	100		
5	87	81	78	81	83	92		
4	81	76	74	76	78	84	100	
3	74	71	70	71	72	77	87	100
2	68	66	65	66	67	69	74	81
1	60	60	60	60	60	60	60	60
Push-ups								
50			70					
49			69					
48		70	68					
47		69	67					
46		68	66	70				
45		67	65	69				
44		66	64	68				
43		65	63	67	70			
42	70	64	63	66	69			
41	69	63	62	65	68	70		
40	67	62	61	64	67	69	70	
39	66	61	60	63	66	68	69	
38	65	60	59	62	65	67	68	70
37	63	59	58	61	64	66	67	69
36	62	58	57	60	63	65	66	68
Push-ups								
19	40	41	41	43	45	47	48	50
18		40	40	42	44	46	47	49
17				41	43	45	46	48
16				40	42	44	45	46
15					41	43	44	45
14					40	42	43	44
13						41	42	43
12						40	41	42
11							40	41
10								40

- Marines may choose pushups or pullups
- Pushup points max out at 70
- 2 minute time limit for Pushup execution



Male Pushup / Pullup Hybrid Scoring

Reps	17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Pull-ups								
23		100	100	100				
22		97	97	97				
21		94	94	94	100			
20	100	91	91	91	97	100		
19	96	88	88	88	94	96	100	
18	92	85	85	85	90	93	96	100
17	88	82	82	82	87	89	92	95
16	84	79	79	79	84	86	88	90
15	81	76	76	76	81	82	84	85
6	48	43	43	43	44	44	48	52
5	44	40	40	40	40	40	44	48
4	40						40	44
3								40
Push-ups								
87		70						
86		69						
85		69						
84		68	70					
83		67	69					
82	70	67	69					
81	69	66	68					
80	69	66	67	70				
79	68	65	67	69				
78	67	64	66	69				
77	66	64	65	68				
76	66	63	65	67	70			
75	65	62	64	67	69			
72	63	60	62	65	67	70		
68	60	58	59	62	64	67	70	
64	57	55	57	59	61	64	67	70
42	40	41	42	44	46	49	52	55
41		41	41	43	45	48	51	54
40		40	41	43	44	47	50	54
39			40	42	44	46	50	53
36				40	41	44	48	51
35					41	44	47	50
34					40	43	46	50
30						40	43	47
25							40	43
20								40

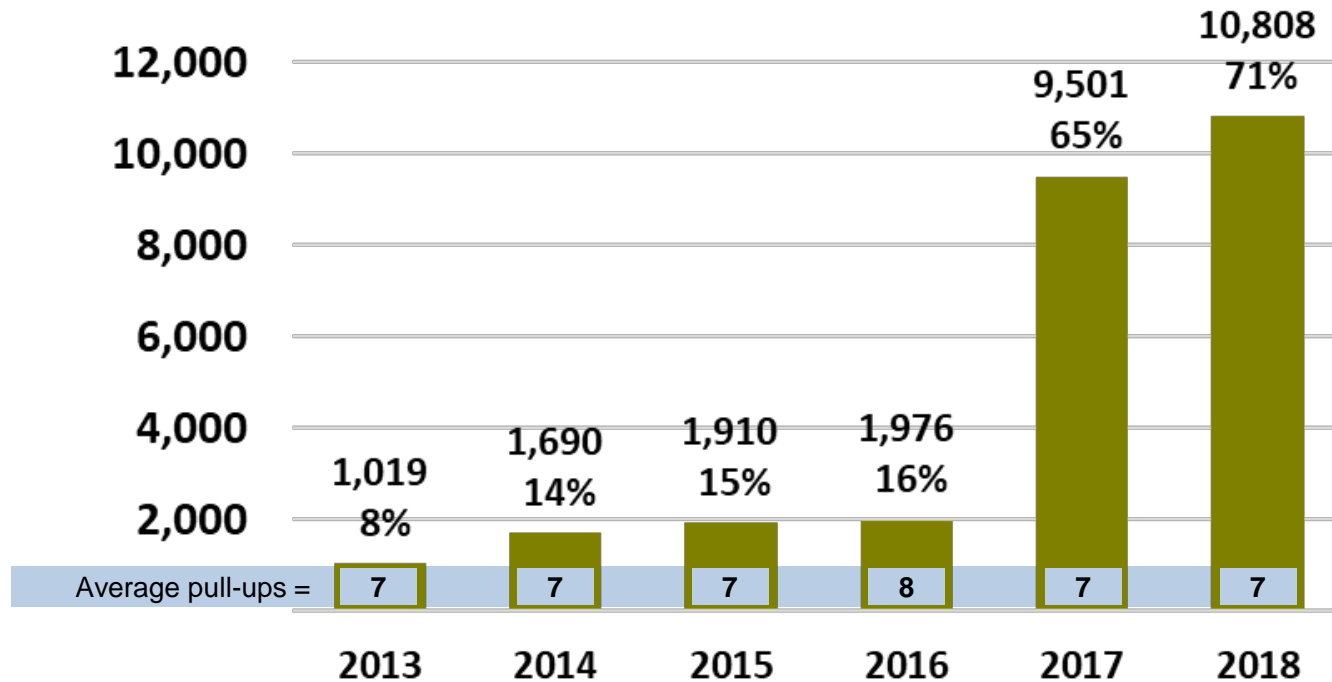
- Marines may choose pushups or pullups
- Pushup points max out at 70
- 2 minute time limit for Pushup execution



