



USING A NUMERICAL SCALE TO KNOW HOW HARD YOU ARE EXERCISING

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YOUNG REVIEWERS:



ANTHONY

AGE: 11



CAROLINE

AGE: 15



CHELSEA

AGE: 14



ELLA

AGE: 14



OLIVIA

AGE: 9

Have you ever wanted to be able to rate how hard you feel like your exercise was? You can, if you use the Rating of Perceived Exertion (RPE) scale. The RPE scale can be used whenever you are engaging in physical activity. RPE allows you to check in with yourself to see how you are feeling when you exercise. It can be used to intensify the activity if it is too easy or to take a step back if you are working too hard. Being able to judge how hard you are working is important for your fitness. Do you want to learn more about how to use RPE while you are exercising? Keep reading for more information and some activities!

WHAT IS RPE?

The Rate of Perceived Exertion (RPE) is a scale used to determine how hard people think they are working when they exercise. The RPE scale

is often used in research, when the researcher wants to know how the participant is feeling during the activity they are completing. RPE is also used by people who like to work out at a certain intensity in the gym, for example. RPE allows users to understand the differences between their minds' and our bodies' responses to the activities they are doing. The researcher that first established the RPE scale is Dr. Gunnar Borg.

When we exercise, our bodies react by, for example, increasing heart rate and sweat rate. Also, our muscles can start to get sore. The harder the activity, the more people's bodies react to the activity [1]. People can use RPE to help figure out how they truly feel during an activity. RPE measures our perception of the exercise—as you may know, your perception of the world and of your activities make up your own reality. If you are not feeling well one day, an activity that may not usually be very hard or intense may feel very difficult. Another time, you may not feel as though an activity is very hard when it is truly a difficult task. People can use RPE to adjust their exercise so that it is based off their feelings for the day, muscle soreness, how much sleep they got the previous night, or other factors that might hinder performance—instead of just using the body's response or the exercise routine they originally had planned for that day.

When people use RPE in either a research or a gym setting, the purpose is to use their experiences of effort, tiredness, and muscle soreness. All these combined determine the number given based on the RPE scale. There are two slightly different RPE scales: the classic Borg RPE scale (with scores of 6–20) and the Borg CR10 Scale (with scores of 0–10; [Figure 1](#)) [2]. The RPE scale has helpful descriptors by the numbers, so the user can read what they should be experiencing at that number. When using the 6–20 RPE scale, it is useful for users to know their heart rates, so they can see if their perceived exertion matches to how hard their hearts are working. Each scale has a specific use, but they can be used interchangeably if needed.

USING RPE IN AEROBIC PHYSICAL ACTIVITY

The best time to use the 6–20 RPE scale is when doing **aerobic physical activity**. Aerobic activities could include running, bike riding, playing field sports, swimming, or even dancing. You might be wondering why the scale starts at 6 and not 1 or 0 like a more traditional scale. Well, the 6–20 RPE scale is used for aerobic activities because it is a better indicator of a person's heart rate range. The scale correlates to heart rate because, generally, a normal resting heart rate is around 60 beats per minute. This means that within 1 min of time, on average, the heart will beat about 60 times. The scale goes up to 20 because, on average, when a person is participating in super challenging activities, the heart could beat about 200 times in 1 min, depending on the activity and person's level of fitness.

AEROBIC PHYSICAL ACTIVITIES

Activities that increase your heart rate and make you breathe faster, like running, jumping, walking, biking, swimming, dancing, and jumping rope.

Figure 1

There are two slightly different versions of the RPE scale: the classic Borg scale (**right**) and the Borg CR10 scale (**left**). Each effort level has a description so users know what they should be experiencing [3].

1-10 SCALE		BORG SCALE
10	ALL-OUT SPRINT The maximum possible effort, sustainable for just 20-30 seconds.	20
9	VERY HARD INTENSITY Hard to speak, breathing labored after a few seconds, requires focus; good for 1-min intervals.	19
8	HARD INTENSITY Requires focus to maintain; hard to say more than 2-3 words; good for Cooper Tests, 5k PRs.	18
7	VIGOROUS ACTIVITY Can speak in short sentences; becomes uncomfortable quickly. Requires constant effort.	17
6	HARD ACTIVITY Labored breathing, challenging and uncomfortable but sustainable for 30-60 mins.	16
5	PROGRESSIVE PACE A pace that requires some pushing and effort to maintain; still able to hold a conversation.	14-15
4	COMFORTABLE WITH SOME EFFORT Slight 'push' but still at a pace which you could speak a few sentences without struggling.	13
3	COMFORTABLE PACE Able to maintain a conversation without getting out of breath while running.	11-12
2	LIGHT AND EASY Non-taxing, very gentle and easy to maintain a conversation - could continue for hours.	10
1	MINIMUM EFFORT Bare minimum exertion; a gentle stroll through the woods. Could continue all day.	6-9

Figure 1

GIVE IT A TRY!

