



European Fitness Monitoring System (EUFITMOS)

Fitness Assessment Course

Unit 1. Progressive Aerobic Cardiovascular Endurance Run (PACER)



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Unit 1. Progressive Aerobic Cardiovascular Endurance Run (PACER)



1.1. PACER test

The Progressive Aerobic Cardiovascular Endurance Run (PACER) is a multistage shuttle run test. The PACER is designed to measure cardiorespiratory fitness. The objective of the PACER aimed to run as long as possible while keeping a specified pace. Adolescents run back and forth across a 20-meter space. The test progressively gets more difficult as it continues. A point is scored for each 20-meter distance covered. The test is easier in the beginning but progressively gets more difficult.

The test is suitable for sports teams and school groups of all ages, but not for people in which a maximal exercise test could be dangerous.

1.2. Preparation (what do we need?)

1. Space

- 20 meters of open space
- Flat non-slip surface

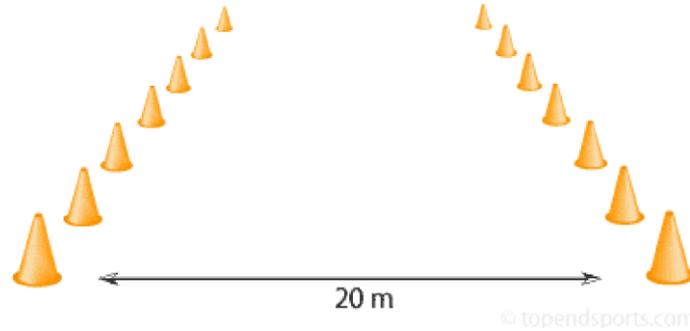
2. Material

- Marking cones
- Measuring tape
- PACER test music
- CD player
- Recording sheets



3. Organization

Use cones or tape to mark two parallel lines, 20 meters apart.



Divide students into small groups or pairs. One will perform the test and the other one will count the number of laps his/her colleague.

1.3. Application

1. Make sure that the 20-meter course is marked with and each of the lanes is divided.
2. Divide students into 2 groups. Students in each group must have a partner in the other group. Thus, while one student is doing the other student is counting the number of laps.
3. Ensure that there are enough pencils or pens and copies of either the group administration score sheets.
4. Ensure that the audio system is working properly.
5. Before the test starts, review the PACER instructions with the students.
6. Instruct the first group of students to stand at the start line and alert the other group to count the laps accurately.
7. Begin the audio. This signifies that the test has begun, and the students should be running. Walking is permitted as long as the student maintains the pace.
8. Students will run from the start line to the end line and touch the end line with their foot before the beep sounds.
9. At the sound of the beep, the students must turn around and run back to the other end. If students reach the line before the beep sounds, they must wait at the line until they hear the beep and then run back to the other end.
10. Students continue running back and forth from the start line to the end line. If the students fail to reach the line by the time the beep sounds, then that is counted as a miss. If a student has achieved two misses, then they have completed the PACER.

1.4. Results

Scoring

Usually, this test is performed in groups, enabling several participants to be tested at once. If the participants are capable of scoring, they score each other in pairs.

The scorer stands where the runner's touching of the lines is visible and crosses a number on the PACER sheet every time the runner completes a lap. If the runner fails to reach the line before the sound signal, a circle is placed around the lap number, marking it as a foul. If two fouls are marked, the test ends.



The last crossed lap is considered the final score.

The recorded number of laps should be converted to VO₂max (Saint-Maurice et al., 2015) and compared to the sex and age-specific health-related reference values.

Age	VO ₂ peak (ml/kg/min)	
	Healthy fitness zone (≥)	
	Girls	Boys
9	40.2	40.2
10	40.2	40.2
11	40.2	40.2
12	40.1	40.3
13	39.7	41.1
14	39.4	42.5
15	39.1	43.6
16	38.9	44.1
17	38.8	44.2
18+	38.6	44.3

1.5. Quiz

1. When should a student stop doing the PACER test?
2. When should someone start running in the opposite direction?



References

Main resources

Saint-Maurice, P. F., Welk, G. J., Finn, K. J., & Kaj, M. (2015). Cross-Validation of a PACER Prediction Equation for Assessing Aerobic Capacity in Hungarian Youth. *Research Quarterly for Exercise and Sport*, 86 (Suppl. 1), S66-73. <https://doi.org/10.1080/02701367.2015.1043002>