Female Marine Pullups

Number of Female Marines Electing Pullups on PFT 2013-2018*

As of 2 Jan 2019

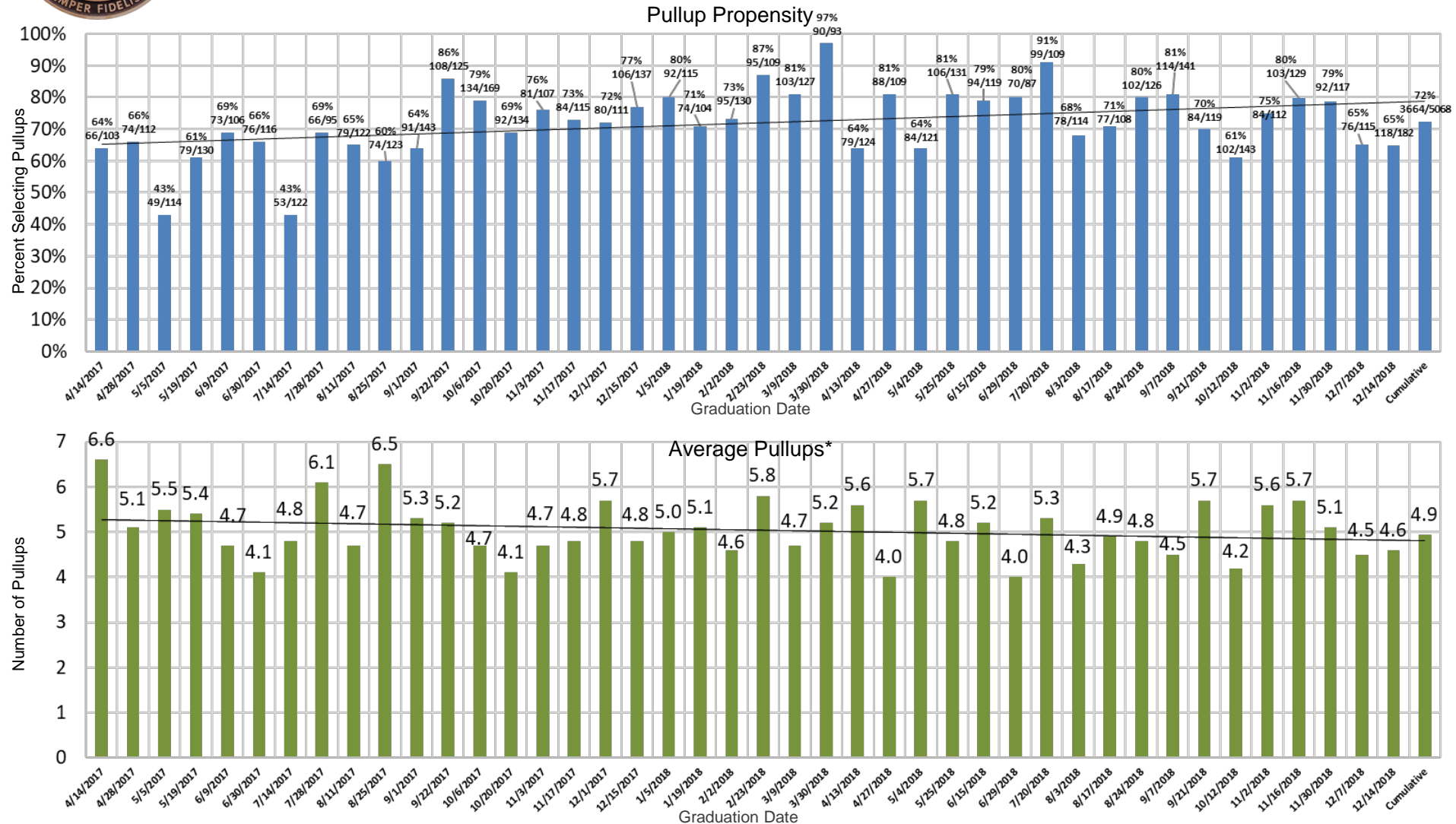


- * From 2013-2016, Female Marines had the option of doing the Flexed Arm Hang (FAH) or Pullups on the PFT.
 - Both events offered a pathway to 100 pts on the event (FAH max=70 secs, Pull-up max=8 reps).
 - Most Female Marines in these years who elected Pullups were those who knew they could do ≥ 8 pull-ups since 100 pts was available on the easier FAH event.
 - In 2018, Female Marine pullup propensity continues to increase with average remaining consistent.
 - Entry Level Training pullup propensity for females in Entry Level Training in 2017 ranges from >95% in OCS/TBS to 71% in recruit training.



Female Recruits Apr 2017- Dec 2018

(Pullup Propensity and Average Pullups)



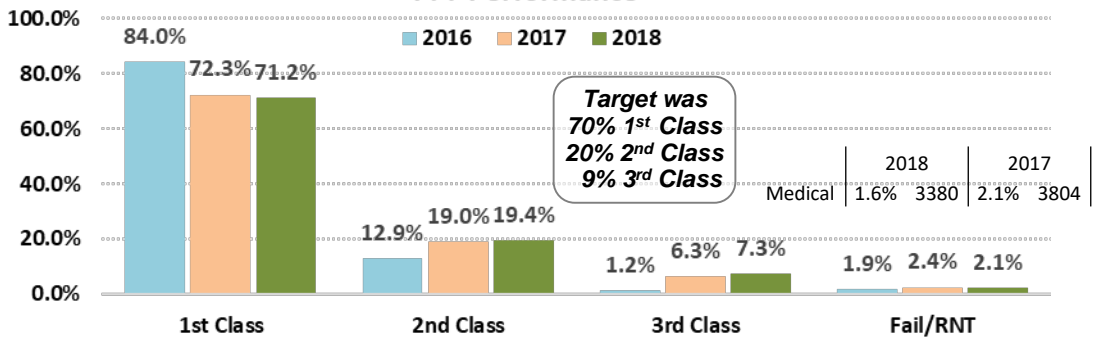
*Flat average pullup curve not a concern in light of rising female recruit pullup propensity.

For OCS and TBS, there is >95% pullup propensity with overall average 7-8



