

# Curl-Up

⇒ *Recommended*

This section provides information on the curl-up assessment used in *FITNESSGRAM*. The curl-up with knees flexed and feet unanchored has been selected because individually these elements have been shown to a) decrease movement of the fifth lumbar vertebra over the sacral vertebrae, b) minimize the activation of the hip flexors, c) increase the activation of the external and internal obliques and transverse abdominals, and d) maximize abdominal muscle activation of the lower and upper rectus abdominals relative to disc compression (load) when compared with a variety of sit-ups.

Few results are available on the consistency and accuracy of the curl-up. Reliability is higher for college students than for children but the values are acceptable for this type of assessment. Determination of validity has been hampered by the lack of an established criterion measure. Anatomical analysis and electromyographical documentation provide the primary support for the use of the curl-up test to determine abdominal strength and endurance.

## Test Objective

To complete as many curl-ups as possible up to a maximum of 75 at a specified pace.

## Equipment and Facilities

Gym mats and a measuring strip for every two students are needed. The measuring strip may be made of cardboard, rubber, smooth wood, or any similar thin, flat material and should be 30 to 35 inches long. Two widths of measuring strip may be needed. The narrower strip should be 3 inches wide and is used to test 5- to 9-year-olds; for older students the strip should be 4.5 inches wide. Other methods of measuring distance such as using tape strips and pencils are suggested in appendix A.

## Test Instructions

Allow students to select a partner. Partner A will perform the curl-ups while partner B counts and watches for form errors.

Partner A lies in a supine position on the mat, knees bent at an angle of approximately 140°, feet flat on the floor, legs slightly apart, arms straight and

parallel to the trunk with palms of hands resting on the mat. The fingers are stretched out and the head is in contact with the mat. Make sure students have extended their feet as far as possible from the buttocks while still allowing feet to remain flat on floor.

The closer the feet are positioned in relation to the buttocks, the more difficult the movement.

After partner A has assumed the correct position on the mat, partner B places a measuring strip on the mat under partner A's legs so that partner A's fingertips are just resting on the nearest edge of the measuring strip (photo 7.1). Partner B then kneels down at partner A's head in a position to count curl-ups and watch for form breaks. Partner B places a piece of paper under partner A's head. The paper will assist partner B in judging if partner A's head touches down on each repetition (photo 7.2). The observer should watch for the paper to crinkle each time partner A touches it with his or her head.

Before beginning the curl-up, it is a good practice for partner B to pull on partner A's hands to ensure that the shoulders are relaxed and in a normal resting position. If partner A is allowed to hunch the shoulders before beginning the test, he or she may be able to get the fingertips to the other side of the testing strip by merely moving the arms and shoulders up and down. Keeping heels in contact with the mat, partner A curls up slowly, sliding fingers across the measuring strip until fingertips reach the other side (photo 7.3, a and b); then partner A curls back down until his or her head touches the piece of paper on the mat. Movement should be slow and gauged to the specified cadence of about 20 curl-ups per minute (1 curl every 3 seconds). The teacher should call a cadence or use a prerecorded cadence. A recorded cadence may be found on the PACER music tape or CD. Partner A continues without pausing until he or she can no longer continue or has completed 75 curl-ups.

## When to Stop

Students are stopped after completing 75 curl-ups, when the second form correction is made, or when they can no longer continue.

## Form Corrections

- Heels must remain in contact with the mat.
- Head must return to the mat on each repetition.

( continued )

Curl-Up ( continued )



**PHOTO 7.1** Starting position for the curl-up test.



**PHOTO 7.2** Position of the student in the “up” position for the curl-up test.

( continued )

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**PHOTO 7.3** Close-up of the fingertips sliding: (a) starting position and (b) ending position.

- Pauses and rest periods are not allowed. The movement should be continuous and with the cadence.
- Fingertips must touch the far side of the measuring strip.

### Scoring

The score is the number of curl-ups performed. Curl-ups should be counted when the student's head returns to the mat. For ease in administration, it is permissible to count the first incorrect curl-up. It is important to be consistent with all of the students and classes when determining whether or not you will count the first incorrect curl-up.

### Suggestions for Test Administration

- The student being tested should reposition if the body moves so that the head does not contact the mat at the appropriate spot or if the measuring strip is out of position.

- Movement should start with a flattening of the lower back followed by a slow curling of the upper spine.
  - The hands should slide across the measuring strip until the fingertips reach the opposite side (3 or 4.5 inches) and then return to the supine position. The movement is completed when the back of the head touches the paper placed on mat.
  - The cadence will encourage a steady, continuous movement done in the correct form.
  - Students should not forcibly “reach” with their arms and hands but simply let the arms passively move along the floor in response to the action of the trunk and shoulders. Any jerking, tipping, or reaching motion will cause the students to constantly move out of position. When students first begin to use this test item, many will want to “reach” with their arms and hands, especially if they have previously done a timed sit-up test.
  - This curl-up protocol is quite different from the one-minute sit-up. Students will need to learn how to correctly perform this curl-up movement and be allowed time to practice.