Get out and move: the next time that you are participating in an aerobic-based activity with your friends or family, use the 6–20 RPE scale to rate how hard that activity feels to you, and check your heart rate if you can. This can help you to see if those values relate to each other. Try completing a mile in 30 min your RPE may be a 6 or 7, while completing a mile in 10 min might be a 15 or higher on the RPE scale, depending on your fitness level.

USING RPE IN RESISTANCE PHYSICAL ACTIVITY

The RPE scale that ranges from 1 to 10 is used more traditionally in strength or **resistance physical activities**. This means lifting weights or doing other activities that do not classify as aerobic activities. This scale is a better measure of exertion, or how hard an activity is, instead of trying to measure it using heart rate alone. If you were to use this scale, a 1 would be if you were lifting a weight that you could lift many times without getting tired. A 10 on this scale would represent lifting a weight that you might not be able to lift or could only successfully lift once. This scale could be beneficial for a coach in a gym class, who could ask you what a particular weight felt like, so they could more accurately increase your weight for the next exercises or decrease the weight if it was too heavy.

RESISTANCE PHYSICAL ACTIVITIES

Exercises that can be done with weights like barbells or dumbbells, on gym machines, or using your body weight. Exercises include squats, pushups, lunges, and bench press.

GIVE IT A TRY!

Next time you lift weights, use a 1–10 scale to rate how each set feels. If you are below a 5, consider increasing the weight to work harder and get stronger, depending on your training goals and current fitness level.

WRAPPING IT UP

Checking in with yourself during exercise to assess your RPE is an important skill. It helps people understand how hard they feel they are working during exercise. RPE uses people's feelings of effort, tiredness, and muscle soreness to provide a number from 1–10 or 6–20, depending on the scale used. Aerobic activities like running use the 6–20 scale, matching people's heart rates, while strength activities like weightlifting use the 1–10 scale. You can try using these scales to see how hard different activities feel and adjust your workout based on how you feel each day.

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SUBMITTED: 12 August 2024; **ACCEPTED:** 29 October 2024;
PUBLISHED ONLINE: 14 November 2024.

EDITOR: Viduranga Y. Waisundara, Australian College of Business and Technology, Sri Lanka

SCIENCE MENTORS: Cora J. Burt and Maria Abou Chakra

CITATION: Schumacher BJ, Fleming AR and Kackley ML (2024) Using a Numerical Scale to Know How Hard You Are Exercising. *Front. Young Minds* 12:1436177. doi: 10.3389/frym.2024.1436177

CONFLICT OF INTEREST: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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YOUNG REVIEWERS



ANTHONY, AGE: 11

I am Anthony, I enjoy learning about math and coding languages. I like playing golf, soccer, basketball, strategic boardgames and video games.



CAROLINE, AGE: 15

Caroline is a high school student passionate about STEM, actively pursuing her interests in programming and biology. She regularly attends hackathons to enhance her coding skills and competes in science fairs to gain hands-on lab experience in microbiology. Outside of academics, Caroline plays piano with her school's jazz band, competes with her ultimate Frisbee team, and enjoys spending time with friends in various clubs.



CHELSEA, AGE: 14

Something about myself is that I love being creative, including activities such as reading, writing, and drawing. Science is also of interest to me, which is why I wanted to learn more and do this!



ELLA, AGE: 14

Hello everyone! It is Ella here. When I am bored, you will find me jamming to tunes, whizzing down the track, scribbling some thoughts, or just roaming the streets. I love exploring the outdoors and capturing any beautiful scenes I come across, whether it is a calming scene in a forest or photos of city life. I love meeting creative people, learning about interesting concepts, and creating cool projects.



OLIVIA, AGE: 9

I am Olivia; I like arts, crafts, reading, basketball, and golf. My favorite subjects are math and science. I want to learn about biology. I love the name *Drosophila Melanogaster*!

AUTHORS



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