2018 Total Force PFT Data

PFT Performance



Average Performance when choosing pull-ups or push-ups As of 2 Jan 2019

		Average
Male	Pushups	203.2
	Pullups	249.3
Female	Pushups	214.2
	Pullups	255.1

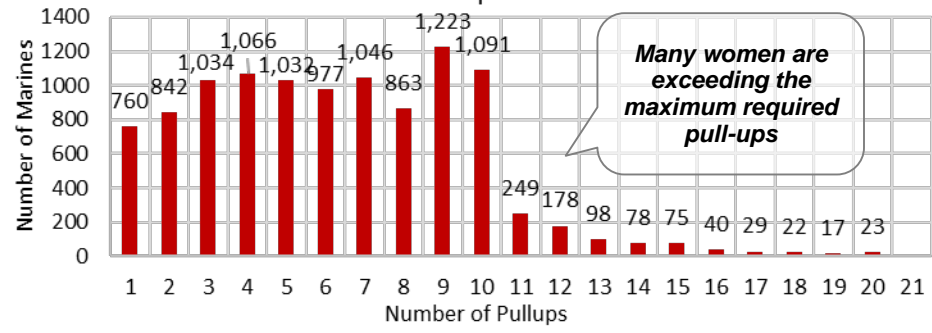
Average PFT scores are where we expected them to be

Pushup/Pullup Preference

	Pushups		Pullups	
	2017	2018	2017	2018
Male	5.0%	2.3%	95.0%	97.7%
Female	35.0%	28.7%	65.0%	71.3%

Both males and females are opting for pull-ups at a greater rate than last year

Female Pullup Distribution



Many women are exceeding the maximum required pull-ups

Performance of 46+ Age Group

	Average	
	2017	2018
Run	249.2	252.1
Row	264.4	257.1

PFT scores with rowing and running now are comparable

No significant differences in average score from last year

Average Score by Age and Gender

		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+	All ages
Male	2018	246	247	252	254	253	251	253	256	249
	2017	251	247	252	253	252	250	253	257	249
Female	2018	237	242	252	252	253	254	255	248	244
	2017	238	246	252	254	251	254	253	264	246



2019 Changes

2018 Female Pull-ups

		Female Pullups							
		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Max		7	9	10	9	8	6	4	3
Min		1	1	1	1	1	1	1	1
Min Pts		60	60	60	60	60	60	60	60
Reps		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
10				100					
9			100	96	100				
8			95	91	95	100			
7		100	90	87	90	94			
6		93	85	82	85	89	100		
5		87	80	78	80	83	92		
4		80	75	73	75	77	84	100	
3		73	70	69	70	71	76	87	100
2		67	65	64	65	66	68	73	80
1		60	60	60	60	60	60	60	60

2018 Female Push-ups

		Female Push-ups							
		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Max		42	48	50	46	43	41	40	38
Min		19	18	18	16	14	12	11	10
Min Pts		40	40	40	40	40	40	40	40
Max Pts		70	70	70	70	70	70	70	70
Reps		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
50				70					
49				69					
48			70	68					
47			69	67					
46			68	66	70				
45			67	65	69				
44			66	64	68				
43			65	63	67	70			
42		70	64	63	66	69			
41		69	63	62	65	68	70		
40		67	62	61	64	67	69	70	
39		66	61	60	63	66	68	69	
38		65	60	59	62	65	67	68	70
21		43	43	43	45	47	49	50	52
20		41	42	42	44	46	48	49	51
19		40	41	41	43	45	47	48	50
18			40	40	42	44	46	47	49
17					41	43	45	46	48
16					40	42	44	45	46
15						41	43	44	45
14						40	42	43	44
13							41	42	43
12							40	41	42
11								40	41
10									40

2019 Female Pull-ups (increase)

		Female Pullups							
		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Max		7	11	12	11	10	8	6	4
Min		1	3	4	3	3	2	2	2
Max		100	100	100	100	100	100	100	100
Min Pts		60	60	60	60	60	60	60	60
Reps		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
12				100					
11			100	95	100				
10			95	90	95	100			
9			90	85	90	94			
8			85	80	85	89	100		
7		100	80	75	80	83	93		
6		93	75	70	75	77	87	100	
5		87	70	65	70	71	80	90	
4		80	65	60	65	66	73	80	100
3		73	60		60	60	67	70	80
2		67					60	60	60
1		60							

2019 Female Push-ups (no change)

		Female Push-ups							
		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
Max		42	48	50	46	43	41	40	38
Min		19	18	18	16	14	12	11	10
Min Pts		40	40	40	40	40	40	40	40
Max Pts		70	70	70	70	70	70	70	70
Reps		17-20	21-25	26-30	31-35	36-40	41-45	46-50	51+
50				70					
49				69					
48			70	68					
47			69	67					
46			68	66	70				
45			67	65	69				
44			66	64	68				
43			65	63	67	70			
42		70	64	63	66	69			
41		69	63	62	65	68	70		
40		67	62	61	64	67	69	70	
39		66	61	60	63	66	68	69	
38		65	60	59	62	65	67	68	70
21		43	43	43	45	47	49	50	52
20		41	42	42	44	46	48	49	51
19		40	41	41	43	45	47	48	50
18			40	40	42	44	46	47	49
17					41	43	45	46	48
16					40	42	44	45	46
15						41	43	44	45
14						40	42	43	44
13							41	42	43
12								40	41
11									40
10									40



Promotion Effects

Promotion Timing*		
E3 to E4		
	Male	Female
2016	2.7*	2.5
2017	2.6	2.4
2018**	2.6	2.4
E4 to E5		
2016	4.1	3.9
2017	4.1	3.8
2018	4.0	3.8
*The first month any PFT effects would have been noticed is April 2017. Time periods are April through September of each year.		
**Average Time in Service (years) at promotion April through July		
MRA/TECOM will continue to monitor effects of PFT changes on promotion timing		

PFT and CFT changes do not appear to have negatively impacted promotion timing for junior enlisted Marines– even with the disparity in female 1st class in the youngest age group

Though the 1st Class male/female difference is 16.8%, the actual difference in the average PFT score in the 17-20 age group is 12.7 points (4.2%). This is unlikely to have any effect on Composite Score.

Effects of PFT Changes on E6 and above difficult to assess due to varying board emphases on PFT scores

TECOM has been providing monthly PFT data updates to Promotion Branch



PFT Change linkage to Integration

- Pullups have a strong correlation to performance on physically demanding tasks
 - TECOM/Naval Health Research Center study, reviewed by RAND/University of Pittsburgh. In this study, the FAH had the weakest correlation to physically demanding tasks
 - Findings match civilian research
- PFT change will cause behavior changes (enhanced strength training) that will benefit female Marines' overall health and occupational fitness
- Pullups as part of the Initial Strength Test / MOS Classification Standards will ensure an individual desiring a previously closed, physically demanding MOS will have a baseline level of upper body strength using an evidence-based measure



Questions?

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